

HP Storage Essentials SRM Enterprise  
Edition 6.0  
Application Integration Software  
for SAP ACC version A.02.01  
User Guide

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HP Storage Essentials SRM Enterprise Edition Application Integration Software for SAP ACC version A.02.01 User Guide

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# About This Guide

This guide provides information about the implementation of the HP Storage Essentials Storage Resource Management (SRM) Enterprise Edition Application Integration Software for SAP Adaptive Computing Controller. The Application Integration Software is available with HP Storage Essentials Storage Resource Management (SRM) to enable and integrate with the Adaptive Computing Controller from SAP when using SAN attached storage on HP StorageWorks arrays.

## Intended Audience

This guide is intended for:

- Storage Administrator
- System Administrator
- SAP Basis Administrator
- Network Administrator

## Prerequisites

Prerequisites for using this product include knowledge in the following areas:

- Networking
- Storage Area Networks (SANs)
- The Common Information Model (CIM)
- HP Storage Essentials Storage Resource Management
- HP Systems Insight Manager

## Related Documentation

In addition to this guide, please refer to the following document sets:

- HP Storage Essentials Storage Resource Management (SRM) Software
- HP Systems Insight Manager
- Adaptive Computing concepts
- Application Virtualizing
- SAP® Adaptive Computing Controller
- SAP note number 1119595

HP documents can be found on the HP website: <http://www.hp.com/support/>


SAP documents can be found on the SAP website: <http://service.sap.com/adaptive>

# Document Conventions and Symbols

**Table 1** Document conventions

Convention	Element
Medium blue text: <a href="#">Figure 1</a>	Cross-reference links and e-mail addresses
Medium blue, underlined text ( <a href="http://www.hp.com">http://www.hp.com</a> )	Web site addresses
<b>Bold font</b>	<ul style="list-style-type: none"><li>• Key names</li><li>• Text typed into a GUI element, such as into a box</li><li>• GUI elements that are clicked or selected, such as menu and list items, buttons, and check boxes</li></ul>
<i>Italics font</i>	Text emphasis
Monospace font	<ul style="list-style-type: none"><li>• File and directory names</li><li>• System output</li><li>• Code</li><li>• Text typed at the command-line</li></ul>
<i>Monospace, italic font</i>	<ul style="list-style-type: none"><li>• Code variables</li><li>• Command-line variables</li></ul>
<b>Monospace, bold font</b>	Emphasis of file and directory names, system output, code, and text typed at the command line

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 **WARNING!** Indicates that failure to follow directions could result in bodily harm or death.


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 **CAUTION:** Indicates that failure to follow directions could result in damage to equipment or data.


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 **IMPORTANT:** Provides clarifying information or specific instructions.

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 **NOTE:** Provides additional information.

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 **TIP:** Provides helpful hints and shortcuts.

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## HP Technical Support

Telephone numbers for worldwide technical support are listed on the HP support web site:

<http://www.hp.com/support/>.

Collect the following information before calling:

- Technical support registration number (if applicable)
- Product serial numbers
- Product model names and numbers
- Applicable error messages
- Operating system type and revision level
- Detailed, specific questions

For continuous quality improvement, calls may be recorded or monitored.

HP strongly recommends that customers sign up online using the Subscriber's choice web site at

<http://www.hp.com/go/e-updates>.

- Subscribing to this service provides you with e-mail updates on the latest product enhancements, newest versions of drivers, and firmware documentation updates as well as instant access to numerous other product resources.
- After signing up, you can quickly locate your products by selecting **Business support** and then **Storage** under Product Category.

## HP-authorized Reseller

For the name of your nearest HP-authorized reseller:

- In the United States, call 1-800-345-1518.
- Elsewhere, visit the HP web site: <http://www.hp.com>. Then click **Contact HP** to find locations and telephone numbers.

## Helpful Web Sites

For third-party product information, see the following HP web sites:

- <http://www.hp.com>
- <http://www.hp.com/go/storage>
- <http://www.hp.com/support/>



# 1 SAP Adaptive Computing Overview

This chapter describes the following:

- [SAP ACC Overview](#), page 2
- [Application Integration Software for SAP ACC](#), page 9

With the increasing complexity and inflexibility of the traditional SAP® environment, it has become necessary to rethink the way that a SAP environment is managed. With the SAP Adaptive Computing Controller (ACC), SAP has taken the first steps in improving the management of the SAP Landscape and has provided a number of integration points for vendors to extend the Adaptive Computing Controller functionality.

This document describes the solution from Hewlett-Packard (HP) to extend SAP Adaptive Computing environment enabling the support of Storage Area Network (SAN) attached storage from HP. The document provides background information about the adaptive computing concept and the specific integration points used by HP. This user guide also describes the usage of the integrated solution with the SAP ACC in detail.

The basis of the SAP ACC is to virtualize the SAP application from the underlying computing environment and to arrange the software services together in a group of resources that can start, stop, or be moved from any system, at any time, when needed, where needed. The process of abstracting the SAP software from the underlying hardware is known as Service Virtualization, and it requires that the SAP instance and all resources necessary for the virtual resource be independent of any physical system or system resource. This includes the IP address or host name for the software service, as well as any storage used by the service.

The benefits of implementing an adaptive computing environment include the following:

- Lower total cost of ownership (TCO)
  - Better server utilization
  - Better control of IT landscape
  - Higher service levels at lower cost
  - A standard approach to the four basic building blocks of your IT landscape: computing, network, storage, and management
- Productivity
  - Faster response time to business-driven needs
  - Reduced operation complexity
- Flexibility
  - Ability to assign and use hardware resources when needed
  - Ease of adding or modifying hardware components in the landscape

# SAP ACC Overview

The following section provides some basic background on the structure and functionality of the SAP Adaptive Computing Controller (SAP ACC). For more detailed information, refer to the documentation provided by SAP on this subject. It is available at <http://service.sap.com/adaptive>. This URL requires you to provide an SAP S-user ID.

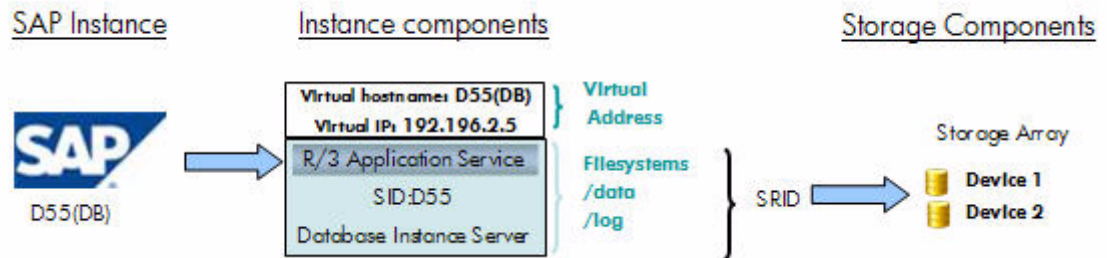
The following topics are covered in this section:

- [The Virtual SAP Landscape](#), page 2
- [SAP ACC Components](#), page 4
- [Virtual IP Address](#), page 7
- [Control](#), page 9

## The Virtual SAP Landscape

To create an adaptive SAP landscape, it is necessary to have a virtual application setup. The application and all the resources belonging to the applications (network and storage) must be grouped together into one unit that can be moved from one system to another independent from anything else on the system.

The following figure describes the components to create a virtualized application.



**Figure 1** Components to create a virtualized application

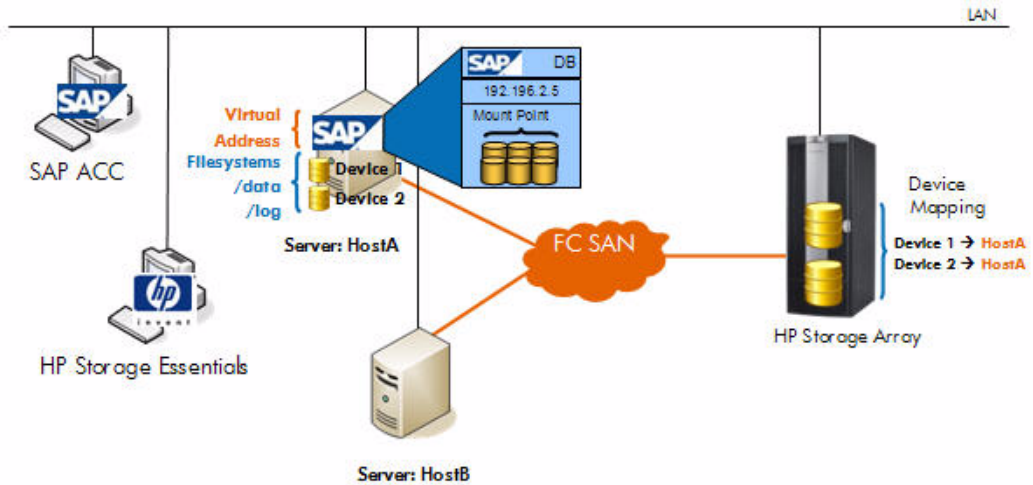
A SAP instance consists of network resources that include a virtual host name and a virtual IP address. This virtual IP address is different from the dedicated server IP address assigned to the hardware. The virtual IP address of the application makes it possible to connect to the application, independent of the hardware, anywhere in the landscape.

The SAP instance also consists of physical storage, either Network Attached Storage (NAS) or Storage Area Network (SAN)-attached storage. The storage is made up of file systems located on logical devices (Ldev) from a storage system. The SAP ACC groups all the storage components of an instance under the Storage Resource Identifier (SRID) and lets you create a custom name for the storage component of the instance.

The HP Storage Essentials Storage Resource Management (SRM) Enterprise Edition Application Integration Software for SAP ACC provides a link between the SRID created in SAP and the physical

storage resources that are associated with that instance. This allows HP Storage Essentials SRM to Present or Un-present this storage from any host in the SAN.

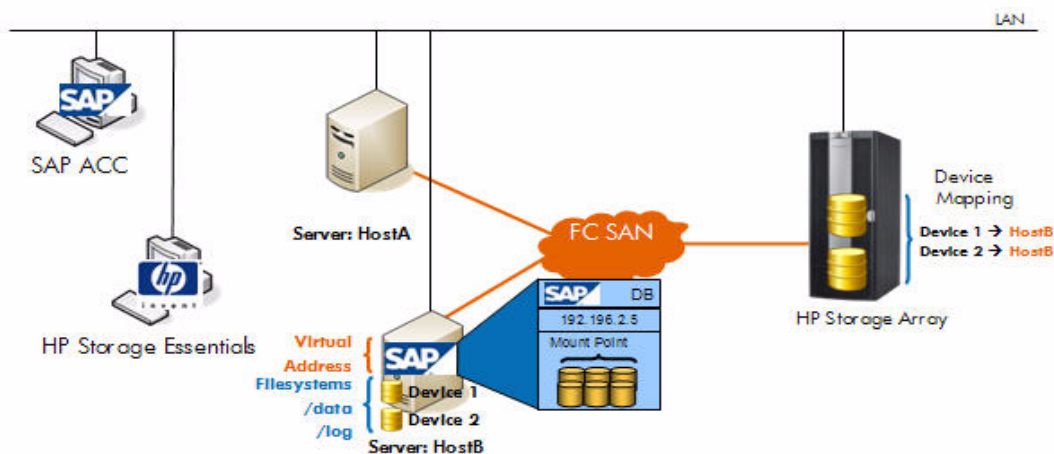
In the following figure, the virtual SAP instance is running on physical server HostA. The SAP Instance has two SAN-attached storage devices mapped from the storage array to the server.



