Hewlett Packard Enterprise

HPE SimpliVity with Micro Focus HCM suite

Technical white paper

Contents

Summary

Every enterprise is required to roll out new applications quickly and cost-effectively to compete in today's fast-paced business environment. However, many are hampered by legacy data center architectures composed of independent compute, storage, and networking platforms with distinct administrative systems. Deploying a new application is often an intensive, time-consuming proposition involving a number of different systems, management interfaces, and operations teams. In the existing scenario, provisioning of IT services can take days to even weeks.

Many organizations are also hindered by legacy data protection solutions that are not well suited for today's highly virtualized IT environments. Everyday operations: cloning VMs, backing up, or restoring virtualized applications— may take hours and even days with inefficient monolithic data architectures designed around individual silos of infrastructure resources.

HPE SimpliVity hyperconverged platform helps to streamline IT operations and it combines the IT infrastructure and advanced data services into a single, integrated all-flash solution. HPE SimpliVity hyperconverged infrastructure supports both public and private cloud computing. An on-premises instance has extensibility on-demand to the public cloud, as well as the ability to store backup and disaster recovery copies in the public cloud. All controlled through a single management view.

Integrated with Micro Focus Hybrid Cloud Management Suite, this solution offers a single glass pane to manage the hybrid IT infrastructure environment.

Overview

The HPE SimpliVity hyperconverged infrastructure is designed from the ground up for today's highly virtualized IT environments. The solution eliminates cost and complexity by consolidating a variety of IT functions—including compute, storage, network switching, replication, and backup—onto virtualized, industry-standard x86 hardware. Unlike legacy IT solutions based on monolithic data architectures, the HPE SimpliVity hyper converged infrastructure performs inline data deduplication, compression, and optimization on all data at inception across all phases of the data lifecycle. By minimizing I/O and network traffic, routine operations such as application cloning, backup, and restore functions can now be completed withiin seconds to minutes instead of hours to days.

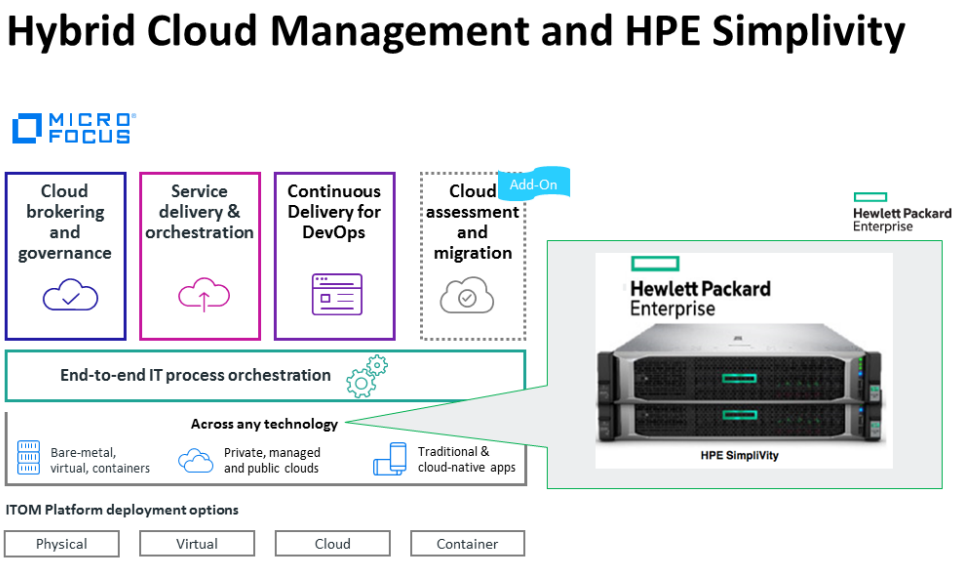
HPE SimpliVity hyperconverged infrastructure can meet the scalability needs of any organization and therefore can be deployed in a wide variety of use cases.

Micro Focus Hybrid Cloud Management (HCM) Suite is a DevOps-ready, multi-cloud management and orchestration software solution that drives cloud-service agility. With Micro Focus HCM Suite, customers can manage a full spectrum of hybrid environments—across any infrastructure (bare metal, virtual machines, and containers), any cloud (private or public), and any workload (traditional, cloud-enabled, or cloud-native). The HCM Suite stands out in the market for its broad technology coverage and cloud agnostic capabilities. Its "design once, run anywhere" services modeling and customizable portal allow customers to offer hybrid IT services across private and public clouds. Thousands of out-of-the-box workflows enable powerful orchestration, while capacity analytics guide how and where to place workloads, and right-size the environment.

Micro Focus HCM Suite offers centralized self-service portal. With a self-service portal, users can subscribe to cloud offerings that are customized in the form of services. IT teams can provide a catalog to business teams so that they can select the IT services which are needed for their respective applications.

HPE Simplivity and Micro Focus HCM integration provides automated workflow for the data services operations of HPE Simplivity from the self-service portal of the HCM suite. All the management operations that can be performed from SimpliVity Extension for vSphere Web Client are automated from Micro Focus HCM self-service portal.

Figure 1: Hybrid cloud management and HPE Simplivity



As part of this integration, the following data services operations of HPE Simplivity is automated using Micro Focus HCM suite.

- Create, delete and update backup policy
- Create, delete, and resize HPE SimpliVity datastore
- Set backup policy on a virtual machine
- Backup and restore a virtual machine
- Move a virtual machine
- Clone a virtual machine
- Display the list of backups and its sizes associated with a virtual machine

Target audience

Chief information officers (CIOs), chief technology officers (CTOs), data center managers, architectural/engineering decision makers, technologists, and others eager to learn more about this reference architecture configuration from Hewlett Packard Enterprise. A working knowledge of server architecture, networking architecture, and storage design is recommended.

Document purpose

The purpose of this document is to describe a reference architecture/solution, highlighting recognizable benefits to technical audiences.

