

# HP Value Stream

Software Version: 1.3

## Request to Fulfill with SAP Best Practices

Document Release Date: August 2015



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# Chapter 1: Request to Fulfill Value Stream with SAP

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## Overview

IT4IT™ is an attempt to standardize certain aspects of IT management. The IT4IT standard provides a “reference architecture” for the IT management ecosystem, set in the context of a value chain based IT operating model. It is intended to help organizations adapt to changes in technology, process and methods without having to re-factor the management architecture to accommodate every shift. It is also intended to function as design guidance for suppliers of IT management products and services.

In 2014, IT4IT was accepted by The Open Group® as a new standard being taken care of under The Open Group. HP will further help to enhance IT4IT and create new products to support IT4IT.

For more information, see [The Open Group® IT4IT™ Forum](https://collaboration.opengroup.org/forums/it4it/) (https://collaboration.opengroup.org/forums/it4it/).

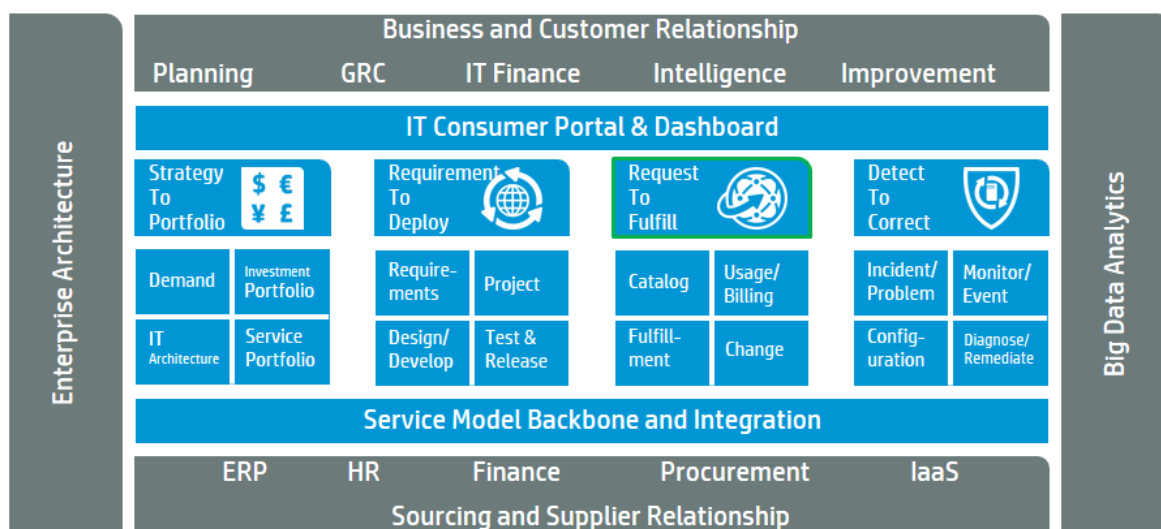
The IT4IT Reference Architecture is fundamentally a functional model for the IT management ecosystem. However, functional/reference models are frequently published from vendors of IT management products. These models are often viewed as “marketecture” which is designed to demonstrate the strengths of a vendor’s products but are too ambiguous to be implementable. Most of these models are not based on architectural principles and/or are not connected to the broader IT operating model that describes how the function works. Therefore, the IT4IT Forum made two deliberate decisions; first, to design a reference model based on architectural design principles that could be implemented and, second, to connect the reference architecture with an IT operating model based on an industry standard construct—the Value Chain.

The Value Chain concept originated with Michael Porter in his book Competitive Advantage and focuses on the activities by which a company adds value to an article as it flows through the production and post-production life cycle. We combined this with the concept of value streams (James Martin: Great Transition) to capture the customer-in perspective. The value stream concept is rooted in Lean and Six-Sigma and emphasizes customer-oriented results.

The IT4IT reference architecture uses the value stream construct as a way of grouping the functional components and artifacts together to provide context for where value is being created/delivered. There are four value streams within the model: Strategy to Portfolio, Requirement to Deploy, Request to Fulfill, and Detect to Correct. There are also supporting functions within the value chain model such as human resource management, legal, and finance. However, the supporting functions are not currently modeled or reflected in the current body of work other than in some of the guidance documentation.

Here an overview of all IT4IT Reference Architecture:

## Reference Architecture for the IT4IT Operating Model



## Request to Fulfill Value Stream

The HP Request to Fulfill (R2F) Value Stream mainly addressed within this paper is a framework connecting the various consumers (business users, IT practitioners, or end customers) with goods and services that they need to drive productivity and innovation. Many IT organizations have multiple request catalogs addressing the needs of business users, IT practitioners, or end customers. The Request to Fulfill Value Stream brings these different request catalogs and consumer personas under a single consumption experience using the Offer Catalog. The value stream goal is to provide a blueprint for a unified experience that consistently engages consumers and hides the complexity of underlying technology.

**Tip:** For a better understanding of this guide, go to **HP Live Network** and check for additional information related to IT4IT. Check for updates in the [HP Live Network Value Chain Community](https://hpln.hp.com/group/it-value-chain) (<https://hpln.hp.com/group/it-value-chain>). HP Live Network Value Chain Community provides more information about the end-to-end integrated IT Value Chain and Reference Architecture.

**Tip:** For a better understanding of this guide, see the [HP Request to Fulfill Stream Concept and Configuration Guide](https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937) (https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937).

This technical white paper covers selected integration aspects for R2F with SAP. This document focuses on the activities which bridge the gap between HP's Cloud Service Automation portfolio and the SAP Installation tools. This is accomplished by integrating with the following products:

- HP Cloud Service Automation (HP CSA)
- HP Operation Orchestration (HP OO)
- HP SAP Cloud Maps (HP SAP installation content packages)
- HP Matrix Operating Environment (MOE)

Additional integrations with SAP may be covered in future automation-related papers covering such topics as integrating with the SAP Cloud Appliance Library, SAP Landscape Virtualization Manager, and other SAP automation techniques. This also includes HP Cloud System version 8.x, HP Helion OpenStack, and HP CSA Topology Designs.

**Note:** Throughout this document, italicized text enclosed in angle brackets (for example, "<your\_server\_name>") indicates replaceable text.



## Who Should Read This Guide

This guide is intended for:

- SAP Basis experts that work with integrating SAP products with non-SAP applications and technology
- Members of the Customer SAP Competence Center or Center of Excellence
- Resource supply managers/Component designer, Service designers
- Business managers, Consumer administrators
- Operations staff
- Quality automation engineers
- IT personnel
- Network managers
- Presales and sales personnel
- IT consultants interested in SAP
- Anyone who wants to learn about the HP SAP installation automation

**Note:** The role(s) responsible for each action are defined at the beginning of each procedure.

Some information in this guide may duplicate information available in other Request to Fulfill Value Stream documentation, but is provided here for convenience.

# Chapter 2: How R2F and SAP Work Together

## This chapter includes:

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## Overview

The Request to Fulfill (R2F) Value Stream is meant to handle the IT automation work done on a daily basis on all IT business services, applications, and infrastructure environments.

Applications include complex and business-critical SAP environments. Management of this business-critical yet increasingly complex SAP environment, integrated with other non-SAP applications and infrastructure, plus the challenge to manage modern hybrid Cloud, must be handled end-to-end. Automated installation, scale up of SAP applications themselves is only one part of the solution—for example, ERP, NetWeaver, Application Server, the Enterprise portal, CRM, SCM, and so on. Non-SAP applications and infrastructure that are part of a given business process must also be deployed in parallel to SAP deployments and often integrated with SAP systems into a landscape.

In complex customer landscapes, business services supporting critical business processes spawn various application landscapes that include but are not limited to SAP—for example, Microsoft and self-made applications; or industry-specific applications for manufacturing, insurance, banking, telecom, and others.

It is mandatory for IT to have the appropriate organizational setup to align SAP teams with non-SAP and Enterprise-oriented teams.

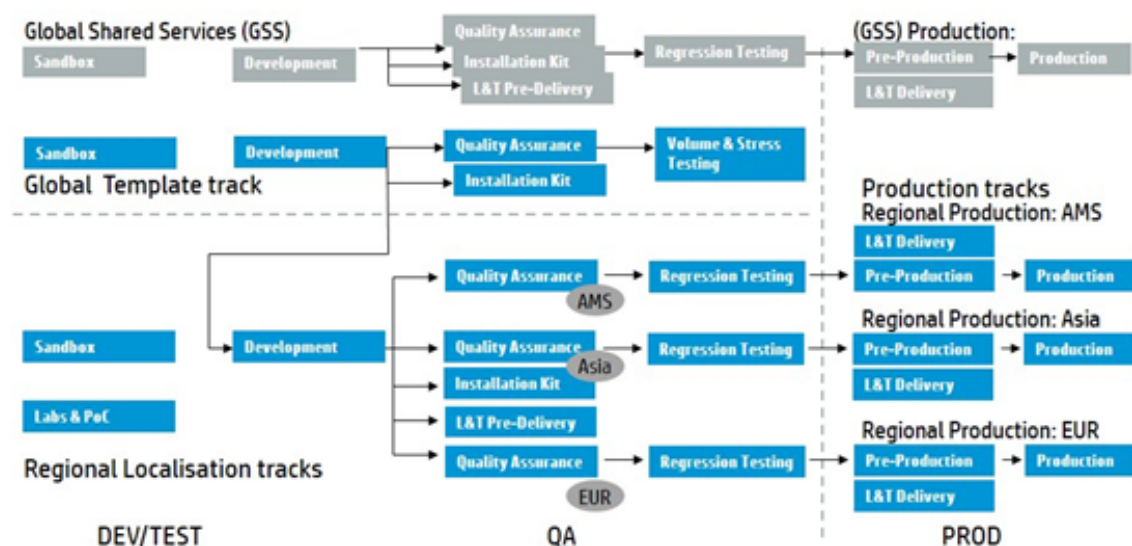
The overall organizational setup for a customer to manage such heterogeneous landscapes is important—where often specific applications or layers are partly outsourced, or where services are consumed via Cloud service provider offerings.

In large IT organizations, SAP teams are organized as a SAP Center of Excellence, with a specific focus on SAP and appropriate SAP support integrations via their Solution Manager. Often these teams, at least in large organizations, use Max Attention support contracts to interact with SAP Active Global Support and to optimize their SAP specific setups, processes, and organization. These structures need to be embedded and interlinked with the Enterprise Management groups supported by HP R2F for SAP.

There has to be a clear separation of what the team for SAP does and how the rest of the system landscape automation and coordination is accomplished. Avoiding duplication of tasks and increased

automation is an important business case. The efficiency benefits of doing this properly assures that team overlap is reduced, correct experts are involved, and system interruptions are limited. It also assures that the customer's SAP organization, with SAP Active Global Support, gets involved with only their SAP-specific issues and that there is cross-organizational team alignment.

The following figure displays a typical SAP blueprint, with the life cycle, depicting the typical components within a complex SAP landscape. In such a landscape, SAP applications coexist with other integrated applications such as mail systems, SAP's Archiving Solution, Printing, Production, Procurement, Disaster Recovery Solutions, Backup Solutions, and others. Each box shown in the figure can host several applications from SAP and others.

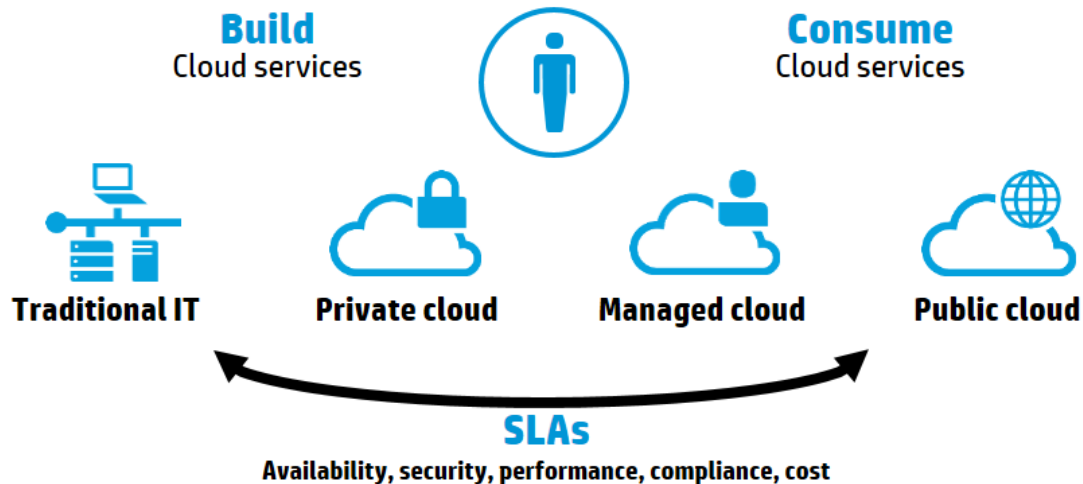


In addition, all of these applications sit on top of a complex set of hardware, virtualization technology, and software infrastructure, including the network (routers, switches, firewalls), servers (hardware and operating system), and other software infrastructure (DNS, LDAP, and so on).

SAP customer are starting to leverage hybrid cloud (private, hosted, public) services to optimize future-based SAP landscape setups and SAP Hana in the Enterprise Cloud Adoption. So the requirements are increasing to automatically set up, scale up, and change landscapes.

## Cloud hybrid delivery

Creating the optimal mix of traditional IT and cloud services for SAP

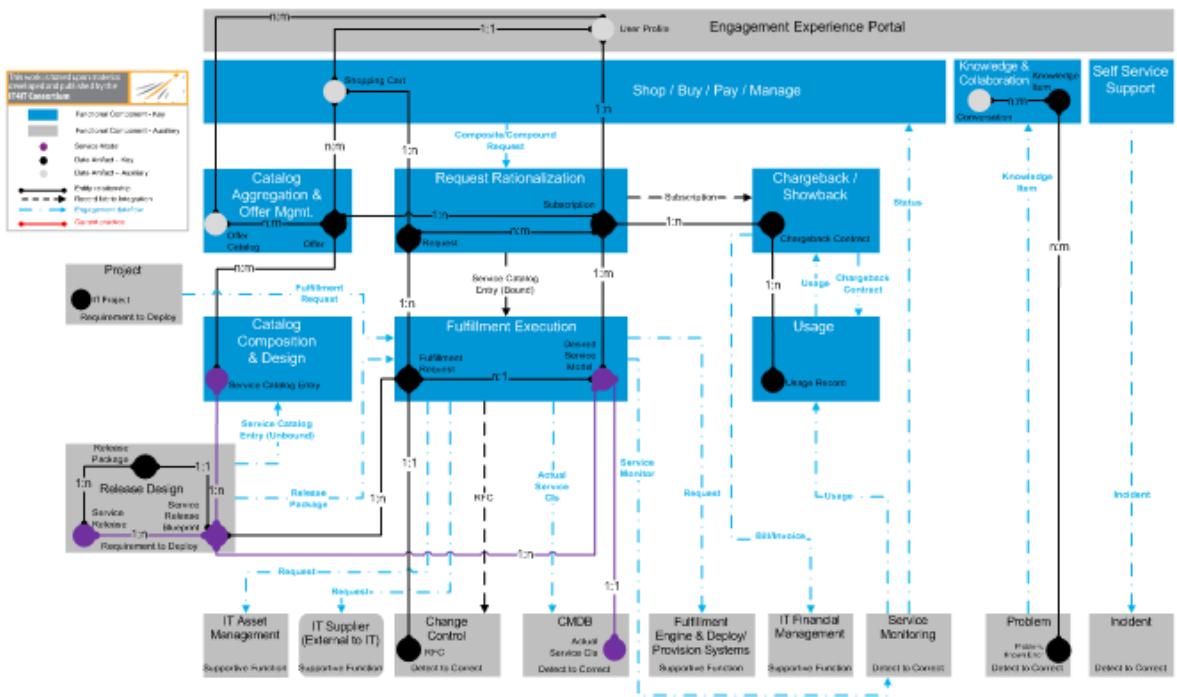


SAP has different tools and content packages, such as SAPINST, Software Provisioning Manager (SPM), Cloud Appliance Libraries and installation, Landscape Virtualization Manager (LVM), and CHARM for change management to deploy and change SAP landscapes.

