

Deploying SAP NetWeaver Information Lifecycle Management with Hitachi Content Platform

Implementation Guide

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Feedback

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Implementation Guide

The information created and held within an SAP system is most often very sensitive and vital to any company. SAP systems, when properly maintained, offer businesses a central repository of all business processes configured in an SAP system. This information is stored at the database level and remains there until it is properly archived. This causes expensive ERP resources to be committed to holding data that might be out dated or infrequently accessed. SAP's NetWeaver Information Lifecycle Management (ILM) strategy addresses the total cost of ownership, risk and legal compliance, and planning the steps to define, document and implement policies to govern the archiving of data.

The SAP NetWeaver Information Lifecycle Management solution from SAP includes the following functionalities:

- Data archiving and data management
- Retention management
- Retention warehousing
- System Decommissioning

This solution uses the Hitachi Content Platform as the archive target. The Hitachi Content Platform is a distributed storage system including software and hardware that can be used to support large, growing repositories of fixed-content data. It helps IT organizations address a number of challenges posed by the ever-growing volume of SAP data. Hitachi Content Platform excels at preserving SAP data for long periods of time and enforcing policies governing its placement, retention and eventual disposal. The Hitachi Content Platform is certified by SAP. Whether it is used for legal, compliance, business or IT practices, Hitachi Content Platform employs key technologies, such as data integrity checking, RAID-6, replication, encryption, write once read many (WORM) and audit logging. This ensures that data remains accessible and in its original form for decades and beyond. In addition, SAP NetWeaver ILM makes use of Hitachi Content Platform policy handling. These capabilities make Hitachi Content Platform the ideal tool for handling SAP NetWeaver Information Lifecycle Management challenges.

This white paper describes how to execute the SAP NetWeaver Information Lifecycle Management solution and store the SAP archived data on Hitachi Content Platform solution. It is written for IT professionals who are charged with storage or SAP system deployment or administration. It assumes SAP Basis skills and basic knowledge of SAN concepts.

Tested Solution Components

This solution uses Hitachi Content Platform as an object store for an SAP ABAP instance. For the testing conducted in the Hitachi Data Systems lab, the SAP ABAP instance was configured with sample company data and SAP's NetWeaver Information Lifecycle Management solution.

Note — Use only experienced SAP NetWeaver Information Lifecycle Management consultants to configure the ILM solution according to your organization's policies.

Figure 1 shows the environment used in the Hitachi Data Systems lab to validate this solution.

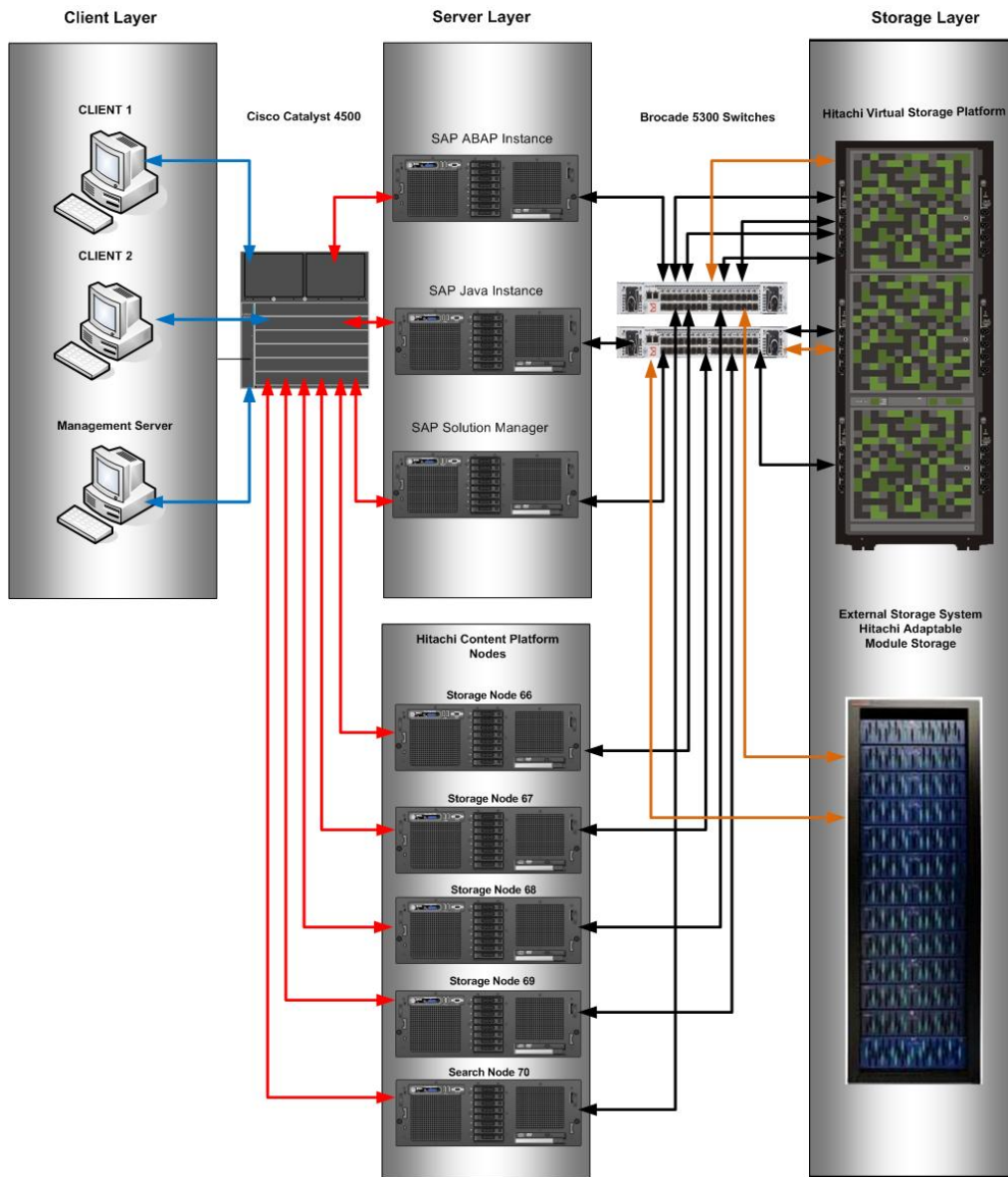


Figure 1

The SAP ABAP instance sends the data to be archived through a remote function call connection to the SAP Java instance. The Java instance immediately sends the data through the WebDAV connection, over Ethernet to the Hitachi Content Platform. For more information about the general SAP ILM architecture, see the [SAP Help](#) documentation.

Both the SAP instances and Hitachi Content Platform nodes store data to the Hitachi Virtual Storage Platform. However all data sent to the Hitachi Content Platform server is stored on external storage. This external storage is a Hitachi Adaptable Modular Storage 2100 system.

Hardware Components

Table 1 describes the hardware used to implement this solution in the Hitachi Data Systems lab.