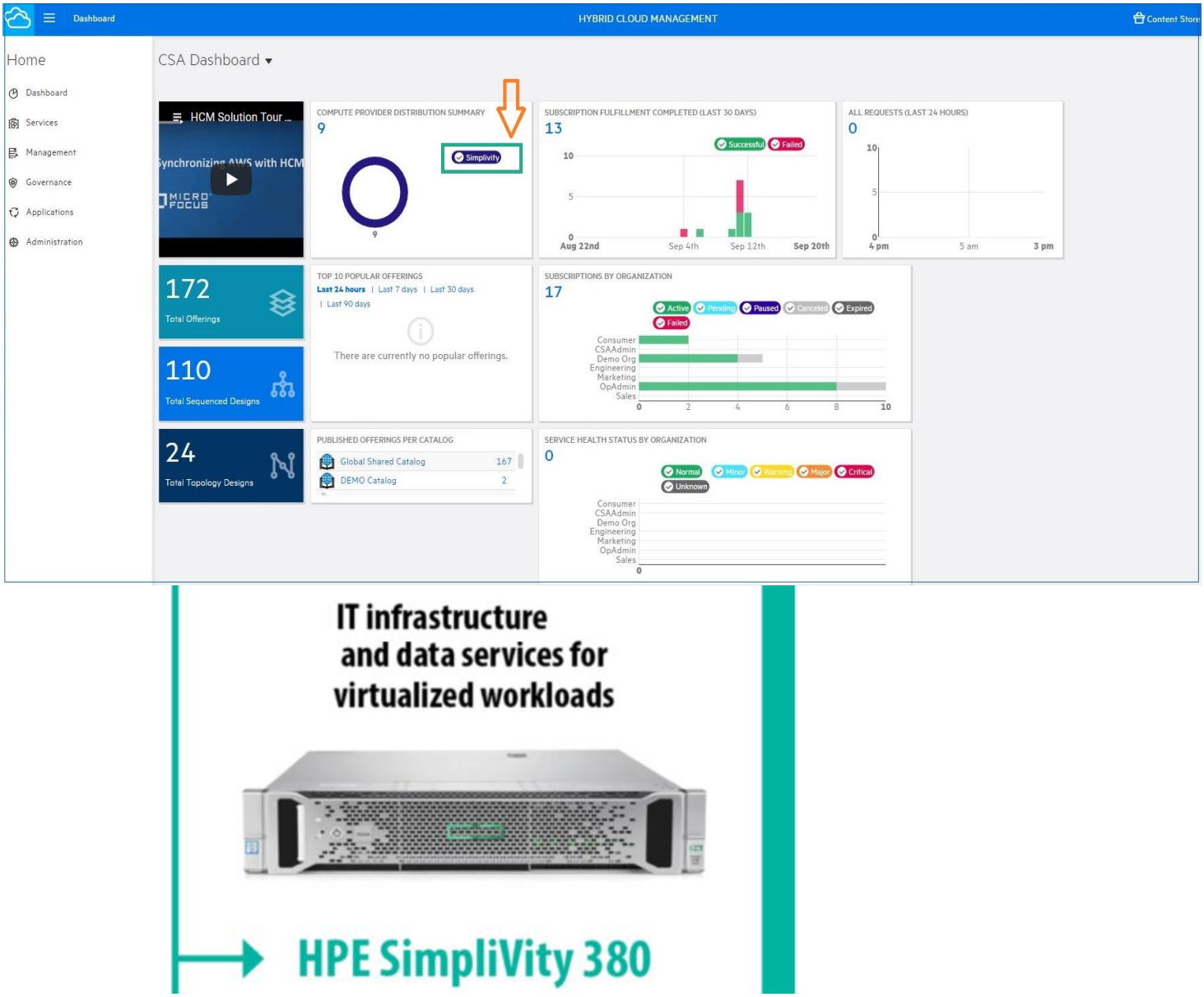
Introduction

HPE SimpliVity is a natural fit for a hybrid environment that is designed to maximize efficiency and still allow for scalability.

More and more IT organizations are reaping the benefits that this hyperconverged solution provides in terms of simplicity and efficiency. Complementing the rich set of data services provided by HPE SimpliVity, having a self-service management tool helps simplify day-to-day operations. IT organizations can lower the operating expenses by automating several services and management tasks.

Hybrid Cloud Management(HCM) suite creates a single catalog (like Amazon marketplace) of all internal and external cloud offerings and thus users have an easy consumer experience and IT can more efficiently manage subscriptions.

Figure 2: Simplivity as Compute provider for Micro Focus HCM



The data services operations of HPE SimpliVity is automated from MicroFocus HCM suite. End users can perform specific HPE SimpliVity operations on their user specific resources based on services entitled to them without the involvement of an IT admin. For example, Admin user can create backup policies for the organization through the self-service portal, and then a developer/consumer user can apply any of those backup policies to their VM, or initiate an on-demand backup.

Administrators:

- Create and manage services available for subscription by end users, in HCM suite
- HPE Simplivity operations like create/delete/update datastore and create/delete/update of backup policy, in addition to the life cycle operations of virtual machines.

Users/Consumers:

Life cycle operations of virtual machines viz. deploy/clone VM, backup/restore VM, set VM backup policy and move VM.

Deployment scenarios

Non-Production/Test Configuration:

Configuration with single HPE SimpliVity federation

This deployment example is considered the minimum requirement, typically suitable for test/non-production environments, as it does not necessarily provide component redundancy or high availability for all the solution components. The configuration consists of a single HPE SimpliVity Federation, managed by a single VMware® vCenter Server™.

Production configuration

Configuration with multiple HPE SimpliVity federations

Two or more deployed clusters of HPE SimpliVity systems form the federation in this deployment model. HPE SimpliVity federation includes a self-learning and self-healing fabric that connects all HPE SimpliVity clusters. This means that there is no reconfiguration required if nodes are added or removed. All VM-centric protection policies continue to run without the need for any reconfiguration. HPE SimpliVity federation learns the topology of the customer environment, sets up alarms, and intelligently warns the administrator of any issues that may arise within the fabric upon connection.

Note:
This deployment scenario is appropriate for production environments as it does provide component redundancy and high availability.

MicroFocus HCM Deployment:

For proof of concept testing, Micro Focus HCM suite is installed on HPE SimpliVity virtual machines - single master node and three worker nodes.

HCM Deployment considerations

HPE SimpliVity - MicroFocus HCM suite - Design considerations

HPE SimpliVity design considerations

HPE SimpliVity software version 3.70, supports the use of VXLAN for virtual machine traffic only. Using VXLAN for storage traffic is not supported.

Linked clones vs HPE SimpliVity clones

Linked clones are space-efficient copies of virtual machines employed to save storage capacity. Linked clones are based on a snapshot of a VM and use a chain of delta disks to track differences from a parent machine. Linked clones require a persistent connection to the parent virtual machine, which can degrade disk performance under load. If the focus is on performance, you should employ a full clone instead of a linked clone.

In HPE SimpliVity software version 3.70 linked clones are supported but not recommended. HPE SimpliVity clones minimize I/O and network traffic and boost performance by performing inline data deduplication, compression, and optimization on all data at inception across all phases of the data lifecycle. HPE SimpliVity clones offer all the space-saving benefits of a linked clone with the performance of a full clone.

Micro Focus HCM suite design considerations

The following considerations should be taken when deploying Micro Focus HCM suite in conjunction with the HPE SimpliVity hyperconverged infrastructure:

Sizing recommendations for MicroFocus HCM suite

Integrating HPE SimpliVity and Micro Focus HCM Suite Automation

Micro Focus HCM workflow for HPE Simplivity

The following data services operations of HPE SimpliVity is automated from Micro Focus HCM suite.