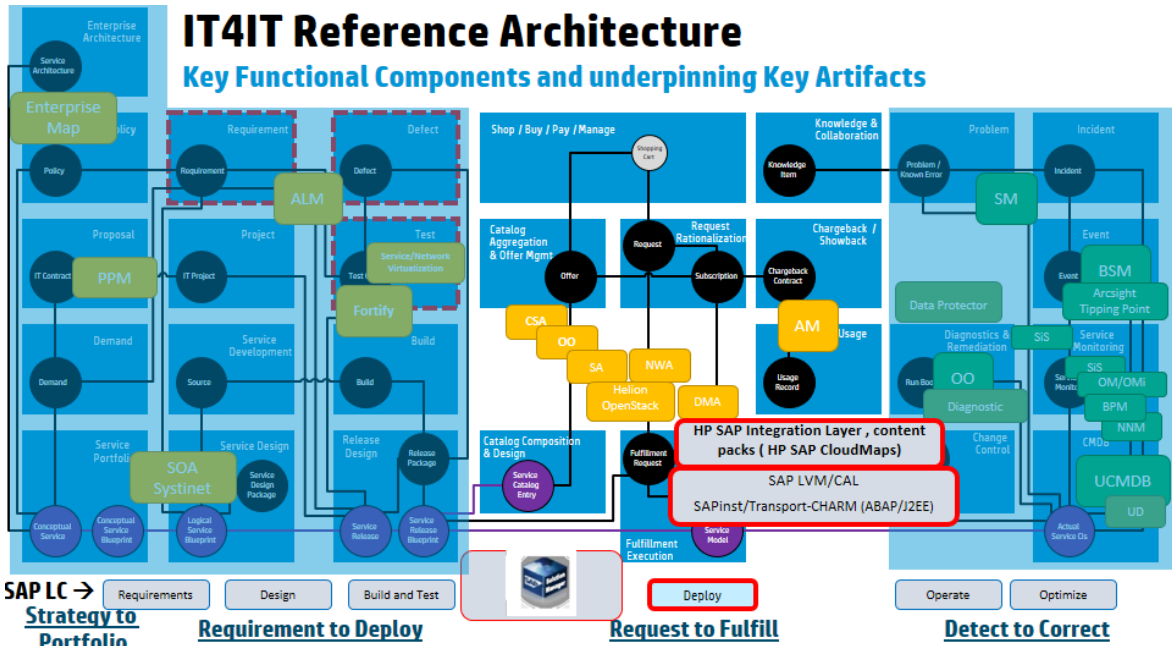
This paper will mainly concentrate on the SAP INST and SAP installation images integration with the HP R2F-related software and converged infrastructure products—especially HP Cloud System Matrix via HP Matrix Operating Environment (MOE).

Rooted in an initiative called Reference Architecture (RA), we look at the Request to Fulfill Value Stream and its implementation using HP Software tools in the context of the business need to automatically deploy SAP systems and landscapes. The Request to Fulfill Value Stream provides a framework for integrating the automation. This document addresses how this is done specifically for services enabled via SAP tools.

The following diagram is part of the software Reference Architecture core material and illustrates the relationship between R2F's key functional components and the underpinning key artifacts. The diagram is SAP and other vendor agnostic.

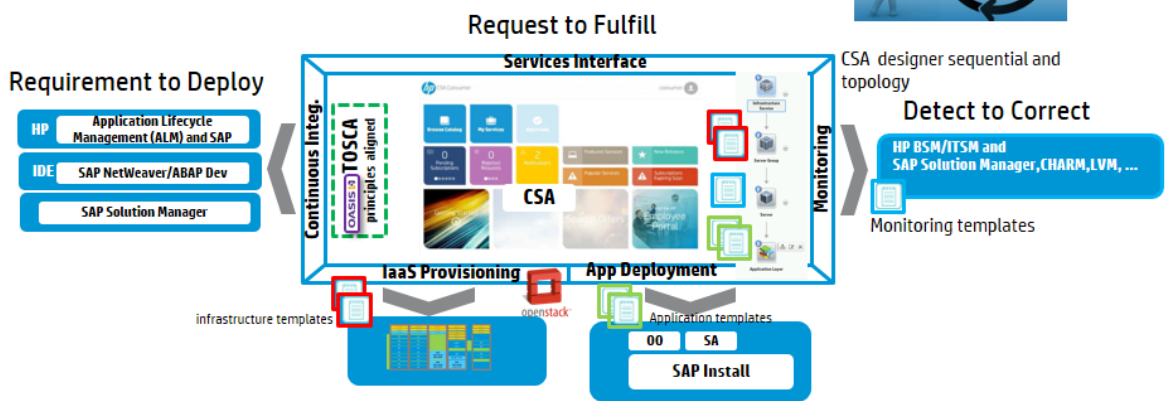


The following diagram shows HP Software Products mapped under the Request to Fulfillment Value Stream and how they interact with the Requirement to Deploy Value Stream and the Detect to Correct Value Stream, as well as with SAP Solution Lifecycle (SAP LC) managed with SAP Solution Manager Framework.



Key HP Software with SAP integrations are described within this document. In the Request to Fulfill area, the following diagram shows an HP Software and converged infrastructure blueprint addressing the various integrations with SAP to automate SAP deployments.

## HP Building Blocks Software SAP



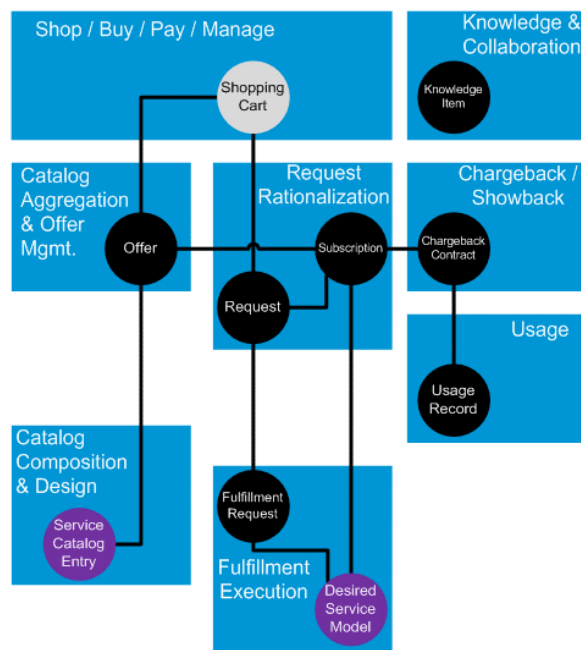
**This paper addresses the following areas:**

- HP Cloud Service Automation (HP CSA)
- HP Operation Orchestration (HP OO)
- HP SAP Cloud Maps (HP SAP installation content packages)
- HP Matrix Operating Environment (MOE)
- SAPinst/Software Provision Manager (SPM)
- Integration with HP Detect to Correct (D2C) Value Stream for SAP

For more information, see the [HP Detect to Correct Value Stream with SAP Best Practices Guide](http://support.openview.hp.com/selfsolve/document/KM00840602) (<http://support.openview.hp.com/selfsolve/document/KM00840602>).

## Request to Fulfill Functional Components

The following detailed view of the key functional components defined in the Request to Fulfill Value Stream serves as an overview for those readers who are not yet familiar with the HP Software Request to Fulfill documentation.



The functional components for this value stream are:

- **Shop / Buy / Pay / Manage.** Make services consumable to various classes of economic buyers and facilitate ordering IT services, supports saving partial activities, as well as supporting service bundles.

First, a single, unified portal where business users can request and consume both private and public cloud services creating a one-stop shop for ordering, provisioning, and reporting on cloud services. This makes it easier than ever before to adopt and consume hybrid cloud service no matter where you are—your environment or the service provider's.

- **Knowledge & Collaboration.** Provide knowledge in the form of content and conversations that help to address the needs of IT Service consumers. Knowledge includes structured IT/supplier produced articles, or unstructured conversations from business/IT users, webinars, videos, training materials, and so on.
- **Catalog Aggregation & Offer Management.** Aggregate the various services delivered by internal functions and those from external supplier catalogs into consumable catalog items that can be ordered through Shop/Buy/Pay/Manage.

Offers can be constructed based on the service catalog entries. The offer adds details on approval and cost, as well as controls which users can consume which service.

The offer is a description of the service catalog entry, including terms and conditions, price, configurable options, approval, SLA, and so on. You see here a relationship between an offer and subscriptions, which says that a single offer can have many subscriptions.

- **Request Rationalization.** Intelligent Resource Management that automates the complex decision-making process of identifying available resources and provisions them based on business policies, compliance, cost and performance goals.
- **Chargeback / Showback.** Provide chargeback or showback for internal and external services by consolidating service subscription and usage information.
- **Catalog Composition & Design.** Service catalog entries are maintained in a service catalog and represent what can be ordered from IT. A service entry is typically constructed from a Service Blueprint.
- **Fulfillment Execution.** Automated application and infrastructure provisioning deploys infrastructure, middleware, databases, and applications. Industry best practice templates make it easier to provide off the shelf automation templates for deploying operating systems, middleware, and applications into public and private clouds



# Chapter 3: Use Case Implementation

## This chapter includes:

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## Overview

This chapter provides general instructions for ordering a new SAP Application Platform, using the HP Cloud Service Automation (HP CSA) Services Request portal service, in order to install a new SAP Central System (standard system), how to suspend or resume a SAP system, or cancel an order for the SAP Central System (standard system).

**Note:** This information contained in this chapter is addressed from the consumer's perspective, which is the Service Subscriber. Configuration information is available in the chapters that follow.

## Use Case 1: Ordering a New SAP System

This basic use case describes how to order a SAP system on a new virtual machine provisioned for this purpose.

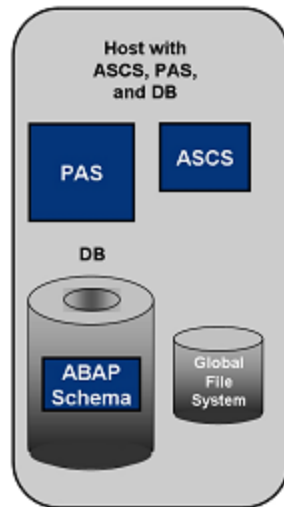
This section contains the following steps:

Step 1: Use the HP CSA Marketplace Portal to Browse for SAP Services .....	19
Step 2: Specify the SAP Application and the SAP System ID .....	19
Step 3: Submit the Order Request .....	21

The procedure described here will order and automatically set up a SAP Central System (standard system). It will install a standard system with a SAP System Identifier (SID), which is a three-digit logical name for a SAP system—for example, **<SID=C10>**—on a single virtual host. In a standard system, all main instances run on a single host.

There are the following instances:

- Central services instance for ABAP (ASCS instance)
- Database instance (DB)
- Primary application server instance (PAS instance)



**ASCS = Central services instance for ABAP**

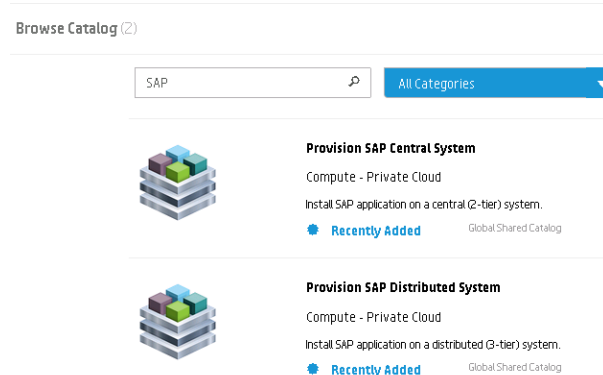
**PAS = Primary application server instance**

**DB = Database instance**

For more information about configuring this use case, see ["Use Case Configurations" on page 40](#).

## Step 1: Use the HP CSA Marketplace Portal to Browse for SAP Services

By logging on to the HP CSA Marketplace Portal (MPP), all of the SAP-related services are available for ordering.



## Step 2: Specify the SAP Application and the SAP System ID

The user needs to choose the desired SAP application, and to provide the **SAP System Identifier (SID)**.

The SID number creates the SAP installation folder. In this example, the requester can choose only allowed SIDs. In a more sophisticated implementation, the requester may specify allowed default Company-specific SIDs and also add a script to validate the input and warn the subscriber. However, in these examples, wrong SIDs lead to installation interruptions as the underlying scripts and SAP installation programs will not allow incorrect values.

This is the System ID that will also be used as the prefix of the virtual machine host name and also the SAP software installation folder in the file system created by the automation procedures in the background.

**Note:** The Best Practices described here leverage and modify HP Operation Orchestration (HP OO) flows to be used inside SAP Cloud Maps developed within the HP Enterprise Group SAP development lab. This Best Practice document has the flows adjusted to match the overall HP Software-driven best practices. The Shellscripts that perform the actual SAP deployments are also leveraged.

For additional background information and restrictions related to the original Cloud Maps flows that are used and modified, as well as Shellscript and SAP Installation prerequisites and

restrictions, see [Implementing the HP Cloud Map for SAP Business Applications](http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx) (<http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx>).

Most of the tips and tricks to install SAP automatically will now be found in this R2F for SAP document.

Additional information is contained in the Cloud Maps document, which was written specifically for HP CloudSystem 7 and SAP. The Cloud Maps document may still provide add-on information, but much of the information is CloudSystem 7 compliant and redundant for the newer technologies that HP and SAP supply.

Listed below are examples of created SAP-related Filesystems laid out using SAP **SID C10** as seen on the screen shot of the HP CSA portal:


- /<sapmnt>/<SAPSID> > Example **/sapmnt/C10**
- /oracle/<DBSID> > **/oracle/C10**
- /usr/sap/<SAPSID> > **/usr/sap/C10**

The SAP SID is also used to create the naming scheme for the following SAP components:


SAP Component	Hostname Pattern
<b>Global Host</b>	<sid>glhost.<subdomain.domain>
<b>Database</b>	<sid>dbase.<subdomain.domain>
<b>SAP Central Services (SCS)</b>	<sid>scs.<subdomain.domain>
<b>Central 2-Tier Installation</b>	<sid>central.<subdomain.domain>
<b>Application Servers</b>	<sid>app<#>.<subdomain.domain>

**Note:** The SID must be three characters long, starting with a capital letter (for example, A01).

By default, the content pack's SAP offerings only expose **Application Name** and **SID** as subscriber options. All of the infrastructure details, such as the type of operation system, database vendor, SAP flavor, and so on, are not visible to the end-user. It is recommended to create a few different offerings with each handling a different combination of infra/application type/flavor.



Option Set Displayname



Option Set Description

● Installation Specifications

Initial Price: **\$ 0.00**  
Recurring Price: **\$ 0.00 monthly**

Option Description

Application Name

SAP Application Name

ERP

SID

SAP System ID. Should be only three characters long, and start with a capital letter (e.g., T01)

C10


## Step 3: Submit the Order Request

After the service changes to the status **Online**, the server details and the required SAP log-on details are displayed. Log on to MPP. Use the dashboard to navigate to **More Actions > My Services**.


Service Components

View service components and manage subscriber actions here.

Refresh



**MOE Compute**  
Deployed Services




**Infrastructure Service**  
Deployed Services

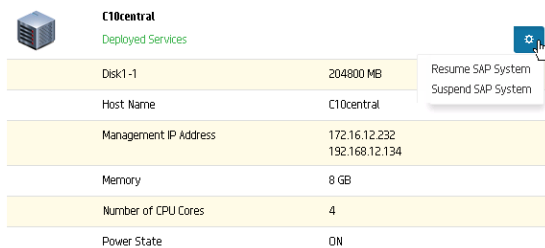
Deployment IP Address	172.16.12.232
Host Name	C10central
Management IP Address	192.168.12.134
MOE Service Name	14ab47110561608
SAP Application	ERP
SAP Master Password	U6WBEvcmdV
SAP SW Directory	B572013-SR1
SAP System ID	C10
SAP Version	B52013SR1

Deployment IP Address	Server IP on the public network
Host Name	Server host name
Management IP Address	Server IP on the internal network

<b>MOE Service Name</b>	Name of the service in MOE responsible for computing the required platform for the installation
<b>SAP Application</b>	SAP application name (based on user's selection)
<b>SAP Master Password</b>	<p>During the installation, a new SAP master password is generated for the special users—SAP* and DDIC. This password can also be found in the following text file:</p> <p><code>/sapmnt/&lt;SID&gt;/global/mpw.txt</code></p> <p><b>Note:</b> This is an example. In reality, this password would be encrypted and the information sent via appropriate tools/emails to requesting user.</p>
<b>SAP SW Directory</b>	Name of the directory from which the installation files are taken
<b>SAP System ID</b>	SAP System ID (SID) number creates the SAP installation folders.
<b>SAP Version</b>	Installed SAP version

## Use Case 2: Suspending and Resuming SAP System

Log on to MPP. Use the dashboard to navigate to **More Actions > My Services**. Select the relevant online service. Click the  button to stop/start the SAP system and suspend/resume the underlying virtual machine.



**C10central**  
Deployed Services


Disk1-1	204800 MB
Host Name	C10central
Management IP Address	172.16.12.232 192.168.12.134
Memory	8 GB
Number of CPU Cores	4
Power State	ON


Resume SAP System  
Suspend SAP System

After the system is suspended, select the **Resume SAP System** entry to reboot the system and restore the server.

## Use Case 3: Adding Application Server

This action executes an OO flow that is responsible for provisioning a new virtual machine (VM), copying the installation script to that VM, and starting and conducting the SAP installation tool on it.


Click the  button on the server group to deploy a new application server and copy the installation script.

**14c6fa9873d2cc8\_Central**  
Deployed Services

ServerGroup Name


14c6fa9873d2cc8

Add Application Server

**C10central**  
Deployed Services

Disk1 -1	204800 MB
Host Name	C10central
Management IP Address	172.16.12.232 192.168.12.134
Memory	8 GB
Number of CPU Cores	4
Power State	ON

After the OO flow is completed, the new application server details are also added to the service details page.