Table 1. Tested Deployment Hardware

<i>Hardware</i>	<i>Quantity</i>	<i>Configuration</i>	<i>Role</i>
Hitachi Virtual Storage Platform	1	8 Fibre Channel ports used 2 pair of front-end directors 2 pair of back-end directors 64 x 300GB 10K RPM SAS drives 64GB cache 14GB shared memory	Primary storage system
Hitachi Adaptable Modular Storage 2100	1	Firmware version 0883/A-S 2 storage ports used 2 disk trays (RKA) 20 x 500GB 7200RPM SATA drive 2GB cache per controller	External storage system attached to Hitachi Virtual Storage Platform
Brocade 5300 SAN Fibre Channel switch	2	FOS 6.4.0E SAN switch with 8Gbps Fibre Channel ports	SAN switch
Server	1	4 quad core AMD Opteron 1.9GHz processors 64GB memory 2 Emulex LPe11002-MH4 Fibre Channel host bus adapters (HBAs) 4Gb/s	SAP Solution Manager server
Server	1	4 quad core AMD Opteron 1.9GHz processors 64GB memory 2 Emulex LPe11002-MH4 Fibre Channel HBAs 4Gb/s	SAP ERP server for ABAP instance
Server	1	4 quad core AMD Opteron 1.9GHz processors 64GB memory 2 Emulex LPe11002-MH4 Fibre Channel HBAs 4Gb/s	SAP ERP server for Java instance
Hitachi Content Platform server	4	6 dual core Intel Core 2 Xeon X5650 CPU @ 2.67 GHz processor 16GB memory	Hitachi Content Platform data nodes

<i>Hardware</i>	<i>Quantity</i>	<i>Configuration</i>	<i>Role</i>
Hitachi Content Platform server	1	6 dual core Intel Core 2 Xeon X5650 CPU @ 2.67 GHz processor 16GB memory	Hitachi Content Platform search node
Server	2	Intel Pentium 3.0GHz processor 1GB memory	SAP clients
Server	1	Intel Pentium 3.0GHz processor 1GB memory	Management server with access to Hitachi Storage Navigator software and NetBackup Administration Console.

The following sections describe the key hardware components used in this solution.

Hitachi Virtual Storage Platform

The Hitachi Virtual Storage Platform is the industry's only 3D scaling storage platform. With the unique ability to concurrently scale up, scale out and scale deep in a single storage system, the new Virtual Storage Platform flexibly adapts for performance, capacity, connectivity and virtualization. No other enterprise storage platform can dynamically scale in three dimensions. The Virtual Storage Platform provides virtual storage that meets the growing demands of server virtualization.

The trend in server virtualization is to consolidate the I/O workload of many servers onto a single storage system. As more virtual machines are consolidated onto a physical host, storage systems must be able to dynamically add more storage resources to keep up with I/O demand. The 3D scaling capability of the Virtual Storage Platform meets that requirement.

Scaling up allows you to increase virtual server consolidation, improve utilization of resources, and reduce costs. With the Hitachi Virtual Storage Platform, you can increase performance, capacity and connectivity by adding cache, processors, connections and disks to the base system. A virtual server that accesses the storage system can use all these resources, which act as one system managed as a common pool of resources.

Scaling out allows you to meet increasing demands by combining multiple chassis into a single logical system with shared resources. By scaling out, you can support increased resource needs in virtualized server environments.

Scaling deep extends the advanced functions of the Virtual Storage Platform to external multivendor storage. By dynamically virtualizing new and existing storage systems, those systems become part of the Virtual Storage Platform's pool of storage resources. Once virtualized, external data can then be migrated, tiered, replicated and managed by the Virtual Storage Platform. In this manner, older data storage systems can gain a longer useful life. You can extend distance replication for business continuity to lower-cost, lower-function storage systems by virtualizing them behind a Virtual Storage Platform.

The switch matrix architecture of the Virtual Storage Platform makes all of this possible. It connects the basic components, front-end directors, back-end directors, global cache modules and virtual storage directors. You can add redundant pairs of directors and cache modules as required without disruption to connected host servers. All these resources are tightly coupled through a global cache that creates a common pool of storage resources. These resources can include external storage that is connected through front-end director initiator ports.

Hitachi Adaptable Modular Storage 2100

As the first midrange products to offer a serial attached SCSI (SAS) architecture and the Hitachi Dynamic Load Balancing Controller, the Hitachi Adaptable Modular Storage 2000 family delivers highly resilient, enterprise-quality storage in an affordable and easy-to-manage modular package. This is ideal for archiving SAP data. It increases the available storage resources for the SAP system which may be using high-end disk drives, and stores this archived data on slower cheaper hard drives.

Although Hitachi Data Systems used an Adaptable Modular Storage 2100 to test this solution, any member of the Hitachi Adaptable Modular Storage 2000 family can be used. By connecting the Adaptable Modular Storage system as external storage it inherited all the capabilities of the Virtual Storage Platform.

Hitachi Content Platform

Hitachi Content Platform is a distributed object store that provides a highly scalable, highly available, secure, cloud-enabled object repository platform capable of supporting multiple simultaneous applications. Hitachi Content Platform takes a layered approach to security, ensuring the safety of data while restricting unauthorized access to it. It supports standard file and Internet protocols to automatically ingest data from multiple source applications, and offers policy-based authentication, protection, retention, and destruction to ensure long-term content integrity. Hitachi Content Platform runs on a redundant array of independent nodes (RAIN) or a SAN-attached array of independent nodes (SAIN). In this solution, Hitachi Data Systems used the default (SAIN), which enables each of the nodes to store all the data of the Hitachi Content Platform server on SAN-attached storage.

SAP Servers

Servers hosting SAP Solution Manager and Solution ERP servers must meet specification requirements for the SAP roles they are hosting. For more information about server requirements for SAP ERP, SAP Solution Manager and SAP clients, see the following SAP Notes, which are available to licensed customers from SAP's [web site](#):

- SAP Note 1094599, Installation NW7-SR3 Business Suite 2005 SR3 Unix Oracle
- SAP Note 26147, SAP GUI Resources: Hardware and Software
- SAP Note 901070, Resource Requirements for SAPECC6

Software Components

Table 2 lists the software used to test this solution in the Hitachi Data Systems lab.

Table 2. Tested Deployment Software

<i>Software</i>	<i>Version</i>
Hitachi Dynamic Provisioning	Microcode dependent
Hitachi Storage Navigator	Microcode dependent
Hitachi Dynamic Link Manager	6.0.1.0.804
Hitachi Content Platform	Microcode dependent
SAP ERP (ABAP instance)	7.01 Enhancement Package 4
SAP ERP (Java Instance)	NetWeaver 7.0 Enhancement Package 1
SAP Solution Manager	7.0 Enhancement Package 1 on SP 25
SAP GUI	7.2
Oracle Database 10g Enterprise Edition	10.2.0.4

The following sections describe the key software components used in this solution.