- Create, delete and update backup policy
- Create, delete, and resize HPE SimpliVity datastore
- Set backup policy on a virtual machine
- Backup and restore a virtual machine
- Move a virtual machine
- Clone a virtual machine
- Display the list of backups and its sizes associated with a virtual machine

The customizable hybrid cloud management dashboard of Micro Focus HCM, enables complete visibility into the hybrid cloud infrastructure. The self-service portal offers users and administrators the ability to perform the following operations using the integration plugin for HPE Simplivity.

Administrators:

Using the hybrid cloud management dashboard/ self-service portal of Micro Focus HCM suite, an administrator can perform the following Simplivity operations. IT admin manages the subscriptions across the organization.

- create, delete and resize HPE SimpliVity datastore
- create, delete and update HPE SimpliVity backup policies

- lifecycle operations of virtual machine

Users/Consumers:

Using the self-service portal, users/consumers can perform the following lifecycle operations for Simplivity virtual machines:

- deploy/clone virtual machine
- backup and restore virtual machine
- move virtual machine
- set backup policy
- start/stop virtual machine

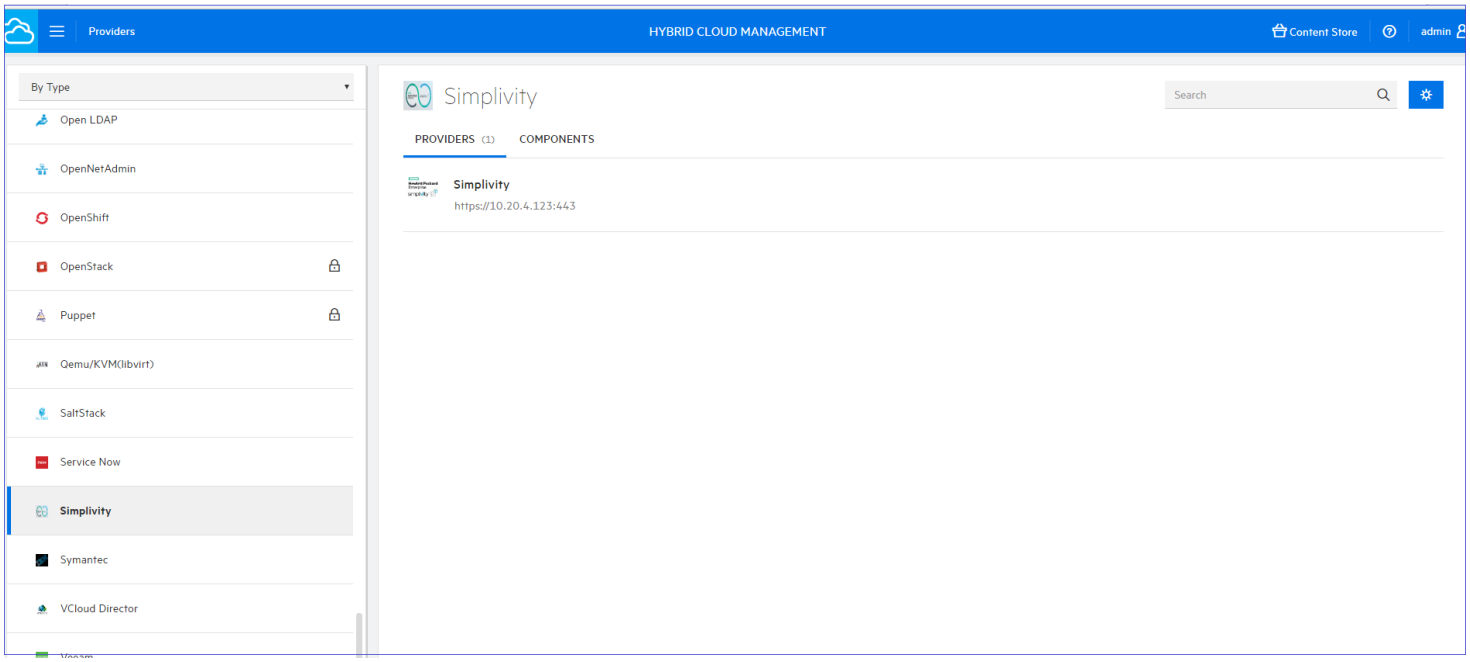
Installation of Integration Plugin - HPE SimpliVity HCM integration

For Micro Focus HCM Content Capsule for Simplivity in the market place including configuration document, refer https://marketplace.microfocus.com/itom/content/capsule-hpe-simplivity

Configure the HPE SimpliVity Provider in MicroFocus HCM

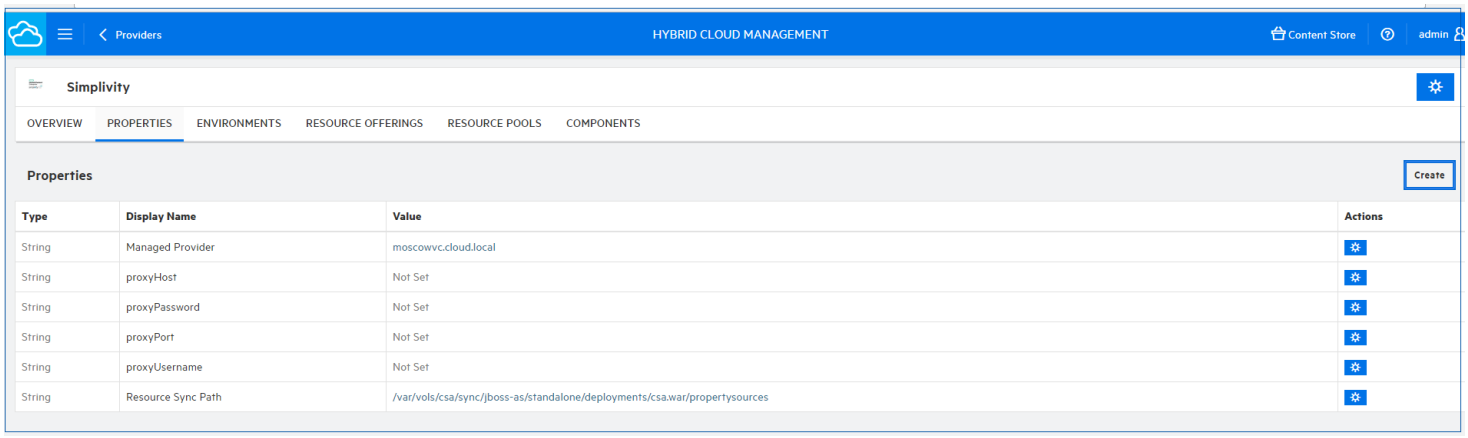
1. Install the integration plugin/content for HPE Simplivity.
2. Login to hybrid cloud management dashboard using the administrator credentials
3. Configure the endpoints for Simplivity provider – IP address of OmniStack virtual controller and secure port 443

