SAP Landscape Virtualization Management Version 2.0 on VCE Vblock® System 700 series

Version 1.1
December 2014
THE INFORMATION IN THIS PUBLICATION IS PROVIDED "AS IS." VCE MAKES NO
REPRESENTATIONS OR WARRANTIES OF ANY KIND WITH RESPECT TO THE INFORMATION IN
THIS PUBLICATION, AND SPECIFICALLY DISCLAIMS IMPLIED WARRANTIES OR
MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Copyright 2014 VCE Company, LLC. All Rights Reserved.

VCE believes the information in this publication is accurate as of its publication date. The information is
subject to change without notice.
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audience</td>
<td>4</td>
</tr>
<tr>
<td>Introduction</td>
<td>5</td>
</tr>
<tr>
<td>A best-of-breed integrated operations architecture</td>
<td>6</td>
</tr>
<tr>
<td>Vblock Systems</td>
<td>7</td>
</tr>
<tr>
<td>SAP Landscape Virtualization Management</td>
<td>8</td>
</tr>
<tr>
<td>EMC Storage Integrator</td>
<td>9</td>
</tr>
<tr>
<td>Solutions overview</td>
<td>11</td>
</tr>
<tr>
<td>Software components</td>
<td>11</td>
</tr>
<tr>
<td>Logical layout</td>
<td>12</td>
</tr>
<tr>
<td>Test scenario</td>
<td>13</td>
</tr>
<tr>
<td>SAP system copy and SAP system clone</td>
<td>17</td>
</tr>
<tr>
<td>Cloning steps</td>
<td>18</td>
</tr>
<tr>
<td>Configuring SAP LVM before cloning</td>
<td>18</td>
</tr>
<tr>
<td>Configuring VMware vSphere</td>
<td>19</td>
</tr>
<tr>
<td>Reviewing UNIX user and group settings</td>
<td>20</td>
</tr>
<tr>
<td>Clone</td>
<td>20</td>
</tr>
<tr>
<td>Creating a clone</td>
<td>21</td>
</tr>
<tr>
<td>Copy</td>
<td>22</td>
</tr>
<tr>
<td>Conclusions</td>
<td>23</td>
</tr>
</tbody>
</table>
Audience

This paper is intended for customers that are familiar with SAP Landscape Virtualization Management (LVM), but not familiar with the opportunities presented by Vblock® Systems for SAP LVM implementations.
Introduction

As cloud computing and virtualization rapidly evolve, VCE is working with SAP, EMC, and VMWare to develop tools and services that make it faster and easier for customers to operate on-premise SAP solutions in virtualized and cloud environments. The goal is to help customers run SAP Business Suite applications in converged infrastructure systems with increasing levels of automation. VCE accelerates the adoption of converged infrastructure and cloud-based computing models. This approach dramatically reduces the cost of IT while improving time to market for customers.

Purpose

SAP Landscape Virtualization Management (LVM) software is a management tool that enables SAP administrators to automate SAP system operations including end-to-end SAP system copy and refresh operations. The large-scale enterprise landscape to which SAP LVM is suited is addressed by both the Vblock® System 300 series and Vblock System 700 series.

Organizations with large and varied SAP deployments often face the challenge of validating and implementing multiple projects within a short time. The challenges of validating these projects can have significant implications for production system availability. SAP LVM provides a solution to this problem by providing a way to clone a production system to a development environment for testing and validation. In this very large enterprise landscape, the highest levels of data backup and application availability are also required. The Vblock System 700 series is ideally suited to meeting these challenges. EMC Storage Integrator (ESI) has been upgraded to support EMC VMAX storage, a component of the Vblock System 700 series. This facilitates SAP LVM on the Vblock System 700 series and provides an excellent solution for large-scale SAP deployments.

