Protect Microsoft Exchange 2010 in a VMware Environment with Hitachi Data Protection Suite, Powered by CommVault®

Lab Validation Report

By Leo Nguyen

July 3, 2012
Feedback

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Email systems are integral to business functions. Organizations rely on continuous access to email systems and need to protect the data that is shared via email. It is important for companies to implement backup solutions that do not disrupt email access and that allow their Microsoft Exchange 2010 mailboxes and databases to be consistently backed up and quickly and completely restored after a failure.

This lab validation report shows that Hitachi Data Protection Suite, powered by CommVault®, can backup and restore Microsoft Exchange databases and mailboxes within a VMware environment.

This white paper is for you if you are a storage administrator or backup administrator responsible for backup and recovery of Microsoft Exchange running in a VMware environment. It assumes familiarity with Hitachi storage systems and data protection software, VMware vSphere, Microsoft Windows Server 2008 R2, and Microsoft Exchange Server 2010.
Product Features

Hitachi Data Protection Suite, powered by CommVault® (HDPS), integrates with Hitachi storage systems to deliver near-instant backup of VMware virtual machines and Microsoft Exchange 2010 databases and mailboxes. With its centralized management console, use Data Protection Suite to do the following:

- Install software on client systems
- Schedule backups
- Manage security, policies, and storage resources
- Run reports

The Data Protection Suite architecture is a backup ecosystem managed by software provided by CommVault.

The media agent transfers data from the client computer to the backup media. A large number of UNIX and Windows platforms support the media agent.

The Data Protection Suite architecture uses iDataAgents for communication to execute backups.

- **Windows File System iDA**—By default, each detected Windows host has this iDataAgent installed.
- **ProxyHost**—This iDataAgent creates the snapshot of the Exchange data on the virtual machine and runs the snap mining job.

**Note**—ProxyHost must be installed on a physical server. The Hitachi command device cannot communicate properly when using a virtual server.

- **VMware iDA**—This iDataAgent communicates with VMware vCenter or the ESX host to discover virtual machines and to execute backups using the VMware vStorage API for Data Protection. The installation of VMware iDataAgent, also called the virtual server agent, is on a proxy host.
- **Microsoft Exchange iDA**—This application iDataAgent executes Exchange database and mailbox backups. It is installed on the proxy and Exchange hosts.
- **VSS Provider**—This application iDataAgent coordinates the copy activities between the snap engines, the applications, and the hardware. It communicates with Microsoft Volume Shadow Copy Service and Shadow Copy to produce uncorrupted snapshots of volumes.
- **SnapProtect**—This application iDataAgent, built in to Data Protection Suite, utilizes Hitachi hardware and software components to create point-in-time snapshots.
These reduce the impact of backup processes on production servers over traditional backup methods by off-loading processing to a proxy host. Data Protection Suite takes a snapshot of the virtual machine, and then accesses the snapshot through the proxy server.

Figure 1 shows the physical architecture of the tested solution.
Hardware Components

This solution included these hardware components.

Hitachi Virtual Storage Platform

Hitachi Virtual Storage Platform is the first 3-D scaling storage platform designed for all data types. Its storage architecture flexibly adapts for performance, capacity, and multi-vendor storage. Combined with the unique Hitachi Command Suite management platform, it transforms the data center.

- **Scale Up**—Meet increasing demands by dynamically adding processors, connectivity, and capacity in a single unit. Provide the highest performance for both open and mainframe environments.

- **Scale Out**—Meet multiple demands by dynamically combining multiple units into a single logical system with shared resources. Support increased demand in virtualized server environments. Ensure safe multi-tenancy and quality of service through partitioning of cache and ports.

- **Scale Deep**—Extend storage value by virtualizing new and existing external storage systems dynamically. Extend the advanced functions of Hitachi Virtual Storage Platform to multivendor storage. Offload less demanding data to external tiers to save costs and to optimize the availability of tier one resources.

Hitachi Compute Blade 2000

Hitachi Compute Blade 2000 is an enterprise-class blade server platform. It features the following:

- A balanced system architecture that eliminates bottlenecks in performance and throughput

- Configuration flexibility

- Eco-friendly power-saving capabilities

- Fast server failure recovery using a N+1 cold standby design that allows replacing failed servers within minutes
Software Components

This solution included these software components.

**Hitachi Copy-on-Write Snapshot**
Hitachi Copy-on-Write Snapshot creates point-in-time snapshots at the volume level.

**Hitachi Command Suite**
Hitachi Command Suite manages virtualized storage and server infrastructures. With usability, workflow, performance, scalability, and private cloud enablement, Hitachi Command Suite lets you build sustainable infrastructures with leading storage technologies. It helps you flexibly align with changing business requirements and maximize return on IT investments.