Figure 3: Hybrid cloud management



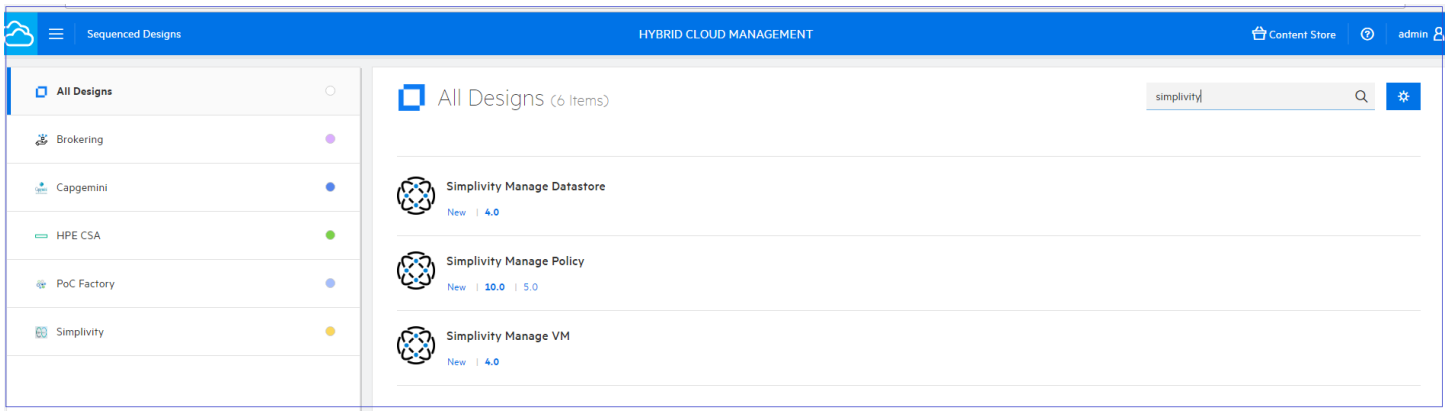
4. Set the required properties for the SimpliVity provider

Figure 4: Set properties for SimpliVity provider



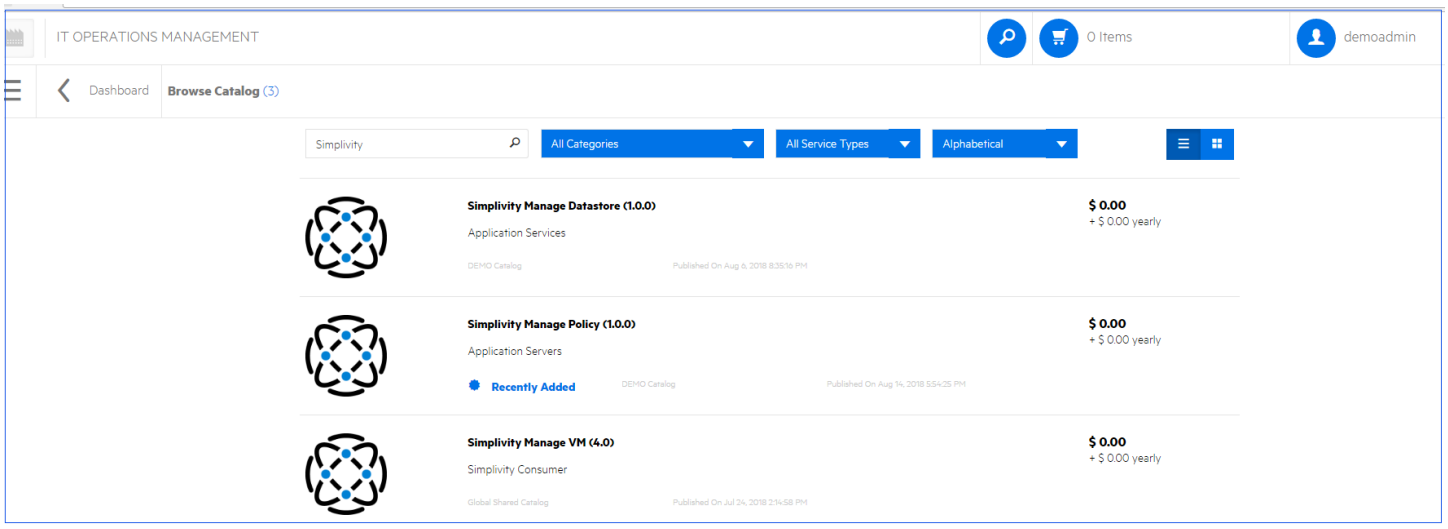
With the integration plugin, the following service designs are available for administrator user.

Figure 5: Set Service Designs



Admin publishes the offerings to different users across different organizations. Once the offering is published the user can log into the self-service portal, browse the service catalog, and subscribe to the offering.

