



HP CloudSystem Matrix Federation using CSA

Integrating CSA and MOE for maximum Cloud agility

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Introduction

HP Cloud strategy, HP Converged Cloud, was designed to provide solutions in 3 key areas:

- Public Cloud with HP Cloud Services (www.hpcloud.com)
- Managed Cloud
- Private Clouds

This strategy allows HP to be uniquely positioned today, as the sole provider of Hybrid Cloud solutions.

The key product in the Private Cloud space, is called HP Cloud System, and is available in 3 flavors:

- HP CloudSystem Matrix, a turnkey solution including software and hardware to build a Private Cloud in a short amount of time using components of the HP Converged Infrastructure such as HP BladeSystem, HP VirtualConnect, HP 3PAR storage and the Matrix Operating Environment (MOE) software stack to control the entire package
- HP CloudSystem Enterprise which includes several software packages to what HP CloudSystem Matrix already offers, such as HP Cloud Service Automation (CSA), HP Server Automation (SA), HP SiteScope, HP uCMDB
- HP CloudSystem Service Provider which adds to these two packages a Telco oriented aggregation layer

HP CloudSystem Matrix

HP CloudSystem Matrix includes a set of hardware components and a software stack often referenced as MOE for Matrix Operating Environment. On its own MOE handle enough functionality to build an IT centric private Cloud. MOE is particularly well suited for what is often referred as IaaS (Infrastructure as a Service). The most important components of the solutions are:

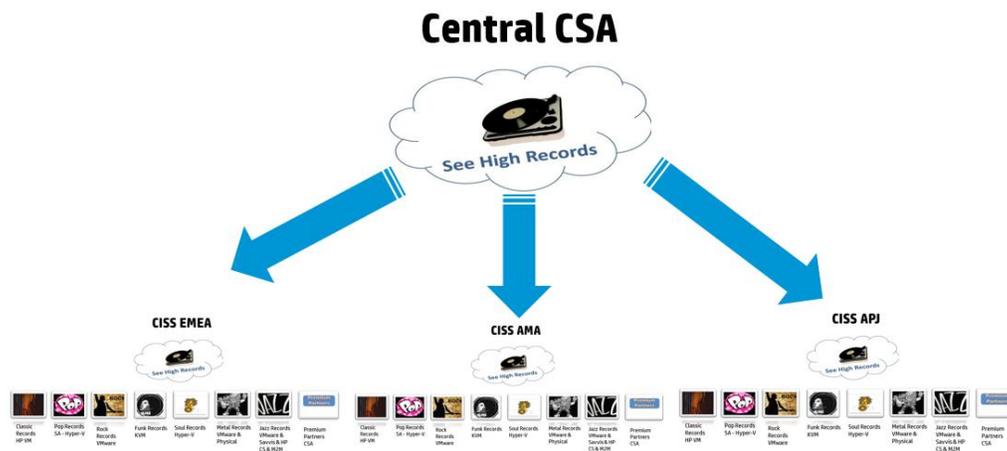
- A Service Template designer (a.k.a. HPIO Designer) which allows a solution architect to build an infrastructure service template, by assembling compute resources (virtual, physical, both) from different virtualization vendors (Microsoft, VMware, HP, RedHat), storage resources and network resources.
- An administrative console (which plugs in HP Systems Insight Manager) to control the pools of compute, storage, and network resources, and the private Cloud roles and responsibility, in a multi-tenant way. This is also the place where Service Templates are assigned to organization (or tenants), and made available in their service catalog.
- One or more tenant administrative console, in the case where multi-tenant is configured, then MOE handle some level of delegation to organization administrator using a dedicated portal.
- One or more tenant user portal, where end users of the cloud (line of business managers, IT managers) can login and order, automatically provisioned services from their catalog.
- A workflow engine called HP Operations Orchestration (HP OO), which allows a solution architect to extend the behavior of MOE by graphical programs (workflows), added to a service template and automatically (headless) executed by MOE during a provisioning.

HP Cloud Service Automation (CSA)

HP CSA is a product that is available as part of the HP CloudSystem Enterprise Edition. It's a framework which allows to build more complex Cloud solution, where MOE is considered a resource provider, side by side with other resource providers such as VMware vCenter or OpenStack. While the two product share a fair amount of features (provision VM on a VMware or on an OpenStack environment), we will focus here, on a use case where it makes good sense to combine the power of both solutions to offer an even more complete solution to our customers. The use case is quite simple, although quite common in our Matrix customer's environment. If CSA can have a MOE as a compute resource provider, it can also have several of them configured. So why not use CSA to federate multiple isolated MOE platforms. This is exactly what this whitepaper is all about.

A word about our test environment

Let's quickly explain the environment used to setup this experiment. We used an HP internal platform called CISS (Converged Infrastructure Solution Showcase). This platform is available on the internal HP network and consist in 3 identical (replicated) MOE platforms, located in three datacenters around the world. These platforms are used for Pre-sales demonstrations throughout the year via our **Solutions Demo Portal**. We have one copy of this MOE environment in Houston, TX, one in Grenoble, France, and one in Singapore. Each of these is configured the same way, so the same organizations, templates, images, user, password are available at each location. In each of them we created a fictitious company called SeeHigh Records, with multiple organizations mapped to different music styles (soul, metal, rock, pop ...). A separated organization was create for Premium Partners, to allow selected partners to benefit from SeeHigh Records IT Services. A central CSA was added to provide the federation of the 3 CISS platforms, and allows those premium partners to order IT services and request hosting anywhere in the 3 datacenters that SeeHigh Records owns.



The central CSA system is where all configuration steps take place. It's important to realize that in this architecture, the MOE platforms were already in production and are not changed in any ways.

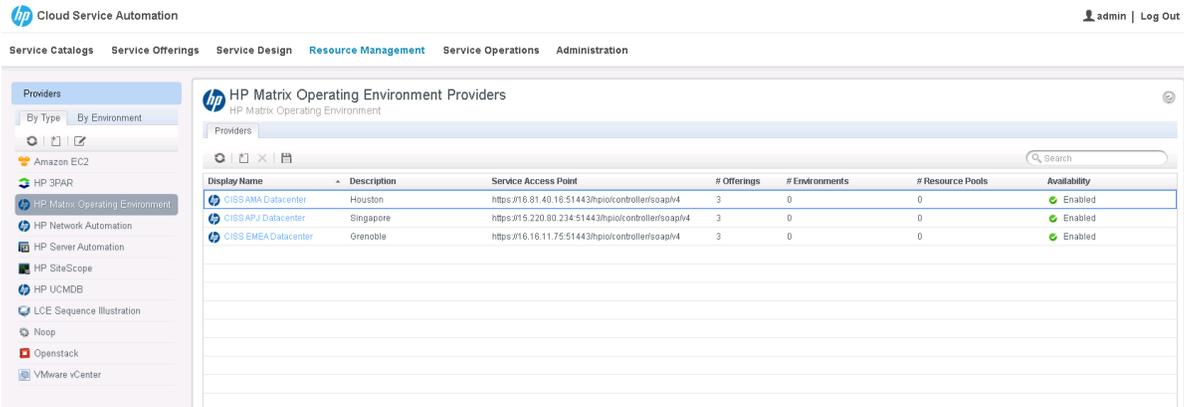
Setting up MOE Providers in CSA

Let's first focus on what has to be done to configure Compute Providers in CSA. In our case we will set up 3 MOE Compute Providers, one for each region. To achieve this we will use the administrative portal of CSA



Cloud Service Automation

From there we will configure the connections to the 3 Resources Management Providers. One for each MOE.