Hitachi Dynamic Provisioning Software

Hitachi Dynamic Provisioning software provides features that provide virtual storage capacity to eliminate application service interruptions, reduce costs, and simplify administration, as follows:

- Optimizes or “right-sizes” storage performance and capacity based on business or application requirements.
- Supports deferring storage capacity upgrades to align with actual business usage.
- Simplifies and adds agility to the storage administration process.
- Improves performance

Hitachi Storage Navigator Software

Hitachi Storage Navigator software is the integrated interface for the Virtual Storage Platform firmware and software features. Use it to take advantage of all of the Virtual Storage Platform’s features. Storage Navigator software provides a Web-accessible graphical management interface.

Storage Navigator software is used to map security levels for SAN ports and virtual ports and for inter-system path mapping. It is used for logical unit (LU) creation and expansion, and for online volume migrations. It also configures and manages Hitachi Replication products. It enables online microcode updates and other system maintenance functions and contains tools for SNMP integration with enterprise management systems.

Hitachi Dynamic Link Manager Advanced Software

Hitachi Dynamic Link Manager Advanced software bundles Hitachi Dynamic Link Manager I/O multipathing software and Hitachi Global Link Manager software. Hitachi Dynamic Link Manager software, which is installed on the SAP ABAP and Java servers as well as the SAP Solution Manager server, includes capabilities such as path failover and failback and automatic load balancing to provide higher data availability and accessibility.

Hitachi Content Platform Software

Hitachi Content Platform system software consists of an operating system (the Appliance Operating System) and core software. The core software includes components that offer the following functionalities:

- Enable access to the object repository using the industry-standard HTTP or HTTPS, WebDAV, CIFS, NFS, SMTP and NDMP protocols.
- Ingest fixed-content data, convert it into Hitachi Content Platform objects, and manage objects' data and metadata over time.
- Maintain integrity, stability, availability and security of stored data through enforcing repository policies and executing cluster services.
- Enable configuration, monitoring and management of the Hitachi Content Platform system via a browser-based interface.
- Support searching the repository via graphical and programmatic interfaces using Hitachi Content Platform search facility.

SAP Software

SAP ERP combines scalable and effective software for enterprise resource planning (ERP) with a flexible, open technology platform that can leverage and integrate SAP and non-SAP systems. SAP provides end-to-end software functionality for enterprise management.

SAP Solution Manager is a service and support platform that provides the integrated content, tools and methodologies to implement, support and monitor operations of SAP implementation. Solution Manager is installed on a separate system. Hitachi Data Systems uses the Solution Manager server for these functions:

- Configuring installation keys for the install of any SAP ABAP and Java instance
- Approving the download of any updates from SAP like service packs or enhancement packs
- Installing SAP enhancement packs onto ABAP instances
- Obtaining support from SAP

SAP GUI is the client software that allows SAP users to access various functionalities in SAP ABAP instances and SAP Solution Manager.

SAP systems can be used with a variety of databases available from different vendors. The business transactions in SAP systems are processing units grouped to provide specific functions; these processing units execute changes to the database that are consistent.

Oracle Database

Oracle is the industry leader in providing state-of-the-art high performance database management system. For this solution, Hitachi Data Systems used Oracle Database 10g Enterprise Edition.

Solution Implementation

Deploying this solution requires these following high-level steps:

1. Configure the SAN.
2. Configure storage.
3. Configure servers.
4. Deploy SAP software.
5. Deploy the Hitachi Content Platform.
6. Configure Hitachi Content Platform.
7. Set up and execute SAP Information Lifecycle Management

Your checklist might vary based on your environment. More information about each of these steps is included in the following sections.

Configure the SAN

In the tested deployment, all the servers shown in the server tier in Figure 1 were connected via two HBAs on each physical server to two Brocade 5300 Fibre Channel switches. The Brocade 5300 switches, in turn, were connected to six ports of the Hitachi Virtual Storage Platform storage system. Two additional ports of the Hitachi Virtual Storage Platform were connected to two ports of the Hitachi Adaptable Modular Storage 2100 system via the Brocade 5300 switches. Each connection was configured with zones on the fabric switches according to the manufacturer's guidelines; in addition, follow these best practices:

- Use World Wide Port Name (WWPN) identification for all zoning configuration.
- Connect a minimum of two HBAs per server for multipath high availability.
- Disable all unused switch ports to increase security.
- Configure ports for point-to-point topology.
- Set ports to a specific speed. Do not use the auto negotiate setting.
- Use single initiator zoning.

When deploying an SAP system made up of SAP Solution Manager and SAP ABAP and Java instances, the storage used by these servers must be logically isolated from each other in the SAN via the use of zones and host groups.

Table 3 lists the path configurations used in this solution.

Table 3. Path Configuration

<i>Initiator</i>	<i>Host HBA Number</i>	<i>Switch</i>	<i>Zone Name</i>	<i>Storage System Port (Target)</i>
SAP Solution Manager	HBA 1 Port 1	Brocade 5300-1	SAP_SOLMAN_HBA1_1_VSP_1A	VSP 1A
SAP Solution Manager	HBA 1 Port 2	Brocade 5300-2	SAP_SOLMAN_HBA1_2_VSP_2A	VSP 2A
SAP ABAP Instance	HBA 1 Port 1	Brocade 5300-1	SAP_ABAP_HBA1_1_VSP_3A	VSP3A
SAP ABAP Instance	HBA 1 Port 2	Brocade 5300-2	SAP_ABAP_HBA1_2_VSP_3A	VSP 4A
SAP Java Instance	HBA 1 Port 1	Brocade 5300-1	SAP_JAVA_HBA1_1_VSP_5B	VSP 5B
SAP Java Instance	HBA 1 Port 2	Brocade 5300-2	SAP_JAVA_HBA1_2_VSP_6B	VSP 6B
Storage Node 66	HBA 1 Port 1	Brocade 5300-1	Storage_Node_66_HBA1_1_VSP_7A	VSP 7A
Storage Node 66	HBA 1 Port 2	Brocade 5300-2	Storage_Node_66_HBA1_2_VSP_8A	VSP 8A
Storage Node 67	HBA 1 Port 1	Brocade 5300-1	Storage_Node_67_HBA1_1_VSP_1B	VSP 1B
Storage Node 67	HBA 1 Port 2	Brocade 5300-2	Storage_Node_67_HBA1_2_VSP_2B	VSP 2B
Storage Node 68	HBA 1 Port 1	Brocade 5300-1	Storage_Node_68_HBA1_1_VSP_5B	VSP 5B
Storage Node 68	HBA 1 Port 2	Brocade 5300-2	Storage_Node_68_HBA1_2_VSP_6B	VSP 6B
Storage Node 69	HBA 1 Port 1	Brocade 5300-1	Storage_Node_69_HBA1_1_VSP_5A	VSP 5A
Storage Node 69	HBA 1 Port 2	Brocade 5300-2	Storage_Node_69_HBA1_2_VSP_6A	VSP 6A
Search Node 70	HBA 1 Port 1	Brocade 5300-1	Search_Node_70_HBA1_1_VSP_3B	VSP 3B
Search Node 70	HBA 1 Port 2	Brocade 5300-2	Search_Node_70_HBA1_2_VSP_4B	VSP 4B
Virtual Storage Platform	3E	Brocade 5300-1	VSP_3E_AMS0A	AMS 0A
Virtual Storage Platform	4E	Brocade 5300-2	VSP_4E_AMS1A	AMS 1A

Figure 2 shows the storage network configuration of the SAP instances. This solution uses six connections from the SAP instances to the Virtual Storage Platform. This includes two HBA connections to each of the three SAP instances.