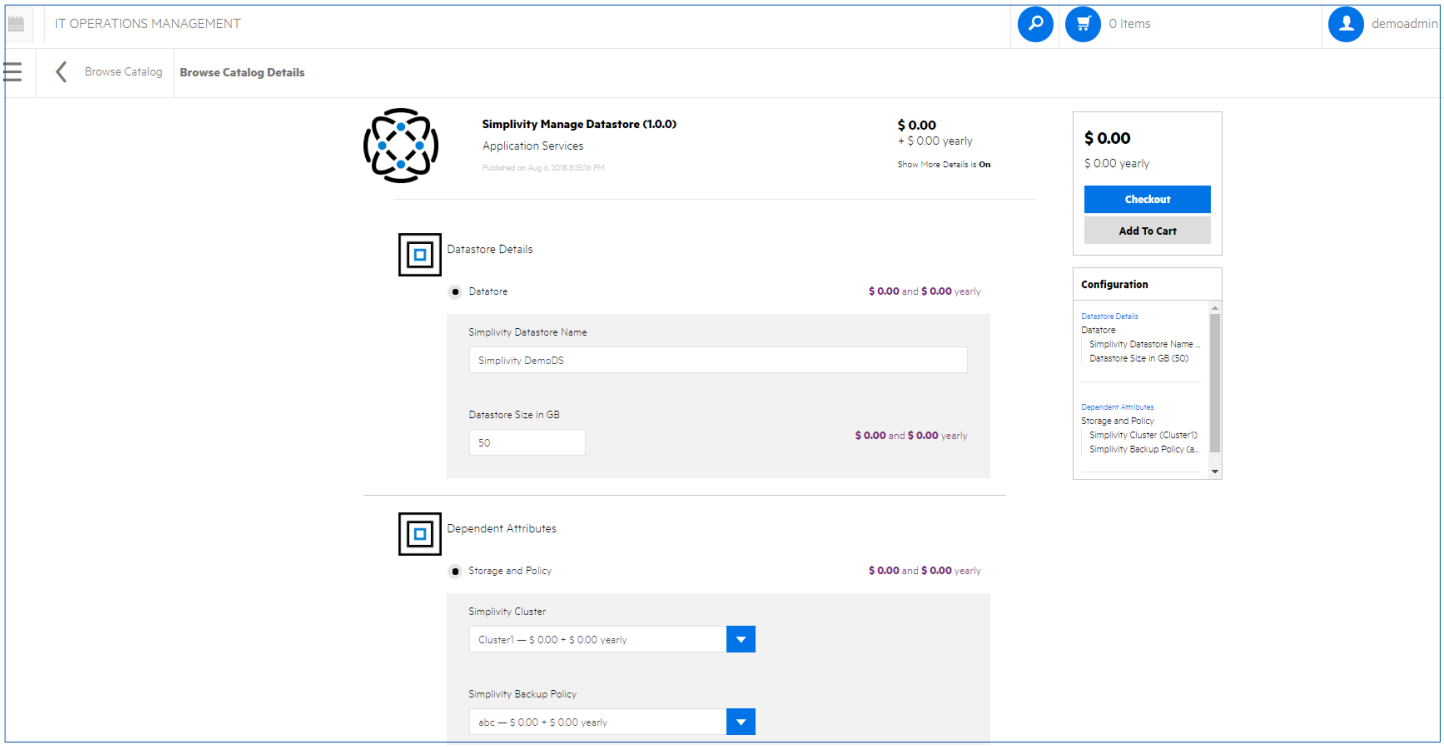
Figure 6: SimpliVity manage Datastore



Creating a Datastore

The SimpliVity Create Datastore workflow creates a new datastore that is accessible by all HPE SimpliVity hosts in a cluster. At least one datastore per cluster is needed to store information of the virtual machines. Each datastore is assigned a backup policy and it can be changed based on business needs.

Figure 7: SimpliVity create Datastore



After entering the "Datastore Details" and "Dependent Attributes" as input, an admin user checks out the service. On "Service Checkout" screen the details on subscription needs to be entered.

Figure 8: SimpliVity service checkout

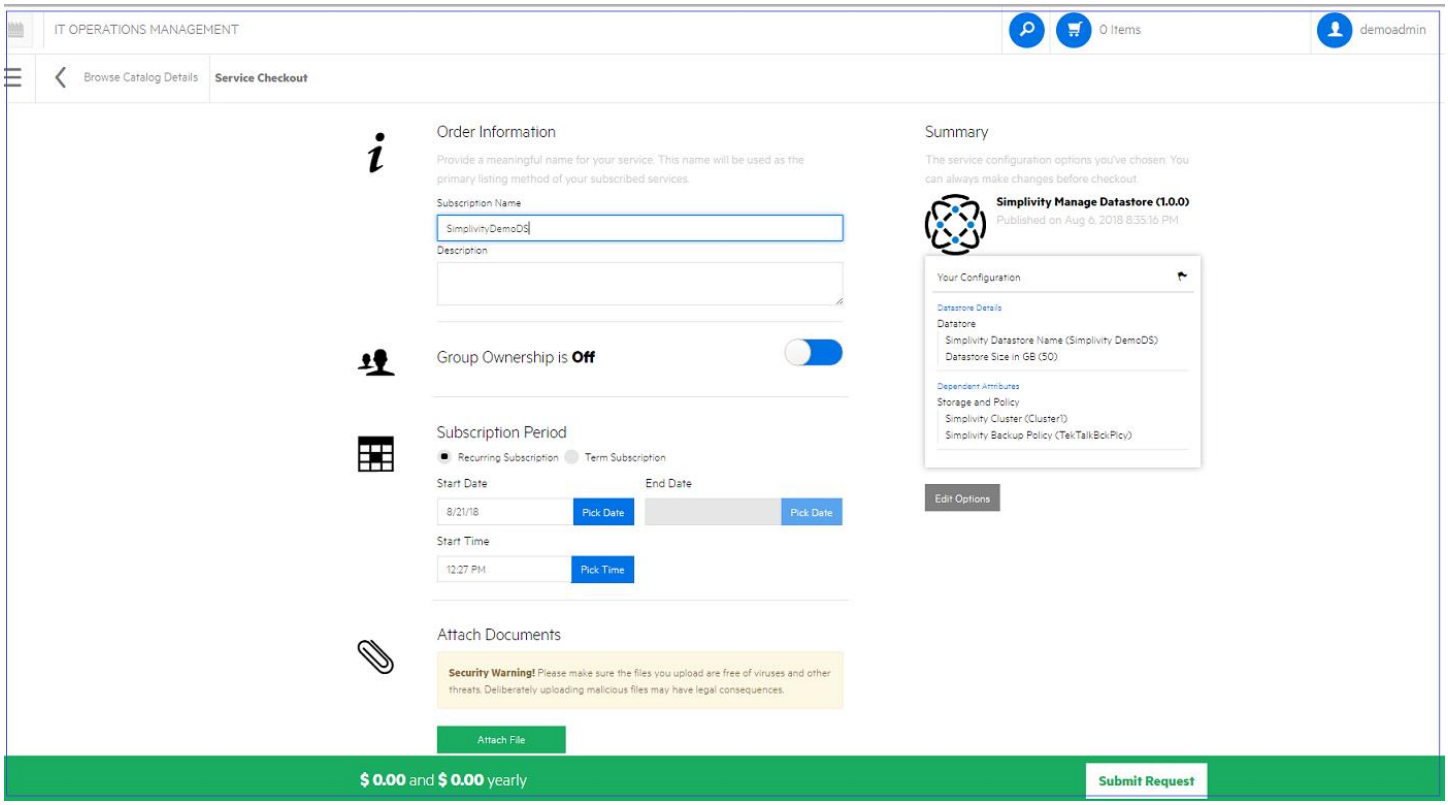
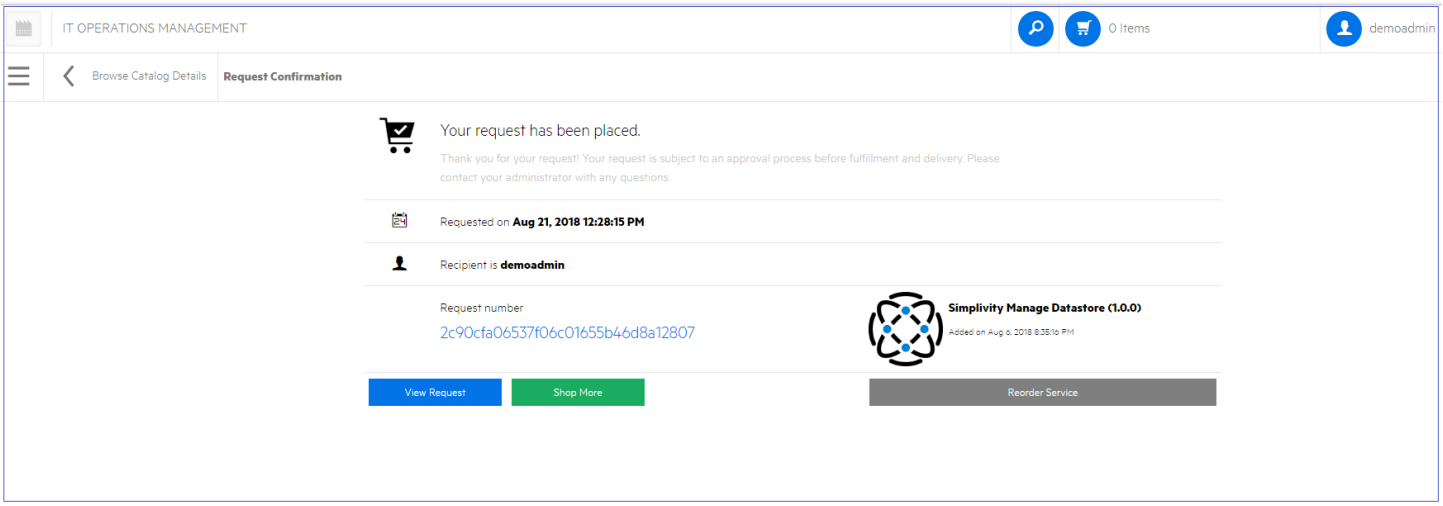
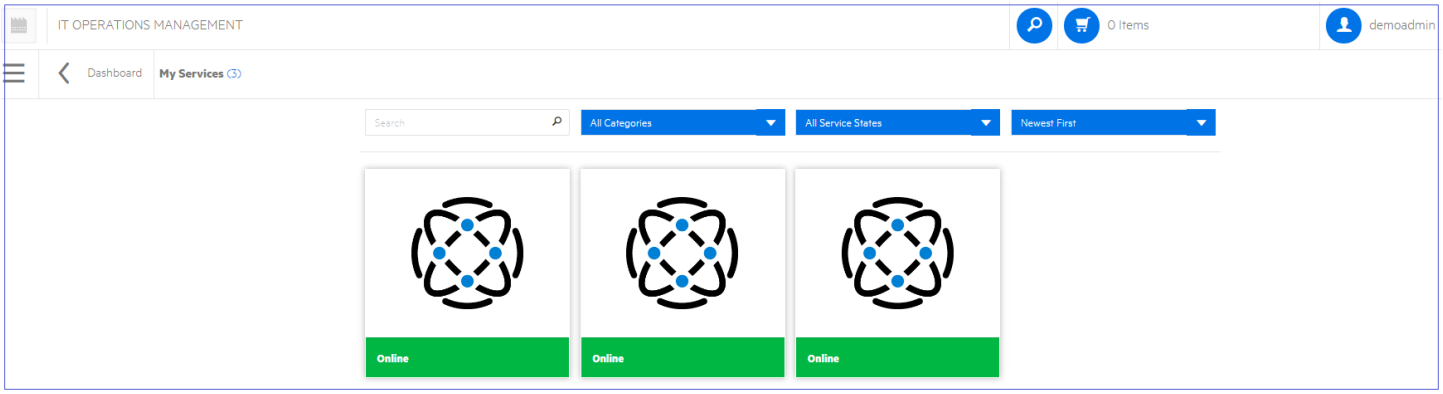