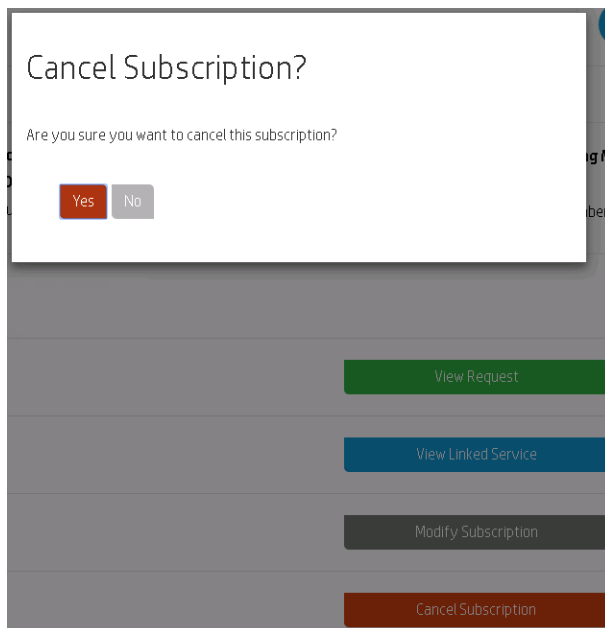
**C10appserver**  
Deployed Services

Appserver Deployment IP	172.16.12.207
Appserver IP	192.168.12.145
Disk1-1	204800 MB
Host Name	C10appserver
Memory	8 GB
Number of CPU Cores	4
Power State	ON

## Use Case 4: Cancelling an Order for the SAP System

Now the user would like to delete the installation and clean the virtual machine. He logs in to MPP and searches for the relevant subscription he would like to delete.

To begin the deletion process, on the **Subscription Details** page in the MPP, click the **Cancel Subscription** button. This deletes the required files and removes the virtual machine.





# Chapter 4: Configuration and Setup

## This chapter includes:

Overview .....	25
A word about the provided content pack .....	26
Prerequisites .....	27
Hardware and Software Requirements .....	28
Tested Versions .....	28
Enterprise Hardware and Software Requirements .....	29
HP Cloud Service Automation – Overview .....	29
HP Matrix Operating Environment – Overview .....	29
HP Operations Orchestration – Overview .....	30
HP OO Central .....	30
HP OO Studio .....	30

## Overview

The balance of this guide provides the information necessary to implement the integrations necessary to achieve the provisioning of SAP using the Catalog Management and Deployment Management capabilities of the Request to Fulfill Value Stream.

For more details on the R2F implementation, see the [HP Request to Fulfill Concept and Configuration Guide](https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937) (https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937).

This document uses specific HP Matrix Operating Environment (MOE) templates and HP Operations Orchestration (HP OO) scripts that are recommended as the best practice to implement the use cases described herein.

**Note:** Throughout this document, italicized text enclosed in angle brackets (for example, "<your\_server\_name>") indicates replaceable text.

## A word about the provided content pack

This package contains the following:

- **SLES 2-tier\_CSA.xml**. MOE template responsible for allocating the required machines for central system deployment
- **SLES 3-tier\_CSA.xml**. MOE template responsible for allocating the required machines for distributed system deployment
- **SLES Appserver\_CSA.xml**. MOE template responsible for allocating the required machines for new application server deployment
- **001002.zip**. OO project with all the related scripts to upload to the OO Studio
- **SAP-cp-1.0.0.jar**. OO content pack with required SAP-related flows to upload to OO Central
- **oo10-csa-moe-cp-5.0.0 OO**. OO content pack with MOE-related flows to upload to OO Central
- **SERVICE\_DESIGN\_Provision\_SAP\_Central\_System.zip**. HP Cloud Service Automation (HP CSA) sequenced design that orchestrates the MOE template and the OO flows to install SAP on a Central System
- **SERVICE\_DESIGN\_Provision\_SAP\_Distributed\_System.zip**. CSA sequenced design that orchestrates the MOE template and the OO flows to install SAP on a Distributed System
- **install\_SAP\_<version\_number/script\_date>.txt**. SAP installation shellscript embedded on the installation OO flow

**Note:** The version number and version date are included inside the script.

Using this content enables you to configure your environment to provision SAP using HP CSA version 4.x with MOE as the resource provider.

The full use case is described in ["Use Case Implementation" on page 17](#).

## Prerequisites

This guide expects that the following products are installed and fully functional.

**Note:** The installation role will be handled by the MOE Administrator, CSA Administrator, Operations Staff, and SAP Basis Experts.

- **HP Matrix Operating Environment.** Server, HP Matrix IO Designer, and HP System Insight Manager are installed.

**Note:** For more details and requirements for the Matrix Operating Environment, see the **Cloud Maps Overview** document in the R2F – SAP Content Pack.

- **HP Cloud Service Automation.** Server and Client are installed.
- **HP Operations Orchestration.** Central and Studio are installed, including Base and CSA content packs.

# Hardware and Software Requirements

This section includes the following topics:

Tested Versions ..... 28

Enterprise Hardware and Software Requirements .....29

## Tested Versions

**Note:** For the hardware and software requirements, see the product documentation.

Product	Version	Instructions
Cloud Service Automation	<ul style="list-style-type: none"><li>4.50</li></ul>	For installation instructions, see the <a href="#">HP Cloud Service Automation version 4.50 Installation Guide</a> .
Operations Orchestration	<ul style="list-style-type: none"><li>10.21</li></ul>	For installation instructions, see the <a href="#">HP Operations Orchestrations version 10.2x Documentation, Videos, Best Practices &amp; Helpful Information</a> .
Matrix Operating Environment	<ul style="list-style-type: none"><li>7.02 or later</li></ul> <b>Recommended. 7.02</b>	For installation instructions, see the Matrix Operating Environment documentation in the <a href="#">HP Enterprise Information Library</a> .

**Note:** Make sure that each application you install is up and running before you perform any configuration steps.

## Enterprise Hardware and Software Requirements

**Note:** The following tables detail the deployment environments that have been rigorously tested by HP quality assurance personnel.

For the complete listing of hardware and software requirements, see the relevant Support Matrix for each product.

- **HP Cloud Service Automation.** For more information, see the [HP Cloud Service Automation version 4.50 System and Software Support Matrix](#).
- **HP Operations Orchestration.** For more information, see the [HP Operations Orchestration version 10.20 System Requirements](#).
- **HP Matrix Operating Environment.** For more information, see the [HP Insight Management version 7.3 Update 1 Support Matrix](#), which includes both HP Insight Control and HP Matrix Operating Environment.

## HP Cloud Service Automation – Overview

HP Cloud Service Automation (HP CSA) is a unique platform that orchestrates the deployment of compute and infrastructure resources and of complex multi-tier application architectures. HP CSA integrates and leverages the strengths of several HP data center management and automation products, adding resource management, Service Offering design, and a customer portal to create a comprehensive service automation solution.

## HP Matrix Operating Environment – Overview

The HP Matrix Operating Environment (MOE) is cloud management software for infrastructure-as-a-service (IaaS) that increases agility and enables you to:

- Design and provision infrastructure services in minutes via a self-service portal
- Optimize infrastructure with capacity planning and showback/chargeback
- Protect service continuity with automated cost-effective failover

The HP Matrix Operating Environment, which includes HP Insight Control, is at the core of the HP CloudSystem Matrix, an infrastructure as a service solution for private and hybrid cloud deployments, built on proven HP Converged Infrastructure technologies. It is available for both HP ProLiant and HP Integrity servers, as well as for provisioning third-party x86 virtual machine environments.

## HP Operations Orchestration – Overview

HP Operations Orchestration (HP OO) is a system for creating and using actions in structured sequences (called Ops flows, or flows) which maintain, troubleshoot, repair, and provision your IT resources by:

- Checking the health of, diagnosing and repairing, networks, servers, services, software applications and individual workstations
- Checking client, server, and virtual machines for needed software and updates, and, if needed, performing the necessary installations, updates, and distributions
- Performing repetitive tasks, such as checking status on internal or external Web site pages

The two main components of HP OO are Central and Studio.

### HP OO Central

This is a Web-based interface in which you can:

- Run flows
- Administer the system
- Extract and analyze data resulting from the flow runs

### HP OO Studio

This is a standalone authoring program in which you can:

- Create, modify, and test flows, including flows that run automatically, as scheduled
- Create new operations

You can create operations within Studio and run them in Central. You can also create operations that execute outside of Central in a remote action service (RAS). You do so in a development environment that is appropriate to the task, then associate the code you have created with an operation that you create in Studio.

- Specify which levels of users are allowed to run various parts of flows

# Chapter 5: Operating System Requirements for a SAP Installation

Additional operating system packages, kernel settings, and other configurations are required for SAP Business Applications.

You must have access to the SAP support web pages to view and download the SAP notes.

To access SAP support pages where SAP notes are stored, at a minimum you must be a so-called **s-user** with credentials for support access. If you do not have such an account, connect to your company's SAP super-administrator or connect to SAP and provide your company's contract information number.

**Note:** For Linux users, read the SAP note: [171356 - SAP Software on Linux: General information](#).

For example, on a Linux operating system, read at least Chapter IV of the SAP note. The following is an overview of Chapter IV's content to provide an example of what Chapter IV covers. However, to install SAP, it is mandatory to download SAP's latest notes.

## IV/Special notes about installing the operating system

### • Novell SUSE Linux: Installation

Before the installation, it is essential that you read the note that corresponds to your Novell SUSE version from the following list:

1310037 (Novell SUSE Linux Enterprise Server 11)  
958253 (Novell SUSE Linux Enterprise Server 10)  
797084 (Novell SUSE Linux Enterprise Server 9)  
767814 (Novell SUSE Linux Enterprise Server 8)

- Among other things, these notes describe the "sapinit" RPM (or up to and including SLES 9 Service Package 2: "SUSE-sapinit" RPM). This should be installed in order for the parameters of the Linux kernel to be set correctly.

- If you use the BRTTOOLS (for example brbackup) delivered by SAP, problems may arise when the system compresses data files. As of SLES 8, Novell SUSE does not deliver the "compress" program that is otherwise used on UNIX for licensing reasons. The problem can be avoided if you set the following parameters in the file init<SID>.sap:

compress\_cmd = "gzip -c \$ > \$"  
uncompress\_cmd = "gunzip -c \$ > \$"

### • Red Hat Linux: Installation

Before the installation, it is essential that you read the note that corresponds to your Red Hat version from the following list:

2002167 (Red Hat Enterprise Linux 7)  
1496410 (Red Hat Enterprise Linux 6)  
1048303 (Red Hat Enterprise Linux 5)  
722273 (Red Hat Enterprise Linux 3 and 4)

### • Oracle Linux: Installation

Before the installation, it is essential that you read the notes that are listed below, in particular, those that correspond to your Oracle Linux version:

1565179 (SAP Software and Oracle Linux)  
2069760 (Oracle Linux 7.x SAP installation and upgrade)  
1635808 (Oracle Linux 6.x SAP installation and upgrade)  
1567511 (Oracle Linux 5.x SAP installation and upgrade)

## V/ General notes about installing the operating system



# Chapter 6: SAP Software Depot

**This chapter includes:**

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SAP Software Depot Directory Structure .....	36

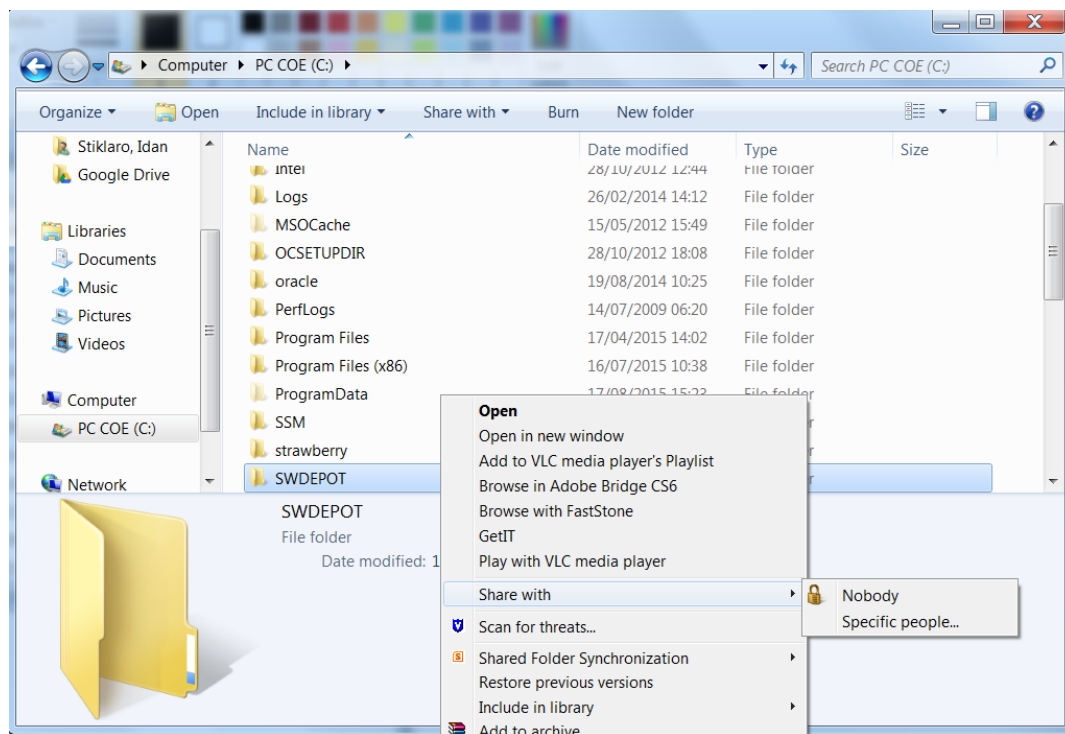
## SAP Software Depot Creation

To support repeatable, automated SAP installations, it is crucial to store all necessary installation media at a central location—a software depot. Depending on your environment, you can host the software depot on any server that is reachable in your environment.

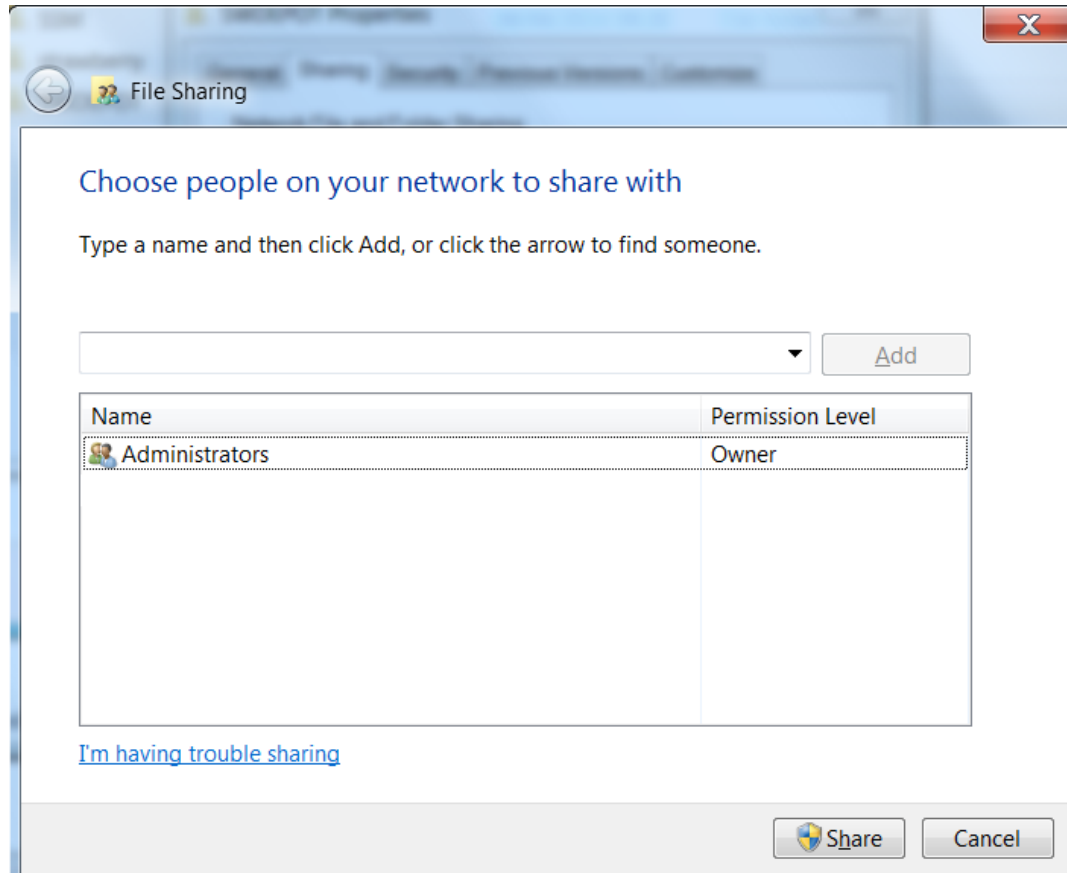
You can share the software depot on Windows through the Common Internet File System (CIFS) or on Linux through the Network File Systems (NFS)—both described below:

### 1. Option: Software Depot on Windows (CIFS)

- a. Create a folder on your Windows server for the software depot, such as **C:\SWDEPOT**.
- b. To share the software depot folder, right-click **SWDEPOT** and select **Share with > Specific people ...** as shown below.



- c. Ensure that at least one user has full access to the folder by adding an appropriate user (as shown below) and sharing the folder.