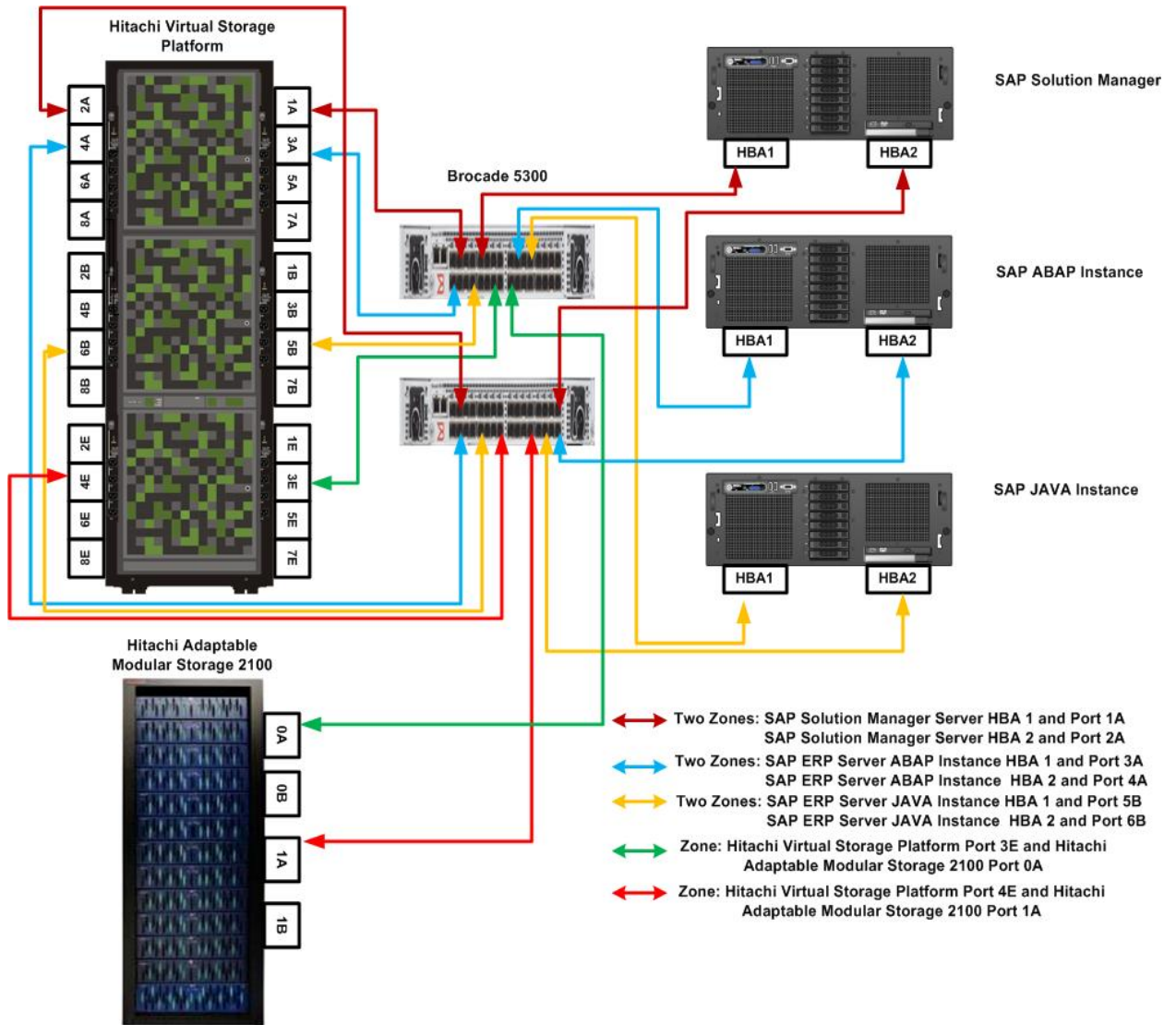


Figure 2

Figure 3 shows the storage network configuration of the of Hitachi Content Platform nodes. Each node has two HBA connections to the Virtual Storage Platform system. The Hitachi Adaptable Modular Storage 2100 is connected to the Hitachi Virtual Storage Platform as an external storage system.