Figure 9: Request confirmation



Once subscribed, check the service status by clicking on “My Services” in the drop down menu. On successful subscription the service status will be “online”.

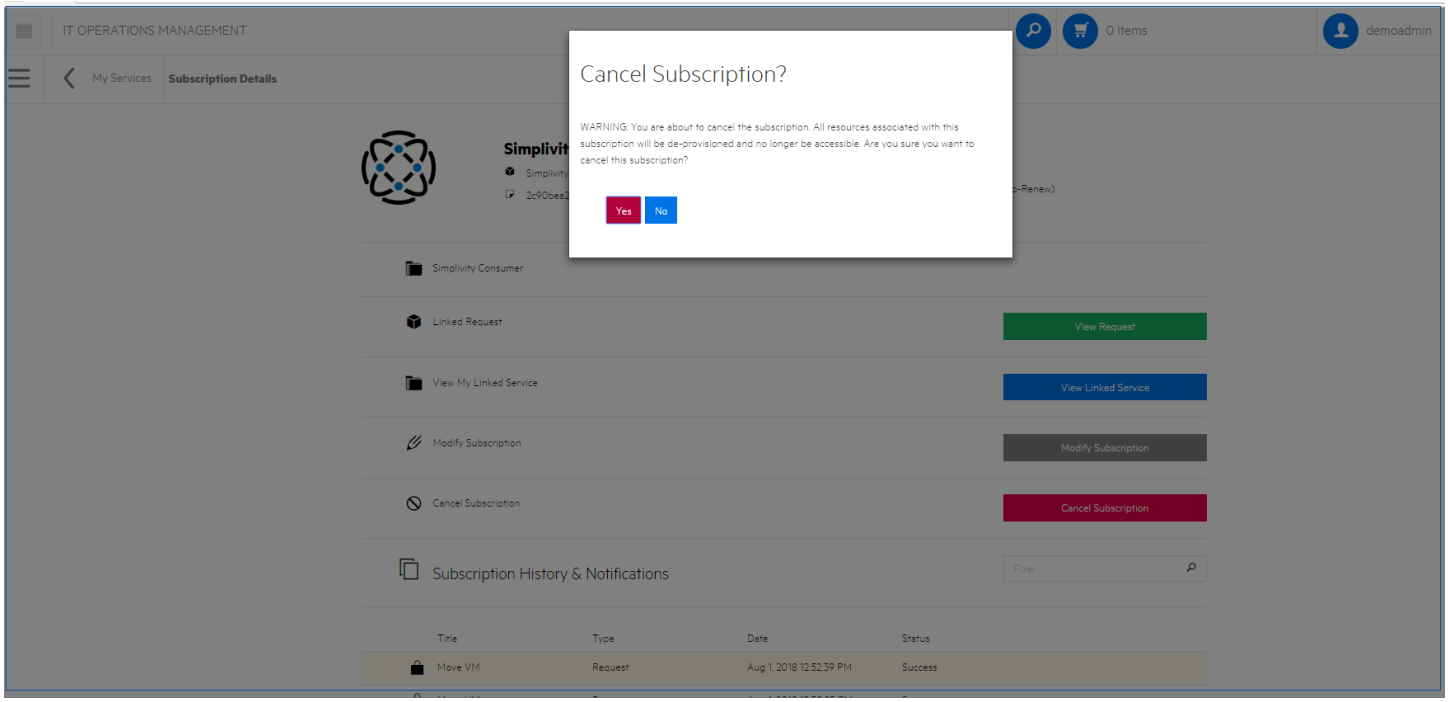
Figure 10: SimpliVity service status



Deleting a Datastore

1. Go to “My Services” in the HCM dashboard
2. Select the service corresponding to the datastore that needs to be deleted
3. Click “Cancel Subscription” for deleting a datastore.