## 2. Option: Software Depot on Linux (NFS)

- a. Create a folder on your Linux server for the software depot.

```
# mkdir /SWDEPOT
```

- b. Install the NFS Server package on your Linux host, if not already done.
- c. Modify the exports file where we export our NFS share.

```
# vi /etc/exports
```

- d. Make the following entry for your share:

```
/SWDEPOT *(fsid=0,ro,root_squash,sync)
```

- e. Now run **exportfs** to make the changes effective.

```
# exportfs -a
```

## SAP Software Depot Directory Structure

Once the software depot folder has been shared, you can begin storing SAP installation media. SAP customers can get a copy of the installation media from the [SAP Service Marketplace Software Download Center](https://support.sap.com/swdc) (<https://support.sap.com/swdc>).

Be sure to download the appropriate media archives, because some of them are operating system dependent. For example, for **SAP Business Suite 7 Innovations 2013 SR2**, you must obtain the following media:

- **Operating system dependent media archives**
  - Software Provisioning Manager 1.0 SP09
  - SAP Kernel 7.42
  - Database Server for your desired databases (DB2, MaxDB, Oracle, Sybase)
    - DB2 10.5
    - MaxDB 7.9
    - Oracle 11.2
    - SAP ASE 15.7
- **Operating system independent media archives**
  - Database Client for your desired databases (DB2, Oracle, HANA)
    - DB2 10.5 - Client
    - ORACLE 11.2 - Client

- SAP HANA Platform Edition 1.0 SPS07 Rev. 74 - Client
- Installation Export for your ABAP applications (NW, ERP, CRM, SCM, SRM)
  - NetWeaver 7.4 SR2 Installation Export
  - SAP ERP 6.0 EHP7 SR2 Installation Export
  - SAP CRM 7.0 EHP3 SR2 Installation Export
  - SAP SCM 7.0 EHP3 SR2 Installation Export
  - SAP SRM 7.0 EHP3 SR2 Installation Export

Create a folder for each SAP Application Suite you want to install. For our example, we created the folder **BS7i2013-SR2** in the software depot and copied the desired SAP installation media archives there.

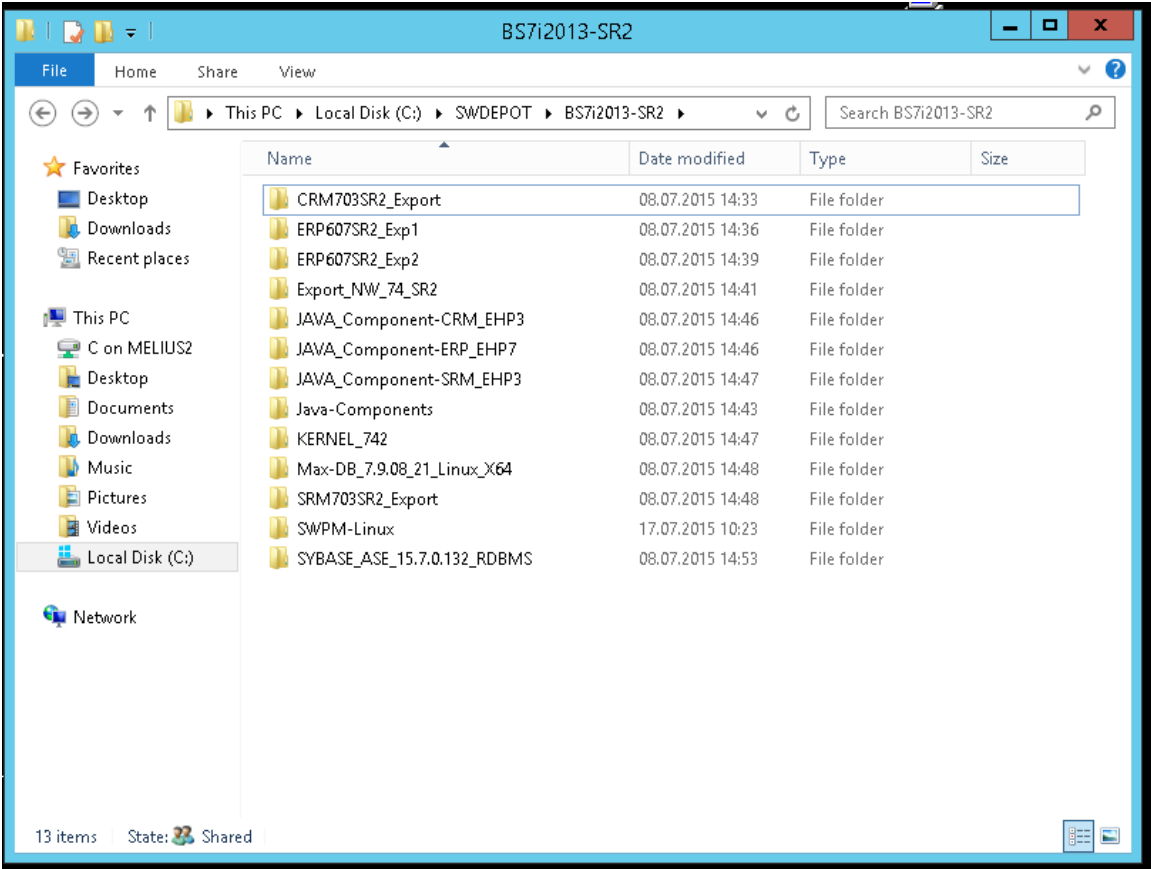
If the media archives have the file extension **.sar**, then you need the SAPCAR tool to extract them. The SAPCAR tool is inside the Kernel archive. (This is dependent on the operating system.) If you need the SAPCAR for another operating system, download it from the [SAP Service Marketplace](https://service.sap.com) (service.sap.com).

The SAPCAR syntax is the same as for tar—for example, on Linux:

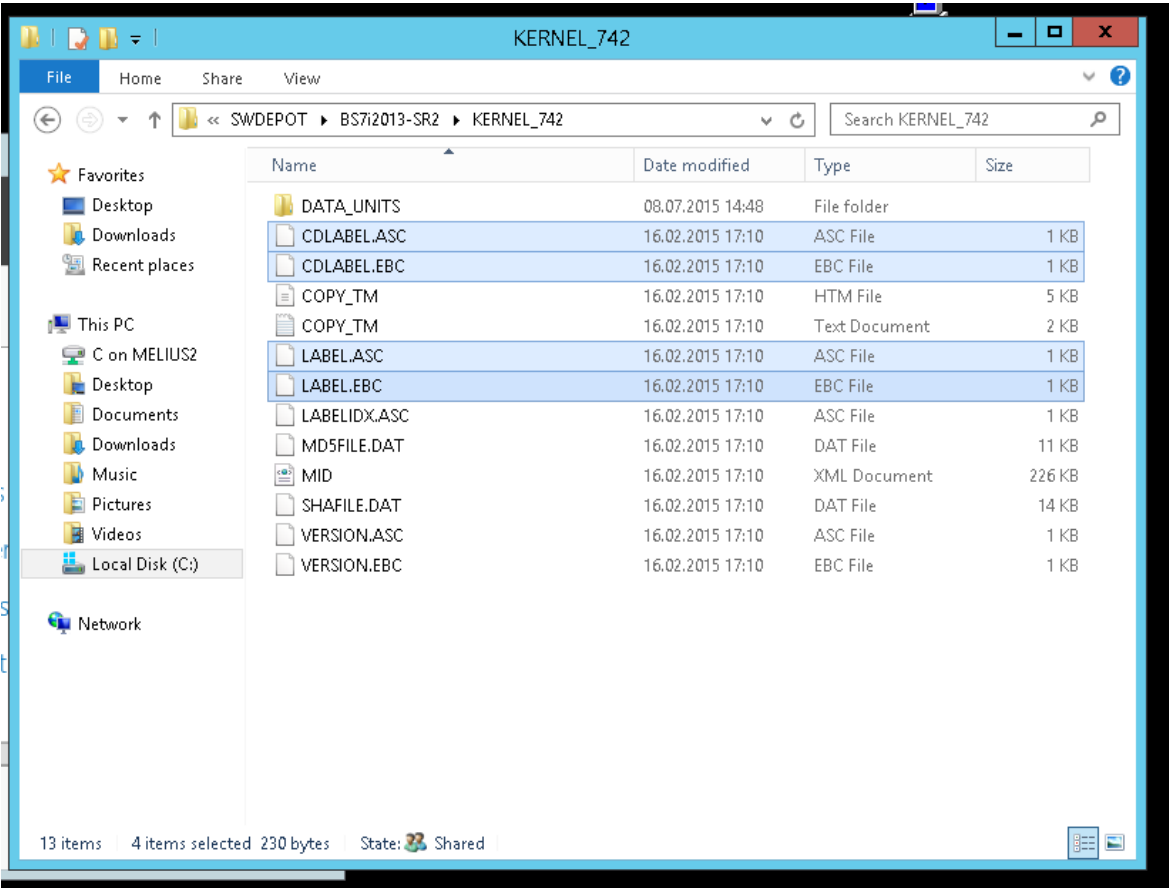
```
# ./SAPCAR -xvf your-archive-file.sar
```

Now you can extract the archives. Extract one archive after the other and rename the extracted folder. For example, after the extraction of the Kernel, there will be a folder named **Kernel\_742-Linux** and you know what is inside this folder. Repeat this for all extracted archive files.

After completion, you will have a folder structure similar to this for **BS7i2013-SR2**:



Next, verify that the **CDLABEL** and **LABEL** files are visible inside each of these folders. Otherwise the automated installation will fail because the SAP installer SWPM will not find the appropriate media files. The following is an example of the content of the Kernel directory **Kernel\_742-Linux**:



# Chapter 7: Use Case Configurations

This section contains the following topics:

Importing Templates to MOE .....	41
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Populating the Service Offering in HP CSA Marketplace .....	54
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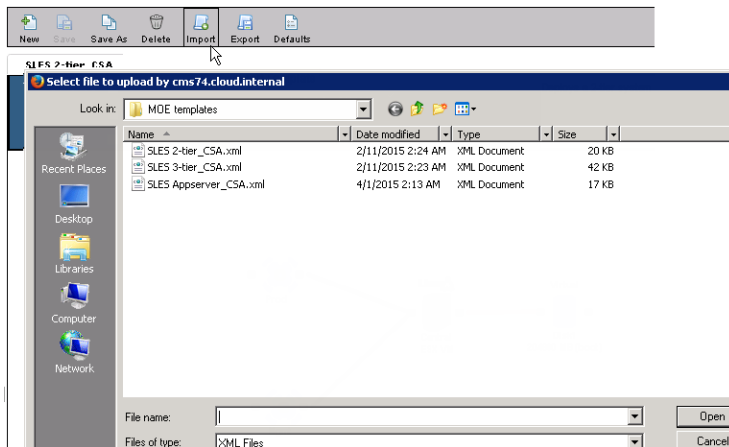
## Importing Templates to MOE

### Note:

- Before importing the template, read "How to use this HP Cloud Map" in [Implementing the HP Cloud Map for SAP Business Applications](http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-7326ENW&cc=us&lc=en) (<http://h20195.www2.hp.com/V2/GetDocument.aspx?docname=4AA4-7326ENW&cc=us&lc=en>).
- The role responsible for this procedure is **MOE Administrator**.

The Infrastructure Orchestration (IO) template is used by HP Matrix OE (MOE) Infrastructure Orchestration to deploy virtual and physical servers, storage, and networking suitable for a SAP Business Applications cloud service. The template automatically deploys Linux for SAP Business Applications.

To import the template, use the HP Matrix IO Designer. Click the **Import** button and select the **SLES 2-tier\_CSA.xml** file from the package. Repeat this action with the **SLES 3-tier\_CSA.xml** file and **SLES Appserver\_CSA.xml** files.



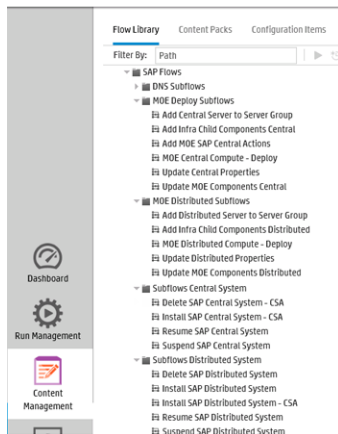
The new templates are now added to the **New Templates** section.

Now the templates are ready to be used as a service in the HP Systems Insight Manager and via HP Cloud Service Automation.

## Deploying Content to HP OO Central

**Note:** The role responsible for this procedure is **Operations Staff**.

The jar file contains the Infrastructure Orchestration cloud maps that convert to HP Operations Orchestration (HP OO) version 10.x flows and HP Matrix Operating Environment provisioning scripts.



The **SAP Flows** folder contains the following:


- **DNS Subflows.** Supportive flows that handle the DNS when installing or deleting SAP on the virtual machine
- **MOE Deploy Subflows.** Based on the **HP Infrastructure Orchestration (IO) Lifecycle** folder in the HP CSA version 4.10.0000 content pack, customizes MOE deploy scripts to provision the required virtual machine for central installation, populates the installation properties, and updates the HP CSA consumer page with details.
- **MOE Distributed Subflows.** Based on the **HP Infrastructure Orchestration (IO) Life Cycle** folder in the HP CSA version 4.10.0000 content pack, customizes MOE deploy scripts to provision the required virtual machines for distributed installation, populates the installation properties, and updates the CSA consumer page with details
- **MOE AppServer Subflows.** Based on the **HP Infrastructure Orchestration (IO) Life Cycle** folder in the HP CSA version 4.10.0000 content pack, customizes MOE add server script to provision the required virtual machine for application server, updates the CSA consumer page with details, and executes the application server installation flow

- **SAP Central System Flows.** Installs, deletes, suspends, and resumes a centralized (two tier) SAP system with all of the SAP components (database, application server) on a single host
- **SAP Distributed System Flows.** Installs, deletes, suspends, and resumes a distributed (three tier) SAP system with a different server for each of the SAP components (database, application server)
- **SAP Application Server Flows.** Installs, deletes, suspends, and resumes an application server with SAP system

**Note:** The HP OO flows support both Linux and Windows Operating Systems, but were only tested on Linux for the purpose of this Best Practice document.

To view the full table of tested configurations, see ["Tested Configurations" on page 87](#).

### To deploy these flows to HP OO version 10.21:

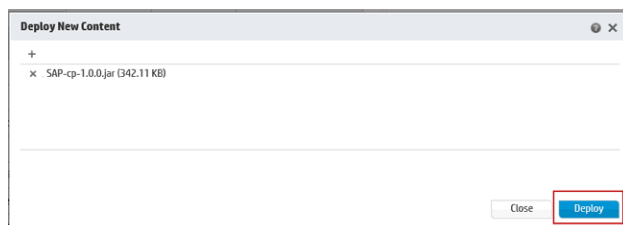
1. Log on to **HP OO Central**: [https://<OO\\_server>:<port\[8443\]>/oo](https://<OO_server>:<port[8443]>/oo)
2. Select the **Content Packs** tab and click the **Deploy Content**  button.



3. On the Deploy New Content window, click the **+** button and select the **oo10-csa-moe-cp-5.0.0** jar file.

**Note:** This is in the R2F – SAP Content Pack.

4. After the file is loaded, click the **Deploy** button.



5. Repeat these steps with the **SAP-cp-1.0.0** jar file.

Now the flows can be executed on **Run Management** on HP OO Central.

## Registering Workflow to be Used in HP CSA

**Note:** The role responsible for this procedure is **Operations Staff**.

Before executing flows through HP Cloud Service Automation (HP CSA), they must be imported into HP CSA by running the Process Definition Tool. A process definition tool is set up during the installation and configuration of HP CSA. This tool ensures that HP CSA can correctly locate the HP OO workflows needed by the HP CSA Service Offerings.

**Note:** By default, the **HP00InfoInput.xml** file defines the content available to HP CSA. Unless this is changed, this is the file that needs to be configured using the Process Definition Tool.

For more details regarding importing the HP OO flows to CSA, refer to the [Request to FulFill Concept and Configuration Guide](https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937) (https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937) or the [HP Cloud Service Automation Installation Guide for Windows version 4.50](https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01691507) (https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01691507).