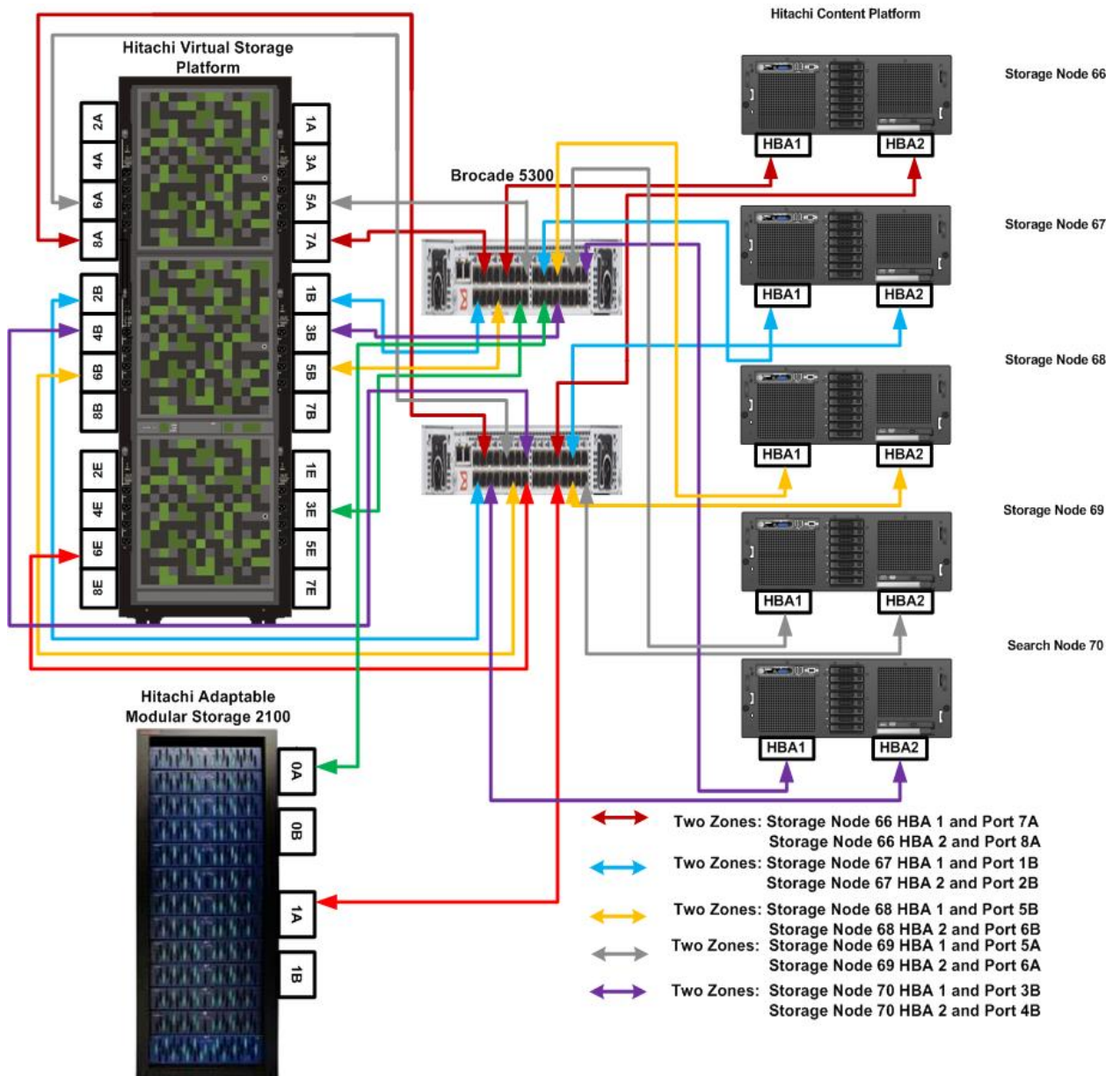


Figure 3

Configure Storage

For this solution, Hitachi Data Systems used a Hitachi Adaptable Modular Storage 2100 (AMS 2100) connected as external storage to a Hitachi Virtual Storage Platform (VSP). The Hitachi Content Platform stored backup images of the SAP ERP data on the AMS 2100.

World wide names (WWNs) of the HBAs residing on a physical server must be assigned to a host group and then associate logical devices (LDEVs) with each host group. This isolates LDEVs so that they are visible only to the assigned physical servers.

Hitachi Data Systems used Hitachi Dynamic Provisioning software to provision storage. Three Dynamic Provisioning pools were configured for SAP Solution Manager, the SAP ABAP instance and the SAP Java instance. All RAID groups used to create the Dynamic Provisioning pools were configured as RAID-5 (3D+1P). A total of 12 300GB 15K RPM SAS drives were used for each of the three Dynamic pools, giving each pool a capacity of 3.14TB. 14 200GB DP-VOLs were created in each pool and mapped to the Hitachi Virtual Storage Platform ports listed in Table 4.

Table 4. Dynamic Provisioning Pools and VSP Ports used by SAP Servers

<i>Pool</i>	<i>Server</i>	<i>VSP Ports</i>
61	SAP Solution Manager	2A,3A
62	SAP ABAP instance	4A,5A
63	SAP Java instance	6A,7A

15 LDEVs were created on the Hitachi Adaptable Modular Storage 2100 for use by the Hitachi Content Platform nodes. Table 5 lists storage configuration details for the LDEVs created for the Hitachi Content Platform nodes. The LDEVs are located on the external Adaptable Modular Storage 2100 storage and mapped to the Virtual Storage Platform.

Table 5. LDEV Storage Configuration for Hitachi Content Platform

<i>LDEV</i>	<i>LUN</i>	<i>Size (GB)</i>	<i>Node</i>	<i>VSP Port</i>
00:06:51	00	30	66	3C,4C
00:06:52	01	250	66	3C,4C
00:06:53	02	250	66	3C,4C
00:06:55	03	30	67	3C,4C
00:06:56	04	250	67	3C,4C
00:06:57	05	250	67	3C,4C
00:06:71	06	30	68	3C,4C
00:06:72	07	250	68	3C,4C
00:06:73	08	250	68	3C,4C
00:06:61	00	30	69	5C,6C
00:06:62	01	250	69	5C,6C

00:06:63	02	250	69	5C,6C
00:06:65	03	30	70	5C,6C
00:06:66	04	250	70	5C,6C
00:06:67	05	250	70	5C,6C

Configure RAID Groups on the Hitachi Adaptable Modular Storage 2100

To configure RAID groups on the Hitachi Adaptable Modular Storage 2100 using Hitachi Device Manager software, follow these steps:

1. In the Explorer pane, expand **Resources** and click the **Subsystems** link.

The **Subsystems** pane displays.

2. Expand your storage system in the navigation tree.
3. Expand **Groups** in the navigation tree.
4. Click the **Logical Units** link.

The **Logical Units** pane displays.

5. Click the **RAID Groups** tab.
6. Click the **Create RG** button.

The **Create RAID Group** dialog box displays.

7. Enter a numeric value in the **RAID Group** field.
Any value can be selected to identify this new RAID group.
8. Select **RAID5** from the **RAID Level** drop-down menu,
9. Select **4D+1P** from the **Combination** drop-down menu.
10. Enter 1 in the **Number of Parity Groups** field.

This is a Hitachi Data Systems recommendation. Increasing the number of parity groups above the default of 1 allows the creation of large LUs across multiple RAID groups. Hitachi Data Systems recommends against the creation of LUs that span across multiple RAID groups. Instead, use Hitachi Dynamic Provisioning software to create LUs that automatically span across a greater number of hard drives.

11. Select the **Automatic Selection** radio button.
12. Select a drive type from the **Drive Type** drop-down menu in the **Automatic Selection** section.
13. Select a drive capacity from the **Drive Capacity** drop-down menu in the **Automatic Selection** section.

14. Click the **OK** button.

A message displays indicating that the RAID group was created.

15. Click the **Close** button.

Create Logical Units on the Hitachi Adaptable Modular Storage 2100

To create logical units on the Hitachi Adaptable Modular Storage 2100 using Hitachi Device Manager software, follow these steps:

1. In the Explorer pane, expand **Resources** and click the **Subsystems** link.

The **Subsystems** pane displays.

2. Expand your storage system
3. Expand **Groups**.
4. Click the **Logical Units** link.

The **Logical Units** pane displays

5. Click the **RAID Groups** tab.
6. Click the ID number for the RAID group you created in the previous procedure.

The **Raid Group <ID>** pane displays details about this RAID group.

7. Click the **Create LU** button.

The **Create Logical Unit** dialog box displays.

8. Enter a **LUN ID** in the **LUN** field.

You can enter any value can be entered to identify the LUN.

9. In the **Capacity** section, choose **RG ALL** from the drop-down menu.
10. Click the **OK** button.

A message displays indicating that the logical unit was created.

11. Click the **Close** button.

Create Host Groups and Assign Logical Units in Hitachi Adaptable Modular Storage 2100

To create host groups and assign the LUs created in the previous section to these new host groups, follow these steps from within the Hitachi Device Manager software:

1. In the **Explorer** pane, expand **Resources** and click the **Subsystems** link.

The **Subsystems** pane displays.

2. Expand your storage system
3. Expand **Groups**.

4. Click the **Host Groups** link.

The **Host Groups** pane displays.