Figure 11: Deleting Datastore



Updating a Datastore

1. Go to “My Services” in the HCM dashboard
2. Select the service corresponding to the datastore that needs to be updated
3. Click “Manage Subscription”, select “Modify Subscription”, make the required property updates in the input and click on “Modify Subscription” and then “Submit Subscription”.

Note
With the integration plugin, SimpliVity Manage Datastore is an admin offering in MicroFocus HCM.

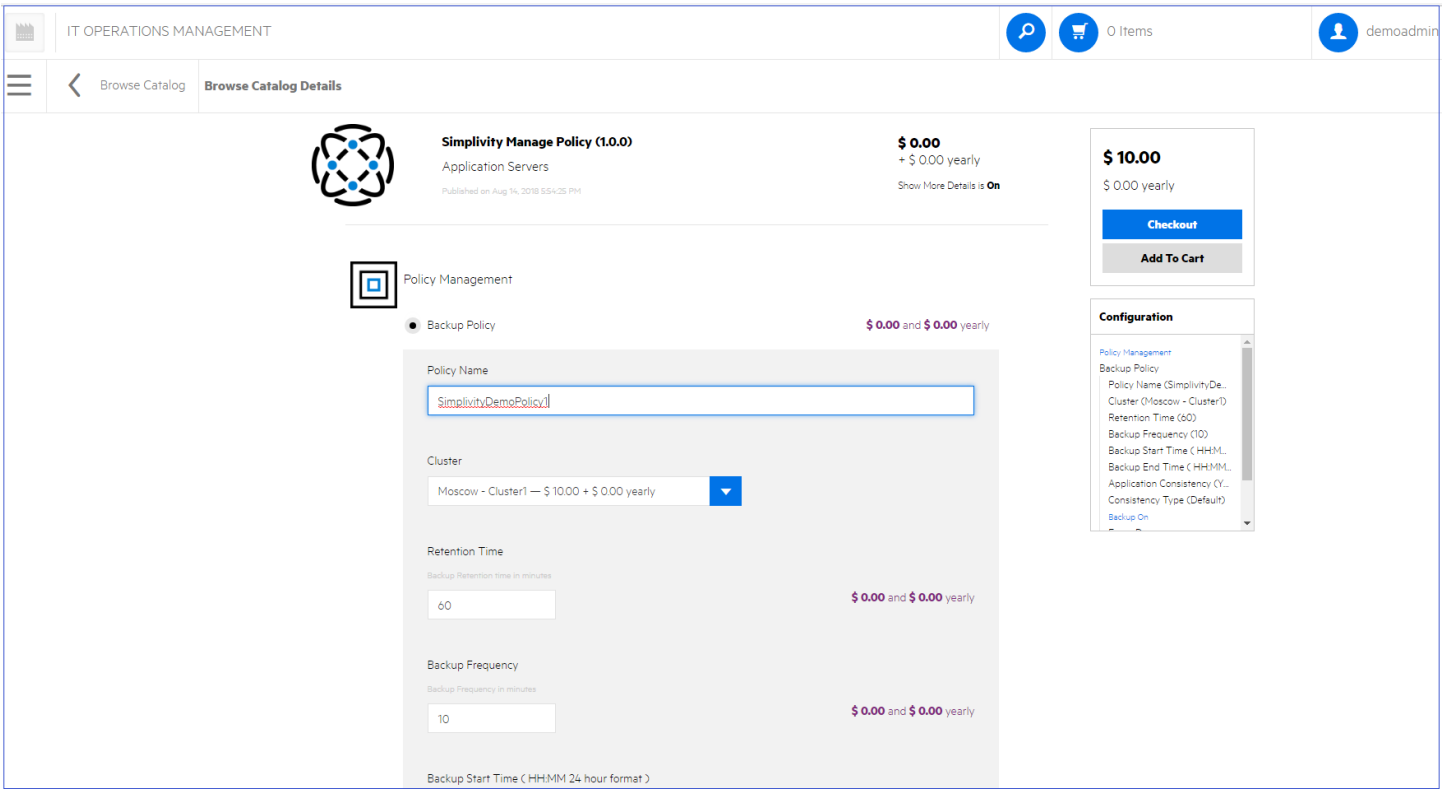
SimpliVity manage policy

Creating a backup policy

HPE SimpliVity Create Backup Policy workflow creates a new backup policy.