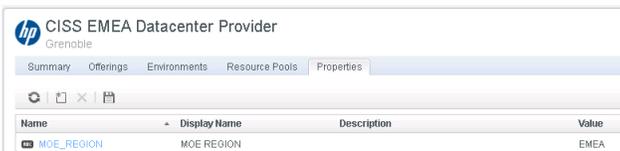
For each of these connections we need to set:

Connection Name	Access Point	Property Name	Property Value
CISS AMA Datacenter	http://<iP-AMA>:51443/hpio/controller/soap/v4	MOE_REGION	AMA
CISS EMEA Datacenter	http://<iP-EMEA>:51443/hpio/controller/soap/v4	MOE_REGION	EMEA
CISS APJ Datacenter	http://<iP-APJ>:51443/hpio/controller/soap/v4	MOE_REGION	APJ

We also need to set the credential (User ID/password) used to control each MOE (which is the same in our case but doesn't have to be). Make sure you use an administrative account there. Because when using a multi-tenant design, CSA will call the MOE API, with that user, impersonating the CSA logged in user. And when using a non multi-tenant design CSA calls the MOE API with this provided user.



Use the Properties tab to add the MOE_REGION property on each of the providers:



This property will be used to select the right provider based on the user selected region at subscription (ordering) time.

The last configuration required on the providers, is to assign the MOE_SCL_MT which will be used as the source of our Service Offering to all three providers as shown below:

HP Matrix Operating Environment Offerings

HP Matrix Operating Environment

Display Name	Description	Category	# Providers	# Service Designs
MOE_AMA	To Provision Simple Compute Lin...	Compute	1	1
MOE_AFJ	To Provision Simple Compute Lin...	Compute	1	1
MOE_EMEA	To Provision Simple Compute Lin...	Compute	1	1
MOE_COMPUTE_BOAPV4_3.11	Provisions simple compute server	Compute	0	2
MOE_SCL	To Provision Simple Compute Lin...	Compute	3	8
MOE_SCL_ADM_3.01	To Provision Simple Compute Lin...	Application	0	2
MOE_SCL_DMA_BOSS_3.01	To Provision Simple Compute Lin...	Compute	0	0
MOE_SCL_MT	To Provision Simple Compute Lin...	Compute	3	4

MOE_SCL_MT Offering

To Provision Simple Compute Linux server using MOE with Multi-tenancy Support (MOE 7.0)

Summary Providers Lifecycle Properties Service Designs

Display Name	Description	Type	Service Access Point	# Offerings	# Environments	# Resource Pools	Availability
CISSAMA Datacenter	Houston	HP Matrix Op	https://16.81.40.16:51443/hpio/c	3	0	0	Enabled
CISSAFJ Datacenter	Singapore	HP Matrix Op	https://15.220.80.234:51443/hpio/c	3	0	0	Enabled
CISS EMEA Datacenter	Grenoble	HP Matrix Op	https://16.16.11.75:51443/hpio/c	3	0	0	Enabled

Creating a new Service Design in CSA

Now we need to create a new Service Offering, and for this we will duplicate an existing one called MOE_SCL_MT. MT stands for Multi-Tenant, because in our implementation the MOE platform have been setup with multiple organizations. If you have no organization you can duplicate the MOE_SCL design instead (don't forget to assign it to MOE Providers as we just did in the previous step)

Cloud Service Automation

Service Catalogs Service Offerings Service Design Resource Management Service Operations Administration

All Service Designs

This service design interface allows you to view existing service designs or create additional ones.

Display Name	Description	Availability	# Service Offerings
AMAZON EC2 C5A 4x1 instance	Launches an Amazon AMI instance of the C5A 4x1-in-one syst...	Enabled	1
MOE_COMPUTE_3.10	Provisions compute infrastructure using MOE 7.0.3.	Enabled	0
MOE_COMPUTE_3.10	Provisions compute infrastructure using MOE 7.0.3. Deploys	Enabled	0
MOE_COMPUTE_ADM_SITECOPE_UCM1	Provisions compute infrastructure using MOE 7.0.3. Deploys	Enabled	0
MOE_COMPUTE_CUSTOM_PROVIDER_00	Provisions compute infrastructure using MOE 7.0.3. Resourc...	Enabled	0
MOE_COMPUTE_DMA_BOSS_3.10	Provisions compute infrastructure using MOE 7.0.3. Deploys	Enabled	0
MOE_COMPUTE_DMA_BOSS_SITECOPE	Provisions compute infrastructure using MOE 7.0.3. Deploys	Enabled	0
MOE_COMPUTE_MT_3.10	Provisions compute infrastructure with Multi-tenancy using MO...	Enabled	0
MOE_COMPUTE_SITECOPE_LICMOR_3.1	Provisions compute infrastructure using MOE 7.0.3. Monitors	Enabled	0
MOE_COMPUTE_BOAPV4_3.10	Provisions compute infrastructure using MOE 7.1 with SOAP v...	Enabled	0
MOE_COMPUTE_BOAPV4_SITECOPE_LIC	Provisions compute infrastructure using MOE 7.1 with SOAP v...	Enabled	0
MOE_SCL	Service Blueprint to provision Simple Compute Linux Server us...	Enabled	0
MOE_SCL_3P	Service Blueprint to provision Simple Compute Linux Server us...	Enabled	0
MOE_SCL_SITECOPE_LICMOR	Service Blueprint to provision Simple Compute Linux Server us...	Enabled	0
HA_VIRTUAL_NETWORK_3.10	Provisions VLAN from a network switch using Network Autom...	Enabled	0
Noop 3 Tier with Flaring - Test	Build a mult tier environment in seconds August 26, 2013 5 P...	Enabled	1
Noop Multi Tier	Build a mult tier environment in seconds	Enabled	2
Noop Multi Tier with Flaring	Build a mult tier environment in seconds	Enabled	0
Noop Service Design	Noop Service Design for testing	Enabled	0
OPENSTACK_INFRA_COMPUTE_3.10	Provisions server instances using Openstack on HP Cloud En...	Enabled	0
All Help	test - remove	Enabled	1
Simple Sequence Testing		Enabled	1

Edit the newly duplicated Service Design and set a new name to it. For example A New Service:

MOE_SCL_MT Copy Properties

Display Name: A New Service

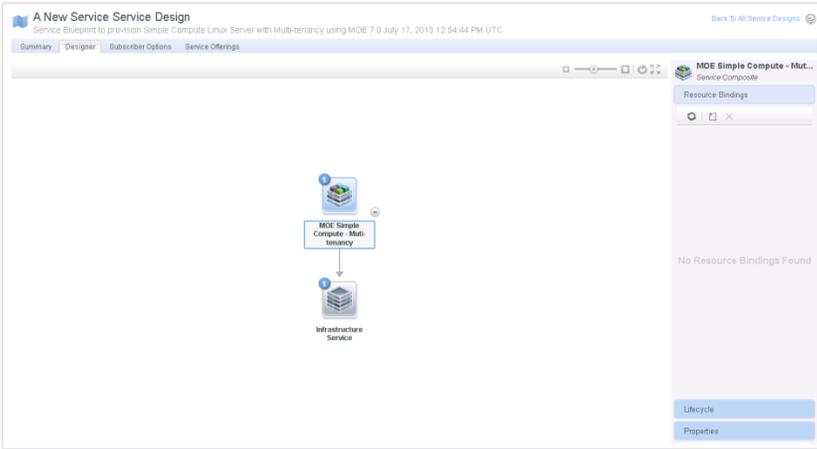
Description: Service Blueprint to provision Simple Compute Linux Server with Multi-tenancy using MOE 7.0 July 17, 2013 12:54:44 PM UTC

URL:

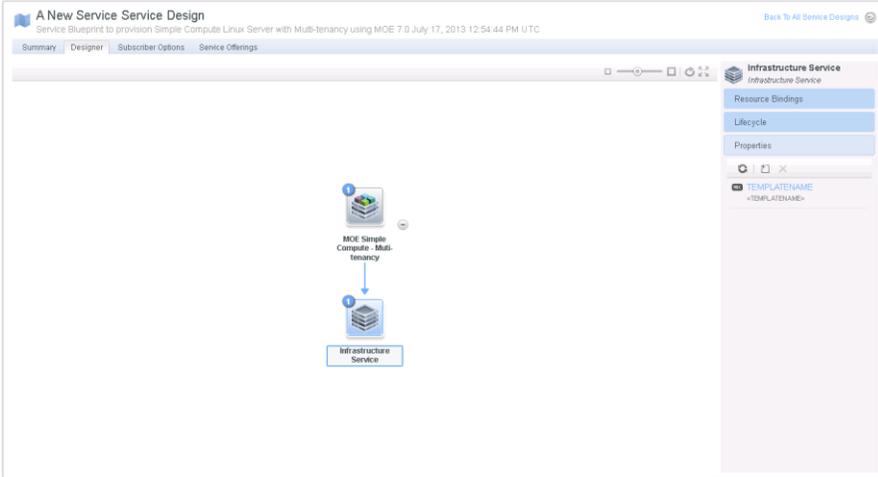
Availability: Enabled

Buttons: Save Changes, Reset, Cancel

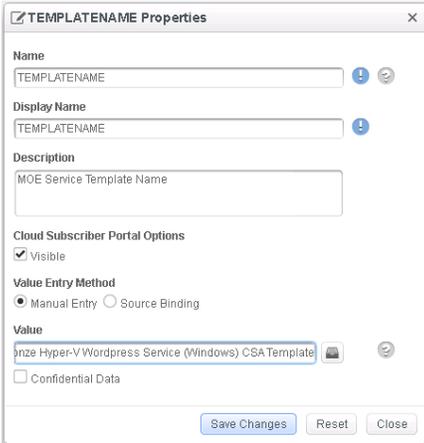
Open the Design view of the service



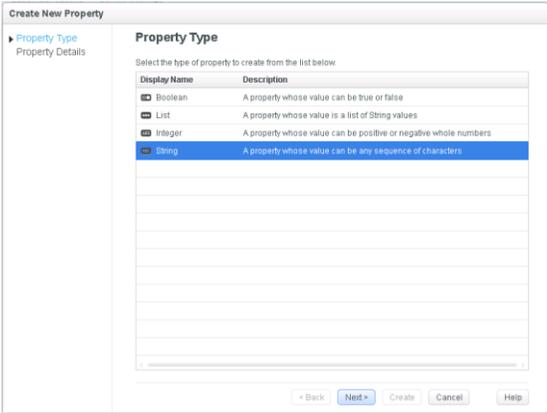
Select the Infrastructure Service that compose our service and on the right side, select the Properties section to visualize the properties associated.



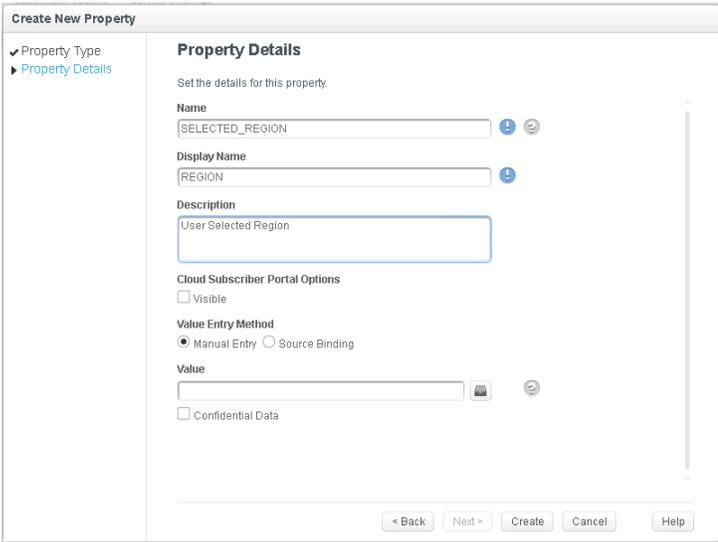
We can see that the only property required by such a design is a **TEMPLATENAME**. Let's edit this property and assign a value to it. This value is the name of the MOE Template that we would like to provision. In our case it's called: **Bronze Hyper-V Wordpress Service (Windows) CSA Template**



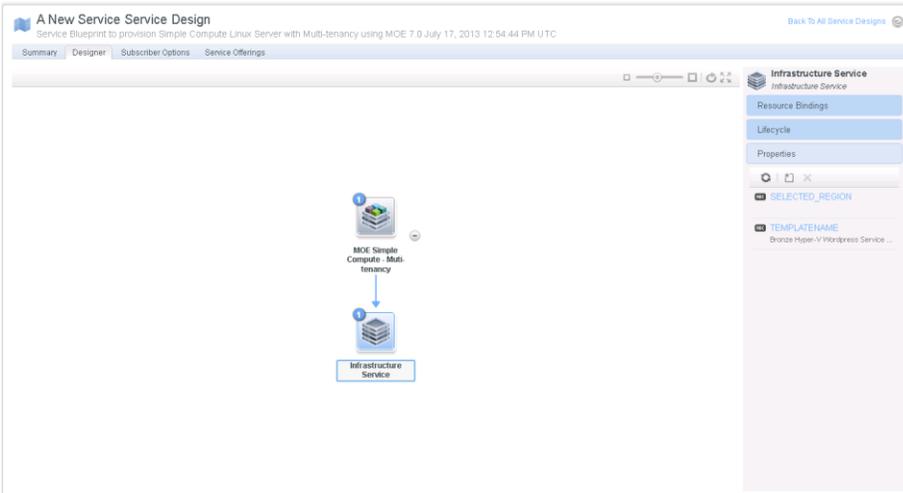
In addition to this we will create a new property to hold the user selected region at ordering time. It's going to be typed String:



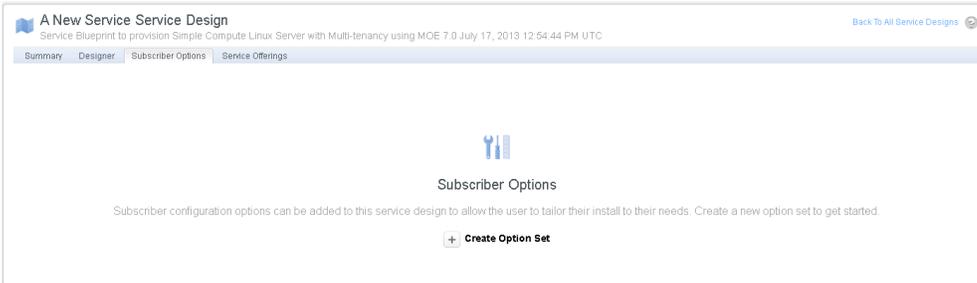
Let's call this new property: **SELECTED_REGION**. No need to assign a value as this will be done via subscription options



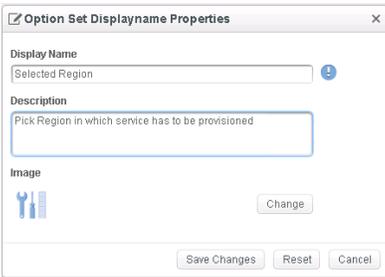
After this we shall have two properties for this design, **TEMPLATE_NAME** and **SELECTED_REGION**.



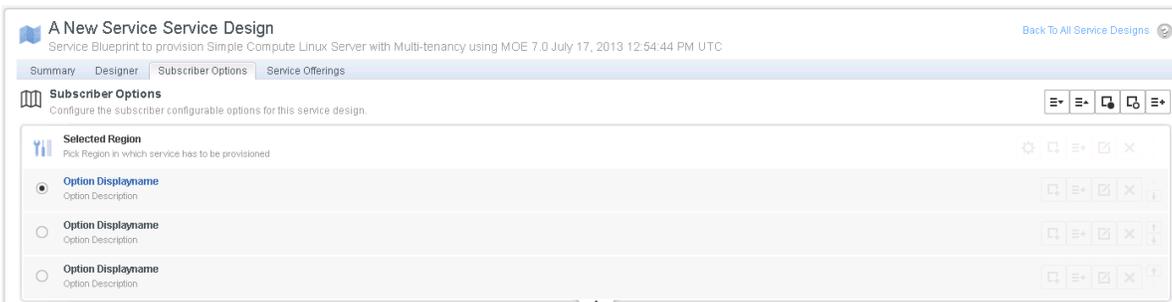
Let's now pick the **Subscriber Options** tab. This is where we can add additional options, which will be prompted to the user at ordering time in the consumer portal of CSA.