5. Click the **Create Host Groups** button.

The **Create Host Groups** dialog box displays.

6. Enter a value in the **Host Group No.** field.

You can enter any value from 1 to 127 to identify the host group.

7. Enter a name for the host group in the **Name** field.

8. In the **Available Ports** section, select the checkbox for the port where you want to create your host group.

9. Click the **WWNs** tab.

10. Select the **Select from List** radio button.

11. In the **Detected WWNs** pane, select the checkbox for the WWNs that you want to assign to the host group.

12. Click the **Add** button.

The **Selected WWNs** field is populated with the WWNs you chose.

13. Click the **Logical Units** tab.

14. In the **Available Logical Units** pane, select the LUNs that you want to assign to this host group.

15. Click the **Add** button.

The **Assigned Logical Units** pane is populated with the LUNs.

16. Click the **Options** tab.

17. From the **Platform** drop-down menu, choose **Windows**.

18. Click the **OK button**.

A message indicating that the host group was created displays.

Set Port Attributes for Hitachi Storage Navigator Software

Universal Volume Manager must be set to an external port. To set the port attribute to the external port for the Virtual Storage Platform, use Hitachi Storage Navigator software, and follow these steps:

1. In the Explorer pane, expand **Ports/Host Groups**.

The **Ports/Host Groups** pane displays.

2. Click the **Ports** tab.

3. Highlight the desired port.

You must select a port that can be set to external, that is, you must select a port that has no host group assigned to it.

4. Click the **Edit Ports** button.

The **Edit Ports** dialog box displays.

5. Select the **Port Attribute** checkbox.
6. Choose **External** from the **Port Attribute** drop-down menu.

Click the Finish button.

The **Confirm** window displays.

7. Click the **Apply** button.

The **Edit Ports** dialog box closes.

Mapping an External Volume to Virtual Storage Platform

To add external storage to a Virtual Storage Platform using Hitachi Storage Navigator software, follow these steps:

1. Click **Actions > External Storage > Add External Volumes**.

The **Add External Volumes** dialog box displays.

2. Select the **By New External Path Group** radio button.
3. Click the **Create External Path Group** button.

The **Create External Path Group** dialog box displays.

4. Enter a value in the **Initial External Path Group ID** field.
5. Click the **Discover External Target Ports** button.

The **Discover External Target Ports** dialog box displays.

6. Highlight the ports that you want to scan for new external storage systems and click the **Add** button.

The **Selected External Port** pane is updated.

7. Click the **OK** button.

The **Discover External Target Ports** dialog box closes.

8. Select the correct external storage system from the **External Storage System** drop-down menu.

9. In the **Available External Paths** pane, highlight the desired Port IDs and click the Add button.

The **Selected External Paths** pane is updated.

10. Click the **OK** button.

The **Add External Volume > Selection External Path Group** dialog box displays.

11. Click the **Next** button.

The **Add External Volume > Add External Volumes** dialog box displays.

12. In the **Discovered External Volumes** pane, highlight a LUN ID.

13. Click the **Add** button.

The **Selected External Volumes** pane is updated.

14. Click the **Finish** button.

The external logical unit now exists within Virtual Storage Platform and will be assigned to host groups later.

Create Dynamic Provisioning Pools

To create Dynamic Provisioning pools on a Virtual Storage Platform using Hitachi Storage Navigator software, follow these steps:

1. Choose **Actions > Pool > Create Pools**.

The **Create Pools** window displays.

2. From the **Pool Type** drop-down menu, choose **Dynamic Provisioning**.

3. Click the **Select Pool VOLs** button.

The **Select Pool VOLs** window displays.

4. Highlight one or more pool volumes in the **Available Pool Volumes** pane and click **OK**.

The **Create Pools** window displays with the **Total Selected Pool Volume** and **Total Selected Capacity** fields populated.

5. Assign a prefix for the pool name in the **Prefix** field.
6. (Optional) Assign an initial number for the pool name in the **Initial Number** field.
7. Expand the **Options** pane.
8. Assign a pool ID in the **Pool ID** field.
9. Assign a subscription limit in the **Subscription Limit** field.

This is the percentage of oversubscription for this pool that you allow in your environment.

10. Choose a value from the **User-Defined Threshold** drop-down menu and click the **Add** button.

The **User Defined Threshold** value determines when a pool capacity alert is triggered.

The **Selected Pools** pane is populated.

11. Click the **Finish** button.

The **Create Pools** window displays.

12. Click the **Apply** button.

Create LDEVs within a Dynamic Provisioning Pool

This procedure assumes that Dynamic Pool creation in your environment is complete. To create one or more LDEVs within a Dynamic Provisioning pool using Hitachi Storage Navigator software, follow these steps:

1. Choose **Actions > Logical Device > Create LDEVs**.

The **Create LDEVs** window displays.

2. From the **Provisioning Type** drop-down menu, select **Dynamic Provisioning**.
3. From the **Emulation Type** drop down menu, select **OPEN-V**.
4. (Optional) Choose a menu item from the **Drive Type/RPM** drop-down menu and from the **RAID Level** drop-down menu.

These options allow you to filter the available pool volumes.

5. Click the **Select Pool** button.

The **Select Pool** window displays.

6. Highlight a pool in the **Available Pools** pane and click **OK**.

The **Create LDEVs** window displays with the **Selected Pool Name** and the **Selected Pool Capacity** fields populated.

7. Enter a capacity amount in the **LDEV Capacity** field and choose a unit of measure from the drop-down menu.
8. Enter the number of LDEVs of that size to be created in the **Number of LDEVs** field.
9. In the **LDEV Name** pane, assign a prefix in the **Prefix** field and assign an initial number in the **Initial Number** field.
10. Expand the **Options** pane.
11. Review the value in the **LDKC** field.

Modify the LDKC value if the default of **00** is not appropriate. This is most often the case if the storage will be configured with more than one LDKC.

12. Choose a value from the **CU** drop-down menu.

13. Choose a value from the **DEV** drop-down menu.

14. (Optional) Choose a value from **Interval** drop-down menu.

Leave this value at the default of **0** for sequential numbering of LDEVs. If you want a different numbering sequence, choose a different value.

15. Review the default values in the **Initial SSID** field, the **CLPR** field and **Processor Blade** field.

In most situations, use the default values. Change them only if your environment requires different values.

16. Click the **Add** button.

The **Selected LDEVs** pane is populated.

17. Click the **Finish** button.

The **Create LDEVs** window displays.

18. Click the **Apply** button.

Create Host Groups

To create host groups using Storage Navigator software, follow these steps:

1. Choose **Actions > Ports/Host Groups > Create Host Groups**.

The **Create Host Groups** window displays.

2. Assign a name in the **Host Group Name** field.

3. From the **Host Mode** drop-down menu, choose **00[Standard]**.

4. In the **Available Hosts** pane, highlight one or more hosts.

5. In the **Available Ports** pane, highlight one or more ports.

6. Click the **Add** button.

The **Selected Host Groups** pane is populated.