This paper examines the implementation of SAP LVM Version 2.0 in a Vblock System 700 environment. The purpose of this paper is to:

- Clone an existing SAP environment using SAP LVM Version 2.0 on a Vblock System 740
- Demonstrate the value of updated versions of ESI in the implementation of SAP LVM through the expansion of use cases to include EMC VMAX storage.
A best-of-breed integrated operations architecture

SAP Consulting and VCE have jointly designed a best-of-breed integrated operations architecture, intended specifically for customers that have invested significantly in on-premise SAP landscapes to run their mission-critical applications, and validated it in a lab environment.

This document describes the architecture design and provides information to help you perform routine operational tasks and respond quickly and efficiently to IT and business needs. The paper details design considerations such as the configuration, software versions, and tips, tricks, and traps associated with the various test scenarios.

SAP customers running RISC/Unix have been taking a phased journey to the cloud by first migrating existing landscapes and associated databases to an x86 platform by way of converged infrastructure from VCE. Customers have reported achieving 50% better performance, 30% reduction in total cost of ownership, and 50% smaller footprint.

![Functionality of SAP Landscape Virtualization Management, Version 2.0](image)

*Figure 1: Functionality of SAP Landscape Virtualization Management, Version 2.0*
Vblock® Systems

VCE represents the next evolution of IT, one focused on the next generation data center and the future of cloud computing. VCE seeks to eliminate the challenges that consume today's data center resources.

Vblock® Systems seamlessly integrate leading compute, network, and storage technologies. Through intelligent discovery, awareness and automation, Vblock Systems provide the highest levels of virtualization and application performance. Vblock Systems are unique in their ability to be managed as a single entity with a common interface that provides end-to-end visibility.

The Vblock System 300 series is an agile and efficient data center class system, providing flexible and scalable performance.

The Vblock System 700 series is an enterprise-class mission-critical system for the world's most demanding workloads and service levels.

Each Vblock System has a base configuration, which is a minimum set of compute and storage components as well as fixed network resources. Within the base configuration, certain hardware aspects can be customized. Together, the components offer balanced CPU, I/O bandwidth, and storage capacity relative to the compute and storage arrays in the system.

For more information, go to www.vce.com.

Reference environment

SAP software, because of its heavy transaction load and analytical processing load, requires storage throughput. The SAP database caches the transactions in memory. However during heavy workloads, a much higher level of read and write to the storage is required. EMC VMAX is ideally suited to address these workloads. The throughput and performance of VMAX gives extensive support to the SAP production landscape. The Vblock System 700 series, which incorporates EMC VMAX storage, is designed to provide the high availability and disaster recovery features that enable large-scale enterprise implementations of the SAP product portfolio. Utilizing the combination of the Vblock System 700 with integrated EMC Solutions Enabler, in combination with SAP LVM allows you to easily manage your SAP landscape effectively. The Vblock System 740 environment used for this paper consists of:

- Cisco UCS servers as the compute base (8 UCS B-200 M2 blades at 2.93 GHz, yielding a total of 768 TB memory, 16 sockets, and 192 cores)
- EMC VMAX 40K (Build 5876.268.174) with total storage of 223 TB
- VMware vSphere 5.1
SAP Landscape Virtualization Management

SAP Landscape Virtualization Management (LVM) is an SAP software product that automates the operations of SAP system landscapes. It increases flexibility and business agility by simplifying and optimizing the provisioning and management of SAP systems through the use of virtualization technology such as VMware vSphere and VMware vCloud Director.

SAP LVM simplifies the management of your landscape through:

- System management (start, stop, relocate and mass operations)
- Landscape visualization
- End-to-end monitoring of systems and infrastructure (performance and health data)
- Configurable dashboards
- Reporting functionality

Besides the system management, automation is achieved by:

- Automated end-to-end framework for SAP system clone, copy, and refresh
- Automatic capacity management via dialog instance scaling
- Task planner to schedule one-time or repetitive activities
- Automatic validation to verify environment before performing operations

This paper discusses the implementation of SAP LVM Version 2.0. This version has been upgraded to include enhancements in these areas:

- Improvements in virtual hosts management with options to delete virtual hosts and storage volumes during the system refresh process.
- Custom cloning process, refresh and other operational hooks
- Updates to task scheduling and provisioning
- Better portal support pack updates and management
- Configuring managed system as a solution manager system
- Post copy automation process has been improved
- Improved system snapshots capability

For more information about the new features contained in SAP LVM Version 2.0, see http://help.sap.com/saphelp_lvment20/helpdata/en/a3/86db51e0f4f761e10000000a445394/content.htm
EMC Storage Integrator

EMC Storage Integrator (ESI) integrates with SAP Landscape Virtualization Management (LVM) to allow you to simplify management and operations of SAP systems and landscapes running on traditional or cloud infrastructures. ESI for SAP LVM provides SAP application virtualization and the ability to automate and manage SAP system clone, copy, and refresh processes.

ESI contains two main components: an ESI adapter and a web service called EMC High-Level Storage (HLS) Administrator Console (EHAC).

EHAC provides a deployment utility and gateway for the ESI adapter to allow SAP LVM to access storage systems such as the EMC VMAX contained in the Vblock® System 700 series. Using EHAC, you can manage the storage assigned to individual users by controlling the read/write access to the storage pools.

The ESI for SAP LVM adapter provides storage management capabilities within LVM. The adapter enables you to manage cloning and snapshots of an SAP system that is managed by SAP LVM.

The ESI adapter is a Java Enterprise Archive (EAR) file that complies with LVM specifications. It runs within the SAP Java stack with the SAP LVM add-on installed. The ESI for SAP LVM integrates with EMC file and block storage systems. The adapter uses the same Java Application Server to query the storage systems, so storage can be provisioned as part of system cloning.

In the diagram shown, The SAP Management server contains ESI for SAP LVM which implements the SAP LVM central storage adapter and (together with EMC’s SMI-S adapter) manages central storage. ESI for SAP LVM also implements the SAP LVM virtualization adapter. On the SAP Managed Node, EMC’s Solutions Enabler (SE) supplements the SAP LVM storage library for EMC’s SAN storage.

*Figure 2: ESI and SAP LVM integration*
The EMC’s SMI-S adapter is an ANSI standard for storage management. It is a specification that defines an open storage management interface to enable 3rd party and EMC technologies to manage, monitor and control SAN resources. Version 4.6.1 added support for EMC VMAX storage.
Solutions overview

The following is a detailed overview of the physical and logical layout of the infrastructure and software architecture used in this reference setup.

Software components

The software components used in the reference configuration consists of components for SAP, operating systems, database, EMC Storage Integrator (ESI), and virtualization.

Table 1: Software components

<table>
<thead>
<tr>
<th>Component</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP</td>
<td>SAP Landscape Virtualization Management (LVM) software, version 2.0, SP 03 (SID: VM1, Instance Nr: 00)</td>
</tr>
<tr>
<td>SAP</td>
<td>SAP ERP 6.0 based on SAP NetWeaver 7.20, SP 13 (SID: ER1, Instance Nr: 00)</td>
</tr>
<tr>
<td>SAP</td>
<td>SAP ERP 6.0 based on SAP NetWeaver 7.20, SP 13 (SID: ER2, Instance Nr: 00)</td>
</tr>
<tr>
<td>Note</td>
<td>This system is created using the cloning operation performed in SAP Landscape Virtualization Management.</td>
</tr>
<tr>
<td>SAP host agent for Red Hat Linux</td>
<td></td>
</tr>
<tr>
<td>Operating System</td>
<td>Red Hat Enterprise Linux (RHEL) Server 6.4</td>
</tr>
<tr>
<td>Operating System</td>
<td>Microsoft Windows Server 2008 R2</td>
</tr>
<tr>
<td>Database</td>
<td>Oracle 11.2.0.3</td>
</tr>
<tr>
<td>EMC Storage Integrator (ESI)</td>
<td>JBoss Application Server 7.1.1</td>
</tr>
<tr>
<td>EMC Storage Integrator (ESI)</td>
<td>EMC High-Level Storage Library Administrator Console (EHAC)</td>
</tr>
<tr>
<td>EMC SMI-S Provider</td>
<td>4.6.2.7 - Installed on EMC EHAC Server</td>
</tr>
<tr>
<td>EMC Solutions Enabler</td>
<td>7.6.2.9 - Installed on all SAP LVM Managed hosts</td>
</tr>
<tr>
<td>EMC Storage Integrator (ESI)</td>
<td>EMC ESI Storage Adapter v 2.1.7 for LVM. Required Storage library version: 7.6.1.25</td>
</tr>
<tr>
<td>Virtualization</td>
<td>VMware vCenter Server 5.1.0</td>
</tr>
<tr>
<td>Virtualization</td>
<td>VMware ESXi 5.1.0</td>
</tr>
</tbody>
</table>
Logical layout