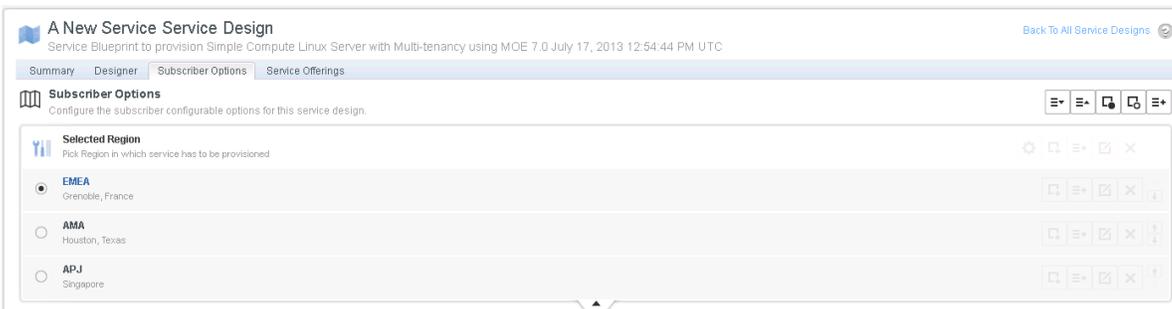
Select to create a new Option Set, and call it Select Region:



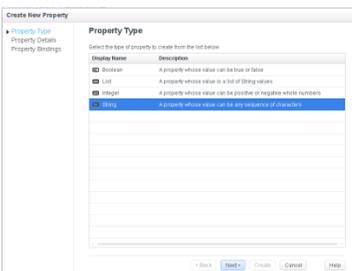
Add three options to this Option Set (one for each region):



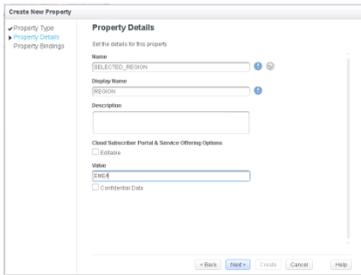
Then edit each Option to give it a name (EMEA, AMA or APJ)



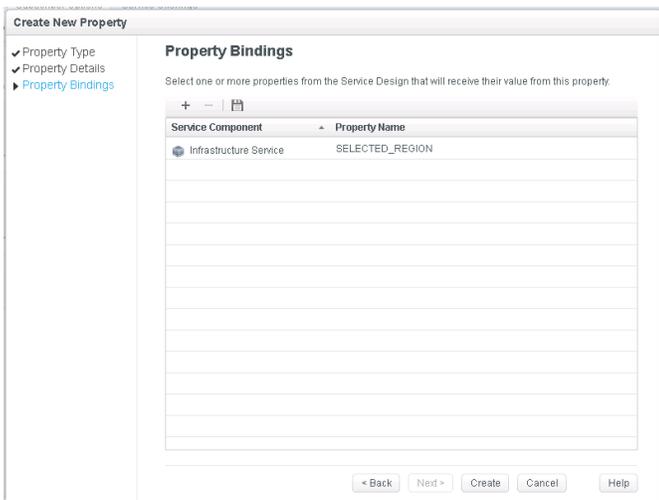
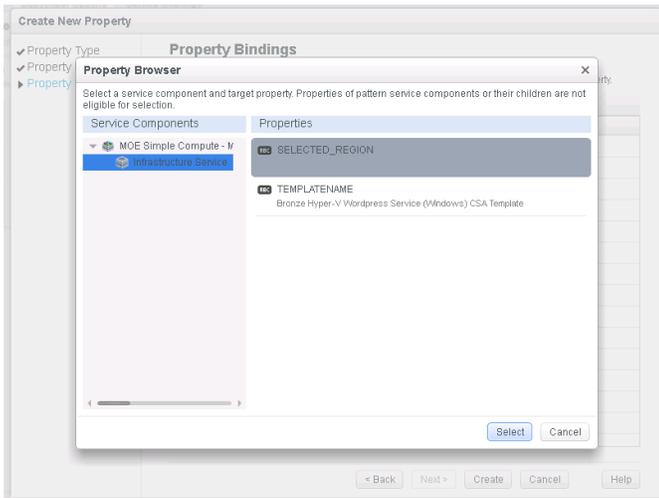
Then on each Option, add an Option Property, of type String



Call this property **SELECTED_REGION** and assign the right value for each Option (set the value to EMEA for Option EMEA, to AMA for Option AMA and APJ for Option APJ).



Finally add a binding to this property, so that it sets automatically the value of our Service Design property **SELECTED_REGION**:



Note that you can do this in a single step by using the “Create a property on all option within this set” button.

The effect of this, will be that each Option in the Option Set (shown as a radio button) will set a different value to the `SELECTED_REGION` property as user pick a choice. Don't forget to save your changes at this step:

A New Service Service Design
Service Blueprint to provision Simple Compute Linux Server with Multi-tenancy using MOE 7.0 July 17, 2013 12:54:44 PM UTC

Summary Designer **Subscriber Options** Service Offerings

Subscriber Options
Configure the subscriber configurable options for this service design.

Selected Region
Pick Region in which service has to be provisioned

EMEA
Grenoble, France
REGION: EMEA

AMA
Houston, Texas
REGION: AMA

APJ
Singapore
REGION: APJ

Save Changes Reset

Building a custom provider selection process in CSA

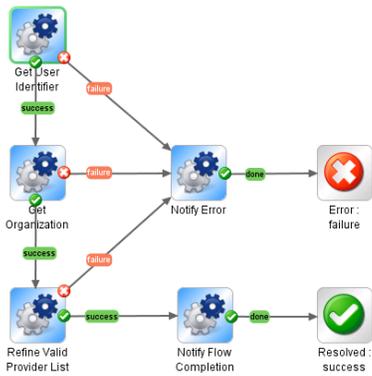
Now the last tricky part of the process is to create a custom provider selection algorithm, so that when a user picks a region, the right datacenter is used to provision. Remember that we have tagged each provider with a property called `MOE_REGION`, and that each design will have a property representing the user selected region called `SELECTED_REGION`. We will need to match those two properties, and the way this is done in HP CSA, is by using a HP OO workflow.

Creating a new provider selection workflow

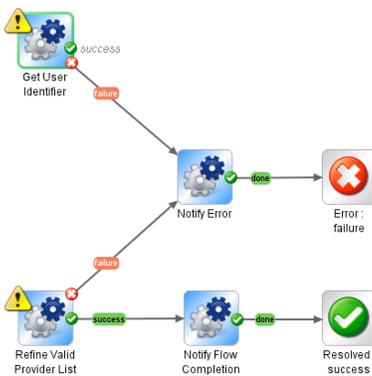
So let's start Operations Orchestration Studio, the flow authoring tool of HP OO. There we can browse the flow Library and locate the place where all the CSA content is located. For example in CSA->3.0->Providers->Matrix Operating Environment->HP IO Customer Provider Selection->Actions we can see a flow called User Organization based MOE Provider Selection, which we can use as a good starting point. So let's duplicate this flow and call our new flow: **MOE Selection based on Region**



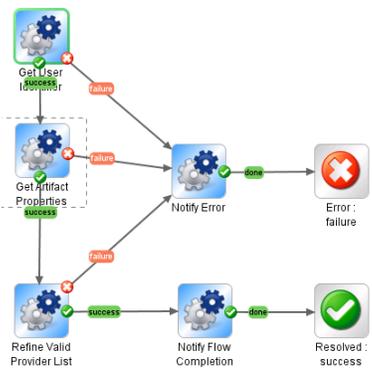
And start editing this flow.