**Hitachi Device Manager**
Use Hitachi Device Manager to manage LDEVs within a storage system in logical hierarchical groups. Device Manager has an agent that installs on hosts to collect host and storage system information.
# Test Environment Configuration

The environment for these tests is in Table 1 and Table 2.

## Table 1. Hardware Components

<table>
<thead>
<tr>
<th>Hardware</th>
<th>Detail Description</th>
<th>Firmware Version</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Virtual Storage Platform</td>
<td>Single chassis array&lt;br&gt;64 × 8 Gb/sec ports&lt;br&gt;256 GB cache&lt;br&gt;32 × 6 Gb/sec back-end SAS links&lt;br&gt;20 × 2 TB 7.2 SATA drives</td>
<td>70-03-04-00/00</td>
<td>1</td>
</tr>
<tr>
<td>Hitachi Compute Blade 2000 Chassis</td>
<td>8-blade chassis&lt;br&gt;2 management modules&lt;br&gt;2 × 1 Gb/sec LAN switch modules&lt;br&gt;8 cooling fan modules&lt;br&gt;4 power supply modules</td>
<td>A0195-C-6443</td>
<td>1</td>
</tr>
<tr>
<td>Hitachi E55A2 Server Blade</td>
<td>Full blade&lt;br&gt;2 × 6-core Intel Xeon X5670 2.93 GHz&lt;br&gt;80 GB RAM</td>
<td>03-73</td>
<td>3</td>
</tr>
<tr>
<td>Hitachi Dual-Port HBA</td>
<td>Dual port 8 Gb/sec Fibre Channel PCIe card</td>
<td>00300439</td>
<td>3</td>
</tr>
<tr>
<td>Brocade 5300 Fibre Channel Switch</td>
<td>8 Gb/sec</td>
<td>6.4.0b</td>
<td>2</td>
</tr>
</tbody>
</table>

## Table 2. Software Components

<table>
<thead>
<tr>
<th>Software</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Data Protection Suite</td>
<td>9.0 SP6</td>
</tr>
<tr>
<td>Hitachi Command Suite</td>
<td>7.1.1</td>
</tr>
<tr>
<td>Hitachi Device Manager</td>
<td>7.1.1</td>
</tr>
<tr>
<td>Hitachi Copy-on-Write Snapshot</td>
<td>Licensed on Hitachi Virtual Server Platform</td>
</tr>
<tr>
<td>Command control interface</td>
<td>01-25-03-05</td>
</tr>
<tr>
<td>VMware vSphere</td>
<td>5.0</td>
</tr>
</tbody>
</table>
The snapshot backup process for Data Protection Suite consists of the following steps:

1. The backup job initiates from the CommCell console.
2. The virtual server agent queues VMware vCenter to get a consistent state of the virtual machines.
3. The storage API is called through the command device and the RAID manager to verify the backup job content.
4. A snapshot is created between a P-VOL and V-VOL.
5. The virtual server agent releases the virtual machines for normal operations.

### Hitachi Virtual Storage Platform Configuration

These are the steps used to configure the Hitachi Virtual Storage Platform storage device.

1. Create one dynamic provisioning pool using Hitachi Dynamic Provisioning.
2. Create one pool for Hitachi Copy-on-Write Snapshot.
3. Create one LDEV and change it to a command device.
4. Create one P-VOL.
5. Create one V-VOL.

### Hitachi Command Suite Configuration

The steps used to configure Hitachi Command Suite are the following.

1. Install the RAID manager using command control interface on the Data Protection Suite proxy and VMware vCenter servers.
2. Install the Hitachi Device Manager agent on Data Protection Suite proxy and VMware vCenter servers.
3. Configure the Device Manager agent to point the IP address to Hitachi Command Suite.

### Hitachi Data Protection Suite Configuration

To configure Data Protection Suite, do the following.

<table>
<thead>
<tr>
<th>Software</th>
<th>Version</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMware vCenter</td>
<td>5.0</td>
</tr>
<tr>
<td>Microsoft Windows Server</td>
<td>2008 R2 Enterprise Edition SP1</td>
</tr>
<tr>
<td>Microsoft Exchange Server</td>
<td>2010 Enterprise Edition SP2</td>
</tr>
</tbody>
</table>
1. For **Virtual Server Agent**, add VMware vCenter to discover the virtual machines.