7. Click the **Finish** button.

The **Create Host Groups** window displays.

8. Click the **Apply** button.

Map LDEVs

To map LDEVs using Hitachi Storage Navigator software, follow these steps:

1. Choose **Actions > Logical Device > Add LUN Paths**.

The **Add LUN Paths** window displays.

2. In the **Available LDEVs** pane, highlight one or more LDEVs.

3. Click the **Add** button.

The **Selected LDEVs** pane is populated.

4. Click **Next**.

The **Add LUN Paths** window displays.

5. In the **Available Host Groups** pane, highlight one or more host groups.

6. Click the **Add** button.

The **Selected Host Groups** pane is populated.

7. Click **Next**.

The **Add LUN Paths** window displays.

8. Click **Finish**.

The **Add LUN Paths** window displays.

9. Click the **Apply** button.

Configure Servers

To implement SAP ILM, you must install SAP ABAP and Java instances in your landscape. Although these two instances can be installed as two separate instances (single stack) or both as a single instance (dual stack), Hitachi Data Systems implemented these two servers as two separate applications servers for this solution.

This solution also requires the installation of SAP ILM Enhancement Pack 4 for the ABAP instance and Enhancement Pack 1 for the Java instance. For more information about upgrading an SAP ERP 6.0 system to Enhancement Pack 4, see the following SAP guides, which are available to licensed customers at the [SAP Service Marketplace](#):

- **Master Guide** — SAP enhancement package 4 for SAP ERP 6.0
- **Must Know Guide** — Overview of the fundamental changes and the new implementation procedure
- **How to Install SAP Enhancement Package 4 Guide** — Step-by-step installation instructions

You must connect the ABAP and Java instances via remote function call connections. Add the Java User Management Engine (UME) to the production ABAP instance. For more information about the ILM Browser store, see the [Implementation Considerations](#) section of SAP's AS Java Administration online documentation.

If Hitachi storage management software does not exist in your environment, you must install it on the management server. Several Hitachi management software options exist. For more information, see the Hitachi Command Suite [web site](#).

In the Hitachi Data Systems lab, the storage provisioned to the servers was managed using a logical volume manager (LVM) on the host to create volume groups and logical volumes.

Table 6 lists disk group, logical volume and file system layout details about the SAP Solution Manager server and the SAP ABAP and Java instances within the Hitachi Data Systems lab environment. Both servers had the same layout.

Table 6. SAP Solution Manager Server, SAP ABAP instance and SAP Java Instance Disk Group, Logical Volume and File System Layout

<i>Host LUN</i>	<i>Disk Group</i>	<i>Logical Volume</i>	<i>File System Mount Point</i>	<i>Usage</i>
00	appbin_vg	appbin_sapmnt_lv	/sapmnt	File system for central repository for SAP Solution Manager and SAP binaries and central location for moving data to another system when required
01	appbin_vg	appbin_ursap<SID>_lv	/usr/sap/<SID>	File system for SAP binaries
02	appbin_vg	appbin_ursap_trans_lv	/usr/sap/trans	File system for central location for moving data to another system
03	appbin_vg	appbin_oracle_lv	/oracle	File system for Oracle binaries for installation of Oracle, Oracle client, home directory for Oracle user and to store data temporarily for online data reorganization respectively
04	appl og_vg	appl ogA_lv	/oracle/<SID>/origlogA	File system for online redo logs
05	appl og_vg	appl ogB_lv	/oracle/<SID>/origlogB	File system for online redo logs
06	appl og_vg	appmirrlogA_lv	/oracle/<SID>/mirrlogA	File system for online redo logs
07	appl og_vg	appmirrlogB_lv	/oracle/<SID>/mirrlogB	File system for online redo logs
08	appl og_vg	apparch_lv	/oracle/<SID>/saparch	File system for archived logs
09	appdata_vg	appdata_sapdata1_lv	/oracle/<SID>/sapdata1	File system for SAP Solution Manager data
0A	appdata_vg	appdata_sapdata2_lv	/oracle/<SID>/sapdata2	File system for SAP Solution Manager data
0B	appdata_vg	appdata_sapdata3_lv	/oracle/<SID>/sapdata3	File system for SAP Solution Manager data
0C	appdata_vg	appdata_sapdata4_lv	/oracle/<SID>/sapdata4	File system for SAP Solution Manager data
0D	appdata_vg	appdata_oradata_lv	/oracle/<SID>/oradata	File system for Oracle data dictionary, temporary, UNDO and users tablespace data

Install Hitachi Dynamic Link Manager Advanced Software and Create File Systems

To install and configure Hitachi Dynamic Link Manager Advanced software and create file systems, follow these steps:

1. Execute the following command on the server on which you want to install Hitachi Dynamic Link Manager Advanced software:

```
./installhdlm
```

When the installation is complete, Hitachi Dynamic Link Manager Advanced software displays a message indicating that the software was successfully installed.

Hitachi Dynamic Link Manager Advanced software names your disk device using the following format:

```
sddl m<disk- device>
```

<disk- device> is a combination of letters from a to z identifying your disk device.

2. On each server, using LVM, create a physical volume (PV) on each disk device using the following syntax:

```
pvcreate /dev/sddl m<disk- device>
```

3. On each server, using LVM, create volume groups using the following syntax:

```
vgcreate -s 64 <volume group name> <physical volume name(s)>
```

Table 5 shows the volume groups needed for this solution.

4. On each server, create logical volumes, using the following syntax:

```
lvcreate -l <size of logical volume> -n <volume volume name> <volume group name>
```

Table 5 shows the logical volumes and respective volume groups needed for this solution.

5. On each server, create a file system for each logical volume using the following syntax:

```
mke2fs -t ext2 /dev/<volume group name>/<logical volume name>
```

6. Mount each file system using the following syntax:

```
mount -t ext2 -o async /dev/<volume group name>/<logical volume name>  
/<mount point>
```

Table 5 shows the file systems and mount points needed for this solution.

Deploy SAP Software

Deploy or use your existing Solution Manager instance. Next, you need to deploy the SAP ERP software for ABAP instance and SAP NetWeaver instance for Java on their respective servers. Add the Java UME to the production ABAP instance. For more information about deploying an ABAP instance, see the *Deploying SAP with Oracle in Linux Environments Using Hitachi Dynamic Tiering on the Hitachi Virtual Storage Platform Implementation Guide*.

For more information about deploying an SAP installation, see the following SAP ERP guides, which are available to licensed customers at SAP's Installation Guides [web site](#).

- **First Steps** — Read before SAP ERP installation
- **Master Guide** — Installation sequence information
- **Installation** — Step-by-step installation guide

Deploy the Hitachi Content Platform

Deploy the Hitachi Content Platform with four data nodes and a search node using a SAIN configuration. For more information, see the *Hitachi Content Platform Installing an HCP System* guide that accompanies the Hitachi Content Platform.