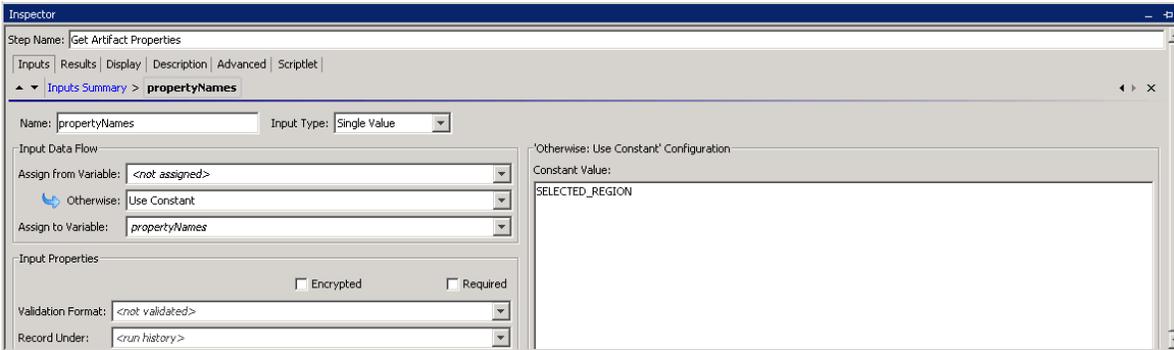
First let's delete the second step, **Get Organization Details**, which we don't need:



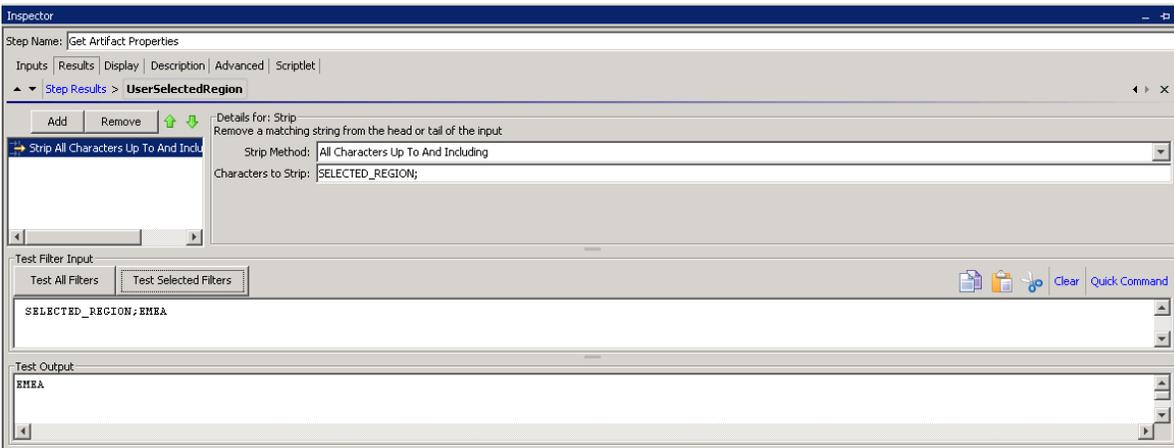
Then drag and drop a step called: **Get Artifacts properties** which you will find in the library at: **Integrations->Hewlett Packard->Cloud Server Automation**. Now let's do a little plumbing: Connect the previous step success transition to it, and connect this step success transition to the next step. Connect the failure transition of the step to the Notify Error step, so it looks like this:



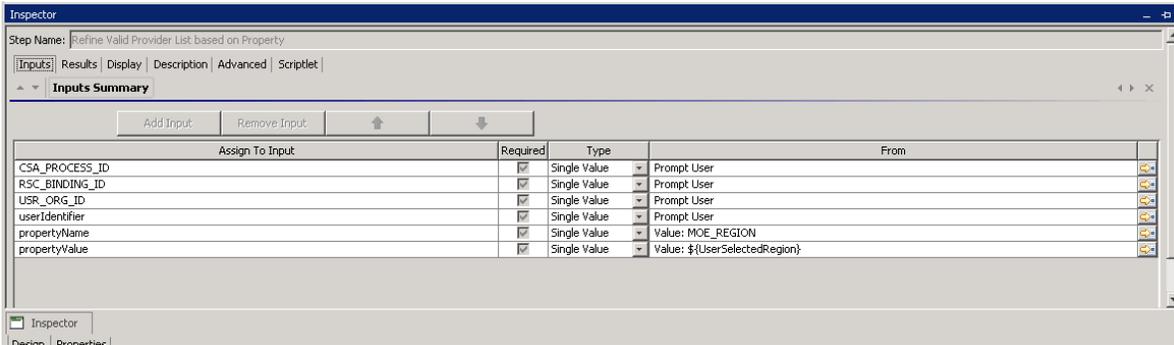
Let's now configure the details of our step but using the Step Inspector (double click on step). The property we need to retrieve from the object we are correctly servicing (called the Artifact) is called: `SELECTED_REGION`. So let's set this up as a constant value as shown below:



Then as a step result, add a **UserSelectedRegion** variable and apply a strip filter to only keep the value of the property, knowing that the call will return a string of the form: **SELECTED_REGION;value**



Now select the next step called **Refine Valid Provider List based on Property** and change the **propertyName** to be **MOE_REGION** (the property on the provider), and **propertyValue** to be the result of the previous step stored in variable **UserSelectedRegion** (the property selected by user in portal) which in OO is: **\${UserSelectedRegion}**



Save all changes and check the flow in.

Registering the workflow to be used in CSA

The next step is a bit complicated, and unfortunate, but what it boils down to is that we have to tell CSA, about our new workflow, before CSA can actually make use of it.

For this you have to register it and this is done by tools located in: **<CSA Install dir>\tools\ProcessDefinitionTool**

If you created the new flow in the location described in this document, you will only have to basically rerun the process definition tool that was run when CSA was installed, because the folder is already taken into account there. You can see this in the XML file that describes the content that needs to be exposed to CSA:

```

<!-- Import all the Flows under a single folder, use the syntax
<folder path="/path/to/folder">, as shown below
-->
<!-- To import all the flows under a folder and all its subfolders,
use the syntax
<folder path="/path/to/parent/folder" recursive="true">
-->
<!-- To import a specific flow, use the syntax
<folder path="/path/to/the/Flow" Flow="true">
-->
<!-- To detect and import changes to previously imported Flows, set
the "update" attribute to "true" on <folders>
-->
<!-- To delete previously imported Flows that are unreferenced, set
the "delete" attribute to "true" on <folders>
-->
<folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP ID Lifecycle/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP ID Lifecycle - Multi-tenancy Support/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Matrix Operating Environment/HP ID Admin Lifecycle/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Server Automation/ADM Application Deployment/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Server Automation/Manage Servers/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Server Automation/Server Monitoring/Actions"/>
<folder path="/Library/CSA/3.0/Providers/SCMDB/Configuration Management/Actions"/>
<folder path="/Library/CSA/3.0/Providers/SCenter/Clone Server/Actions" update="true"/>
<folder path="/Library/CSA/3.0/Providers/SCenter/Clone Server Resources/Actions" update="true"/>
<folder path="/Library/CSA/3.0/Providers/SCenter/HP ID Scoping Lifecycle/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Network Automation/Virtual Network/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Network Automation/Software Policies Deployment/Actions"/>
<folder path="/Library/CSA/3.0/Providers/Email/Actions"/>
<!-- Start of post vanilla-install imported & developed CSA Flows : naming and location is currently a mess -->
<folder path="/Library/My Ops Flows/CSA/Custom Content/Providers/SCenter/Clone Windows Server/Actions"/>
<folder path="/Library/My Ops Flows/CSA/Custom Content/Providers/SA/SA Policy/Actions"/>
<folder path="/Library/My Ops Flows/CSA/Custom Content/Utilities/Actions"/>
<folder path="/Library/My Ops Flows/CSA/Custom Content/Provider/Amazon EC2/Actions"/>
<!-- End of post vanilla-install imported & developed CSA Flows -->
~/soengine>
~/soengine>