### To run the Process Definition Tool:

1. Open the following file in a text editor:

```
%ProgramFiles%\Hewlett-  
Packard\CSA\Tools\ProcessDefinitionTool\HP00InfoInput.xml
```

2. Add a new **<ooengine>** tag inside the **<ooengines>** tag.

**Note:** The engines will be reflected on HP CSA when choosing a script from HP OO. Separating the **<ooengine>** tags to logic engines makes it easier to find the flow and reduces the loading time.

```
<ooengine delete="false" name="00-SAP-RELATED" password="ENC(CU1ER6as6r+VRI1zN0JHEBw==)"  
truststore="C:/Program Files/Hewlett-Packard/CSA/openjre/lib/security/cacerts"  
truststorePassword="ENC(KSyTTeioHgU1GX0t0ORTItZncSYHUM1M)" update="false" uri="  
https://localhost:8443/PAS/services/WSCentralService" username="admin">  
  
  <folder path="/Library/SAP Flow" recursive="true" update="true"/>  
  <folder path="/Library/CSA/3.2/Providers/Matrix Operating Environment/HP I0  
  Lifecycle/Actions" update="true" flow="false" recursive="true" />  
  <folder path="/Library/CSA Content Pack/CSA3.2/Providers/Infrastructure/Matrix  
  Operating Environment/HP I0 Lifecycle/Actions" recursive="true" update="true"/>  
  
</ooengine>
```

3. Add a link to the SAP folder and create a new **<folder>** tag.

```
<folder update="true" flow="false" path="/Library/SAP Flows" recursive="true"/>
```

4. Add the following links to the MOE-related folders:

```
<folder path="/Library/CSA/3.2/Providers/Matrix Operating Environment/HP IO Lifecycle/Actions" update="true" flow="false" recursive="true" />
```

```
<folder path="/Library/CSA Content Pack/CSA3.2/Providers/Infrastructure/Matrix Operating Environment/HP IO Lifecycle/Actions" recursive="true" update="true"/>
```

5. Run the **runProcessDefinitionTool.bat** file for Microsoft® SQL Server or, from **C:\Program Files\Hewlett-Packard\CSA\Tools\ProcessDefinitionTool**, run the following command:

- **For Oracle**

```
java -Djava.class.path=ojdbc6.jar -jar process-defn-tool.jar -d db.properties -i HPOOInfoInput.xml
```

- **For Microsoft® SQL Server**

```
java -jar process-defn-tool.jar -d db.properties -i HPOOInfoInput.xml
```

**Step 5** makes the imported HP OO workflows available to HP CSA and can take several minutes to complete. When done, the tool reports that the process definitions were created. The **db.properties** file was created when HP CSA was installed and the original content was loaded.

## Setting System Properties in OO Central

**Note:** The role responsible for this procedure is **Operations Staff**.

The SAP installation flow uses a few **System Properties** in HP OO. This chapter describes how to change these properties.

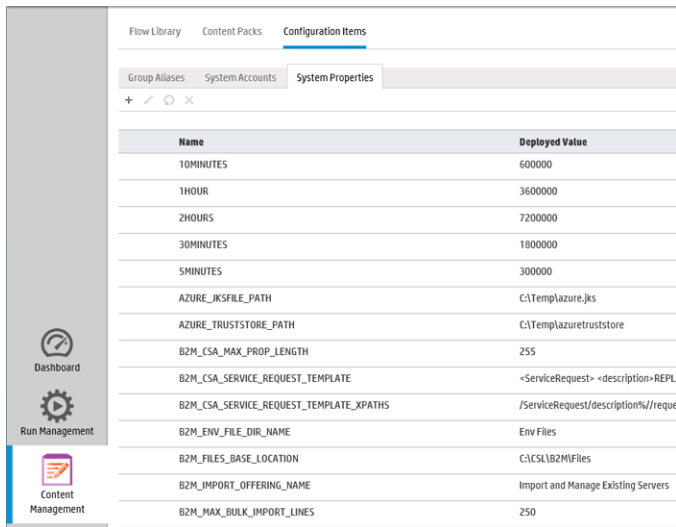
**Note:** For more details about setting the system properties in OO Central, see "Implementing the HP Cloud Map for SAP Business Applications" in [HP Cloud Maps for SAP Applications](http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx) (<http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx>).

Most of the tips and tricks to install SAP automatically will now be found in this R2F for SAP document.

Additional information is contained in the Cloud Maps document, which was written specifically for HP CloudSystem 7 and SAP. The Cloud Maps document may still provide add-on information, but much of the information is CloudSystem 7 compliant and redundant for the newer technologies that HP and SAP supply.

### To set the System Properties in OO Central:

1. Log on to HP OO Central: [https://<OO\\_server>:<port\[8443\]>/oo](https://<OO_server>:<port[8443]>/oo)
2. Select the **Content Management** tab and then select the **Configuration Items > System Properties** tabs:



Name	Deployed Value
10MINUTES	600000
1HOUR	3600000
2HOURS	7200000
30MINUTES	1800000
5MINUTES	300000
AZURE_JKFILE_PATH	C:\Templazure.jks
AZURE_TRUSTSTORE_PATH	C:\Templazuretruststore
B2M_CSA_MAX_PROP_LENGTH	255
B2M_CSA_SERVICE_REQUEST_TEMPLATE	<ServiceRequest> <description>REPLU
B2M_CSA_SERVICE_REQUEST_TEMPLATE_XPATHS	/ServiceRequest/description%//reque
B2M_ENV_FILE_DIR_NAME	Env Files
B2M_FILES_BASE_LOCATION	C:\CS\B2M\Files
B2M_IMPORT_OFFERING_NAME	Import and Manage Existing Servers
B2M_MAX_BULK_IMPORT_LINES	250

3. Change the following properties as shown in the following table:

Name	Value	Description
<b>InstanceNumber</b>	00	Instance Number of the SAP systems scheduled to-be deployed
<b>DepotHost</b>	cifs:cms.cloud.internal	Protocol and hostname of the server hosting the software depot. Protocol can be either <b>cifs</b> (when using Windows shares) or <b>nfs</b> (when using Linux/UNIX® shares).
<b>SWDepotPath</b>	SWDEPOT	Name of the folder on <b>DepotHost</b> holding the installation media to be exported
<b>TSIG_Key</b>	Not applicable	This system property is optional. If you protect the automatic update of your Domain Name Service with <b>Transaction Signatures (TSIG)</b> , enter the key name here.
<b>TSIG_Secret</b>	Not applicable	This system property is optional. If you protect the automatic update of your Domain Name Service with <b>Transaction Signatures (TSIG)</b> , enter the key secret here.

4. Verify that **DepotHost** refers to the correct location of the MOE server.

## Importing Sequenced Design Template to HP CSA

**Note:** The roles responsible for this procedure are **Resource Supply Manager/Component Designer** and **Service Designer**.

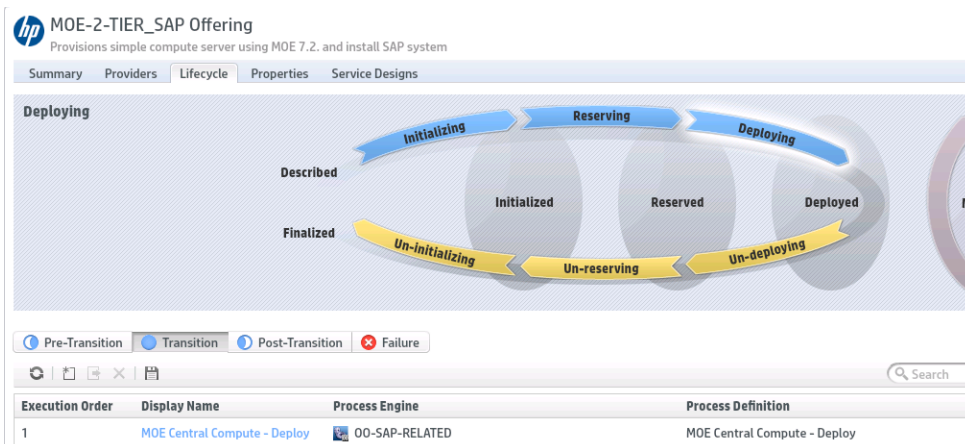
This section contains the following topics:

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Importing an HP CSA Template .....	51
Connecting the Resource Offering to Resource Provider .....	52
Setting TemplateReference Property .....	52

## Overview

The **SEQ\_DESIGN\_Provision\_SAP\_Central\_System** zip file contains the sequenced design template that is responsible for all of the services related to SAP provisioning.

The **SEQ\_DESIGN\_Provision\_SAP\_Central\_System** design template is based on the **CSA\_BP\_MOE\_COMPUTE\_v3.20.00** template to provision a server via any MOE template with an addition of two components consisting of a Server and an Application Layer. This HP CSA design template uses the **MOE\_2-TIER\_SAP** resource offering that is responsible for the execution of the OO flows according to the service life cycle.



The **Deploy** stage of the life cycle calls two OO flows:

- **MOE Central Compute – Deploy.** Script that is responsible for creating the connection between HP CSA and MOE, and executing the required template from the **templateReference** property. Also responsible for updating the **hostname**, **IPaddress**, and **DeployIPaddress** properties with the details of the newly created virtual machine. This script executes on the **Transition** stage.



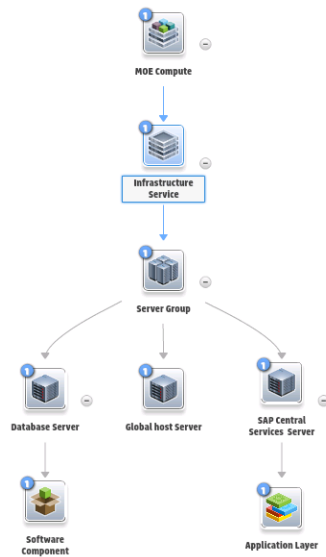
- **Install SAP Central System – CSA.** Script that is responsible for the SAP installation on the created virtual machine based on the parameters given in the design template. This script executes on the **Post Transition** stage.



Another design template exists for the distributed system installation—called **Provision SAP Distributed System**. The design reflects the distribution of the servers on a distributed system. This design uses a resource offering—**MOE-3-TIER-SAP**—which calls the following OO flows:

- **MOE Distributed Compute – Deploy.** Script that is responsible for creating the connection between CSA and MOE, and executing the required template from the **templateReference** property. Also responsible for updating the **hostname**, **IPaddress**, and **DeployIPaddress** properties with the details of the newly created virtual machine. This script executes on the **Transition** stage.

- **Install SAP Distributed System – CSA.** Script that is responsible for the SAP installation on the created virtual machine based on the parameters given in the design template. This script executes on the **Post Transition** stage.



Use the following URL to enter the CSA Console to import a sequenced design template:

**[https://<CSA\\_server>:<port\[8444\]>/csa/dashboard/index.jsp](https://<CSA_server>:<port[8444]>/csa/dashboard/index.jsp)**

## Creating a New Resource Provider

For a HP CSA integration with MOE, simply define a new MOE resource provider.

### To create a New Resource Provider:

1. Navigate to **Providers** and select **HP Matrix Operating Environment (MOE)** as a resource provider.
2. Click the **Create**  button.

3. On the new window, enter all of the information required to connect to the MOE system.

The screenshot shows a web interface for configuring a resource provider. At the top, there's a breadcrumb 'Providers' with a back arrow. Below it is the 'MOE' logo and name. A horizontal tab bar contains 'Overview', 'Properties', 'Environments', 'Offerings', and 'Res'. The 'Overview' tab is active. The main content area lists several fields:

- Provider Type:** HP Matrix Operating Environment
- Display Name:** MOE
- Description:**
- User ID:** Administrator
- Service Access Point:** https://cms74.cloud.internal:51443/hpio/controller/soap/v4
- Enabled:** Yes

Now that there is the required resource provider, import the Service Design.

## Importing an HP CSA Template

This section provides general instructions for importing a Sequenced Design to HP CSA.

### To import a CSA Sequenced Design template:

1. Navigate to **Designs > Sequenced > Designer**.
2. Click the **Import** button.
3. On the opened window, select the **SEQ\_DESIGN\_Provision\_SAP\_Central\_System** zip file located in the CSA-SAP content pack.

The design now appears on the **Sequenced Designs** page.

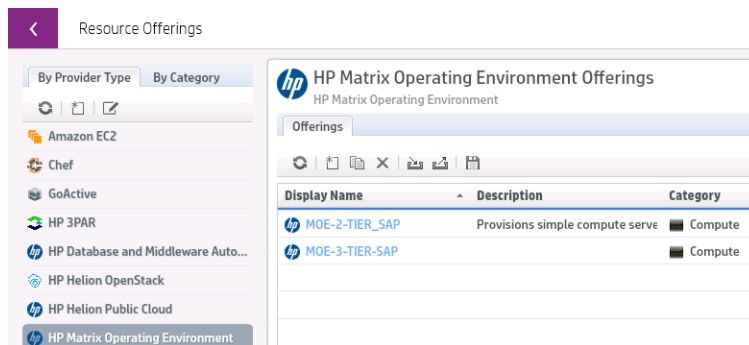
4. Repeat these steps with the **SEQ\_DESIGN\_Provision\_SAP\_Distributed\_System** zip file located in the CSA-SAP content pack.

## Connecting the Resource Offering to Resource Provider

As part of the import process, a new Resource Offering is created with the relevant scripts in its life cycle.

**To connect the MOE that you created as the Resource Provider to the Resource Offering that was created:**

1. Navigate to **Design > Sequenced > Resource Offering**.
2. Select the **HP Matrix Operating Environment** providers.



3. Open the **MOE-2-TIER\_SAP** offering.
4. Navigate to the **Providers** tab.
5. Associate the MOE provider that you created.
6. Repeat these steps with the **MOE-3-TIER-SAP** resource offering.

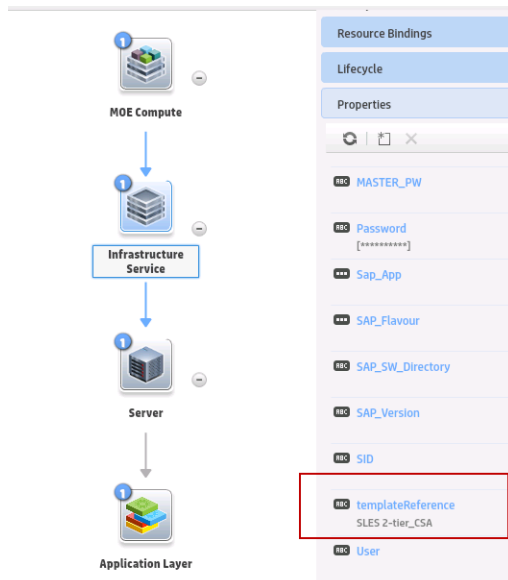
## Setting TemplateReference Property

The TemplateReference property is responsible for defining which MOE template will be executed when submitting a new subscription.

**To set the TemplateReference Property on the Provision SAP Central System design:**

1. In the **Provision SAP Central System**, select the **Designer** tab.
2. Select the **Infrastructure Service** component and open the Properties window.

3. Confirm that the **templateReference** property is set to **SLES 2-tier\_CSA.xml**.



**Note:** All of the installation properties are handled at the Service Offering.

### To set the TemplateReference Property on the Provision SAP Distributed System design:

1. In the **Provision SAP Central System**, select the **Designer** tab.
2. Select the **Infrastructure Service** component and open the Properties window.
3. Confirm that the **templateReference** property is set to **SLES 3-tier No SAP Installation**.

Once the service design is configured and before creating a service offering based on it, the service design must be published.

To publish the service design, open it and select **versions**. Select the relevant version and click **Publish**.

# Populating the Service Offering in HP CSA Marketplace

**Note:** The roles responsible for this procedure are **Business Manager** and **Consumer Administrator**.

This section includes the following topics:

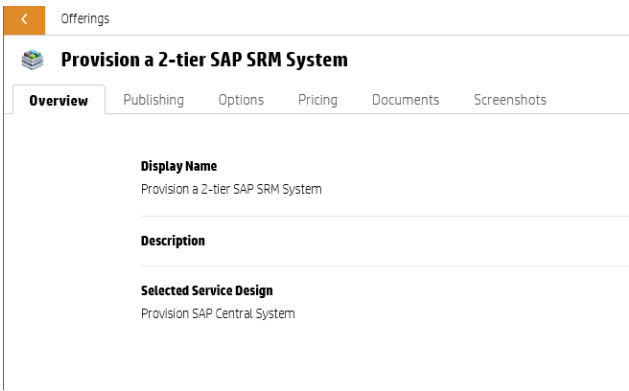
Creating a Service Offering .....	54
Publishing a Service Offering to the HP CSA Catalog .....	58

## Creating a Service Offering

After importing the Service Design, create a Service Offering and then place it in whichever consumer catalog it will be offered to.

### To create a Service Offering:

1. From HP CSA Console home page, select **Offerings**.
2. Create a new Service Offering based on the Service Design.



3. When necessary, use this page to customize the description and the image of the offering that will be displayed in the catalog once it is published.

4. Use the **Options** tab to edit all of the visible properties that are required for the installation.

**Note:** For more information, see the [SAP Installation Guide](https://service.sap.com/instguides) (https://service.sap.com/instguides). This document is available in the SAP Service Marketplace. For access, you need minimal SAP user credentials. Contact SAP for the credentials if you do not have them.

Check [SAP Note 1680045](https://service.sap.com/sap/support/notes/1680045) (https://service.sap.com/sap/support/notes/1680045) for all SAP-supported installation options. SAP user credentials are necessary to view the page.