The reference setup used in this paper hosts the components listed in this topic. The software components are deployed on a Vblock® System 740.

- SAP Landscape Virtualization Management (LVM) Version 2.0 SP05 runs on a virtualized SUSE Linux Enterprise Server Version 11 SP01 in combination with Oracle 11.2.0.3 acting as the management system.

- The managed system is SAP ERP version 6.0 running on a virtualized Red Hat Enterprise Linux Server 6.4 in combination with Oracle 11.2.0.3.

- The virtual resources (for example, virtual machines) managed by SAP LVM are Red Hat Linux servers installed on VB7013-ESXI-1, VB7013-ESXI-2 physical blade servers.
• EMC Storage Integration (ESI) for the SAP LVM storage adapter is deployed on a JBoss Application Server 7.1.1 running on Microsoft Windows 2008 R2 Server, which is installed on VB7013-ESXI-3.

Figure 3: Building blocks for this solution

Test scenario

The systems to be managed with SAP Landscape Virtualization Management (LVM) can be installed in different variants.

• Storage-based and adaptively configured SAP systems are installed on shared, central storage with virtual host names and IP addresses.

• SAP systems based on a virtual machine (VM) are traditionally installed within a VM, and the corresponding virtualization manager is configured within SAP LVM.
The SAP systems used in this setup are adaptively installed on a Vblock® System 740. The system copy process is based on a storage-based file-system cloning approach. The following describes the functionality and required configuration aspects.

For this paper, the cloning operation was evaluated as it is indicative of the complexity of the operations involved in the integration of the virtualization layer, the storage layer, and the EMC Storage Integrator (ESI) Adapter plugin. It provides a clear indication of how the components relate and operate in conjunction with SAP to complete the cloning process of the system.

The SAP LVM provides the portal and the task scheduler and connects to the ESI adapter plug in which communicates with the virtual machine, virtualization layer, and the storage layer to deliver a system clone.

Start, Stop, and Relocation of SAP Systems

The start, stop, and relocate functionality is achieved by using an adaptively configured SAP application used in conjunction with the appropriate SAP host agent.

The adaptive configuration refers to decoupling of the operating system (OS) from the SAP application layer. This setup is established by using virtual IP addresses and virtual host names in conjunction with mounting the application-relevant file systems via a shared, central storage, in this case NFS, from the central EMC VMAX.

The SAP ERP 6.0 system (SID: ER1) has been set up as a distributed configuration for the test scenario using the following virtual host name configuration.

<table>
<thead>
<tr>
<th>Host Name</th>
<th>SAP Component</th>
</tr>
</thead>
<tbody>
<tr>
<td>VERPOR1.mordor.vce</td>
<td>System Database (ABAP) Oracle 11g</td>
</tr>
<tr>
<td>VERPOR1.mordor.vce</td>
<td>Central Services(ABAP) - Instance No. 00</td>
</tr>
<tr>
<td>VERPOR1.mordor.vce</td>
<td>Central Instance(ABAP) - Instance No. 01</td>
</tr>
</tbody>
</table>

In addition to the virtual host names and IP addresses, the SAP application and database-specific file systems have been mounted to the SUSE Linux operating system using NFS from the EMC VMAX series, unified storage system. The tables displayed show the mount point configuration in SAP LVM.