```

There is an example of command to validate the content:

```

..\..\CSA\jre\bin\java.exe -Djava.class.path="ojdbc6.jar\oraai18n.jar" -jar process-defn-tool.jar -d
db.properties -i HPO0Input3.10.xml -v HPO0Input3.10.xml

```

And an example of command to finally import the content:

```

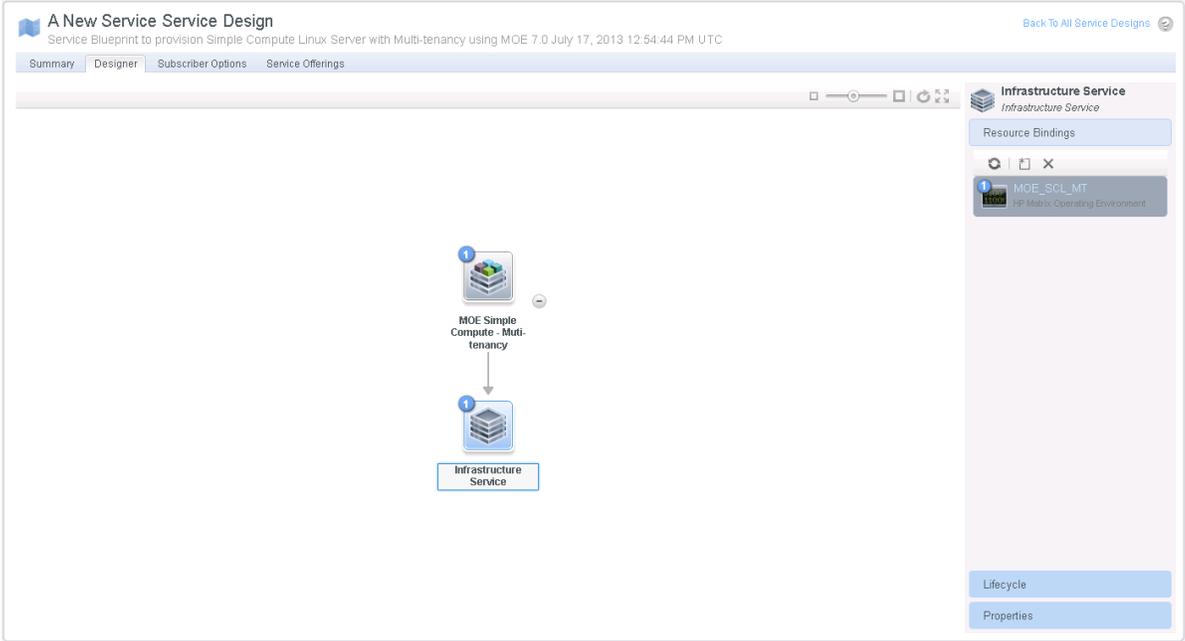
..\..\CSA\jre\bin\java.exe -Djava.class.path="ojdbc6.jar\oraai18n.jar" -jar process-defn-tool.jar -d
db.properties -i HPO0Input3.10.xml

```

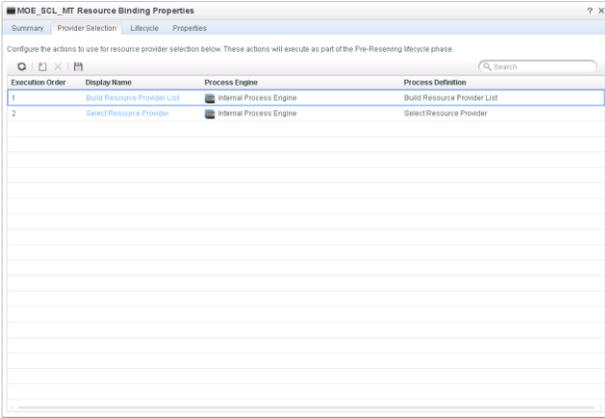
Both would have to be adapted to your CSA environment but at the end of the procedure the new flow is added to CSA, and the command will show the name of the newly added workflow.

Adding the workflow in the Service Design

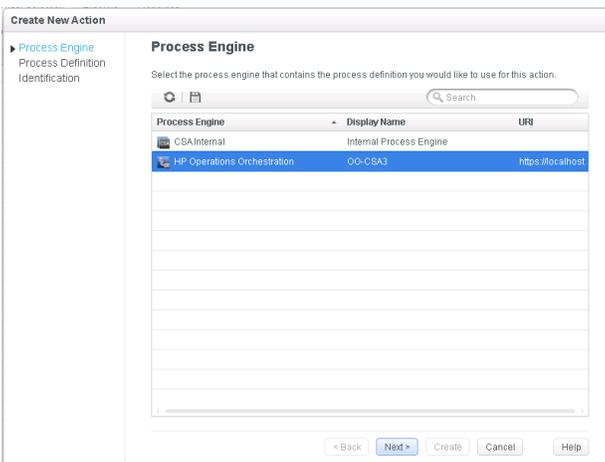
So let's now go back to our Service Design and make use of this custom procedure. Open the Designer view and locate the Resource Bindings section on the right side.



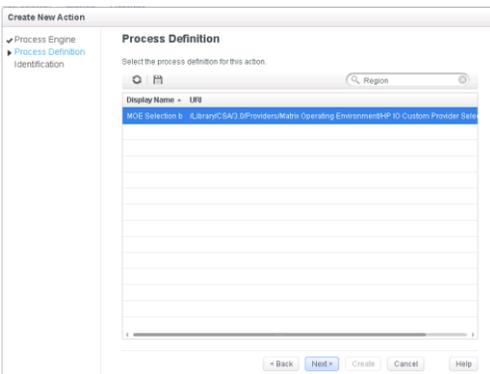
Select MOE_SCL_MT, and there select the Provider Selection tab. You can see that there is a two steps process to select a provider by default. Step 1 builds a list using an Internal CSA process engine procedure, and Step 2 Select Resource Provider using, again an internal CSA procedure.



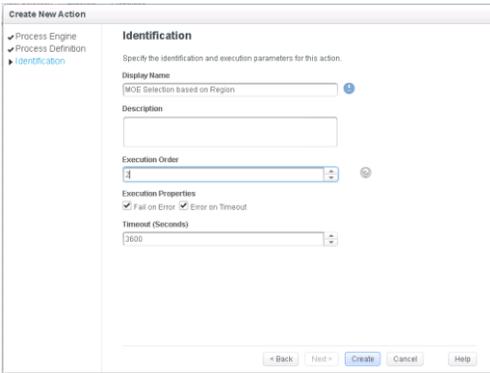
Let's change this a little and add a new step, select the HP Operations Orchestration, as this is how our step is implemented:



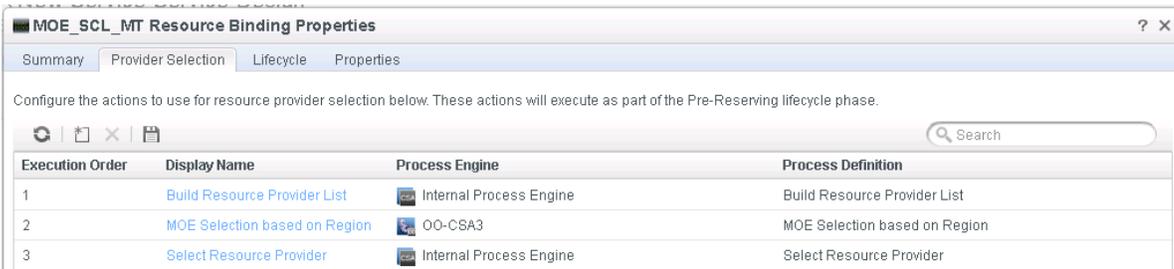
And in the long list of available flows, pick the one we've just created. You can type in **Region** in the search box to find it quickly.