**Figure 2** Virtual SAP instance on physical server HostA

Let's assume the SAP administrator decides that it is necessary to move this SAP instance from server HostA to server HostB due to business reasons or for maintenance. The SAP administrator initiates the service relocation from the GUI of the SAP Adaptive Computing controller. The SAP ACC is responsible for the application shutdown and startup function, but will call the Application Integration Software for SAP ACC, which is running on the HP Storage Essentials server, to ensure that the storage devices are removed from server HostA and are presented to server HostB.

The following figure shows the status of the landscape after the service relocation is completed.



**Figure 3** SAP instance is moved from HostA to HostB

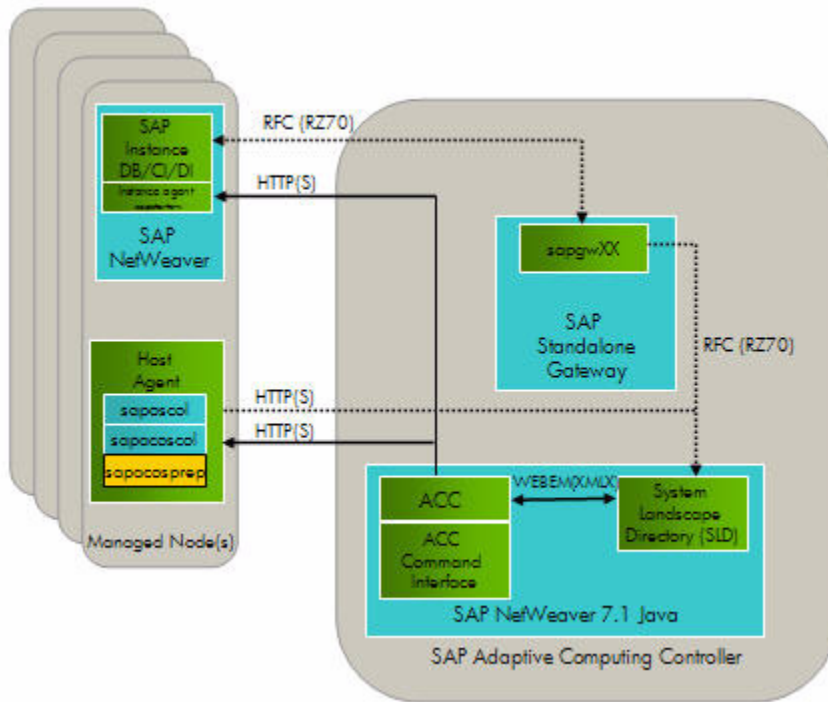
The SAP ACC gives the SAP administrator the power and flexibility to stop, start, or relocate any SAP instance to any system in the landscape when needed and based on what resources are available.

## SAP ACC Components

SAP developed the ACC as a system management-like application based on the J2EE engine of the Web application server. The ACC software runs on a control node and interacts with other SAP components to create a full image of the entire SAP landscape. The SAP ACC also implements a component that runs on the Managed Node, enabling SAP to perform specific function on each node.



The following is a high level diagram of the SAP ACC Architecture.



**Figure 4** Architecture for SAP Adaptive Computing Controller

The ACC station or Control node consists of the NetWeaver 7.1 Java Engine and the Adaptive Computing Controller software. The ACC software communicates with the System Landscape Directory (SLD) to derive a list of Managed Nodes installed in the SAP Landscape. Each Managed Node needs to register itself in the SLD using remote function calls, and the SLD collects status information from the Managed Node using the sapascoscol agent installed on each Managed Node.

The gateway process can be implemented either as a standalone or as an integrated gateway system.

All Adaptive Computing operations are initiated and controlled from the SAP ACC control node using the GUI provided by SAP.

SAP ACC version 7.1 utilizes the SAP Host Agent infrastructure (sapascosprep, sapascoscol, sldreg, and so on), which is installed on each Managed Node in the system landscape to initiate all host-based operations. This agent receives command operations from the central SAP ACC controller and executes the necessary integration modules to enable adaptive computing functions on the Managed Node.

Internally, the SAP host agent's "sapascosprep" is made up of a platform/partner independent module and an API that enables partners to integrate their platform and storage solutions by

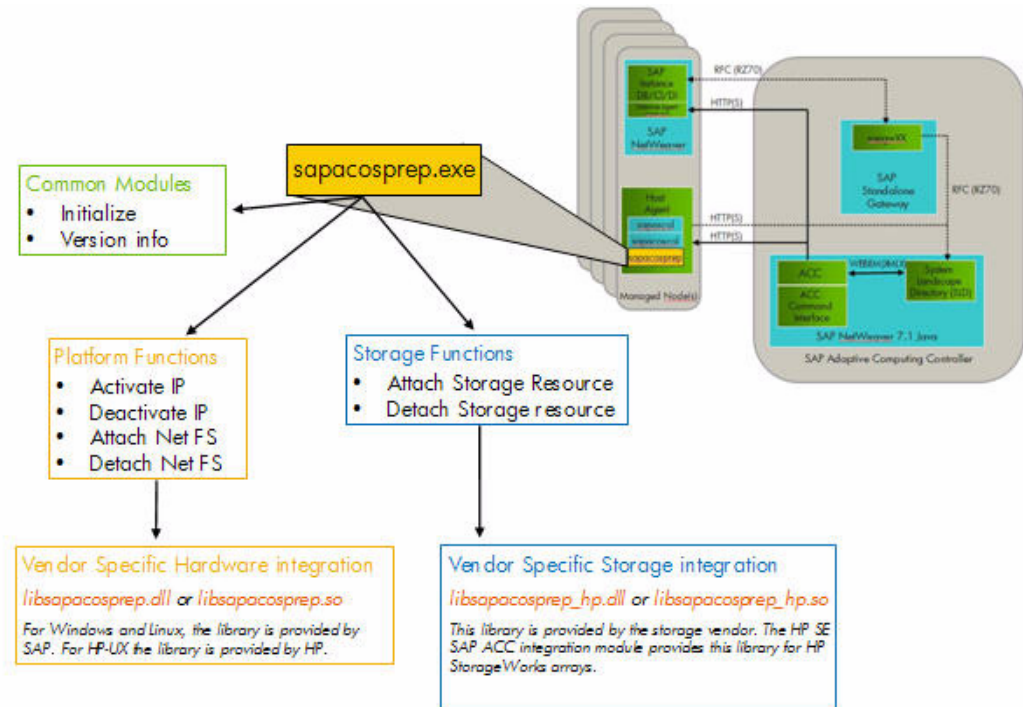
providing the necessary integration modules. The functions that the partner modules need to provide can be divided into two categories:

- Functions that are platform-specific
  - Activate an IP address
  - Deactivate a virtual IP address
  - Attach a network file system
  - Detach a network file system
- Functions that are storage-specific
  - Attach a distributed file system
  - Detach a distributed file system
  - Attach a Storage Resource
  - Detach a Storage Resource

Besides the two partner modules, SAP maintains and offers a common function module that provides:

- Setup and callback functions
- Return module version and information

The following figure provides an overview of the SAP ACC integration library, the functions implemented, and the available vendor integration point.



**Figure 5** Overview of the SAP ACC library

Keep in mind the following about Figure 5, “Overview of the SAP ACC library,” on page 7:

- The platform-specific modules are provided by each platform hardware/operating system support team. For HP-UX, these modules are provided by the HP SAP consulting and integration team for HP-UX, which are available by email request to HPUX.ACC@hp.com. The storage-specific modules are provided by each storage vendor. Storage-specific modules can also be platform-specific. The Application Integration Software for SAP ACC distributes this storage-specific module for HP StorageWorks arrays.

## Virtual IP Address

Adaptive Computing uses the concept of assigning a unique virtual IP address and network name to the application, and by doing this, it separates the application from the physical host IP address. The process of using virtual IP addresses for applications is commonly used in all cluster systems, and all major operating system releases support the overloading of a network interface card with multiple IP addresses. The advantage of this approach is that you can always access the application through one unique name, no matter where the application is running.

---

**NOTE:** Platform specific libraries are required to install or convert a SAP installation to a virtual landscape. These libraries enable virtual IP addresses on the Managed Nodes.

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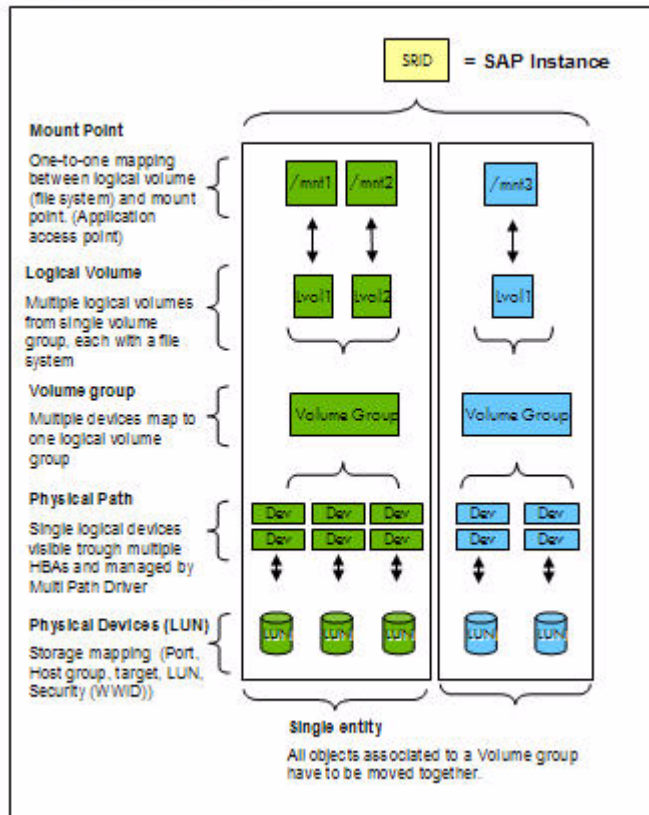
## Virtualized Data

Adaptive Computing also implements the concept of virtualizing the application data into a single group of data devices (Storage Resources) that can be moved between physical Managed Nodes. The first requirement to accomplish data virtualization is to ensure that all the data required for the application is located on a dedicated set of storage devices. For the Application Integration Software for SAP ACC, it is required that all the storage devices for a specific SAP application are located on a central storage system with SAN access from all of the Managed Nodes. In the SAP ACC, the set of physical Storage Resources that are required for a specific SAP instance are identified by a Storage Resource Identifier (SRID). This identifier provides the link between the SAP ACC application and the Application Integration Software for SAP ACC.

The Application Integration Software for SAP ACC is specifically designed to support SAN-attached storage in an adaptive landscape.

The following diagram shows the relationships between physical storage devices and their usage on HP-UX systems.