**Table 3: Central services and central Instance mount point Configuration in SAP LVM**

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Datastore name</th>
<th>Mount point</th>
<th>FS Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMFS Datastore</td>
<td>USRSAPER1</td>
<td>/usr/sap/ER1</td>
<td>EXT3</td>
</tr>
<tr>
<td>VMFS Datastore</td>
<td>SAPMNTER1</td>
<td>/sapidm</td>
<td>EXT3</td>
</tr>
</tbody>
</table>

**Table 4: Database Instance mount point configuration in SAP LVM**

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Datastore name</th>
<th>Mount point</th>
<th>FS Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMFS Datastore</td>
<td>ORACLE1</td>
<td>/oracle</td>
<td>EXT3</td>
</tr>
<tr>
<td>VMFS Datastore</td>
<td>DATA1</td>
<td>/SAPDATA1</td>
<td>EXT3</td>
</tr>
</tbody>
</table>
Table 4: Database Instance mount point configuration in SAP LVM

<table>
<thead>
<tr>
<th>Storage Type</th>
<th>Datastore name</th>
<th>Mount point</th>
<th>FS Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>VMFS Datastore</td>
<td>DATA2</td>
<td>/SAPDATA2</td>
<td>EXT3</td>
</tr>
<tr>
<td>VMFS Datastore</td>
<td>DATA3</td>
<td>/SAPDATA3</td>
<td>EXT3</td>
</tr>
<tr>
<td>VMFS Datastore</td>
<td>SAPLOG1ER1</td>
<td>/SAPLOG1</td>
<td>EXT3</td>
</tr>
<tr>
<td>VMFS Datastore</td>
<td>SAPLOG2ER1</td>
<td>/SAPLOG2</td>
<td>EXT3</td>
</tr>
</tbody>
</table>

Figure 4: Mount point configuration in LVM

The ER1 system can be attached to the virtual resource verport1 running on Red Hat Linux. As a prerequisite, the users er1adm and orae1r have to be available on all three resources. The SAP host agent 7.20 SP 189 is installed on all virtual resources.
The relocation process can be used for each SAP component of the ER1 system separately. This means the database, the central service, or the central instance can be moved to the virtual resource VERPORT1.

Figure 5: Relocation of SAP services using SAP LVM
SAP system copy and SAP system clone

SAP Landscape Virtualization Management (LVM) provides end-to-end SAP system clone, system copy, and system refresh functionality. The system clone functionality is the basis for a system copy and system refresh.

Each process – system clone, system copy, and system refresh – can be divided into subtasks.

![Subtasks for System Clone, System Copy and System Refresh](image)

*Figure 6: Subtasks for system clone, system copy, and system refresh*

Using SAP LVM, a fully automated, comprehensive SAP system copy was performed using the SAP ERP application system as a source system, as shown in the table below.

*Table 5: Source and target system configuration*

<table>
<thead>
<tr>
<th>Item</th>
<th>Source System</th>
<th>Target System</th>
</tr>
</thead>
<tbody>
<tr>
<td>SID</td>
<td>ER1</td>
<td>ER2</td>
</tr>
<tr>
<td>Database</td>
<td>VERPOR1.Mordor.vce</td>
<td>VERPORT1.mordor.vce</td>
</tr>
<tr>
<td>Central Services</td>
<td>VERPOR1.mordor.vce</td>
<td>VERPORT1.mordor.vce</td>
</tr>
<tr>
<td>ASCS Number</td>
<td>00</td>
<td>00</td>
</tr>
</tbody>
</table>
Table 5: Source and target system configuration

<table>
<thead>
<tr>
<th>Item</th>
<th>Source System</th>
<th>Target System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Instance</td>
<td>VERPOR1.mordor.vce</td>
<td>VERPORT1.mordor.vce</td>
</tr>
<tr>
<td>CI Number</td>
<td>01</td>
<td>01</td>
</tr>
</tbody>
</table>

The existing resource VERPORT1.mordor.vce was used as the target resource for the system copy procedure.