Set the execution order to 2 so the step execute in second:



And modify the order so that Select Resource Provider is executed third

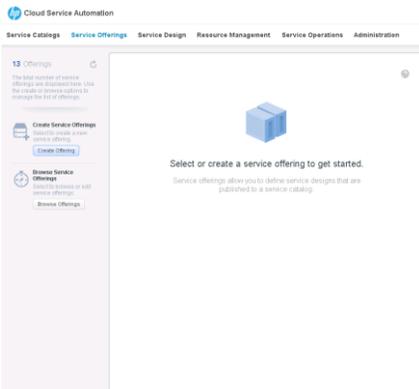


Open the Select Resource Provider step and set the Provider Property Name to **MOE_REGION**, as this is the name we have used on our 3 providers.



Populating an end-user catalog in CSA

Now that we have built a Service Design, we need to create a Service Offering and then place this in whichever consumer catalog it will be offered to. So let's start with the Service Offering:



Create a new Service Offering called **A new service offering**

Create New Service Offering
Name your new service and select a blueprint to start forming the offering.

Name Service Offering
A new service offering

Select Blueprint

- A New Service**
Service Blueprint to provision Simple Compute Linux Server with Multi-tenancy using MCE 7.0 July 17, 2013 12:54:44 PM UTC
- AMAZON EC2 CSA_Ain1 Instance
Launches an Amazon AMI instance of the CSA all-in-one system on Amazon
- MCE_COMPUTE_3_10
Provision compute infrastructure using MCE 7.0/6.3
- MCE_COMPUTE_ADM_3_10
Provision compute infrastructure using MCE 7.0/6.3. Deploys application using ADM.
- MCE_COMPUTE_ADM_SITESCOPE_UCMDB_3_10

Create Cancel

And select **A New Service** as a service design.

A new service offering

Summary

General Information

Options

Pricing

Associated Documents

Service Blueprint
Selected Blueprint
A New Service

Service Options
1 Primary Option Sets
Selected Region

Service Pricing
Initial Price: 0.00
Recurring Price: 0.00
Currency: USD
Billing Period: Monthly

Associated Documents
0 Attached Documents
Attach Document
Max File Upload: 5MB

In the General Information page, customize it a little with a description, an icon and save those changes

A new service offering
My new service offering with Region selected by user at ordering time

Summary

General Information

Options

Pricing

Associated Documents

General Information
Enter service information here.

Offering Name
A new service offering

Offering Description
My new service offering with Region selected by user at ordering time

Offering Image
icsafimageslib/rangitono35_43.png

Service Blueprint
The selected Service Offering Blueprint.

Selected Blueprint
A New Service
Service Blueprint to provision Simple Compute Linux Server with Multi-tenancy using MCE 7.0 July 17, 2013 12:54:44 PM UTC

Save Changes Reset Delete Offering

In the Pricing page, let's assign cost information about the service. Not that there can be cost variation based on Service Options, in our case based on Selected Region. Save those changes.

A new service offering
My new service offering with Region selected by user at ordering time

Summary

General Information

Options

Associated Documents

Service Offering Pricing
Enter the base pricing information for this service offering below

Initial Price: 250.00
Recurring Price: 25.00

Currency: USD (United States, D...
Recurring Period: Monthly

Service Options Pricing
Enter the pricing information for the options available for this offering

Option Name	Initial	Recurring
Selected Region		
• EMEA	10.00	12.00
• AMA	15.00	15.00
• APJ	10.00	10.00
Base Price (\$)	250.00	25.00
Selected Options (\$)	10.00	12.00
Grand Total (\$)	260.00	37.00

Save Changes | Reset

Now we can make this Service Offering available in any consumer service catalog we wish. In our example we will publicize the offering in the default Consumer Catalog

hp Cloud Service Automation

Service Catalogs | Service Offerings | Service Design | Resource Management | Service Operations | Administration

4 Catalogs

- Consumer Catalog CSA Consumer
- EMEA SW CSA lab users Catal...
- EMEA SW CSA lab users
- Global Shared Catalog CSA.Provider
- Marketing Department Catalog Marketing Department

Consumer Catalog
CSA Consumer Organization

Summary

General Information

Access Control

Approval Policies

Categories

Published Offerings

Resource Environments

Published Service Offerings
Publish service offerings into specific categories in your catalog.

Select Category: All Categories

- Action Sequence Illustration (will execute, but fail as a service) R & D
Published on 01/30/2013
- Simple Linux Server on vCenter Simple System
Published on 09/12/2012
- Simple VCenter instance sample Featured Services
Published on 02/07/2013
- Two Tier Infrastructure Service with approval Featured Services
Published on 01/30/2013
- Two Tier Infrastructure Service with approval Infrastructure Services
Published on 01/30/2013
- Two Tier Infrastructure Service without approval Infrastructure Services
Published on 01/30/2013

Add Offering

We can add the new Offering

Add Service Offering
Select an available offering from the list below.

14 Available Offerings

3-Tier IaaS for everyone
Delivers a 3-tier infrastructure service with choice of number of machines per tier, choice of OS per tier and size of servers. (noop)

A new service offering
My new service offering with Region selected by user at ordering time

Action Sequence Illustration (will execute, but fail as a service)
This service does nothing but invoke OO flows on the underlying service design and resource offering with descriptive names, to study the execution sequence of complex service designs' pre-, during- and post-transition actions.

Amazon EC2 CSA 3.01 EA all-in-one
An all-in-one CSA 3.01 (EA) system for demo, training, workshop and simple PoCs.

sb noop
costs nothing but a click!

Select | Cancel

And place it in the right Category, in our case Infrastructure Services:

Add Service Offering

Select an available offering from the list below.

A new service offering
My new service offering with Region selected by user at ordering time

Select Category
Infrastructure Services

Approval Policy Exception*
Approval Process* PASSIVE

Please select an approval policy

*Changing the approval process or policy for a service offering does not change the default catalog approval process or policy. Go to General Information to change the catalog approval process and policy.

Add Cancel

Ok configuration is terminated at this point. Let's pretend we are a user of the Consumer portal and see how this all works.

Putting it all together

CSA users log in to their assigned portal (as you can have many portals for different population). In our case, we have this premiumuser, login in, and this premiumuser is also a user of the target MOE platforms, where we have created an organization called Premium Partners, a user called premiumuser and an organization administrator called premiumadmin.



Premium Partners Portal

Welcome to SeeHigh Records IT Services

premiumuser

Remember me

The first page show to the end user is the Dashboard where the status of the resources are shown. Let's pick the Catalog tab:

Cloud Services Consumer Portal

Dashboard Catalog Requests Subscriptions

Subscriptions

Services you own and manage

- Active Subscriptions **3**
- Pending Subscriptions **0**
- All Subscriptions **3**

Expiring Soon
Subscriptions ending in the next 30 days
No subscriptions are expiring soon.

Requests

Check status of services ordered

Pending	0
Approved	24
Denied	0
Canceled	0
All Requests	24

Popular Services

Most requested service offerings

- Two Tier Infrastructure Service without approval
- Simple Linux Server on vCenter
- Two Tier Infrastructure Service with approval
- Simple vCenter instance sample
- WordPress Service in selected Region

Catalogs

View and request services

What kind of service are you looking for?
Choose a service

New Releases

Items recently added

- A new service offering
- WordPress in selected CSS Datacenter
- WordPress Service in selected Region

And there we can see the categories of Services available, and in the Infrastructure Services section, our newly created service: A new service offering. Select it:

The screenshot shows the 'Cloud Services Consumer Portal' with a navigation bar containing 'Dashboard', 'Catalog', 'Requests', and 'Subscriptions'. A search bar is present on the right. The 'Catalog' section is active, showing a list of services under the 'Infrastructure Services' category. The services listed are:

- A new service offering**: My new service offering with Region selected by user at ordering time. Published 07/17/2013. Price: from \$ 260.00 + \$ 37.00 Monthly.
- Two Tier Infrastructure Service with approval**: Creates a two tier infrastructure service with choice of number of servers in each tier, their OS (Windows or Linux) and the server side. Requires approval. (noop). Published 09/12/2012. Price: from CHF 250.00 + CHF 85.00 Daily.
- Two Tier Infrastructure Service without approval**: Creates a two tier infrastructure service with choice of number of servers in each tier, their OS (Windows or Linux) and the server side. (noop). Published 08/21/2012. Price: from € 1,000.00 + € 100.00 Monthly.
- WordPress in selected CMS Datacenter**: Pick a datacenter and deploy your WordPress Service. Published 07/16/2013. Price: from \$ 200.00 + \$ 60.00 Monthly.
- WordPress Service in selected Region**: Select one of the available datacenters. Published 07/15/2013. Price: from \$ 110.00 + \$ 35.00 Monthly.