Property Name	Description	Possible Values
Application Name	Installed SAP application	<p>Values depend on the SAP version.</p> <p>For 2013, the possible applications are:</p> <ul style="list-style-type: none"> <li>◦ SAP NetWeaver</li> <li>◦ SAP SRM</li> <li>◦ SAP ERP</li> <li>◦ SAP SCM</li> <li>◦ SAP CRM</li> <li>◦ Solution Manager</li> </ul> <p><b>Note:</b> For more options, see the SAP installation documentation. Changes may be necessary to the shellscrip.</p>
Database Vendor	Database for the application	<p>Values appear in a fixed list:</p> <ul style="list-style-type: none"> <li>◦ Oracle</li> <li>◦ MSSQL</li> </ul>

Property Name	Description	Possible Values
		<ul style="list-style-type: none"> <li>Max-DB</li> <li>DB2</li> </ul>
HPIO User Name	User name of the MOE that executes the IO scripts	
HPIO User Password	Password of the MOE user	
Operating System	Operating system of the server that hosts the installation	<p>Values appear in a fixed list:</p> <ul style="list-style-type: none"> <li>Linux</li> <li>Windows</li> </ul>
SAP Flavor	Programming language used by SAP	<p>Values appear in a fixed list:</p> <ul style="list-style-type: none"> <li>ABAP</li> <li>J2EE</li> </ul>
SAP Installation Directory Name	Name of the installation directory used in the installation	<p>List of installation directory names depends on how you set up your depot.</p> <p>For example:</p> <ul style="list-style-type: none"> <li>BS7i2013-General</li> <li>BS7i2013-SR1</li> <li>and so on</li> </ul>
SAP Version	Depending on the installation directory, the installed version of SAP	<p>Values depend on how the depot content is created.</p> <p>For example:</p> <ul style="list-style-type: none"> <li>BS2013SR1</li> <li>BS2013</li> <li>and so on</li> </ul>
SID	<b>SAP System ID:</b> A unique string that is used as the <b>SID of the system</b> , as well as the <b>prefix of</b>	SID must be three characters long and start



Property Name	Description	Possible Values
	<b>the hostname</b> of the server that hosts the installation.	<p>with a capital letter (for instance, T01).</p> <p><b>Caution:</b> Each request must have a unique SID.</p>
User Name	User name of the server that hosts the installation	<p>System administrator's user name</p> <p>For example, for Linux, the default system administrator User Name is <b>root</b>.</p>
User Password	Password of the local operating system administrator	<p>System administrator's password</p> <p><b>Note:</b> SAP installation script used in the background also creates SAP admin and database accounts. Administrator has to change these passwords.</p>

It is recommended to set all parameters, except SID, as invisible to the marketplace. This way you can create a predefined **Offering** for the user. The design is flexible in a way that allows setting all or part of the properties as visible to the user.

**Note:** The SID property will always be open to the user so they can provide a unique ID.

The screenshot shows the 'Options' tab of the 'Provision a 2-tier SAP SRM System' configuration. The 'Installation Specifications' section is expanded, showing a list of properties with their values and status icons. The properties are:

Property	Value	Status
Application Name	SRM	Open
Data Base Vendor	Oracle	Open
Domain Name	prod.local	Open
HPID User Name	Administrator	Open
HPID User Password	*****	Open
Operating System	Linux	Open
SAP Flavour	ABAP	Open
SAP Installation Directory Name	BS712013-SR1	Open
SAP Version	BS2013SR1	Open
SID		Open
User Name	root	Open
User Password	*****	Open

At the bottom of the configuration window, there are 'Save' and 'Reset' buttons.

The only configuration left to do is to publish the Service Offering in the desired catalog.

## Publishing a Service Offering to the HP CSA Catalog






The Service Offering to the HP CSA Catalog is exposed to the relevant consumers only after it is published. This section provides the general instructions for publishing a Service Offering to the HP CSA Catalog.

### To publish a Service Offering to the HP CSA Catalog:

1. Open **SAP Service Offering**.
2. Navigate to the **Publishing** tab.
3. In the Publish Service Offering window, select the catalog and category where the SAP Service Offering appears.

**Publish Service Offering**

---

<b>To Catalog</b>  <input type="text" value="Search"/>  <div>  <b>Global Shared Catalog</b> </div> <div>  <b>CSA Import and Migrate P...</b>          CSAAdmin       </div> <div>  <b>Engineering Catalog</b>          Engineering       </div> <div>  <b>Marketing Catalog</b>          Marketing       </div> <div>  <b>Sales Catalog</b>          Sales       </div>	<b>In Category *</b> <input type="text" value="Compute - Private Cloud"/>  <b>Approval Policy Exception</b> Changing the approval policy for a service offering does not change the default catalog approval policy.
	<b>Approval Policy</b> <input type="text" value="No Approval"/>

Publish
Cancel

# Chapter 8: Testing and Troubleshooting

**This chapter includes:**

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Verifying the SAP Installation .....	62
Possible Errors While Importing the HP CSA Design Template .....	63
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SAP Installation Progress and Troubleshooting .....	66
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## Verifying the Service Request

**Note:** The roles responsible for this procedure are **Consumer Administrator**, **Operations Staff**, and **MOE Administrator**.

The first check is to test that the HP Matrix Operating Environment (MOE) template and the HP Operations Orchestration (HP OO) flows are running as expected.

**To verify the service request:**

1. Log on to the HP Cloud Service Automation (HP CSA) Marketplace Portal (MPP). At **Shop for Services**, click the **Browse Services** button and select the service offering.
2. Verify that only the parameters set as visible are showing. If not, recheck the **Offering** setting as described in ["Populating the Service Offering in HP CSA Marketplace" on page 54](#).
3. Enter all of the required parameters and click the **Checkout** button.
4. Verify the request and click the **Submit** button.

**Note:** It may take a few minutes until the request changes the status to **Approved**, after which continue with the verifications.

5. Log on to **OO Central > Run Management** and verify that **MOE Central Compute – Deploy** is running
6. Log on to **MOE Insight Manager** and view the new request on the **Requests** tab.
7. Verify that a new request was created with a generated name—for example, **149ebceba782dd7**.

If the new request was not created, see ["Possible Errors on MOE Central Compute – Deploy Script" on page 64](#).

8. After the request is complete, go back to **OO Central** and verify that the script completed successfully. If the script has not completed successfully, see ["Possible Errors on MOE Central Compute – Deploy Script" on page 64](#)

**Note:** It takes approximately ten minutes for the request to complete.

9. Verify that the **Install SAP Central System – CSA** script is running.

**Note:** It takes approximately 150 minutes to complete the installation.

If the script fails, see the ["Possible Errors on SAP Installation – HP CSA Script \(install\\_SAP.sh\)" on page 65](#) section.

10. Log on to the HP CSA Marketplace and open **More Actions > My Services** to view the newly created service.
11. Verify that the service's status is in **Online**. If the service is not in **Online** status, see ["CSA Service Error" on page 70](#).
12. Open the service and view that the following data is available for the user:
  - Virtual Machine details (hostname, IPaddress, DeployIPaddress)
  - SAP Installation details [SAP System ID (SID), Instance Number, Master Password]

If the data is not presented in the service, see ["Administration" on page 73](#).

## Verifying the SAP Installation

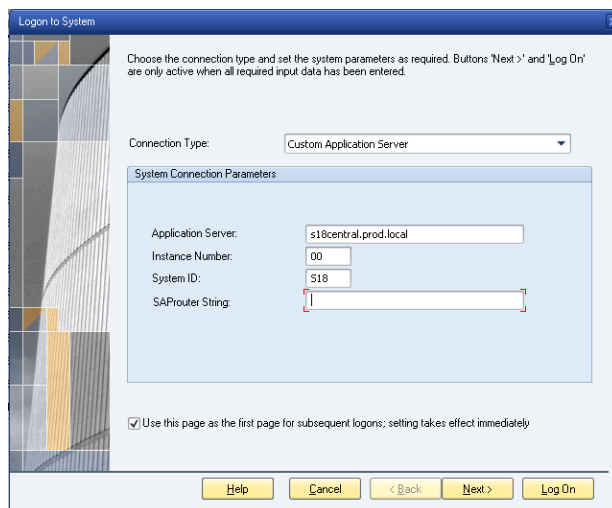
**Note:** The role responsible for this procedure is **SAP Basis Expert**.

Use the SAP System ID (SID), Instance Number, and Master Password that you get from the service to check that SAP was installed based on the parameters you supplied.

### To verify the SAP installation:

1. Open the SAP log-on user interface and enter the required parameters.

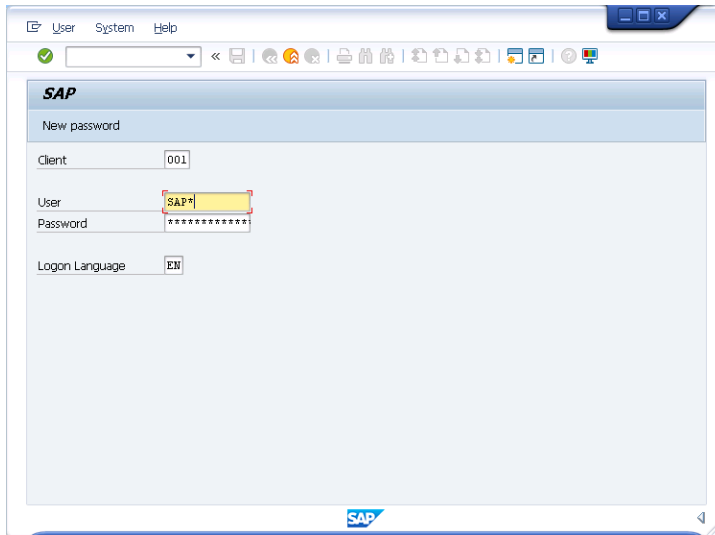
**Note:** The parameters can be found in HP Cloud Service Automation Service Details.



The screenshot shows the 'Logon to System' dialog box. It has a title bar with a close button. Below the title bar, there is a text area that says: 'Choose the connection type and set the system parameters as required. Buttons 'Next >' and 'Log On' are only active when all required input data has been entered.' Below this, there is a 'Connection Type:' dropdown menu set to 'Custom Application Server'. Underneath is a 'System Connection Parameters' section with four input fields: 'Application Server:' (containing 's10central.prod.local'), 'Instance Number:' (containing '00'), 'System ID:' (containing 'S10'), and 'SAProuter String:' (empty). At the bottom of the dialog, there is a checkbox labeled 'Use this page as the first page for subsequent logons; setting takes effect immediately' which is checked. At the very bottom, there are five buttons: 'Help', 'Cancel', '< Back', 'Next >', and 'Log On'.

2. Log on with the new generated password.

**Note:** The password can be found in HP Cloud Service Automation Service Details.



## Possible Errors While Importing the HP CSA Design Template

**Note:** The roles responsible for this procedure are **Operations Staff** and **Service Designer**.

In order for the import to complete successfully, all of the scripts that the design template is using must be recognized by HP Cloud Service Automation.

If a script name is not recognized, the following error message is returned:



**Caution:** The script name may be different.

If this error message is returned, check the following:

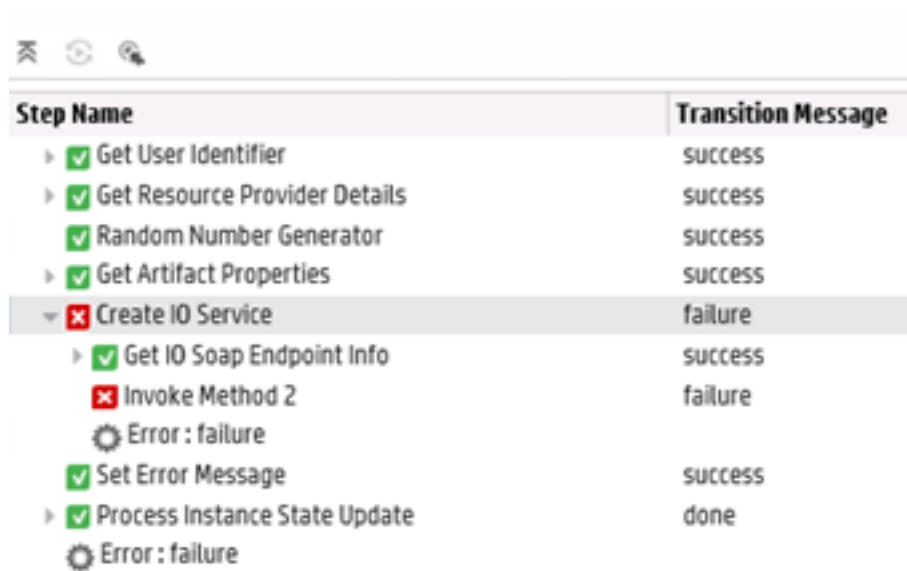
- If the script exists on HP Operation Orchestration Central
- If the path of the script exists on the **HP00InfoInput.xml** file

If the error continues, go to the OO Studio and use the search function to check if the script exists in another path. Then add its path to the **HP00InfoInput.xml** file and run the **Process Definition Tool** again—as explained in ["Registering Workflow to be Used in HP CSA" on page 44](#).

## Possible Errors on *MOE Central Compute – Deploy* Script

**Note:** The role responsible for this procedure is **Operations Staff**.

When a Create IO Service failure occurs on the MOE Central Compute – Deploy script, verify the correct inputs have been selected.



The screenshot shows a workflow execution log with two columns: 'Step Name' and 'Transition Message'. The 'Create IO Service' step is highlighted in grey and shows a failure. Below it, the 'Invoke Method 2' step also shows a failure, followed by an 'Error : failure' message. The 'Set Error Message' step shows success, and the 'Process Instance State Update' step shows 'done'. The log also includes a 'Random Number Generator' step and a 'Get Artifact Properties' step, both showing success.

Step Name	Transition Message
➤ ✓ Get User Identifier	success
➤ ✓ Get Resource Provider Details	success
✓ Random Number Generator	success
➤ ✓ Get Artifact Properties	success
▼ ✗ Create IO Service	failure
➤ ✓ Get IO Soap Endpoint Info	success
✗ Invoke Method 2	failure
⚙ Error : failure	
✓ Set Error Message	success
➤ ✓ Process Instance State Update	done
⚙ Error : failure	

### To debug the Create IO Service step:

1. Log on to **HP OO Central** (<https://<oomachine>:8443/oo>) > **Run Management** and select the **MOE Central Compute – Deploy** run that failed.



2. Select **Step Name: Create IO Service**, and verify that the following inputs are correct:

- **URL.** Point to the API of MOE—for example, **https://<moe.machine>51443/hpio/controller/soap/v4**.
- **TemplateReference.** Verify that the template exists on MOE.
- **SAP System ID (SID).** Impacts the hostname. Verify that it is unique.

Flow Graph

Step Details

✔

Create IO Service

Step ID:

Oe95443c-d922-487f-9d51-b60cc444551

Start Time:

Wednesday, November 26 2014 4:56 AM

End Time:

Wednesday, November 26 2014 7:23 AM

Response:

Resolved: success

Duration:

2 hours 26 minutes

Inputs:

url	https://cms74.cloud.internat:51443/hpio/controller/soap/v4
username	Administrator
password	*****
serviceName	149ebf2f8ee30d1
serverPoolName	
templateName	SLES 2-tier SRM Oracle B57 Inno 2013 SR1
hostSuffix	S18
userEmail	consumer@csaconsumer.com
serviceDescription	An infraservice provided by an HPIO solution.
lobUser	Administrator
billingCode	
startEpoch	
endEpoch	

# Possible Errors on *SAP Installation – HP CSA Script* (install\_SAP.sh)

The following errors may occur when installing the SAP System with an HP CSA Script:

SAP Installation Progress and Troubleshooting .....	66
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## SAP Installation Progress and Troubleshooting

### If the installation aborts or you want to check what the installation is doing:

1. In the system preparation phase (pre-SAP installation):
  - a. Check */tmp/SAP\_Installation.log*. If the last line shows **Calling sapinst...**, then the system preparation finished successfully.
  - b. If there are some errors, check the */tmp/SAP\_Dev\_Installation.log* and */tmp/SAP\_Error.log* files for troubleshooting.
2. In the SAP installation:
  - a. Check the */tmp/sapinst\_instdir/sapinst\_dev.log* file for errors. If an exception occurred, it will show in the last lines of the file. Make a tail *-f /tmp/sapinst\_instdir/sapinst\_dev.log* to see what happens or search for the term **ERROR** in the log file.
  - b. If the */tmp/sapinst\_instdir/summary.html* file exists, the SAP installer finished the preparation phase and is already installing the product.
  - c. During the import of the database content, the */tmp/sapinst\_instdir/import\_monitor.java.log* file can be tracked. When the import is finished, go back to *sapinst\_dev.log*.
  - d. The installation finished successfully when the */tmp/sapinst\_instdir/installationSuccessfullyFinished.dat* file was created.

### Manual installation with SAP Installation GUI:

If an exception is returned during the automatic SAP installation, the best practice is to start the SAP installation manually with the SAP graphical user interface and check where the installer stopped and why. You have three options for how to accomplish that; but first stop the automated installation process if it is still running and then check for processes called **sapinst** and **install\_sap.sh**.

1. **Option: The target server/virtual machine operating system has a desktop environment (X-Window).**
  - a. Connect to the desktop (X-Window) of your server.
  - b. Open a terminal as root user.

c. Go to the installation log directory: */tmp/sapinst\_instdir/*.

d. Execute the SAP installer within this log directory:

```
/nfsmnt/<YOUR_SAP_SW_DIRECTORY>/SWPM-Linux/sapinst
```

The installation resumes at the point where it stopped with the problem.

2. **Option: The server does not have a desktop environment, but you have another Linux host with X-Window.**

a. Connect to your server via shell.

b. Go to the installation log directory: */tmp/sapinst\_instdir/*.

c. Execute the SAP installer within this log directory with the parameter **-nogui**:

```
/nfsmnt/<YOUR_SAP_SW_DIRECTORY>/SWPM-Linux/sapinst -nogui
```

d. Connect to the desktop (X-Window) of another Linux host.

e. Open a terminal as a root user.

f. Mount the Software Depot or copy the necessary SAP SWPM (Software Provisioning Manager) Linux bits to the system.

g. Execute the SAP graphical user interface installer:

```
/nfsmnt/<YOUR_SAP_SW_DIRECTORY>/SWPM-Linux/sapinstgui
```

h. Provide the host name of your installation server, leave the port as it is, and click **Next**.

i. On the next screen, enter the root credentials of the server.