Cloning steps

There are three configuration steps that must be completed as part of the cloning operation. These steps involve configuration of SAP Landscape Virtualization Manager (LVM), VMware vSphere, and Unix configuration. Once these steps are completed, the clone can be completed.

Configuring SAP Landscape Virtualization Management before cloning

To complete cloning a number of initial configuration steps must be completed. For more detailed information about configuration of SAP LVM, see the Managing System and Application Configurations sections under the SAP NetWeaver 7.3 or 7.4 Library documentation in SAP Help Portal.

1. Complete an initial configuration of SAP Landscape Virtualization Management (LVM) in the Settings tab. Each of the parameters in each of the sub-tabs must be aligned to ensure that they are appropriate to the environment.

2. In the Infrastructure section, confirm the version of EMC Storage Integrator (ESI). Each of the remaining settings in each of the remaining infrastructure tabs is confirmed to be appropriate to the environment.

3. Select Cloning in the System Details pane for the source system that is being cloned.

![Figure 7: Cloning enabled for source system](image)
4 In the **Hosts** tab, ensure that the host for the source system and the agent password for the source and target system are identical.

![Figure 8: Setting the agent password](image)

5 In **Host Properties**, select **Isolation Ready**.

![Figure 9: Isolation Ready is selected](image)

6 Ensure that the HBA details match the details from the server and storage components.

7 In the **Systems** tab, verify the WWN number for the file system mount points.

8 Once all of the settings are confirmed, click **Validate All** in the **Validations** tab to ensure that the source system validation completes successfully before proceeding.

## Configuring the VMware vSphere client

To complete system cloning using SAP Landscape Virtualization Management (LVM), a number of configuration settings in VMware vSphere client must be set.

1 For each virtual machine in the source system ensure that the settings for each of the hardware components is appropriate. In particular, the SCSI controller settings. Compare the settings for the source and target systems so that all of the settings, except the data disks, match the settings on the source system.
2 Set the `disk.EnableUUID` parameter to `true`.

**Reviewing UNIX user and group settings**

On the target system, the user permissions and group assignments must match those on the source system.

**Cloning components**

SAP Landscape Virtualization Management (LVM) software include system cloning which creates a copy of the SAP system in a fenced LAN configuration. This is done so that the SAP system ID can remain the same.

SAP integration with EMC as part of a Vblock System ensures that you can make a copy of an SAP system using either full volume clones or pointer-based snaps within the array.

EMC clones are similar to devices that use the same storage space as the source SAP system. EMC snaps are pointer-based copies that require the space for changed data. In typical environments, this could be as little as 30% of the source SAP system.

Depending on the frequency with which the SAP system data is updated and changed, EMC tools can be used to determine how much space is required for snaps.

After a clone is initiated, the SAP LVM software uses EMC’s SMI-S provider integration to create new devices or use existing devices for the clone or snap. Either a clone or a snap is created and activated. SAP LVM creates a fenced LAN environment on the target server. The clones or snaps of the cloned SAP system are mounted (prepared) on the target server and the newly cloned SAP system is started.

**EMC Storage Integrator**

The cloning step is performed via a storage-based cloning using the EMC Storage Integrator (ESI) for SAP LVM. One component of EMC ESI is an adapter deployed on SAP LVM. The other component is the EMC High-Level Storage Library Administration Console (EHAC) running on a JBoss Application Server. EHAC provides a single point of management to manage user accounts, assign storage systems to users, and act as a gateway for the SAP LVM adapter to access storage systems.

With EHAC, administrators can manage storage space assigned to individual users by controlling read/write access to the storage pools for each individual system.

The components of the EMC ESI for the integration with SAP LVM used in this setup.

The ESI for SAP LVM provides storage management capabilities and allows users to manage cloning and snapshots from within the SAP LVM user interface.