Assign a name for this new subscription for example: MOE Service in AMA, and pick a Region using the radio button at the bottom. Then select Request Now to place the order in the queue:

The screenshot shows the 'A new service offering' details page. The main content area includes:

- Subscription Name***: MOE Service in AMA (with a green checkmark).
- Description**: A large empty text area.
- Requested start date***: 07/17/2013.
- Requested end date***: no end date (selected) and 7/15/2014 (available).
- Selected Region**: A list of regions with radio buttons:
 - EMEA: Grenoble, France (Subtract \$ 5 + Subtract \$ 3.00 Monthly) Properties Required
 - AMA: Houston, Texas (Included in Price)
 - APJ: Singapore (Subtract \$ 5 + Subtract \$ 5.00 Monthly) Properties Required

On the right side, there is a **Summary** panel showing:

- Initial Price**: \$ 265.00
- Monthly Price**: \$ 40.00 Monthly
- Request Now** button.
- Specifications**: Selected Region: AMA.
- Associated Documents**: No associated documents.

Request can be monitored in the Requests tab:

Cloud Services Consumer Portal | premiumuser ? Log out

Dashboard Catalog **Requests** Subscriptions

Search

Requests

My Requests

- All 25
- Pending 1
- Approved 24
- Denied 0
- Canceled 0

Request Name	Status	Date Requested	Requested Action	Price
MOE Service in AMA A new service offering	Pre-approved	07/17/2013 04:20 PM	Order - Pending	\$ 205.00 + \$ 45.00 Monthly
Test4 WordPress Blog in EMEA	Pre-approved	07/16/2013 05:32 PM	Cancel Subscription - ...	\$ 0.00 + \$ 0.00 Monthly
Testing AMA WordPress Blog in AMA	Pre-approved	07/16/2013 05:32 PM	Cancel Subscription - ...	\$ 0.00 + \$ 0.00 Monthly
Didier APJ 2 WordPress in selected OSS Datacenter	Pre-approved	07/16/2013 04:20 PM	Order - Approved	\$ 190.00 + \$ 75.00 Monthly
Didier APJ 1 WordPress in selected OSS Datacenter	Pre-approved	07/16/2013 03:20 PM	Order - Approved	\$ 190.00 + \$ 75.00 Monthly
Didier AMA 1 WordPress in selected OSS Datacenter				\$ 200.00

And subscriptions in the Subscriptions tab (the new one might take a little time to show up, on top of the list)

Cloud Services Consumer Portal | premiumuser ? Log out

Dashboard Catalog Requests **Subscriptions**

Search

Subscriptions

- All 4
- Infrastructure Services 4

Subscription Name	Status	Service Instance Status	Expiration Date	Price
MOE Service in AMA A new service offering	Pending	Deploying	07/17/2013 no end date	\$ 205.00 + \$ 45.00 Monthly
Didier APJ 2 WordPress in selected OSS Datacenter	Active	Online	07/16/2013 no end date	\$ 190.00 + \$ 75.00 Monthly
Didier AMA 1 WordPress in selected OSS Datacenter	Active	Online	07/16/2013 no end date	\$ 200.00 + \$ 65.00 Monthly
Didier EMEA 13 WordPress in selected OSS Datacenter	Active	Online	07/16/2013 no end date	\$ 200.00 + \$ 60.00 Monthly

Expiring Soon
Subscriptions ending in the next 30 days.
No subscriptions are expiring soon.

Recent Subscriptions
Recently added subscriptions

- MOE Service in AMA
- Didier APJ 2
- Didier AMA 1
- Didier EMEA 13

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Last quick check is to login to our MOE backend, using the Premium Partners Admin portal in AMA:



And check the Request currently in progress on the MOE AMA platform. We can see that we have this Service Name with a numerical value (generated by CSA) being processed, from user premiumuser, and using the right template.

Request	Service Name	Status	Progress	User	Submit Date	Start Date	End Date	Service Template
<input type="radio"/> Create	13he90b48a1305		6%	OMSSRV/premiumuser	07/17/2013 04:31 PM	07/17/2013 04:32 PM		Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Delete	13he7a313860a63	✓	COMPLETE	OMSSRV/Administrator	07/17/2013 01:54 PM	07/17/2013 01:54 PM	07/17/2013 01:57 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Create	13he7a313860a63	✓	COMPLETE	OMSSRV/premiumuser	07/16/2013 03:21 PM	07/16/2013 03:22 PM	07/16/2013 03:40 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Delete	EM	✓	COMPLETE	OMSSRV/premiumadmin	07/15/2013 04:20 PM	07/15/2013 04:20 PM	07/15/2013 04:23 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Create	EM	✓	COMPLETE	OMSSRV/premiumuser	07/15/2013 03:58 PM	07/15/2013 04:00 PM	07/15/2013 04:16 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Delete	13he20074db0f05	✓	COMPLETE	OMSSRV/premiumuser	07/15/2013 03:51 PM	07/15/2013 03:51 PM	07/15/2013 03:54 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Create	13he20074db0f05	✓	COMPLETE	OMSSRV/premiumuser	07/15/2013 03:26 PM	07/15/2013 03:27 PM	07/15/2013 03:44 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Delete	13he07f9040a86	✓	COMPLETE	OMSSRV/premiumuser	07/12/2013 01:34 PM	07/12/2013 01:34 PM	07/12/2013 01:37 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Delete	13he04d10c90c58	✓	COMPLETE	OMSSRV/premiumuser	07/12/2013 01:33 PM	07/12/2013 01:33 PM	07/12/2013 01:36 PM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Create	13he04d10c90c58	✓	COMPLETE	OMSSRV/premiumuser	07/12/2013 05:00 AM	07/12/2013 05:01 AM	07/12/2013 05:16 AM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Create	13he07f9040a86	✓	COMPLETE	OMSSRV/premiumuser	07/12/2013 03:31 AM	07/12/2013 03:32 AM	07/12/2013 03:49 AM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Delete	13he07f9100844	✓	COMPLETE	OMSSRV/premiumuser	07/12/2013 12:42 AM	07/12/2013 12:42 AM	07/12/2013 12:46 AM	Bronze Hyper-V Wordpress Service (Windows) CSA Template
<input type="radio"/> Create	13he07f9100844	✓	COMPLETE	OMSSRV/premiumuser	07/12/2013 12:22 AM	07/12/2013 12:23 AM	07/12/2013 12:40 AM	Bronze Hyper-V Wordpress Service (Windows) CSA Template

Agreed the automatically generated service name is not that intuitive, but this can be changed too, and will be the subject of another whitepaper. Stay tuned!

Conclusion

Aggregating or federating several MOE platforms with a single HP CSA is one great example of integrating two powerful products to provide an even more powerful solution to our customers. Thanks to CSA great flexibility and programmability, and thanks to the MOE API, we can assemble such complex solution and a relatively short amount of time.

For more information:

HP CloudSystem Matrix:

hp.com/go/matrix

Programming Cloud System Matrix for Dummies:

dummies.com/go/hpcloudsystemmatrixfordummies

CloudSystem Developers Community Web site:

hp.com/go/csdevelopers

Other HP CloudSystem Matrix white papers:

hp.com/go/matrixoe/docs

Other HP CloudSystem Matrix use case examples:

hp.com/go/matrixusecases

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