Configure Hitachi Content Platform

The following sections describe how to configure Hitachi Content Platform to store data from the SAP System via the WebDAV interface. The following are the procedures used to configure the Hitachi Content Platform in the Hitachi Data Systems lab environment. For advanced configuration options see the *Hitachi Content Platform, Administering HCP* document which is shipped with the product.

Create a Default Namespace and a Default Tenant

To enable a connection from the SAP instance to Hitachi Content Platform you must create a default tenant and a default namespace from within the Hitachi Content Platform administration console. These are essentially repositories and subdirectories for SAP data. A namespace is a logical grouping of objects such that the objects in one namespace are not visible in any other namespace. To the user of a namespace, the namespace is the repository. A tenant typically corresponds to an organization, such as a company or a division or department within a company. A tenant can also correspond to an individual person.

To create a single default namespace and tenant using the Hitachi Content Platform administration console, follow these steps:

1. Enter your user name in the **Username** field.
2. Enter your password in the **Password** field.
3. Click the **Log In** button.

The home page of the Hitachi Content Platform administration console displays.

4. From the menu bar, choose **Tenants**.

The **Tenant** window displays.

5. Expand **Create Tenant**.

See the *Hitachi Content Platform, Administering HCP* document for advanced configuration settings.

6. Click the **Create Tenant** button.

A default tenant is created. The **Tenant Name** pane is populated with a URL that uses the following syntax:

```
https://default.<Hitachi Content Platform server name>.<Network name>.org:8000
```

A default namespace is also created when the default tenant is created.

7. Click the URL.

The **Default Tenant** web page displays. This ensures that you have successfully created a default namespace and a default tenant.

This web page is used in the follow procedure. Do not navigate away from it.

Enable the WebDAV Protocol for the Default Namespace

For the Hitachi Content Platform server and SAP Java instance to communicate, the Hitachi Content Platform server must have WebDAV protocol enabled. The WebDAV protocol allows the SAP system to remotely view, store, retrieve and delete objects from the Hitachi Content Platform system.

To enable the WebDAV protocol using the Hitachi Content Platform Default Tenant web page, follow these steps:

1. From the menu bar, choose **Default Namespace > Protocols**.

The **Protocol** pane displays.

2. Verify that the **HTTP & WebDAV** window displays.

If it does not, click the **HTTP & WebDAV** link on the left side of the window.

3. In the **Setting** pane select the **Enable HTTP and WebDAV protocols** and **Enable SSL and WebDAV protocols** checkboxes,
4. Click the **Update Settings** button.

A message indicating that the settings were updated displays.

This web page is used in the follow procedure. Do not navigate away from this web page.

Set Permissions for Objects and Directories

Proper permissions are needed so that SAP ILM can override or write additional data to the Hitachi Content Platform system. To set read, write and execute permissions using the Hitachi Content Platform Default Tenant console, follow these steps:

1. Expand **Data Object and Directory Permissions**.
2. Click the **Data Objects** tab and enter **777** in the **Numeric permission code** field.
3. Click the **Directories** tab and enter **777** in the **Numeric permission code** field.
4. Select the **Allow UID, GID and permissions override and changes** checkbox.
5. Click the **Update Permissions** button.

This web page is used in the follow procedure. Do not navigate away from this web page.

Configure Additional WebDAV Settings

The basic login and custom metadata settings must be configured within Hitachi Content Platform so that the Visual Administrator connection from the Java instance can connect as a specific user in Hitachi Content Platform. To configure these settings, using the Hitachi Content Platform default tenant console, follow these steps:

1. Expand **Additional WebDAV Settings**.

Select the **Enable basic authentication** checkbox.
2. Enter a user name in the **Username** field.

This is the user that will be configured as the SAP ILM security account in the SAP Visual Administrator console.
3. Enter a password in the **Password** and **Confirm Password** fields.
4. Select the **Use custom metadata to store WebDAV properties** checkbox.
5. Click the **Update Settings** button.

Set Retention Policies for Hitachi Content Platform

To configure these setting for the Hitachi Content Platform please follow these steps:

1. From the menu bar, choose **Default Namespace > Policies**.

The **Metadata** pane displays.
2. Click the **Retention** link on the left side of the window.

The **Retention** pane displays.
3. In the **Retention** pane click the radio button for **Add, delete, and replace**.
4. Click the **Update Settings** button.

The Retention Policies for the Hitachi Content Platform has been set.

5. Click the **Logout** link.

You are logged out of the Hitachi Content Platform.

Create a Top-level Directory in the Default Namespace

Before you can archive any data from the ABAP instance, you must create a top-level directory using the Cadaver tool. For more information about the download of the Cadaver tool, see [Cadaver command line WebDAV client](#). To create a top-level directory in the default namespace, follow these steps.

1. From the SAP ABAP instance, log in to the host operating system,
2. Launch the Cadaver tool by executing the following command:

```
# cadaver
```

3. From Cadaver's command-line interface, execute the following command:

```
dav: !> open https://default.default.sapilm.aselab.org/webdav/fcfs_data
```

If a prompt appears asking you to accept the certificate, answer yes.

A user name prompt displays.

4. Enter the user name you configured in the "Configure Additional WebDAV Settings" procedure.

A password prompt displays.

5. Enter the password you configured in the "Configure Additional WebDAV Settings" procedure.

A command-line prompt displays.

6. Execute the following command:

```
dav: !> mkcol <SID>_<Client> (ILM_001)
```

A top-level directory, ILM_001, is created for SAP ABAP instance to archive data.

Configure and Execute SAP Information Lifecycle Management

The following sections describe the steps to configure and execute the SAP NetWeaver Information Lifecycle Management process using the WebDAV interface. For a more information, see SAP's [Making the basic Configuration Settings for the SAP NetWeaver ILM](#) document.

Create the ILM Datastore

Before you can execute the SAP NetWeaver Information Lifecycle Management solution to archive data from the SAP ABAP instance, you must create an ILM datastore from the XML DAS administration tool which is included when you complete the installation of the SAP Java instance. The following steps allow you to create the ILM Datastore. For more information about creating an ILM Datastore, see SAP's [Registering the ILM Archive Store in XML DAS](#) document.

Set Up Transactions for Archiving

This setup is needed for any object you are planning to archive in the SAP system. The following sections provide the setup to specific objects or data within the SAP system for archiving. For more information see SAP's [Object category-Independent Customizing for ILM Polices](#) document.

Set Retention Policies For SAP

Retention policies determine how long an object must remain in the Hitachi Content Platform repository. Configuration of these policies must be done according to the company's policies and standards and must meet all regulatory restrictions. For more information, see SAP's [Editing Policies for the Retention of Business Information](#) document. Note that before you change policies, the status of the policies must be set to not live.

Execute the ILM Process

Before you can execute the ILM archiving process, the object you are trying to archive must be set up and retention time periods must be established for it. You must adhere to all SAP guidelines to prevent errors within the archiving procedure. For more information about executing the ILM process, see SAP's [Archiving Procedure](#) document. Hitachi Data Systems used sample company data to archive to the Hitachi Content Platform server this will differ from system to system.

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