## HP-UX with LVM



**Figure 6** Relationship between physical storage and file systems for HP-UX systems

Operating system disk management utilities allow you to combine or subdivide the physical devices into custom-sized file systems, each with a specific mount point on the host. To successfully move physical resources between systems, without impacting other applications, make sure that the physical drives and all associated objects belong only to the SAP instance identified by the SRID.

## Control

Controlling the adaptive landscape is performed from within the SAP application using the ACC software that is build on top of the SAP NetWeaver® application.

## Application Integration Software for SAP ACC

To support a fully automated SAN storage movement between Managed Nodes, HP has developed the Application Integration Software for SAP ACC. The Application Integration Software for SAP ACC consists of the following parts:

- [HP Storage Essentials SRM Enterprise Edition](#), page 10
- [Active Host Management Interface](#), page 10
- [Application Integration Software](#), page 10

## HP Storage Essentials SRM Enterprise Edition

The HP Storage Essentials SRM Enterprise Edition product suite provides an integrated array management functionality for storage provisioning and Managed Node management. The Application Integration Software for SAP ACC is built on the HP Storage Essentials SRM API functions. It utilizes the HP Storage Essentials SRM database for host objects and the storage management functions to present and un-present storage to/from any Managed Node in the landscape.

---

**NOTE:** HP SE integration for SAP ACC is only supported with the Windows version of the HP Storage Essentials SRM Enterprise Edition product suite.

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## Active Host Management Interface

The Application Integration Software for SAP ACC provides an active host management interface for HP SIM to perform active management on the Managed Nodes for storage management. For this to work, it is necessary to have all Managed Nodes discovered in HP SIM and HP Storage Essentials SRM and to configure a Secure Shell (OpenSSH) communication to each Managed Node.

## Application Integration Software

The Application Integration Software has three main functions:

- **Maintain the relationship between the Storage Resource Identifier (SRID) and the physical storage devices** - Since the SAP ACC does not maintain a list of physical devices associated to a SAP instance, but rather only an identifier for the Storage Resources used by an SAP instance, it is necessary to maintain a link between the SRID used in the SAP ACC configuration and the list of physical devices used by the instance. The Application Integration Software for SAP ACC provides an interface that lets you easily associate the Storage Resource Identifier with a specific mount point and associated physical devices.
- **Provide the interaction between SAP ACC and storage management** - The Application Integration Software for SAP ACC provides the vendor specific storage API (`libsapacosrep_hp.sl` and `libsapacosprep.so` for HP-UX hosts) to integrate with the SAP “sapacosprep” agent on the Managed Node. The storage API forwards storage-related requests to the Application Integration Software for SAP ACC.
- **Implement the flow of operation necessary to start, stop, or relocate Storage Resource to/from a Managed Node** - This includes the necessary actions on the Managed Node to discover, configure, and mount/unmount file systems on the individual computing systems and storage array manipulation (to present and un-present storage to/from the Managed Node). The Application Integration Software for SAP ACC is also responsible for protecting storage devices that are not currently accessed by any Managed Node.

## 2 Creating an Adaptive Landscape

This chapter describes the following:

- [SAP Virtual Landscape](#), page 11
- [Configuring the SAP ACC Landscape](#), page 12
- [Configuring the SAP Instance](#), page 13

How you create your adaptive landscape will depend on your environment. Consider the following:

- For new SAP installations, the landscape should be designed and implemented with virtualization in mind, even if you do not plan to utilize virtualization at this stage. This step will eliminate the painful process of changing a landscape to support virtualization at a later stage, and it can also be used to support clustering solutions and operating system virtualization solutions.
- For the existing SAP landscapes that are not virtualized, you will need to change the hostname and IP addresses of most instances. This step can be a complex and time consuming task. Please consult with your SAP provider to plan the best way to modify the landscape.

---

**NOTE:** When creating a virtual landscape, use a DNS server and use NIS for consistent SAP UNIX User IDs and Group IDs to ensure that all user and system data are centrally controlled and consistent on all nodes. Although a Solution Manager server is no longer required for SAP ACC 7.1, a dedicated SAP Solution Manager server is required to download SAP support packages and patches, as well as to generate installation keys.

---

### SAP Virtual Landscape

Installing a virtualized SAP system requires a dedicated network name (IP address and host name) for each SAP instance. This host name must be used when SAP is installed, instead of the fixed server name or IP address. For more details on installing a virtual SAP landscape, consult the SAP installation manuals and your SAP provider/integrator.

The vendor-specific platform library is necessary to add the virtual IP address to the existing IP address of the system. Access the following website to obtain the library for your operating system: <http://service.sap.com/adaptive>

This URL requires you to provide an SAP S-user ID. After you login to the Web site, access the library as follows:

- **HP-UX** - The HP-UX SAP platform team provides the HP-UX library, which is posted in the vendor area of the Web site. Follow the vendor specific links to access this library.

---

**NOTE:** Always use the latest support pack recommended by SAP. This release supports SAP ACC version 7.1. SAP Netweaver 7.1 is a component of SAP ACC version 7.1.

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## Configuring the SAP ACC Landscape

The following steps describe the high-level actions necessary to configure the SAP ACC landscape. For more detailed instructions, consult the SAP documentation for installing and configuring SAP adaptive computing.

### To configure the SAP ACC landscape

1. Set up the SAP ACC 7.1 server and upgrade to the latest support package.
2. Set up the standalone gateway server on the ACC server.
3. Set up the Managed Nodes.
4. Install the SAP Host agent on the Managed Nodes and apply the latest patch.
5. Register the Managed Nodes resources into the System Landscape Directory (SLD) using the `sldreg` command.
6. Register the Managed Nodes services into the SLD using the transaction code RZ70.
7. Configure the adaptive servers on the ACC GUI. ACC Enable the servers and set up the Logical Landscape.



# Configuring the SAP Instance

Using the SAP ACC interface, you must define the appropriate Storage Vendor integration module to be used for each Adaptive enabled SAP instance. The following shows you what the SAP ACC interface looks like:

The screenshot displays the 'Adaptive Computing: Configuration' interface. The left sidebar shows a navigation menu with 'Configuration' selected. The main area is titled 'Service Configuration - ABAP Database: Oracle, dbh11'. It contains a table of services with columns for Service, AC Managed, AC Enabled, Pool, Description, Business Area, and Service Group. The 'H11: WebAS ABAP 7.10, dbh11' instance is highlighted in yellow, and its 'Database: Oracle, dbh11' row is also highlighted. Below the table is a 'Service Configuration Summary' section with an 'Edit' button. The summary shows details for the 'ABAP Database: Oracle, dbh11' instance, including installation host name, service ID, database name, user name, primary system host, and required memory. At the bottom, a 'Mount Points' table is visible, with the 'SR' row highlighted in red, showing a storage type of 'SR', a mount point of 'DB\_SRID\_H11', and a partner ID of 'hp'.

Service	AC Managed	AC Enabled	Pool	Description	Business Area	Service Group
AC7: WebAS JAVA 7.10, lagos	<input type="checkbox"/>	<input type="checkbox"/>				
B77: WebAS ABAP 7.00, dbb77	<input type="checkbox"/>	<input type="checkbox"/>				
D55: WebAS ABAP 7.10, dbd55	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Adaptive Managed Node Landscape			
Database: MIS SQL, dbd55	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Adaptive Managed Node Landscape	x	x	x
Central Instance: 01, ctd55	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Adaptive Managed Node Landscape	x	x	x
ABAP ABAP Instance: 03, did03	<input type="checkbox"/>	<input type="checkbox"/>				
H11: WebAS ABAP 7.10, dbh11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Adaptive Managed Node Landscape			
Database: Oracle, dbh11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Adaptive Managed Node Landscape	Oracle 10G	CASL	SAP ACC
Central Instance: 00, ch11	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Adaptive Managed Node Landscape	Oracle 10G	CASL	SAP ACC

Storage Type	Mount Point	Export Path	Options	FS/SRID Type	Partner ID
SR	DB_SRID_H11			HPSE	hp

**Figure 7** Configuring the Storage Integration in the SAP ACC Interface

To configure the Storage integration in the SAP ACC interface

1. Select the Configuration link on the left side of the dialog.
2. Select the appropriate SAP Instance in the upper panel.
3. Click **Edit**. The bottom panel changes allowing you to specify the following:
  - **Storage Type:** Enter SR to define that it is an integrated Storage Resource.
  - **MountPoint/SRID:** Enter a Storage Resource ID for this instance. This is a free text field and should be descriptive of the instance. This value will be sent to the Application Integration Software for SAP ACC with the appropriate "start" or "stop" operation request. This value must match the Storage Resource defined in the Application Integration Software for SAP ACC.
  - **Partner ID:** Enter HP.



# 3 Install HP Storage Essentials SRM and HP SIM

This chapter describes the following:

- [User Account](#), page 15
- [Storage System Considerations](#), page 16

---

**IMPORTANT:** Refer to the release notes to determine which versions of HP Storage Essentials Storage Resource Management (SRM) and HP Systems Insight Manager (SIM) are supported.

---

Prior to installing the Application Integration Software for SAP ACC, HP Storage Essentials SRM and HP SIM must be installed and configured. The customer or HP Services must complete the following steps in order before installing the HP Storage Essentials SRM SAP ACC Application Integration Software:

---

**IMPORTANT:** The following steps are just an overview. Consult the documentation for HP SIM and HP Storage Essentials SRM for more detailed information.

---

1. Install HP Storage Essentials SRM with the latest service pack according to the HP Storage Essentials SRM documentation.
2. Install HP SIM with the latest service pack according to the HP SIM documentation.
3. Install the HP Storage Essentials SRM/HP SIM connector.
4. From HP SIM, discover all components (hosts, switches, and arrays).
5. Install and configure OpenSSH on all Managed Nodes.
6. Install the CIM Extensions that ship with HP Storage Essentials SRM onto the host machines.
7. From HP SIM, discover all systems.
8. Run Discovery Data Collection.
9. Schedule HP Storage Essentials SRM so that Run Discovery Data Collection runs frequently.

## User Account

The administrator account that is created during the installation of HP Storage Essentials SRM, is the account that is used for communication between the Application Integration Software for SAP ACC and HP Storage Essentials SRM.

---

**NOTE:** When you create custom users, they must belong to the Storage Administrator role or Domain Administrator role. Only users assigned to the Storage Administrator role or Domain Administrator role can access the Application Integration Software for SAP ACC.

---

## Storage System Considerations

This section describes the following:

- [SAN Zoning](#), page 16
- [Host Groups](#), page 16
- [Reserved-Group](#), page 16

### SAN Zoning

For a Managed Node to be able to access the physical storage device, it has to be physically connected to the storage array using a Storage Area Network (SAN). If any zone security is implemented in the SAN, the Managed Node must be added to the appropriate SAN zone for the Managed Node to have logical access to the storage array.

The Application Integration Software for SAP ACC does not change any SAN configuration in order for a Managed Node to have access to the Storage Array.

### Host Groups

For HP StorageWorks XP arrays, each Managed Node in the SAP Landscape must have some physical connection to the storage array, and a host group must be created on the front-end host port, of the storage array, for each Managed Node. The Managed Node's host bus adapter (HBA) world wide name (WWN) must be added to the host group in order for the host to be able to access any devices in that host group. This procedure must be performed even if the Managed Node will not initially have access to any physical storage. During the device presentation phase of the operation, the Application Integration Software will determine the HBA WWN for the requesting Managed Node and must be able to match this to some host groups defined on the array.