The installation resumes at the point where it stopped with the problem.

3. **Option: The server does not have a desktop environment, but you have a Windows system.**

a. Connect to your server via shell.

b. Go to the installation log directory: */tmp/sapinst\_instdir/*.

c. Execute the SAP installer within this log directory with the parameter **-nogui**:

```
/nfsmnt/<YOUR_SAP_SW_DIRECTORY>/SWPM-Linux/sapinst -nogui
```

- d. Connect to your Windows system.
- e. Mount the Software Depot or copy the necessary SAP SWPM (Software Provisioning Manager) Windows bits to the system.
- f. Execute the SAP graphical user interface installer.

**Note:** You need the *Windows binaries* of the SWPM.

Navigate to the appropriate SWPM-Windows directory and execute *sapinstgui.exe*.

- g. Provide the host name of your installation server, leave the port as it is, and click **Next**.
- h. On the next screen, enter the root credentials of the server.

The installation resumes at the point where it stopped with the problem.

## DNS Updating Error

**Note:** The role responsible for this procedure is **Operations Staff**.

The DNS updating error may occur due to the virtual machine not being cleaned correctly from the previous DNS name. This may happen on development and testing environments.

### To correct the DNS updating error:

1. Log on to **HP OO Central** (<https://<oomachine>:8443/oo>) > **Run Management** and select the **Install SAP central system – CSA** run that failed.

2. Click the **Update DNS Server** step to view the details of the virtual machine.

**✖ Update DNS-Server**

**Step ID:** bee46860-c86d-40a1-83de-431e581158fb  
**Start Time:** Monday, November 24 2014 4:52 AM  
**End Time:** Monday, November 24 2014 4:52 AM  
**Response:** Error: failure  
**Duration:** 0.878 seconds

**Inputs:**

username	root
password	*****
hostipaddr	192.168.12.135
hostnamefull	S75central.prod.local
deploymentipaddr	172.16.12.233
HpioCmsUsername	Administrator
HpioCmsPassword	*****
os	LINUX

3. Log on to the virtual machine that was created.
4. In the **tmp** folder, view the **update\_dns.log** file and see what the expected DNS name is.
5. Log on to **HP 00 Central** and run the **Delete DNS** flow.
6. Enter the **expected dns name** listed in the **update\_dns.log** file on the **fullhostname** property.

## OO Flows Failed to Complete

**Note:** The roles responsible for this procedure are **Operations Staff** and **Resource Supply Manager**.

There is a situation in which the OO flow is not failing, but also cannot continue to completion. This may happen when the CSA Service component ID did not transfer correctly to the OO flow. It is not related to a specific flow, but to all flows that executed from CSA.

### To transfer the Service Component ID to the OO flow:

1. Log on to **HP CSA** ([https://<CSA\\_machine>:8444/csa/login](https://<CSA_machine>:8444/csa/login)).
2. Navigate to **Designs > Sequenced > Resource Offerings**.
3. Open the resource offering that is used in the design—**MOE-2-TIER\_SAP** or **MOE-3-TIER-SAP**.
4. If the problem occurs in an installation flow, select the **Lifecycle** tab and click **Deploying**. Then select the **Post-Transition** tab.

5. If the problem occurs in a deletion flow, select the **Lifecycle** tab and click **Deploying**. Then select the **Pre-Transition** tab.
6. Open the flow that exists on that stage.
7. Click the **Properties** tab and verify that the property **SVC\_COMPONENT\_ID** is set with the **[TOKEN:SVC\_COMPONENT\_ID]**.

The screenshot shows a dialog box titled "Delete SAP Central System - CSA Properties" with two tabs: "Summary" and "Properties". The "Properties" tab is active, displaying a list of properties with input fields and icons. The properties listed are: CSA\_PROCESS\_ID, deploymentipaddr, hostipaddr, hostnamefull, password, SVC\_COMPONENT\_ID, and username. The "SVC\_COMPONENT\_ID" field is highlighted with a red rectangular box and contains the text "[TOKEN:SVC\_COMPONENT\_ID]". At the bottom of the dialog, there are three buttons: "Save", "Reset", and "Close".

## CSA Service Error

**Note:** The roles responsible for this procedure are **Operations Staff** and **Resource Supply Manager**.

There are a few factors that can cause the service to fail even if all related OO flows completed successfully.

The first one is timeout on the CSA service. Since the installation flow usually takes more than an hour, the timeout definition on the life cycle action may not be enough.

The second reason for the service failure is that it is missing the **Update Process Instance State** component in the flow.

**To check and correct the action's timeout on CSA:**

1. Log on to **HP CSA** ([https://<CSA\\_machine>:8444/csa/login](https://<CSA_machine>:8444/csa/login)).
2. Click **Designs > Sequenced > Resource Offerings**.
3. Open the resource offering that is used in the design—**MOE-2-TIER\_SAP** or **MOE-3-TIER-SAP**.
4. Open the **Lifecycle** tab and click **Deploying**.
5. Open the flow that exists on the **Transition** stage.
6. Verify that the timeout is enough for the installation.

MOE Central Compute - Deploy Properties

Summary Properties

UU-DAT-RELATED

Process Definition  
MOE Central Compute - Deploy  
/Library/SAP Flows/MOE Deploy Subflows/MOE Central Compute - Deplo

Display Name \*  
MOE Central Compute - Deploy

Description  
Deploys 2-tier system and update relevant properties (for the installation next step)

Execution Order  
1

Execution Properties  
☒ Fail on Error ☒ Error on Timeout

Timeout (Seconds)  
18000

Save Reset Close

7. Do the same for the flow that exists on the **Post-Transition** stage.

**To verify that the Update Process Instance State component exists in the flow:**

1. Log on to **HP OO Central** (<https://<oomachine>:8443/oo>) > **Run Management** and select the **Install SAP central system – CSA** run.

2. Verify that the **Process Instance State Update** step exists.

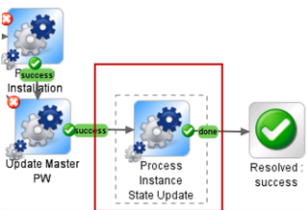
Install SAP Central System - CSA	
Step Name	Transition Message
Get User Identifier	success
Get Artifact Properties	success
Wait for Centralhost	success
Update DNS-Server	success
Perform Installation Centralhost	success
Update Master PW	success
Process Instance State Update	done
Resolved : success	

3. Click this step to verify that the **processReturnCode** parameter is set to **SUCCESS**.

✓ Process Instance State Update	
Step ID:	46fc3709-71c0-4435-a1dc-a7bf23918722
Start Time:	Tuesday, January 13 2015 2:57 AM
End Time:	Tuesday, January 13 2015 2:57 AM
Response:	Resolved: done
Duration:	16.072 seconds
Inputs:	
processInstanceId	2c908c314a529cce014ae25846037bb0
userIdentifier	90d96588360da0c701360da0f1d600a1
processInstanceState	COMPLETED
processReturnCode	SUCCESS
processStatus	Flow completed successfully

4. In case this component does not exist in the flow, you will need to add the following component as the last component of the flow:

/CSA [4.10.0000]/Library/Integrations/Hewlett-Packard/Cloud Service Automation/Update Process Instance State



For more details on how to add the component to the flow, refer to ["Administration" on page 73](#).



## Chapter 9: Administration

This section includes the following topics:

Importing Scripts to HP OO Studio .....	73
Updating OO Installation Script with New Code .....	74
Modifying the OO Scripts .....	75
MOE Central Compute – Deploy Script .....	76
Passing Parameters to HP OO Flow .....	76
Installing SAP Central System – HP CSA Script .....	80
Passing Parameters to HP OO Flow .....	81
Updating the Service with the New Script .....	84
Replacing MOE Provider with a Different Infrastructure Provider .....	85
Tested Configurations .....	87

### Importing Scripts to HP OO Studio

**Note:** The role responsible for this procedure is **Operations Staff**.

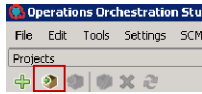
The scripts must be imported to HP Operation Orchestration (HP OO) Studio in order to perform any update or modification on the scripts.

The zipped folder contains the installation scripts, as well as a provisioning virtual machine using a HP Matrix Operating Environment (MOE) template.

#### To import scripts:

1. Unzip **001002.zip** from the R2F – SAP Content Pack.
2. Log on to the HP OO Studio as **admin**.

3. In HP OO Studio, click the **Import folder** button.



4. Browse and select the **001002** folder. The scripts are imported into the SAP project.
5. Make the required changes on the scripts.

HP CSA will recognize the changes only if they are deployed to HP OO Central. For more details, see ["Modifying the OO Scripts" on the next page.](#)

## Updating OO Installation Script with New Code

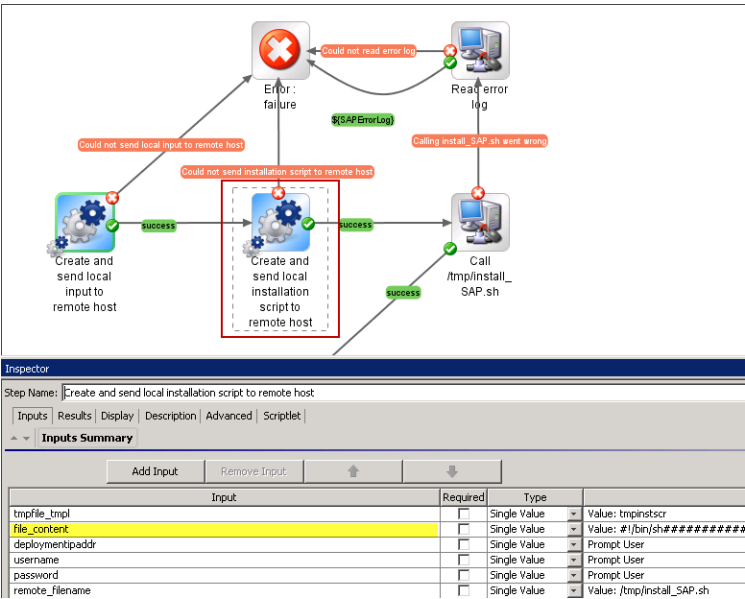
**Note:** The role responsible for this procedure is **Operations Staff**.

From time to time, the installation script of SAP changes, along with new versions and releases. In order to continue working with the HP Cloud Service Automation (HP CSA) Service Design and the HP OO installation script, update the script with the new code.

### To update the script with the new code:

1. Under **/SAP/Library/Hewlett-Packard/Infrastructure orchestration/Service Actions/SAP Business Applications – CloudMap/Subflows Common MOE**, open the **Perform Installation Unix** subflow.
2. Open the Inputs window of the **Create and Send local installation script to remote host** component.

3. Open the **file\_content** input, save its content for a backup, and change it to the new code.



4. Save the script.
5. Update HP OO Central for HP CSA to recognize the changes.

For more information, see ["Modifying the OO Scripts" below](#).

# Modifying the OO Scripts

This section contains the following topics:

MOE Central Compute – Deploy Script .....	76
Passing Parameters to HP OO Flow .....	76
Installing SAP Central System – HP CSA Script .....	80
Passing Parameters to HP OO Flow .....	81
Updating the Service with the New Script .....	84

**Note:** The role responsible for modifying all of the OO Scripts is **Operations Staff**.

This section describes what the components are in the scripts that allows the connection between HP OO and HP CSA and the connection between HP OO and MOE.

To better understand the logic on these scripts, how the parameters are transferred from the Sequenced Design on HP CSA to the HP OO flow are described in this section.

## *MOE Central Compute – Deploy Script*

This script is based on the **MOE Simple Compute – Deploy** script which comes as part of the **oo10-csa-moe** content pack and was modified in order to enable transformation of the newly virtual machine details to the installation script.

The script reads the value of the **SAP System ID (SID)** property as described in the previous section and uses it as a prefix of the hostname of the new created virtual machine.

centralhostnamefull	S25central
SID	S25

Then it executes the MOE template, based on the template name that was set on the **templateReference** property on the HP CSA design.

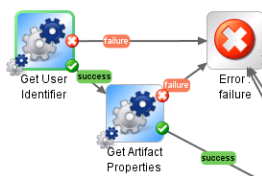
After the execution completes, the HP OO script updates the HP CSA Service.

Two additional HP CSA components are created at this point—**Server Group** and **Server** (as its child). The virtual machine details (hostname and IPaddress) are set on the new HP CSA Server component properties, as well as on the HP CSA Infrastructure Service component, in order for the installation script to recognize these properties.

## Passing Parameters to HP OO Flow

Two subflows are responsible for recognizing the HP CSA properties:

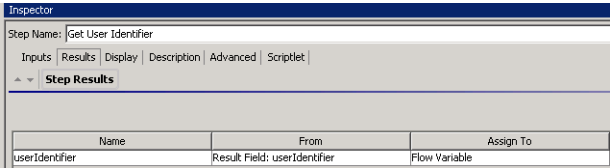
- Get User Identifier
- Get Artifact Properties



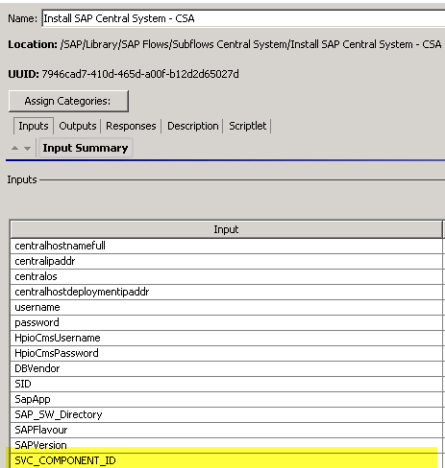
**To Pass Parameters to the HP 00 Flow:**

- 1. The **Get User Identifier** subflow recognizes the HP CSA properties.

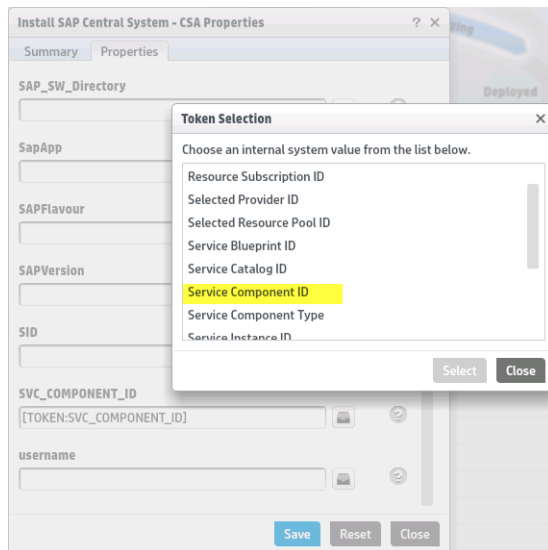
Select the **Results** tab and verify that the **userIdentifier** result exists. If not, add a new result—**userIdentifier**—from the **Result Field**.



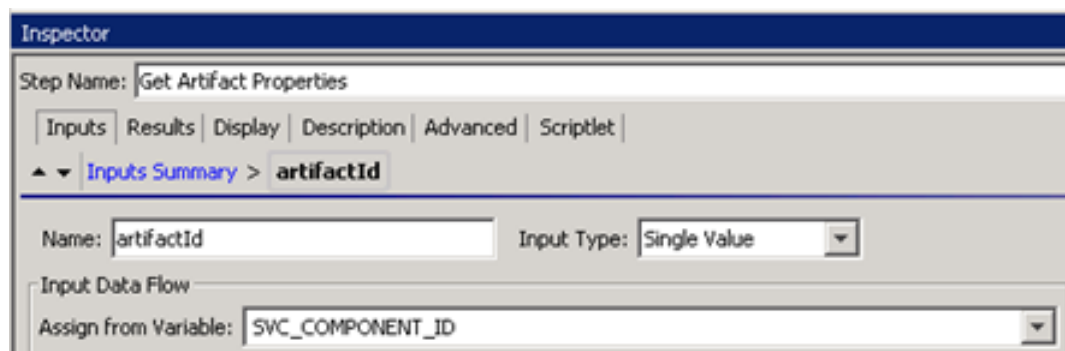
- 2. To show the 00 flow which component on the HP CSA design template to look at, on the **Properties** tab, add a new input to the script called **SVC\_COMPONENT\_ID**.



3. Create a new property in the HP CSA design template and send the **SVC\_COMPONENT\_ID** token as a value.



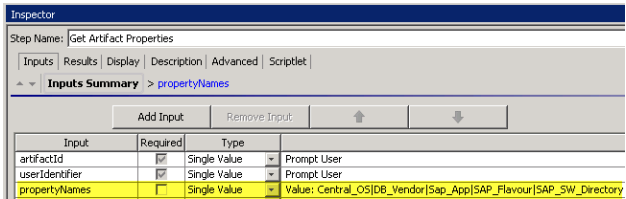
4. Make the following changes to **Get Artifact Properties**:
  - a. Change the **artifactId** input value to **SVC\_COMPONENT\_ID**.



- b. After setting which HP CSA design template component to look at, use the **propertyValue** input of **Get Artifact Properties** to set which property values you want to read.