The EMC ESI is fully integrated into SAP LVM for defining the cloning process. The volumes to be created during the storage configuration step are displayed in the system copy workflow of SAP LVM.
Creating a clone

Ensure that you have completed the pre-configuration steps for SAP Landscape Virtualization Management (LVM) and VMware vCenter.

1. In SAP LVM, click **Provisioning > Systems and AS Provisioning**.

2. In the **System Landscape** pane, select the source system that you want to clone and click **Clone System**.

3. In the **Basic Data of Target System** pane, select the pool for the clone and also enter a short name and description. Click **Next**.

4. In the **Host Selection of Target System** pane, enter the host information for the source system. Click **Next**.

5. In the **Virtual Host Names and Networks** pane, define the virtual host names for the source system. Click **Start System Cloning** and then click **Next**.

6. The **Storage Volume** pane lists the storage information for the selected virtual hostname. The target fields are populated with the same storage system array ID and the same storage pool value as the source system. The storage pool value is empty for meta volumes. The EMC SMI-S Provider selects the appropriate storage pool for any blank values. From the **Operations** list, select **Create New Volume**. EMC SMI-S creates a new device in the storage pool.

7. Enter an name in the **Volume Name** field. Click **Next**.

8. In the **Consistency** pane, select the **Offline database already stopped** option and click **Next**.

9. In the **Isolation** pane, for each item in the **Define Allowed Outgoing Connections for System Isolation** pane ensure that the **Predefined** check box is selected. Click **Next**.

10. In the **Summary** pane, review the details for the clone and click **Start System Cloning** to initiate the cloning process.

The **Monitoring Menu and Activities** tab show the current running system cloning process and the results of each step of the activity that the SAP LVM system is currently working on. The status shows either completed or percentage completion. Also each step can be drilled down into detailed steps of what is being worked upon by the system. This step shows the 100% completion of the cloning process. A retry was initiated after failure and fixing of the errors and this step shows that the clone process was completed 100% in the retry.
Copy

SAP system copy will perform many of the same steps as clone, except instead of creating a fenced LAN environment, so that the ID can remain the same. SAP Landscape Virtualization Management (LVM) renames the SAP system and invokes SAP's Post Copy Automation (PCA).

The PCA procedure automates and performs all of the numerous post-copy steps that are common to most SAP users. Using the integration provided by EMC within the VCE Vblock® System allows you to create new devices or use existing devices to create an EMC clone or snap of the copied SAP system.

After a copy is initiated, the SAP LVM interface uses the EMC SMI-S provider integration to create new devices or use existing devices for a clone or snap. Either a clone or a snap is activated. SAP LVM then renames the SAP system ID and performs the post-copy automation tasks. The clones or snaps of the copied SAP system are mounted (prepared) on the target server and the copied SAP system is started.
Conclusions

Until now, managing SAP landscapes has been mostly a manual and time-consuming endeavor. SAP Landscape Virtualization Management software combined with Vblock® Systems from VCE deliver a highly efficient and productive environment to provision and operate on-premise applications based on the SAP NetWeaver technology platform.

By leveraging SAP Landscape Virtualization Management along with the converged infrastructure of VCE Vblock® Systems, customers can realize greater business and IT agility, improve the quality of their operations, and reduce their total cost of ownership. Do it faster, do it cheaper, do it better – a winning formula for today’s competitive business environment.
About VCE

VCE, formed by Cisco and EMC with investments from VMware and Intel, accelerates the adoption of converged infrastructure and cloud-based computing models that dramatically reduce the cost of IT while improving time to market for our customers. VCE, through Vblock Systems, delivers the industry’s only fully integrated and fully virtualized cloud infrastructure system. VCE solutions are available through an extensive partner network, and cover horizontal applications, vertical industry offerings, and application development environments, allowing customers to focus on business innovation instead of integrating, validating, and managing IT infrastructure.

For more information, go to http://www.vce.com.