For HP StorageWorks EVA arrays, each Managed Node in the SAP Landscape must have some physical connection to the storage array, and a host folder with the WWN of all HBAs of that host must be created in the array configuration.

### Reserved-Group

In the HP StorageWorks XP array, a logical device (LDEV) is considered unused (or available) if the device is not presented to any front-end port or host group. One of the advantages of using Adaptive Computing Controller is the ability to stop some SAP resources, and then, when these resources are needed again, to be able to start them on any available Managed Node. When a resource is stopped using the SAP ACC, the Application Integration Software will un-present the physical storage (LDEVs) from the host group, and for some time, the physical storage will not be presented to any port. In order to protect the physical storage from mistakenly being identified as available, the Application Integration Software will create a Reserved-Group host group on a

specific port in the array and present all adaptive enabled physical storage to that host group. It creates this special host group to ensure that a physical storage device will always have at least one presentation to a host group.

The Reserved-Group will be created when the first storage resource for a storage array is defined in the Application Integration Software.

---

**NOTE:** The HP StorageWorks XP array has a limit for the number of physical devices that can be assigned per host group and per port. This limit is dependent on the array version and can be between 1024 and 2048 devices. For this reason, the current version of the Application Integration Software is limited to the number of devices it can manage per storage array.

---

---

**NOTE:** For the HP StorageWorks EVA array, a reserved group is not necessary.

---



# 4 Install the Application Integration Software for SAP ACC

This chapter describes the following:

- [Requirements](#), page 19
- [New Installation](#), page 19
- [Upgrade Installation](#), page 22
- [Uninstall](#), page 24

## Requirements

The Application Integration Software for SAP ACC is dependent on the prior successful installation of the following software components on the same server:

- HP Storage Essentials SRM Enterprise Edition software
- HP System Insight Manager
- The HP Storage Essentials SRM/SIM Connector

The Application Integration Software for SAP ACC is intended to be installed on the same physical server that HP Storage Essentials SRM Enterprise Edition and HP System Insight Manager are installed on. Installation on any other remote system is not supported.

---

**IMPORTANT:** Refer to the release notes for more requirements.

---

## New Installation

To install the Application Integration Software

1. Login to the HP Storage Essentials SRM server using the same user name used for the HP Storage Essentials SRM installation.

---

**NOTE:** It is important to be able to distinguish between local or domain administrator users and to make sure that the correct user is used for installing the Application Integration Software for SAP ACC. The installation process has to register the Application Integration Software into HP SIM and HP Storage Essentials SRM. Using the incorrect user results in authentication errors. All input fields are case sensitive.

---

2. Insert the CD-ROM for the Application Integration Software into the CD drive. The installation process should automatically start. If it does not start automatically, click **setup.exe** on the installation media.

---

**NOTE:** If **setup.exe** is run from a shared drive, a warning message might appear asking for confirmation if the application is safe to run. Click **OK** to start the installation process.

---

The HP SE SAP ACC Integration Installation window opens.

---

**NOTE:** If the HP SE SAP ACC Integration Installation window does not open after clicking **setup.exe**, and instead, an error message is displayed stating "To run this application, you first must install one of the following versions of the .NET framework:", the user can still manually launch the installation of the desired version *without* installing the .NET framework. Before manually launching the installation as described in this note, the user must uninstall any prior version of HP SE SAP ACC Integration Software. After uninstalling any prior version of the software, the user can click the **setup.exe** file included in the directory on the installation CD that matches the desired version (/A.02.00/setup.exe or /A.02.01/setup.exe). For example, if a user wants to install version A.02.01, the user can click the **setup.exe** file located in the /A.02.01 directory on the installation CD. The InstallShield Wizard window will open and the wizard will guide the user through the installation.

---

3. Select the version to install. You can choose to install either version A.02.01 for HP-UX Managed Nodes or A.02.00 for Windows Managed Nodes. You will not be allowed to install A.02.00 on a system where A.02.01 is installed (that is, you are not allowed to install an older version of the product if a more current version is already installed).

---

**NOTE:** The installation process of version A.02.01 automatically uninstalls version A.02.00. The user is prompted before the uninstall process starts. The installation process of HP SE SAP ACC Integration version A.02.01 can be started manually by clicking **setup.exe** located in the /A.02.01 directory on the installation CD.

---

---

**NOTE:** The A.02.00 installation assumes that both HP Storage Essentials and HP System Insight Manager have been installed in the default directories, namely C:\hp\SE and C:\Program Files\HP\System Insight Manager. If that is not the case, the installation of HP SE SAP ACC Integration A.02.00 will fail the installation port test. The user will have to reinstall HP Storage Essentials and HP System Insight Manager to their default locations.

---

---

**IMPORTANT:** The information in this guide describes setup and configuration using SAP ACC 7.1 for version A.02.01 of the SE Integration Software for SAP ACC. If you are using version A.02.00 of the SE Integration Software for SAP ACC, refer to the user guide for the A.02.00 release of the HP Storage Essentials SRM Enterprise Edition 6.0 Windows Application Integration Software for SAP ACC for configuration and usage information.

---

4. Click **Install**. The License Agreement window opens.



5. Read and accept the license agreement.
6. Click **Next**. The Choose Destination Location window opens.
7. Accept the default location or click **Change** to select another folder location.  
The default location to install the Application Integration Software for SAP ACC is  
`%SystemDrive%\Program File\HP\SE_SAP_ACC_Integration`

---

**NOTE:** It is recommended that you use the default installation location.

---

8. Click **Next**. The Ready to Install the Program window opens.
9. Click **Install** to begin the installation. A window opens where you can specify integration information about port numbers, domain\usernames, and passwords. In this window, specify the following:
  - **Configuration port1:** This port listens for communications with the HP Storage Essentials SRM SAP ACC Integration Configuration Web interface. The default port of 3330 is specified. You can use this default port if it is not already being used by the system. If it is in use, specify another one.
  - **Configuration port2:** This port also listens for communications with the HP Storage Essentials SRM SAP ACC Integration Configuration Web interface. The default port of 3331 is specified. You can use this default port if it is not already being used by the system. If it is in use, specify another one.
  - **Service monitor port:** This port listens for the service to connect and monitors the status of HP Storage Essentials SRM SAP ACC Integration Core. The default port of 3332 is specified. You can use this default port if it is not already being used by the system. If it is in use, specify another one.
  - **External operations port:** Mount and dismount operations will be requested through this port. The default port of 3333 is specified. You can use this default port if it is not already being used by the system. If it is in use, specify another one.
  - **SE username:** Enter the username for the HP Storage Essentials SRM. The user name needs to be provided in the format <domain>\username, where <domain> is either the local system domain or the global domain user, depending on what account was used during installation of HP Storage Essentials SRM. This field is case-sensitive.
  - **SE password:** Enter the password for the HP Storage Essentials SRM. This field is case-sensitive.
  - **Confirm SE password:** Confirm the password for the HP Storage Essentials SRM.
  - **SIM username:** Enter the username for the HP System Insight Management. The user name needs to be provided in the format <domain>\username, where <domain> is either the local system domain or the global domain user, depending on what account was used during installation of HP System Insight Management. This field is case-sensitive.
  - **SIM password:** Enter the password for the HP System Insight Management. This field is case-sensitive.
  - **Confirm SIM password:** Confirm the password for the HP System Insight Management.

The user name and password settings for HP Storage Essentials SRM and HP Systems Insight Management allow the Application Integration Software for SAP ACC to communicate with HP Storage Essentials SRM and HP System Insight Management so that storage movement operations can be performed. If you do not know the user name and password settings for HP Storage Essentials SRM and HP Systems Insight Manager, ask your system administrator to enter this information.

10. Click **Next** to complete the installation of the necessary files on the HP Storage Essentials SRM server.
11. Click **Finish** to exit the InstallShield Wizard.

## Upgrade Installation

An upgrade installation is basically the uninstall of the prior version of the Application Integration Software and the install of the current version. If a prior version of the Application Integration Software is installed on the machine, the installation program will uninstall the prior version first.

---

**IMPORTANT:** The removal program for the Application Integration Software for SAP ACC stops AppStorManager, which is the service for HP Storage Essentials SRM, before removing the Application Integration Software. Schedule the removal of the Application Integration Software for SAP ACC when HP Storage Essentials SRM is not being heavily used and/or during off peak hours.

---

### To upgrade the Application Integration Software

1. Login to the HP Storage Essentials SRM server using the same user name used for the HP Storage Essentials SRM installation as you did for the new installation.
2. Insert the CD-ROM for the Application Integration Software into the CD drive. HP SE SAP ACC Integration Installation window should automatically open. Select HP SE SAP ACC Integration version A.02.01 and click **Install**. If the HP SE SAP ACC Integration Installation window does not open automatically, click **setup.exe** located in the root level on the installation media (that is, *<Installation CD Drive>:\setup.exe*).

---

**NOTE:** If the HP SE SAP ACC Integration Installation window does not open after clicking **setup.exe**, and instead an error message is displayed stating "To run this application, you first must install one of the following versions of the .NET framework:", the user must uninstall any prior version of HP SE SAP ACC Integration Software. The uninstall procedure is described in [Uninstall](#), page 24. After completing the uninstall process, the user must proceed to [step 4](#) below.

---

**NOTE:** The installation process of version A.02.01 automatically uninstalls version A.02.00. The user is prompted before the uninstall process starts. The installation process of HP SE SAP ACC Integration version A.02.01 can be started manually by clicking **setup.exe** located in the /A.02.01 directory on the installation CD.

---

A window opens stating that another version of the Application Integration Software is installed. To uninstall the previous version, the HP Storage Essentials service (AppStorManager) needs to be stopped.

3. Click **YES** to stop the HP SE service (AppStorManager) and to proceed with the uninstall of the previous version.

After the prior version has been uninstalled, the InstallShield Wizard Welcome window opens.

4. To continue with the installation, start with [step 3](#) of the "New Installation" procedure.

## Installation Checks

The following directories are created during installation:

- C:\Program Files\HP\SE SAP ACC Integration
- C:\Program Files\HP\SE SAP ACC Integration\ACC\_deploy
- C:\Program Files\HP\SE SAP ACC Integration\bin
- C:\Program Files\HP\SE SAP ACC Integration\config
- C:\Program Files\HP\SE SAP ACC Integration\deploy
- C:\Program Files\HP\SE SAP ACC Integration\lib
- C:\Program Files\HP\SE SAP ACC Integration\logs
- C:\hp\StorageEssentials\JBossandJetty\server\appiq\deploy\SE\_SAP\_ACC\_Integration.war (and all subdirectories)
- C:\hp\StorageEssentials\JBossandJetty\server\appiq\work\jboss.web\localhost\SE\_SAP\_ACC\_Integration (and all files and subdirectories)

---

**IMPORTANT:** Verify that the AppStorManager service has been started. The AppStorManager service runs HP Storage Essentials SRM. To allow user login and other normal operations, the Application Integration Software for SAP ACC depends on the AppStorManager service running. The AppStorManager service is not part of the Application Integration Software for SAP ACC.

---

## Uninstall

The following procedure explains how to remove the Application Integration Software for SAP ACC.