To do this:

- i. Change the **propertyValue** input value for all of the properties sent from HP CSA, separated by a | sign.



- ii. Add all the properties returned as results of this subflow.

Inspector

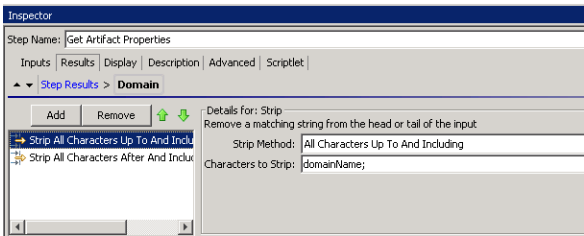
Step Name: Get Artifact Properties

Inputs Results Display Description Advanced Scriptlet

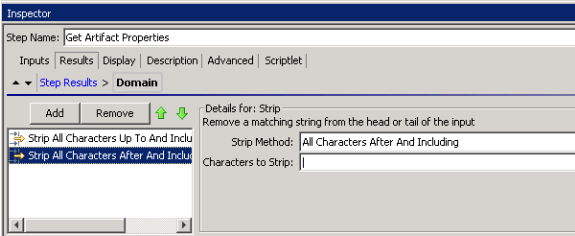
Step Results

Name	From	Assign To
Domain	Result Field: propertyNameValuesList	Flow Variable
DBVendor	Result Field: propertyNameValuesList	Flow Variable
centralipaddr	Result Field: propertyNameValuesList	Flow Variable
SapApp	Result Field: propertyNameValuesList	Flow Variable
SAPFlavour	Result Field: propertyNameValuesList	Flow Variable
centralhostdeploymentipaddr	Result Field: propertyNameValuesList	Flow Variable
password	Result Field: propertyNameValuesList	Flow Variable
SID	Result Field: propertyNameValuesList	Flow Variable
centralos	Result Field: propertyNameValuesList	Flow Variable
SAPVersion	Result Field: propertyNameValuesList	Flow Variable
SAP_SW_Directory	Result Field: propertyNameValuesList	Flow Variable
HpIoCmsUsername	Result Field: propertyNameValuesList	Flow Variable
HpIoCmsPassword	Result Field: propertyNameValuesList	Flow Variable
centralhostnamefull	Result Field: propertyNameValuesList	Flow Variable
username	Result Field: propertyNameValuesList	Flow Variable

- iii. For each one of them, create two filters:



and



Now you can use these parameters on the OO flow.



# Installing SAP Central System – HP CSA Script

The installation script reads the value of all of the properties on the HP CSA design template and performs the installation based on the parameters sent by the user.

After the installation is finished, it updates the installation information with the SAP System ID and the SAP Master Password that was automatically generated as part of the installation process.

## Service Components

View service components and manage subscriber actions here.

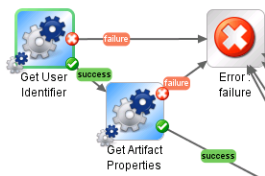
	<b>MOE Compute</b> Deploying Services
	<b>S12central</b> Deploying Services
Deployment IP Address	172.16.12.233
Host Name	S12central
Management IP Address	192.168.12.135
MOE Service Name	149ebc261df2a65
SAP Application	SRM
SAP Master Password	LSPzuOBQSr
SAP SW Directory	BS7I2013-SR1
SAP Version	BS2013SR1
System Unique ID	S12



## Passing Parameters to HP 00 Flow

Two subflows are responsible for recognizing the HP CSA properties:

- Get User Identifier
- Get Artifact Properties



### To Pass Parameters to the HP 00 Flow:

1. The **Get User Identifier** subflow recognizes the HP CSA properties.

Select the **Results** tab and verify that the **userIdentifier** result exists. If not, add a new result—**userIdentifier**—from the **Result Field**.

Inspector		
Step Name: Get User Identifier		
Inputs   Results   Display   Description   Advanced   Scriptlet		
Step Results		
Name	From	Assign To
userIdentifier	Result Field: userIdentifier	Flow Variable

- To show the OO flow which component on the HP CSA design template to look at, on the **Properties** tab, add a new input to the script called **SVC\_COMPONENT\_ID**.

Name: Install SAP Central System - CSA  
Location: /SAP/Library/SAP Flows/Subflows Central System/Install SAP Central System - CSA  
UUID: 7946cad7-410d-465d-a00f-b12d2d65027d

Assign Categories: [ ]

Inputs | Outputs | Responses | Description | Scriptlet

Input Summary

Inputs

Input
centralhostnamefull
centralipaddr
centralos
centralhostdeploymentipaddr
username
password
HpicmsUsername
HpicmsPassword
DBVendor
SID
SapApp
SAP_SW_Directory
SAPFlavour
SAPVersion
SVC_COMPONENT_ID

- Create a new property in the HP CSA design template and send the **SVC\_COMPONENT\_ID** token as a value.

Install SAP Central System - CSA Properties

Summary | Properties

SAP\_SW\_Directory

SapApp

SAPFlavour

SAPVersion

SID

SVC\_COMPONENT\_ID

[TOKEN:SVC\_COMPONENT\_ID]

username

Save Reset Close

Token Selection

Choose an internal system value from the list below.

- Resource Subscription ID
- Selected Provider ID
- Selected Resource Pool ID
- Service Blueprint ID
- Service Catalog ID
- Service Component ID
- Service Component Type
- Service Instance ID

Select Close

4. Make the following changes to **Get Artifact Properties**:

- a. Change the **artifactId** input value to **SVC\_COMPONENT\_ID**.

- b. After setting which HP CSA design template component to look at, use the **propertyValue** input of **Get Artifact Properties** to set which property values you want to read.

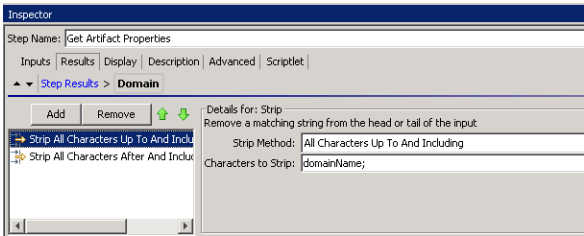
To do this:

- i. Change the **propertyValue** input value for all of the properties sent from HP CSA, separated by a | sign.

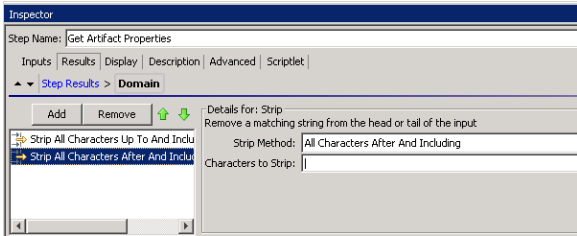
- ii. Add all the properties returned as results of this subflow.

Name	From	Assign To
Domain	Result Field: propertyNameValuesList	Flow Variable
DBVendor	Result Field: propertyNameValuesList	Flow Variable
centralpaddr	Result Field: propertyNameValuesList	Flow Variable
SapApp	Result Field: propertyNameValuesList	Flow Variable
SAPFlavour	Result Field: propertyNameValuesList	Flow Variable
centralhostdeploymentpaddr	Result Field: propertyNameValuesList	Flow Variable
password	Result Field: propertyNameValuesList	Flow Variable
SID	Result Field: propertyNameValuesList	Flow Variable
centralos	Result Field: propertyNameValuesList	Flow Variable
SAPVersion	Result Field: propertyNameValuesList	Flow Variable
SAP_SW_Directory	Result Field: propertyNameValuesList	Flow Variable
HpioCmsUsername	Result Field: propertyNameValuesList	Flow Variable
HpioCmsPassword	Result Field: propertyNameValuesList	Flow Variable
centralhostnamefull	Result Field: propertyNameValuesList	Flow Variable
username	Result Field: propertyNameValuesList	Flow Variable

iii. For each one of them, create two filters:



and



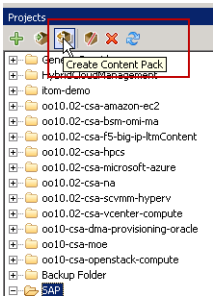
Now you can use these parameters on the OO flow.

# Updating the Service with the New Script

If changes are made on an HP OO script that the HP CSA already recognizes, then the changes must be uploaded to HP OO Central.

## To upload changes to HP OO Central:

- 1. Create a new content pack from the first level folder.



- 2. Deploy the content pack to HP OO Central as described in ["Deploying Content to HP OO Central"](#) on [page 42](#).

If you added a new script and HP CSA does not recognize it, run the **Process Definition Tool** as explained in ["Registering Workflow to be Used in HP CSA" on page 44](#).

## Replacing MOE Provider with a Different Infrastructure Provider

**Note:** The role responsible for this procedure is **Service Designer**.

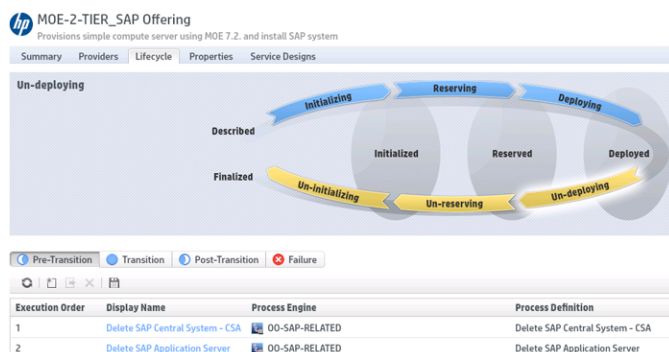
In the design we created, we used MOE as a provider for the infrastructure level. This can be changed to any other infrastructure provider, such as **vCenter**.

### To replace the MOE provider with a different provider:

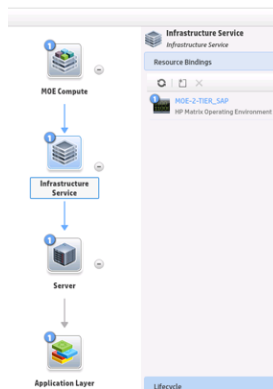
1. Create a new **Resource Offering** for the new provider.
2. Open the lifecycle of the resource provider and add the relevant deploy flow—for example, **vCenter Simple Compute – Deploy**—to the **Deploying > Transition** stage.

**Note:** The deploying OO flow must return the new virtual machine details (hostname, IP address, and management IP address) to the infrastructure level on the service design.

3. Add the related SAP installation flow (central or distributed) to the **Deploying > Post-Transition** stage.
4. Add the **Delete** system and **Delete** application server flows to the **Un-Deploying > Pre-Transition** stage.



5. Add an Un-deploy flow—for example, **vCenter Simple Compute – Un-deploy**—to the **Un-Deploying > Transition** stage.
6. Open the desired service—**Provision SAP Central System** or **Provision SAP Distributed System**.
7. Click the **Infrastructure Service** component and open the **Resource Bindings** tab
8. Remove the MOE-related resource offering, and add the desired resource offering that you created in the previous steps.



## Tested Configurations

Application Name	Database Vendor	Operating System	SAP Flavor	Ins. Directory	SAP Version
<b>Central System</b>					
<b>SRM</b>	Oracle	LINUX	ABAP	BS7i2013-SR1	BS2013SR1
<b>CRM</b>	Oracle	LINUX	ABAP	BS7i2013-SR1	BS2013SR1
<b>ERP</b>	Oracle	LINUX	ABAP	BS7i2013-SR1	BS2013SR1
SRM	<b>Max-DB</b>	LINUX	ABAP	BS7i2013-SR1	BS2013SR1
SRM	<b>Max-DB</b>	LINUX	ABAP	BS7i2013-SR1	BS2013SR1
SRM	Oracle	LINUX	ABAP	BS7i2013-SR2	BS2013SR2
<b>Distributed System</b>					
SRM	Oracle	LINUX	ABAP	BS7i2013-SR1	BS2013SR1

## Chapter 10: Abbreviations

ABAP	Advanced Business Application Programming
ALM	HP Application Lifecycle Management
BAPI	SAP Business Application Programming Interfaces
BSM	HP Business Service Management
CAL	SAP Cloud Appliance Library
CI	Configuration Item
CCMS	Computing Center Management System
CMA	Custom Message Attributes
CMDB	Configuration Management Database
CMS	Configuration Management System
CRM	SAP Customers Relationship Management software
D2C	HP Detect to Correct Value Stream
ERP	SAP Enterprise Resource Planning software
EUM	HP Business Service Management's End-User Monitoring
HI	Health Indicator
HP OMi	HP Operations Management
HPOM	HP Operations Manager
HP OO	HP Operations Orchestration
ITSM	IT Service Management
JCO	Java Connector
KM	Knowledge Management
KPI	Key Performance Indicator
LMDB	SAP Landscape Management Database
LVM	Landscape Virtualization Management
MAI	SAP Solution Manager Monitoring and Alert Interface



NIC	Network Interface Controller
PI	Process Integration
RC	HP Release Control
RFC	Request for Change
RTSM	Runtime Service Model
SAP SPI	HP Operations Manager SAP Smart Plug-in
SAPINST	SAP Installation Programs
SCM	SAP Supply Chain Management software
SM	Service Manager
TBEC	Topology-Based Event Correlation
SMSSMEX	HP Service Manager Incident Exchange
UCMDB	HP Universal CMDB
UD	HP Universal Discovery

# Chapter 11: Resources

- [HP 00 – SAP Integration v1.00.00 SAP Integration Guide](http://support.openview.hp.com/selfsolve/document/KM1412611)  
(<http://support.openview.hp.com/selfsolve/document/KM1412611>)
- [HP Request to Fulfill Concept and Configuration Guide](https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937)  
(<https://softwaresupport.hp.com/group/softwaresupport/search-result/-/facetsearch/document/KM01491937>)
- [HP Software Solution and Integration Portal](http://cssg.bbn.hp.com:7878/results/index.html) (<http://cssg.bbn.hp.com:7878/results/index.html>)
- [HP SAP Cloud Maps Technical White Paper](http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx)  
(<http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx>)
- *SAP Installation Guide*: see [SAP Service Marketplace](http://service.sap.com) ([service.sap.com](http://service.sap.com))
- [SAP NOTES](http://service.sap.com/notes) (<http://service.sap.com/notes>)
- [SAP System sizing](http://service.sap.com/sizing): Quick sizer tool (<http://service.sap.com/sizing>)
- [SAP Solution Manager](http://support.sap.com/solutionmanager) ([support.sap.com/solutionmanager](http://support.sap.com/solutionmanager))

**Note:** An automatically installed SAP System, in addition to incorporating the newest SAP patches, must be configured with SAP Solution Manager via SAP Change Management or other SAP change automation methods.

For more information about integrating with SAP Solution Manager, visit the HP Software Support Online Web site at: <http://www.hp.com/go/hpsoftwaresupport>

## Additional Online Resources

**Troubleshooting & Knowledge Base** accesses the Troubleshooting page on the HP Software Support Web site where you can search the Self-solve knowledge base. Choose **Help > Troubleshooting & Knowledge Base**. The URL for this Web site is <http://h20230.www2.hp.com/troubleshooting.jsp>.

**HP Software Support** accesses the HP Software Support Web site. This site enables you to browse the Self-solve knowledge base. You can also post to and search user discussion forums, submit support requests, download patches and updated documentation, and more. Choose **Help > HP Software Support**. The URL for this Web site is [www.hp.com/go/hpsupport](http://www.hp.com/go/hpsupport).

Most of the support areas require that you register as an HP Passport user and sign in. Many also require a support contract.

To find more information about access levels, go to:

[http://h20230.www2.hp.com/new\\_access\\_levels.jsp](http://h20230.www2.hp.com/new_access_levels.jsp)

To register for an HP Passport user ID, go to:

<http://h20229.www2.hp.com/passport-registration.html>.

**HP Software Web site** accesses the HP Software Web site. This site provides you with the most up-to-date information on HP Software products. This includes new software releases, seminars and trade shows, customer support, and more. Choose **Help > HP Software Web site**. The URL for this Web site is [www.hp.com/go/software](http://www.hp.com/go/software).

**HP Software Solutions Now** accesses the HPSW Solution and Integration Portal Web site. This site enables you to explore HP Product Solutions to meet your business needs, includes a full list of Integrations between HP Products, as well as a listing of ITIL Processes. The URL for this Web site is <http://support.openview.hp.com/sc/solutions/index.jsp>.

**HP SAP Cloud Maps:** The Best Practices described here leverage and modify HP Operation Orchestration (HP OO) flows to be used inside SAP Cloud Maps developed within the HP Enterprise Group SAP development lab. This Best Practice document has the flows adjusted to match the overall HP Software-driven best practices. The Shellscripts that perform the actual SAP deployments are also leveraged.

For additional background information and restrictions related to the original Cloud Maps flows that are used and modified, as well as Shellscript and SAP Installation prerequisites and restrictions, see

*[Implementing the HP Cloud Map for SAP Business Applications](#)*

(<http://h22168.www2.hp.com/us/en/partners/sap/cloudmaps-sap.aspx>).

Most of the tips and tricks to install SAP automatically will now be found in this R2F for SAP document.

Additional information is contained in the Cloud Maps document, which was written specifically for HP CloudSystem 7 and SAP. The Cloud Maps document may still provide add-on information, but much of the information is CloudSystem 7 compliant and redundant for the newer technologies that HP and SAP supply.