2. For **Storage Resources**, set up the disk library.

3. For **Policies**, create a new backup policy. With the new backup policy, create a new snapshot copy.
   - CommVault requires a primary snapshot copy to house the indexing information for the data retained internal to the snapshots.

4. For **Control Panel**, add Hitachi Virtual Storage Platform to **Array Management** using the following information:
   - **Snap Vendor**—HDS
   - **Control Host** — The IP address of Command Suite
   - **User Name** — A user name to log on to the host
   - **Password** and **Confirm Password** — The password for the user name
   - **Device Group** — The pool ID for the Copy-on-Write Snapshot pool
Test Methodology

These were the procedures used to test the environment in the Hitachi Data Systems laboratory.

Virtual Machine Discovery

The objective of this test was to discover new and existing virtual machines using the virtual server agent.

When testing, the virtual server agent created a new instance in which to add the VMware vCenter server. Then, under the default backup set, a new sub-client was created. Configuration was completed in the sub-client properties on the Content tab to run virtual machine discovery.

With Data Protection Suite, the virtual server agent now provides application-aware support.

Virtual Machine Backup

The objective of this test was to backup and truncate the Microsoft Exchange databases with a VMware environment.

The ProxyHost iDataAgent created a VMware instance, as shown in Figure 2. This is connected to VMware vCenter in order to discover the virtual machines.

![Figure 2](image)

By default, SnapProtect iDataAgent is not enabled. Before running any backups, the SnapProtect iDataAgent must be enabled.
From the proxy host advanced properties, the specific computer was selected from client computer list. Then, the SnapProtect iDataAgent was enabled.

To perform a granular recovery for file, folder, VMDK, or entire guest operating system, click **Enable Granular Recovery** in **Advanced Backup Options**.

**Exchange Database Availability Group Backup**

The objective of this test was to validate that Microsoft Exchange in a database availability group environment could back up active and passive databases.

By default, the backup is from the passive copy with the backup from the active copy if there is no passive copy available.

The first test case was with active databases. The second test case was with passive databases.

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**Note**—The Exchange database availability group backup used the disk-based method instead of using the SnapProtect iDataAgent. This happened because the command device was unable to communicate properly within a VMware environment. The Exchange database availability group in a physical environment supports using the SnapProtect iDataAgent.

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**Mount the Snapshot**

The objective of this test was to validate the ability to mount the snapshot after a successful snap.

If successful, the mounted volume shows up in vCenter under Datastores.

**Exchange Mailbox Mining**

The objective of this test was to perform mailbox backup using mining from a snapshot.

This test required verifying the completion of the granular recovery before performing the mailbox mining.

**Virtual Machine Restore**

The objective of this test was to validate the restore for the entire guest operating system.
Exchange Mailbox Restore

The objective of this test was to do the following in Outlook:

- Delete the email messages in the Inbox folder
- Empty the Deleted Items folder
- Purge the Recover Deleted Items folder

If successful, the mailbox restore recovers the deleted email messages to the Inbox folder.
Analysis

Hitachi Data Protection Suite, powered by CommVault®, when integrated with Hitachi Virtual Storage Platform, Hitachi Copy-on-Write Snapshot, and Hitachi Command Suite, provides a robust unified backup and recovery software for your heterogeneous environments. It reduces downtime and minimizes risk of data loss. This leads to a greater ability to meet application service level agreements.
Test Results

These are the test results from lab validation.

Virtual Machine Discovery
This test environment successfully discovered new and existing virtual machines.

Virtual Machine Backup
This test environment successfully performed a backup of the virtual machines and truncated the Exchange databases.

Exchange Database Availability Group Backup
This test environment successfully performed a backup of the active and passive databases in a Microsoft Exchange database availability group environment.

Mount the Snapshot
This test environment successfully mounted the snapshot.

Exchange Mailbox Mining
This test environment successfully mined the mailboxes for a granular restore.

Virtual Machine Restore
This test environment successfully restored the virtual machine. The Exchange database reverted to its original state prior to running a full backup.

Exchange Mailbox Restore
This test environment successfully restored deleted email messages back to the Outlook Inbox.
For More Information

Hitachi Data Systems Global Services offers experienced storage consultants, proven methodologies and a comprehensive services portfolio to assist you in implementing Hitachi products and solutions in your environment. For more information, see the Hitachi Data Systems Global Services website.

Live and recorded product demonstrations are available for many Hitachi products. To schedule a live demonstration, contact a sales representative. To view a recorded demonstration, see the Hitachi Data Systems Corporate Resources website. Click the Product Demos tab for a list of available recorded demonstrations.

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