---

**IMPORTANT:** The removal program for the Application Integration Software for SAP ACC stops AppStorManager, which is the service for HP Storage Essentials SRM, before removing the Application Integration Software. Schedule the removal of the Application Integration Software for SAP ACC when HP Storage Essentials SRM is not being heavily used and/or during off peak hours.

---

To remove a previous version of the Application Integration Software for SAP ACC

1. Access the Add or Remove Programs window by selecting **Start > Settings > Control Panel > Add or Remove Programs**.
2. From the list of currently installed programs, select **HP\_SE\_SAP\_ACC\_Integration**.
3. Click **Change/Remove**.
4. Click **Remove**.

The removal program for the Application Integration Software for SAP ACC stops and starts AppStorManager.

---

**NOTE:** After removal of the Application Integration Software for SAP ACC, the HP Storage Essentials SRM server takes some time before it is ready for operations. Wait approximately 5 minutes before using HP Storage Essentials SRM after removing the Application Integration Software for SAP ACC. This is only an estimate. It may take longer and can vary depending on the network environment. For example, a greater number of elements in the network increases the time required for path calculations done at the start of HP Storage Essentials SRM.

---

# 5 Interprocess Communications

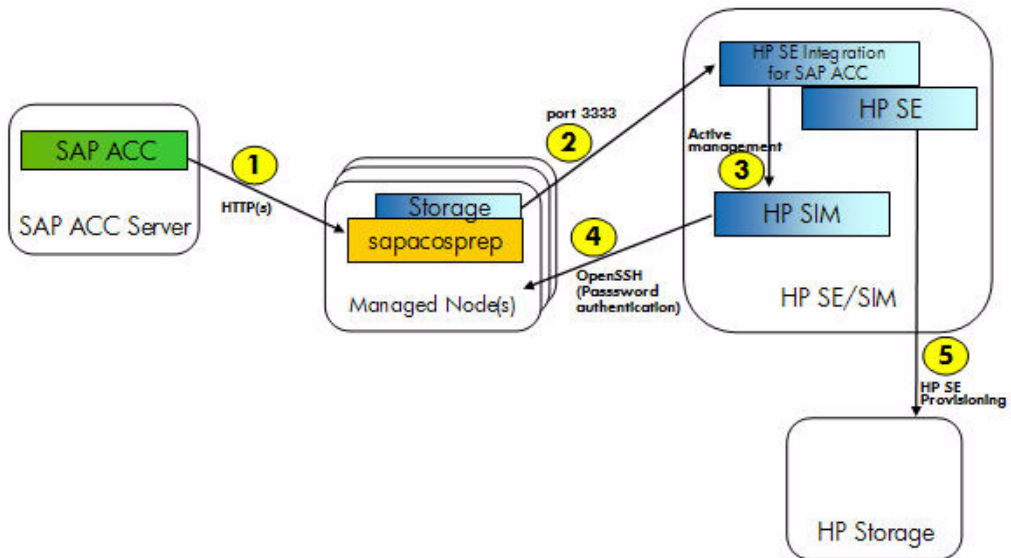
This chapter describes the following:

- [Communication Methods](#), page 25
- [OpenSSH Installation and Configuration](#), page 26

## Communication Methods

The Adaptive Computing Integration Software uses different communication methods to enable all the different components to communicate with each other. For successful implementation, it is necessary to understand the communication methods and the dependencies between the products.

The following diagram displays a summary of the inter-process communications in the adaptive landscape.



**Figure 8** Communication between systems

As you can see from the preceding diagram, the communications methods used are the following:

- 1. HTTP(S):** Used by SAP ACC 7.1 to communicate with the SAP Host Agent and sapacosprep.exe.
- 2. Simple port communications:** Used by the storage specific library to propagate storage operations to the HP Integration Software for SAP ACC.
- 3. Active management:** Requested by the HP Integration Software for SAP ACC from HP SIM.
- 4. OpenSSH:** Used by HP SIM with password authentication to execute commands on the Managed Node for active management.

5. **HP SE API:** Used by HP Integration Software for SAP ACC (uses API to call native HP SE provisioning operations for HP storage arrays) to perform storage management.

## OpenSSH Installation and Configuration

Secure Shell (OpenSSH) is used for communication between HP SIM and the Managed Nodes.

The following is a high level sequence for installing and configuring OpenSSH in the adaptive landscape. For more details on installation, refer to the user documentation on OpenSSH or the Installation Guide for HP SIM.

### Installing OpenSSH

To install OpenSSH on HP-UX Managed Nodes

- HP-UX Managed Nodes already have OpenSSH installed. If for some reason OpenSSH is not installed on the HP-UX Managed Node, you will have to perform this task manually since you cannot install OpenSSH on an HP-UX Managed Node using HP SIM.

---

**NOTE:** On HP-UX systems, ensure that OpenSSH version 4.40.007 or later is installed.

---

### Configuring OpenSSH

After OpenSSH is successfully installed on a Managed Node, you must configure the SIM agent to be able to communicate with the Managed Node.

To configure OpenSSH

- Enter the following command from a command prompt on the Storage Essentials server:

```
mxagentconfig -a -n <hostname> -u <Administrator username> -p  
<password>
```

### Verifying Communication

After configuring the SIM agent to communicate with the Managed Node, it is a good idea to verify the communication.

To verify HP SIM communication with the Managed Node

- Verify that SIM is able to communicate with the Managed Node through OpenSSH by performing the following steps on the Storage Essentials server:

For a HP-UX Managed Node:

- a. Select **Tools > Command Line Tools > Unix/Linux > ls...** from the SIM menu.
- b. Select the host and enter the `ls` command on a local drive.

---

**NOTE:** If the `ls` task fails the first time in HP SIM, you must repeat the operation again. It has been observed that OpenSSH will fail on the first communication attempt, but any subsequent communication will succeed if it has been successfully set up.

---







# 6 Install the Integration Library on Managed Nodes

This chapter describes the following:

- [Installing the Storage Specific Integration Library on Managed Nodes](#), page 29
- [Uninstalling the Storage Specific Integration Library on Managed Nodes](#), page 30

The HP Storage Essentials SRM SAP ACC Integration Software contains a feature that installs/updates and uninstalls the storage specific integration library on the Managed Nodes. The sapacosprep agent running on the Manage Node requires this storage specific library to successfully communicate with SAP ACC Integration Software. The install/update and uninstall feature will work properly only after the Managed Node is configured and discovered in HP Storage Essentials SRM, and the OpenSSH communication between the Managed Node and HP Storage Essentials server was configured correctly.

## Installing the Storage Specific Integration Library on Managed Nodes

To install the storage specific integration library on Managed Nodes

1. Click the HP SE SAP ACC desktop icon to launch the HP Storage Essentials SRM SAP ACC Integration Software.

Alternatively, you can launch the Integration Software application by opening an Internet Explorer browser window and entering the following URL:

```
http://<HP Storage Essentials SRM Server  
Host>/SE_SAP_ACC_Integration/pages/Login.jsp
```

where <HP Storage Essentials SRM Server Host> is the DNS name or IP address of the server running HP Storage Essentials SRM.

The Login window opens.

2. Enter the user name and password to connect to the HP Storage Essentials SRM server. The format of the user name is <domain>\username. Both user name and password are case-sensitive. Click **Connect**.

---

**NOTE:** The <domain> can either be the local host domain or the global domain, depending on what you used to install HP SIM and HP Storage Essentials SRM. For a successful authentication, the username and password must match a username and password recognized by Storage Essentials. The match must be letter-by-letter and case sensitive.

---

After successful authentication, the HP Storage Essentials SRM SAP ACC integration Main Menu opens.

3. Click the **Integration Library** tab. An "Opening page..." message is displayed at the bottom of the Internet Explorer window prior to displaying the Integration Library page.

This tab lists the hosts discovered in HP Storage Essentials SRM, along with the operating system on which each host is running. The Integration Library version is unknown for all hosts, until a specific library version is distributed to that host. The Hosted Storage Resources column displays the active Storage Resources that have been added to a host, if any.

---

**NOTE:** It is possible to configure a Storage Resource for a host without the library installed, but that resource cannot be moved unless a library is also installed on the host.

---

4. Select the host from the list that requires the library to be installed. This is the vendor-specific library that links the SAP ACC to the HP Storage Essentials SRM SAP ACC integration software.

---

**NOTE:** This version only supports one host installation at a time.

---

5. Click **Install/Upgrade**.

The Install/Upgrade Integration Library window opens. This window confirms the version number of the Integration Library that is about to be installed on the selected host. This will always list the latest version of the library that is installed on the local server.

6. Click **Install/Upgrade** to start the installation of the library on the SAP host.

The library is installed in the SAP selected directory on the host. On HP-UX hosts, two files are copied to the `/usr/sap/hostctrl/exe` directory, and they are called `libsapacosprep_hp.sl` and `libsapacosprep_hp.so`. The installation process also adds a configuration file in the `/etc` directory with communication parameters, which the Integration Software requires to connect to the HP Storage Essentials SRM server, including the HP Storage Essentials SRM server name and the port number for communication.

---

**NOTE:** If the HP Storage Essentials SRM server name or communication port numbers for HP Storage Essentials SRM SAP ACC Integration Software is changed, it is necessary to re-install/update the Integration Software on all the Managed Nodes.

---

After the operation is completed, the process displays the version of the library that was just installed on the host.

## Uninstalling the Storage Specific Integration Library on Managed Nodes

It is possible to uninstall the integration library from a specific SAP host.

To uninstall the storage specific integration library on Managed Nodes

1. Select the host from the list that requires the library to be uninstalled.
2. Click **Uninstall**.

The Uninstall Integration Library window opens. This window confirms the version number of the Integration Library that is about to be uninstalled on the selected host.

3. Click **Finish** to confirm that you want to uninstall the library. If the process completes successfully, **Unknown** is displayed in the **Integration Library Version** field for that host.



# 7 Storage Resource Information

This chapter provides information about the following:

- [Adding a Storage Resource Identifier](#), page 33
- [Viewing Resource Information](#), page 38
- [Removing a Storage Resource](#), page 38

## Adding a Storage Resource Identifier

The HP Storage Essentials SRM SAP ACC Integration Software saves the Storage Resource Identifiers (SRIDs) in the Integration Software's database. Actual file system and physical devices are obtained from the host that has the Storage Resource(s) active.

Prerequisites:

- The SAP instance is installed on the Managed Node.
- All the storage associated with the SAP instance is presented and mounted on the Managed Node.
- The Managed Node is configured and discovered in HP Storage Essentials SRM.
- The OpenSSH communication between Managed Nodes and the HP Storage Essentials server is configured and operational.
- The SAP libraries have been deployed on the Managed Nodes. This can be done by selecting the **Integration Library** tab on the Main Menu of the HP Storage Essentials SRM SAP ACC Integration Software GUI. For HP-UX Managed Nodes, the libraries are the `libsapacosprep_hp.sl` and `libsapacosprep_hp.so` files located in the `/usr/sap/hostctrl/exe/` directory.

To add a Storage Resource ID to the Integration Software database:

1. Click the HP SE SAP ACC desktop icon to launch the HP Storage Essentials SRM SAP ACC Integration Software.

Alternatively, you can launch the Integration Software application by opening an Internet Explorer browser window and entering the following URL:

```
http://<HP Storage Essentials SRM Server Host>/SE_SAP_ACC_Integration/pages/Login.jsp
```

where <HP Storage Essentials SRM Server Host> is the DNS name or IP address of the server running HP Storage Essentials SRM.

The Login window opens.

2. Enter the user name and password to connect to the HP Storage Essentials SRM server. The format of the user name is `<domain>\username`. The user name and password are case-sensitive. Click **Connect**.

After successful authentication, the HP Storage Essentials SRM SAP ACC integration Main Menu opens. On the **Storage Resources** tab, the list of Storage Resources is displayed. This list is empty the first time you add a resource.

3. Click **Add** to add a Storage Resource. The Add Storage Resource window opens.
4. In the Add Storage Resource window, specify the following:
  - **Storage Resource Name:** Enter the Storage Resource ID. The Storage Resource ID you enter in this field must match the Storage Resource ID used in the SAP ACC interface when defining the storage for the specific SAP instance. It is recommended that you specify a short but descriptive name using a combination of letters and numbers.
  - **Group:** Enter a Storage Resource group name or select a name from the pull-down list, which displays the list of existing Storage Resource groups. This field is only used to sort the defined Storage Resources on the Main menu, and it has no other functional value. The field can be left blank if desired.

---

**NOTE:** If this is the first Storage Resource, the Storage Resource group menu is empty

---

- **Description:** Enter a description for the Storage Resource. This field is only to provide more detail of actual resources and has no functional value. The field can be left blank if desired.
  - **Hosted by:** Select the host from the pull-down list that has this resource currently active and mounted from the menu. By default, the menu lists the host names configured in the HP Storage Essentials SRM server, including hosts that are not part of the SAP ACC landscape. If this list is too long, select the check box next to the menu to limit the list to only hosts that have the HP Storage Essentials SRM SAP ACC Integration host agent installed.
5. Click **Next**. The Associate Physical Storage to Storage Resource window opens.

A list of active file systems on the selected host are displayed. Detailed information for each file system is displayed in the table. All mount points corresponding to the same LDEV/VDisk must be selected for the same resource.

## Associate Physical storage to Storage Resource

Use the following table to select the physical storage available on host symhpux1 to be associated with storage resource

<input type="checkbox"/>	Mount Point	↑	Volume Group	Storage Array
<input type="checkbox"/>	• /symhpux_xp		/dev/vg_symhpux_xp	10051
<input type="checkbox"/>	• /symhpux11xp		/dev/vg_symhpux11_xp	10051
<input type="checkbox"/>	• /symhpux12_1xp		/dev/vg_symhpux12xp	10051
<input type="checkbox"/>	• /symhpux12_2xp		/dev/vg_symhpux12xp	10051
<input type="checkbox"/>	• /symhpux13xp		/dev/vg_symhpux13_xp	10051
<input type="checkbox"/>	• /symhpux14xp		/dev/vg_symhpux14_xp	10051
<input type="checkbox"/>	• /symhpux15_1xp		/dev/vg_symhpux15_xp	10051
<input type="checkbox"/>	• /symhpux15_2xp		/dev/vg_symhpux15_xp	10051
<input checked="" type="checkbox"/>	• /symhpux16_1xp		/dev/vg_symhpux16_xp	10051
<input checked="" type="checkbox"/>	• /symhpux16_2xp		/dev/vg_symhpux16_xp	10051
<input checked="" type="checkbox"/>	• /symhpux16_3xp		/dev/vg_symhpux16_xp	10051

**Figure 9** Associating physical storage to the storage resource

6. Select all mount points belonging to the SAP instance. Multiple file systems can be selected. A file system can only belong to one Storage Resource at any time. If the file system is already defined in a Storage Resource (resource name is listed in the Storage Resource Name column of display), it is not possible to select this resource again.

**NOTE:** Collecting the selected server's file systems and storage data may take some time.

7. Click **Next**. If this is the first resource for this HP StorageWorks XP array, the Reserved-Group window opens. This window is used to identify the reserved group used for the safekeeping of the Storage Resources when a resource is not presented to any system.

Define the reserved group by specifying the following in the Reserved-Group window:

- **Array Serial Number:** This field is automatically populated with the array serial number.

- **Host Group Name:** The Application Integration Software creates a host group with the default name SAP ACC Reserved on the array port (next field) and assigns all the physical devices used in the Adaptive Computing environment to this group. You can re-name the host group name used for the reserved port, either when defining the port in this dialog box, or in the **Program Properties** tab on the Main Menu. A new or existent group name can be used. When renaming the Reserved-Group, all LUNs currently in the Reserved-Group will be moved over to the new Reserved-Group and the old one will be deleted. This Reserved-Group should not be used for any other purpose besides SAP ACC.
- **Array Port:** Select an array port from the pull-down list of ports. The list of ports displayed are Target (or RCU Target) ports with security enabled.

In the HP StorageWorks XP array, a storage device not presented to any host or host port is considered a free or available device to be used whenever new storage is required. To protect the data on a storage device that is not currently active in the Adaptive Computing environment, the HP Storage Essentials SRM SAP ACC Integration software presents all Adaptive Computing storage devices to a reserved host group (the Reserved-Group), to ensure that these devices will always have at least one presentation to a port in the array. The port does not have to be connected to any hosts, and the host group does not provide access to any host either.

---

**NOTE:** If a reserved port already exists for this HP StorageWorks XP array, the Reserved-Group dialog box is not displayed. Just proceed to [step 8](#).

---

---

**NOTE:** The HP StorageWorks XP array has a limit of the number of physical devices that can be assigned per host group and per port. This limit is dependent on the array version and can be between 1024 and 2048 devices. This provides an upper limit on the maximum number of devices that the current version of Application Integration Software can manage per storage array.

---

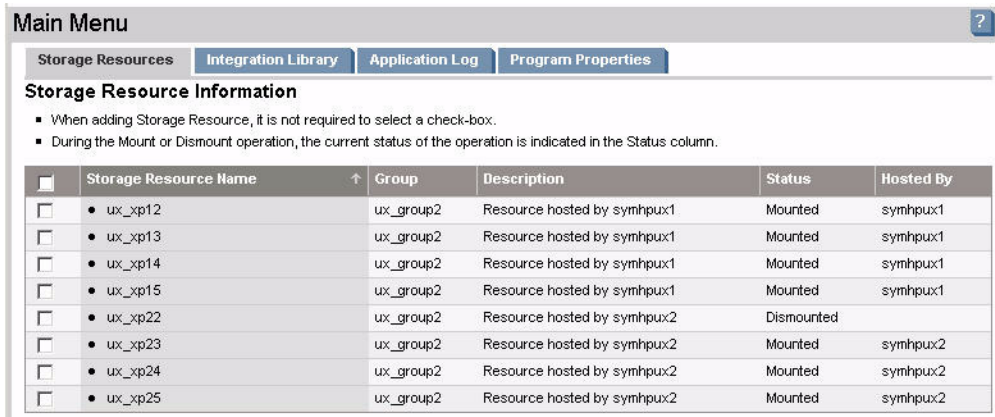
8. Click **Next**. The Confirm details for new Storage Resource window opens. This window does not let you modify the reserved group port number or name. To modify that information, click **Cancel** and restart the process. Specifically, to modify the mount point(s) selected, click **Prev** and the list of mount points will be displayed again including your last selection.
9. Click **Finish** to complete the process.

The Storage Resource is added to the HP Storage Essentials SRM SAP ACC Integration Software configuration files. The physical devices are also added to the reserved group on the specific array. The reserved group is also created if this is the first Storage Resource for that array.



**NOTE:** This process can take some time, due to storage provisioning to the reserve pool.

After successful completion of adding a Storage Resource, the HP Storage Essentials SRM SAP ACC Integration Software returns to the Main Menu and the newly added Storage Resource is displayed in the table of configured Storage Resources.



<input type="checkbox"/>	Storage Resource Name	↑	Group	Description	Status	Hosted By
<input type="checkbox"/>	• ux_xp12		ux_group2	Resource hosted by symhpux1	Mounted	symhpux1
<input type="checkbox"/>	• ux_xp13		ux_group2	Resource hosted by symhpux1	Mounted	symhpux1
<input type="checkbox"/>	• ux_xp14		ux_group2	Resource hosted by symhpux1	Mounted	symhpux1
<input type="checkbox"/>	• ux_xp15		ux_group2	Resource hosted by symhpux1	Mounted	symhpux1
<input type="checkbox"/>	• ux_xp22		ux_group2	Resource hosted by symhpux2	Dismounted	
<input type="checkbox"/>	• ux_xp23		ux_group2	Resource hosted by symhpux2	Mounted	symhpux2
<input type="checkbox"/>	• ux_xp24		ux_group2	Resource hosted by symhpux2	Mounted	symhpux2
<input type="checkbox"/>	• ux_xp25		ux_group2	Resource hosted by symhpux2	Mounted	symhpux2

**Figure 10** Storage resource information displayed in Main Menu

The Status column displays the current status of this storage. A Mounted status means that a resource is currently active on a specific server indicated by the Hosted By column. If a resource is not presented, then the resource status changes to Dismounted and the Hosted by column is empty.

Other possible values for the Status field are:

- **Mounted** - A resource is currently active on the server listed in the Hosted By column
- **Mounting** - A resource is starting on the server listed in the Hosted By column
- **Dismounted** - A resource is not currently active on the server listed in the Hosted By column
- **Dismounting** - The resource is in the process of stopping on the server listed in the Hosted By column
- **Failed** - A process of the mount or unmount operations has failed and resource is in some failed status.
- **Unknown** - This is displayed when an unexplained error occurs in the application.

---

**NOTE:** The HP SAP ACC Integration Software displays the last known status for the resource.

---

**NOTE:** If mounting or dismounting a resource is interrupted prior to completion, the status may be displayed as `Dismounting` or `Mounting`.

---

## Viewing Resource Information

After adding a storage resource to a Managed Node using the HP Storage Essentials SRM Application Software for SAP ACC, it is possible to see detailed information about that storage resource.

To view resource information

1. Select a resource on the **Storage Resources** tab of the Main Menu by selecting the checkbox corresponding to the resource on the left side of the window.
2. Click **Properties**. The Storage Resource Properties window opens displaying the properties for the selected resource.
3. Click **Finish** to close the window.

## Removing a Storage Resource

After adding a storage resource to a Managed Node using the HP Storage Essentials SRM Application Software for SAP ACC, it is also possible to remove resources that are no longer needed.

To remove a Storage Resource Identifier

1. Select a resource on the **Storage Resources** tab of the Main Menu by selecting the checkbox corresponding to the resource on the left side of the window.
2. Click **Remove**. The Remove Storage Resource window opens.

A Storage Resource can be in either the Mounted or Dismounted state at the time of deletion from the HP Storage Essentials SRM SAP ACC Application Integration Software. In the Remove Storage Resource window, check the corresponding acknowledgement check boxes based on the following:

- **Mounted:** If the resource is mounted and therefore presented to a host, the delete operation only removes the configuration information from the local configuration files and removes the physical devices from the reserved group. The physical devices remains presented to the current Managed Node and the file system remains mounted on this host. In this case it is very easy to add the resource back into the HP Storage Essentials SRM SAP ACC Integration software. Check this box if the resource is mounted and this is what you want to occur when removing the resource.
- **Dismounted:** If the Storage Resource is currently dismounted, and therefore not presented to any Managed Node, but only available in the reserved group on the array, the removal process removes the local definition of the resources, as well as the presentation to the

reserved group. In this case, the physical devices are no longer presented to any port on the array, and it is considered to be available to other applications. Check this box if the resource is not mounted and this is what you want to occur when removing the resource. Otherwise, if the data on the devices is important to you, first mount the resource on a Managed Node using the SAP ACC interface, before deleting the resource.

---

**IMPORTANT:** Before selecting the check boxes on this page, you should understand the implications and take responsibility for the physical devices and any data on these devices before performing the delete operation.

---

3. Click **Finish** to exit the dialog.



# 8 Application Logs

The log files for all storage operations are located on the HP Storage Essentials SRM server under `%SystemDrive%\Program File\HP\SE SAP ACC Integration\logs` folder.

The log files can also be accessed from the Main Menu of the Application Integration Software GUI. When you view the log files through the GUI, you can filter the files based on the following criteria:

- time period
- host
- SRID
- type of event

The log messages are classified by the following event levels:

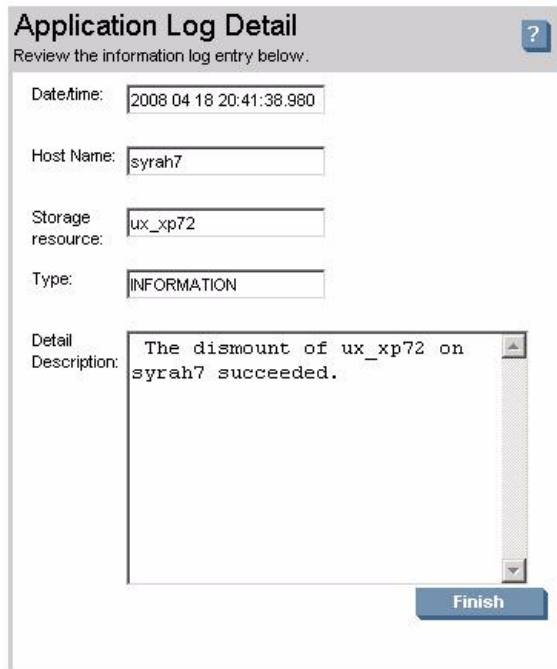
- **Information:** The lowest level for log messages, recording normal operations and events. No action is required.
- **Warning:** The next most important level to indicate that there may be a problem in the configuration or environment. Further investigation and correction of warning condition is recommended.
- **Error:** This level is the most important because it indicates that a problem occurred during a process. Further investigation and corrective actions might be required.

The HP Storage Essentials SRM SAP ACC Integration Software creates a new log file monthly. Old log files remain in the log directory. You can remove the old log files manually from the `%SystemDrive%\Program Files\HP\SE SAP ACC Integration\logs` directory.

## To view application log entries

1. Select the **Application Log** tab on the Main Menu. On the **Application Log** tab, specify the following:
  - **Start time:** If you want to filter by time, enter a start date and time in the `mm/dd/yyyy hh:mm AM|PM` format, for example `1/15/2007 1:30 AM`.
  - **End time:** If you want to filter by time, enter an end date and time in the `mm/dd/yyyy hh:mm AM|PM` format, for example `2/15/2007 1:30 AM`.
  - **Filter by server:** If you want to filter by server, select a host name from the pull-down menu.
  - **Filter by storage resource:** If you want to filter by storage resource, select a storage resource name from the pull-down menu.
  - **Filter by level:** If you want to filter by event level, check any or all of the boxes.
2. Click **Refresh**. The log entries meeting the filter criteria are displayed in the **Application Log** tab.

3. To see more details about an event, select the check box next to the event description and then click **Properties**. The Application Log Detail window opens.



The screenshot shows a window titled "Application Log Detail" with a help icon in the top right corner. Below the title bar, it says "Review the information log entry below." The window contains several text boxes for log entry details:

- Date/time: 2008 04 18 20:41:38.980
- Host Name: syrah7
- Storage resource: ux\_xp72
- Type: INFORMATION

Below these fields is a "Detail Description" section with a text area containing the message: "The dismount of ux\_xp72 on syrah7 succeeded." At the bottom right of the window is a blue button labeled "Finish".

4. Click **Finish** to close the detail window.

# 9 Program Properties

This chapter describes the following:

- [Changing the User Name and Password Used for Communicating with HP Storage Essentials SRM](#), page 43
- [Changing the Reserved-Group Assignment](#), page 43

You can use the **Program Properties** tab on the Main Menu to perform these tasks as described in the following sections.

## Changing the User Name and Password Used for Communicating with HP Storage Essentials SRM

The administrator account which is created during the installation of HP Storage Essentials SRM, is the account used for communication between the Application Integration Software for SAP ACC and HP Storage Essentials SRM.

If the user name or password for the administrator account changes, you must make the Application Integration Software aware of this change so that it can continue to communicate with HP Storage Essentials SRM. This includes changes in the username or password letter case since they are both case sensitive.

To change the user name and/or password:

1. Click the **Program Properties** tab from the Main Menu. On the **Program Properties** tab under the **HP Storage Essentials authentication setting** pane, specify the following:
  - **Username:** If applicable, enter the new user name .
  - **Password:** If applicable, enter the new password.
2. Click **Save Changes**.

## Changing the Reserved-Group Assignment

When a Storage Resource is not mounted on any host, the physical storage for that resource is not presented to any array port. In this case, the Storage Resource may appear to be available. To protect the data on these physical storage devices, a Reserved-Group is created on a specific host port in the array. The physical storage devices that are not mounted are presented to this port. You can modify the information for the Reserved-Group on the **Program Properties** tab of the Main Menu.

---

**NOTE:** The concept of a Reserved-Group only applies to Hp StorageWorks XP arrays.

---

To change the Reserved-Group assignment for a specific array:

1. Click the **Program Properties** tab from the Main Menu.
2. On the **Program Properties** tab under the **Reserved-Group Assignment** pane, select the storage array to be modified.
3. Click **Properties**.

The Modify Reserved-Group Assignment window opens. In this window, specify the following:

- **Storage Array:** This field is not editable and displays the serial number of the selected array. It is a unique number to identify the array where the physical devices are located.
- **Reserved-Group Name:** The HP Storage Essentials SRM SAP ACC integration software creates a host group with the default name of SAP ACC Reserved on the selected port and assigns all of the physical devices used in the Adaptive Computing environment to this group. Enter a new name if you want to change the name of the Reserved-Group on the array, or enter an existent group name.
- **Reserved-Group port:** This field displays the current port for the Reserved-Group.
- **New array port:** If you want to change the port of the Reserved-Group on the array, select a new port from the pull-down menu. The port number selected for the Reserved-Group should be a Target or RCU Target port with security enabled.

---

**NOTE:** The HP StorageWorks XP array has a limit of the number of physical devices that can be assigned per host group and per port. This limit is dependent on the array version and can be between 1024 and 2048 devices. This provides an upper limit on the maximum number of devices that the current version of Application Integration Software can manage per storage array.

---

4. Click **Finish**.

The Application Integration Software for SAP ACC creates a host group on the new port and moves the devices used by the configured resources to the new host group. The old host group is deleted.



---

# 10 Operational Details

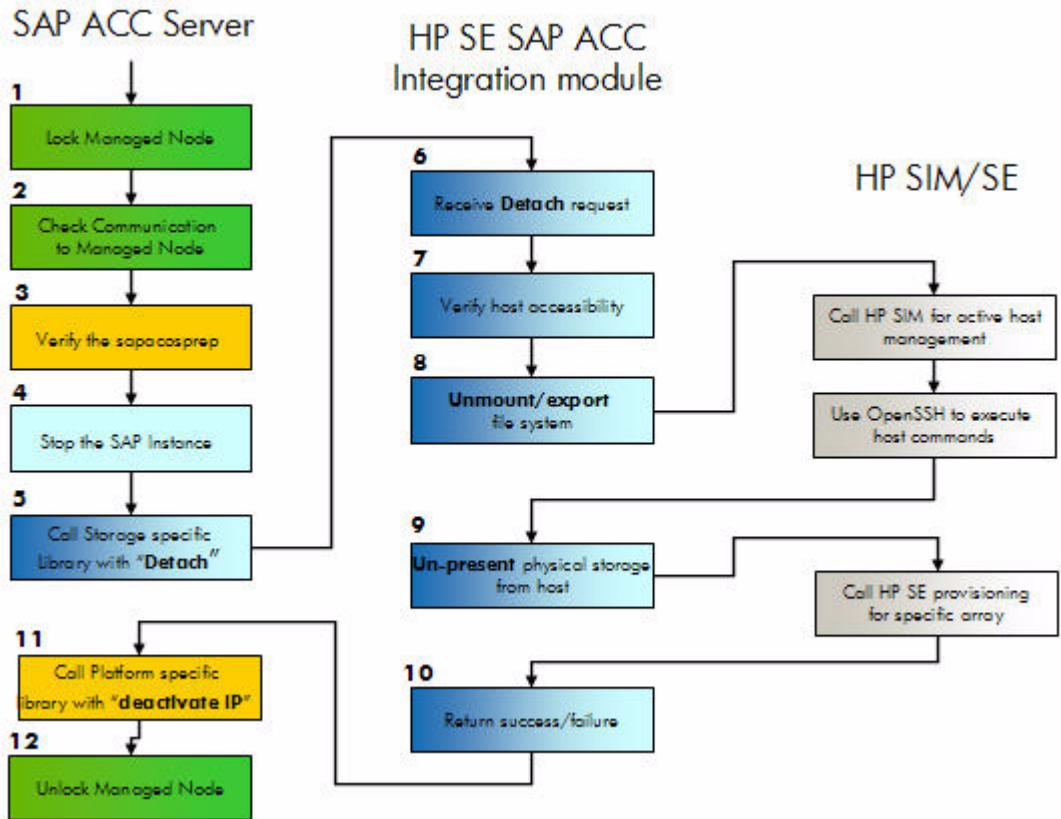
This chapter describes the following:

- [Operational Information](#), page 45
- [Location of Important Log Files](#), page 49
- [Common Issues](#), page 49

## Operational Information

The movement of the application is initiated and controlled from the SAP ACC interface. The administrator has a choice of five operations: prepare, start, unprepare, stop, or relocate a resource, where relocate is a combination of the other four operations on one Managed Node. The prepare and unprepare operations are also referred to as attach and detach.

The following diagram provides the general flow of the stop and unprepare (detach) operation. The diagram indicates the different steps involved in the operation and which application is responsible for managing the specific step. The process is initiated by the SAP ACC Server, the control is passed on to the Application Integration Software, which in turn interacts with HP SIM or HP Storage Essentials SRM to perform the necessary operations.



**Figure 11: Flow diagram of operational details**

This flow diagram can also be used to trace any issues and to determine which log file to look at for failure events.

**1. Lock Managed Node.**

This is an SAP ACC operation to lock any other ACC operations for the specific Managed Node, to ensure that only one operation will be performed on any node at any time. If some other node is already performing an operation, the new request will be put on hold until the previous operation completes.

For any errors during this step, see the SAP ACC log files for the specific instance and operation.

**2. Check communication with Managed Node.**

This is an SAP ACC operation to ensure communication with the Managed Node exists and is working. If the Managed Node cannot be reached, the node will be considered down and the operation will fail.

3. SAP ACC verifies the “sapacosprep.exe” installation and version by running the following command:

```
sapacosprep -a diag
```

The following is the typical output for this command:

```
INFO, OSP-0191, Running SAPACOSPrep diagnostics
INFO, OSP-0193, SAPACOSPrep information: program version: 1.0.6 (compiled
at: Apr 6 2008, systemid: 274 (HP (IA-64) with HP-UX), relno: 7100,
patchno: 99, intno: 20020600); partner API version: 1
INFO, OSP-0195, Library information: HPUX platform module; library version:
1.1.0; partner API version: 1; partner ID: hp
INFO, OSP-0195, Library information: HPUX storage module; library version:
1.0.0; partner API version: 1; partner ID: hp
INFO, OSP-0200, Operation succeeded
```

A failure during this check means that the sapacosprep host agent is either not installed correctly or not working properly.

---

**NOTE:** SAP ACC does not necessarily check to ensure the storage specific library was detected but rather if sapacosprep can be executed.

---

4. Stop the SAP instance.

Stopping the application and any sub-components of the application is handled by the NetWeaver 7.1 host agent infrastructure.

5. Call Storage specific library with “detach”.

SAP ACC now calls the sapacosprep agent with a “detach” option for the Storage Resource ID. The sapacosprep agent invokes the storage specific library and performs the “AcDetachSr” operation.

The storage specific library calls the Application Integration Software for SAP ACC using the information stored in the registry keys on the local system and requests a “detach” operation for the SRID.

The SAP ACC application log file does not display specific information for actions performed during the detach operation. For more specific information, it is necessary to connect to the Application Integration Software for SAP ACC and look at the log files for the specific instance or monitor the text version of the log file.

6. Receive detach request.

The Application Integration Software for SAP ACC now has control of the storage operations and will perform the necessary tasks to “detach” or “attach” the storage.

In the Application Integration Software log file, a message should be logged indicating that the integration core has received the request. If this message is missing, it indicates that the integration core is not running on that the listener port or the integration library port is not correct. Check to ensure the HP Storage Essentials SRM SAP ACC integration service is running on the HP Storage Essentials SRM server.

7. Verify host accessibility through the OpenSSH communication configuration.

This is an internal check from the Integration core service to ensure that the Managed Node is accessible and configured in the Application Integration Software. If the Managed Node is not accessible, a potential problem can be that the Hostagent service is not running.

Another potential issue can be that the Managed Node is indicated as missing in HP Storage Essentials SRM. This would happen if a Managed Node was discovered, but for some reason, HP Storage Essentials SRM could not make contact to this node during the last hardware check process. In this case, check that the credentials for the Managed Node are correct in HP Storage Essentials SRM and ensure that the CIM extensions service is running on the Managed Node.

#### **8. Un-mount/Export File system.**

The Application Integration Software will now call the active host management module added to HP SIM to perform the necessary operations on the Managed Node to un-mount and export the file systems associated with this SRID.

For this operation to succeed, the OpenSSH communication with the host must be functional.

For more details on execution errors, check the tasks log in HP SIM.

If some user or process is still accessing a file system, it is possible that the operation will fail. In this case, ensure that application shutdown was performed correctly, and that all processes using this file system are stopped.

#### **9. Un-present physical storage from the host.**

The Integration core uses the HP Storage Essentials SRM API to request a provisioning action for the specific storage array in order to remove the presentations for the specific physical storage from the Managed Node.

Provisioning errors can occur if the service processor (SVP) of the storage array is in a locked status. It is important to minimize the use of the SVP for any storage changes, instead, it is recommended to perform all storage changes using HP Storage Essentials SRM.

For more details on the failure, check the HP Storage Essentials SRM log files and the storage array audit trails.

#### **10. Return success/failure.**

If all operations are successful, the Integration core will return success status to the integration library and to the sapacosprep module. If any operation fails during the un-mount or un-present operations, the Integration core will attempt to roll back any changes, leaving the Managed Node in the same state that the operation started with, and return "failure" to the integration library and to the sapacosprep module.

#### **11. Call platform specific library with "deactivate IP".**

SAP ACC resumes control of operations and calls the platform specific library, using the sapacosprep module, to deactivate the instance virtual IP address. Monitor the SAP ACC application log for any errors.

#### **12. Unlock Managed Node.**

The last step in the operation is for SAP ACC to unlock the Managed Node and allow for any other operations to be executed on this Managed Node.

In the same way as with the stop and unprepare (detach) process, the operations for prepare (attach) and start can be initiated from the SAP AC server, but the order in executing some of the processes is different.

The Application Integration Software for SAP ACC has one very important change in operation when handling a prepare (attach) operation.

When receiving a prepare request, the Application Integration Software must first determine if the physical storage associated with this request is already presented to any Managed Node. If the storage is already presented to a Managed Node and the Managed Node is not accessible, the physical storage must first be un-presented from that Managed Node before it can be presented to the requesting node.

This condition is true if the system that was running the application crashed for some reason and is now not available. The administrator may want to re-start the application on another node. In this case, the Application Integration Software must ensure that when the crashed server is operational again, it will not have access to the physical storage.

In the event that the original owner of the physical storage is available, the Application Integration Software cannot forcefully un-present the storage from this system, since it has no guarantee that the application is down. In this case, the Application Integration Software must return a failure status for the prepare operation.

## Location of Important Log Files

SAP ACC application logs are available from the SAP ACC interface by selecting the appropriate instance and application log.

- **Application Integration Software for SAP ACC:** Available from the Application Integration Software for SAP ACC by selecting the **Application Log** tab, or viewing the text version located in the `<HP SE SAP ACC Integration InstallDir>\logs` directory.
- **HP Storage Essentials SRM:** Available from the HP Storage Essentials SRM console or text versions available in `<SE InstallDir>\logs`. Specifically the `appstorm.*.log` and `cimom.*.log` files corresponding to the time of the event are of interest.
- **HP Systems Insight Manager:** Available from the console or text versions located at `<InstallDir>\output\runnow`, `<installDir>\logs\mx.log`, and `<InstallDir>\plugin\sedeploy\logs`.
- **OpenSSH:** Available in `<OpenSSH InstallDir>\logs`.

## Common Issues

This section contains common problems that fall into the following categories:

- [Library Call Failures](#), page 50
- [Provisioning Errors](#), page 50
- [An Element in HP Storage Essentials SRM is Reported as “\(missing\)”](#), page 50
- [HP Storage Essentials SRM is Out of Sync with Managed Host or Storage Array](#), page 50
- [Failed Mount Operation with HP-UX Hosts](#), page 51
- [HP-UX 11.23 Maximum Number of Volume Groups Limitation](#), page 51

### Library Call Failures

If the HP Storage Essentials SRM SAP ACC Integration Library call fails, consider the following:

- If the SAP ACC process does not perform the “sapacosprep storage Library function AcDetachSr/AcAttachSr” operation, make sure that storage resource for this instance is configured as type “SR” and that Partner ID field is set to HP.
- Ensure that the “sapacosprep -a diag” call does recognize the HP Library. For HP-UX, there are two HP Libraries, `libsapacosprep_hp.sl` and `libsapacosprep_hp.so`. If the library is not listed during the `sapacosprep -a diag` operation, the installation of this library might be incorrect. Best action is to re-install the integration library using the Application Integration Software for SAP ACC.
- If the HP integration library cannot communicate with HP Storage Essentials SRM SAP ACC Integration core, ensure that the Integration Core service is running on the HP Storage Essentials SRM server.

Another potential issue can be that the configuration file on the HP-UX Managed Node for the integration library is incorrect. The best way to check this is to reinstall the integration library using the Application Integration Software for SAP ACC.

- If the HP Storage Essentials SRM server IP address or listener port for the Application Integration Software for SAP ACC changes, it is necessary to reinstall all host agents to update the configuration file information.

## Provisioning Errors

- The service processor (SVP) for the storage array is locked. This is the most common error. Ensure that users are not using the service processor for array modifications. It is recommended that they use HP Storage Essentials SRM for any changes. This will also ensure that HP Storage Essentials SRM is always in sync with the array configuration. If the hardware maintenance is in progress, it will not be possible to perform SAP ACC operations, due to exclusive access requirements for hardware changes.
- The Web Console user has a Lock on the array. Use HP Storage Essentials SRM to perform any necessary array configuration changes where possible, and limit the time required to exclusively lock the array using the Web console. Any provisioning operations during this time will fail, due to the exclusive lock.

## An Element in HP Storage Essentials SRM is Reported as “(missing)”

On regular intervals, HP Storage Essentials SRM will check hardware accessibility of all discovered elements. If a communication error exists on this Element, HP Storage Essentials SRM will mark the element as “(missing)”. Any subsequent operations on this element will fail, until the issue is solved and the element is rediscovered.

## HP Storage Essentials SRM is Out of Sync with Managed Host or Storage Array

Any manual operation on a Managed Node or a storage array, without a rediscovery from HP Storage Essentials SRM, will result in an out-of-sync condition. Application Integration Software for SAP ACC relies on HP Storage Essentials SRM to have up-to-date information on the Managed Node and storage array, and if the information is out-of-sync, the Application Integration Software for SAP ACC will report incorrect information. To avoid this situation perform Step 2 below. Step 1 is optional.

1. Optionally schedule a Run Discovery Data Collection operation to refresh all HP Storage Essentials SRM element data. This operation should be scheduled to run at off-peak hours when SAP ACC Integration is not being used.
2. Perform a manual Run Discovery Data Collection operation after any manual changes on the storage array or Managed Nodes.

## Failed Mount Operation with HP-UX Hosts

If a mount or dismount operation fails to complete for any reason (for example, array locked by another user, etc.), verify that no directory mount points and/or volume group directories were created on the destination host as a result of the operation. Depending on how far the operation (mount, dismount) progressed, some of the required directories may have been created before the operation failed. If any of the directories were created, you should delete them before trying the same command again, since further attempts may result in failure because some of the directories are already present. The HP SE SAP ACC Integration log will also contain a related message to help troubleshoot the failure.

## HP-UX 11.23 Maximum Number of Volume Groups Limitation

By default, HP-UX 11.23 is configured to support only 10 volume groups. To support multiple SAP instances on the same server, it may be required to support more than 10 volume groups on the same server at the same time. To avoid any errors during relocation operations, it is recommended that you increase this value to be able to support the maximum number of anticipated volume groups on the server.

The maximum number of volume groups is determined by the `maxvgs` parameter and can be modified by using the `kctune` command.

The following command lines can be used to view and change the value of this parameter:

- To display the current value of the `maxvgs` parameter:  
`kctune -v maxvgs`
- To increase the value of the `maxvgs` parameter:  
`kctune +=<number>`  
where `number` is the number of additional volume groups to be supported.

---

**NOTE:** A system reboot is necessary before the change will be implemented.

---

---

**NOTE:** HP-UX 11.31 does not have this default volume group limitation.

---





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