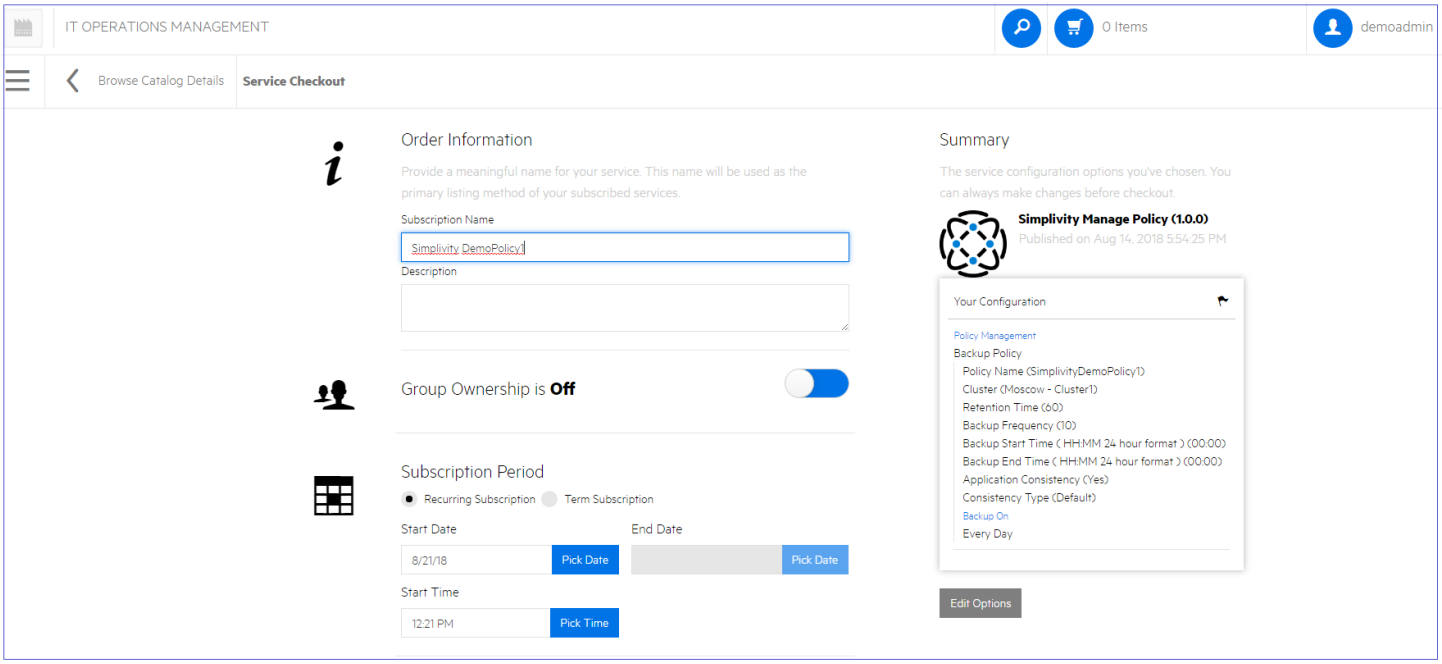
A backup policy enables the end user to schedule automatic backups of virtual machines by adding multiple rules to policy to specify where to store the backup, the frequency of the backup, and the backup retention period. Backup policies can be assigned to the vSphere datastores and/or virtual machines depending on the requirements.

Figure 12: SimpliVity manage policy



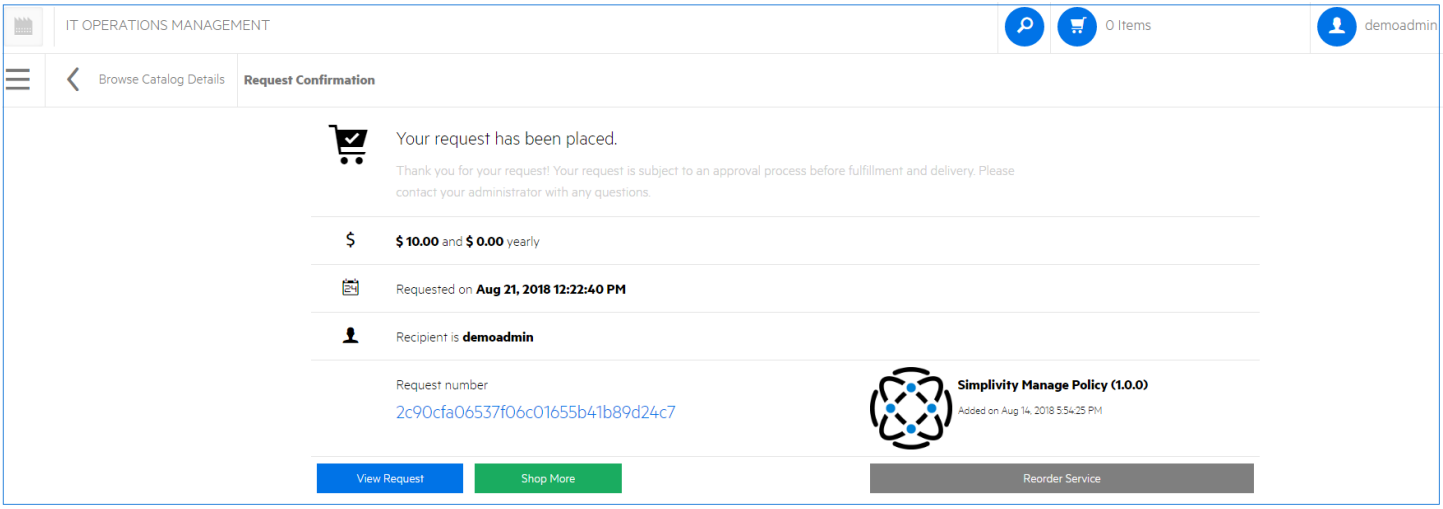
Creating a Backup Policy by subscribing to the service offering in MicroFocus HCM self-service portal

Figure 2: Subscription details screen



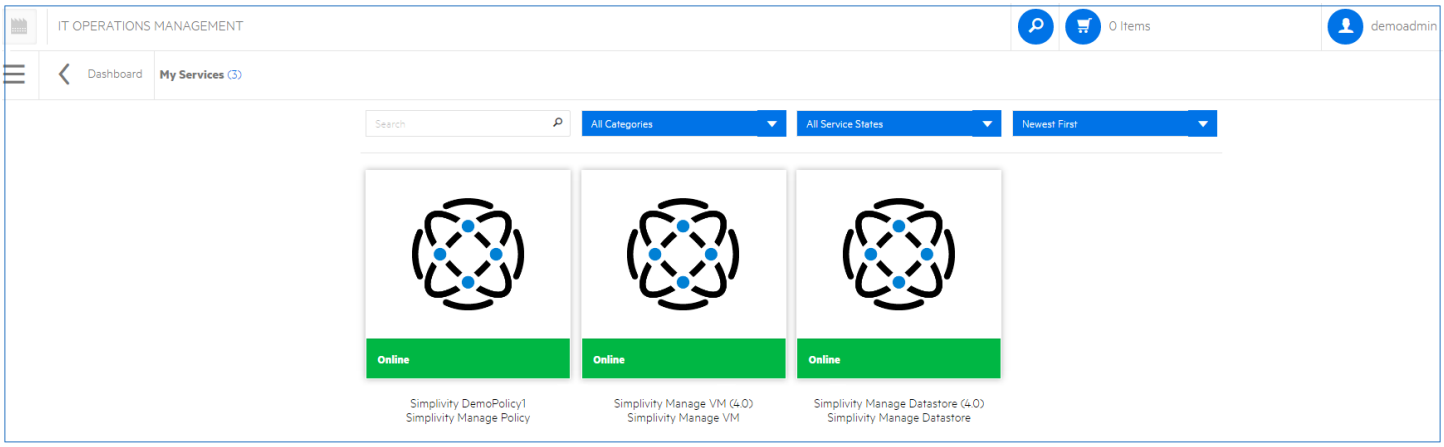
Service subscription request confirmation

Figure 3: Subscription request screen



Successful completion of service subscription request with an “online” status

Figure 4: Successful completion screen



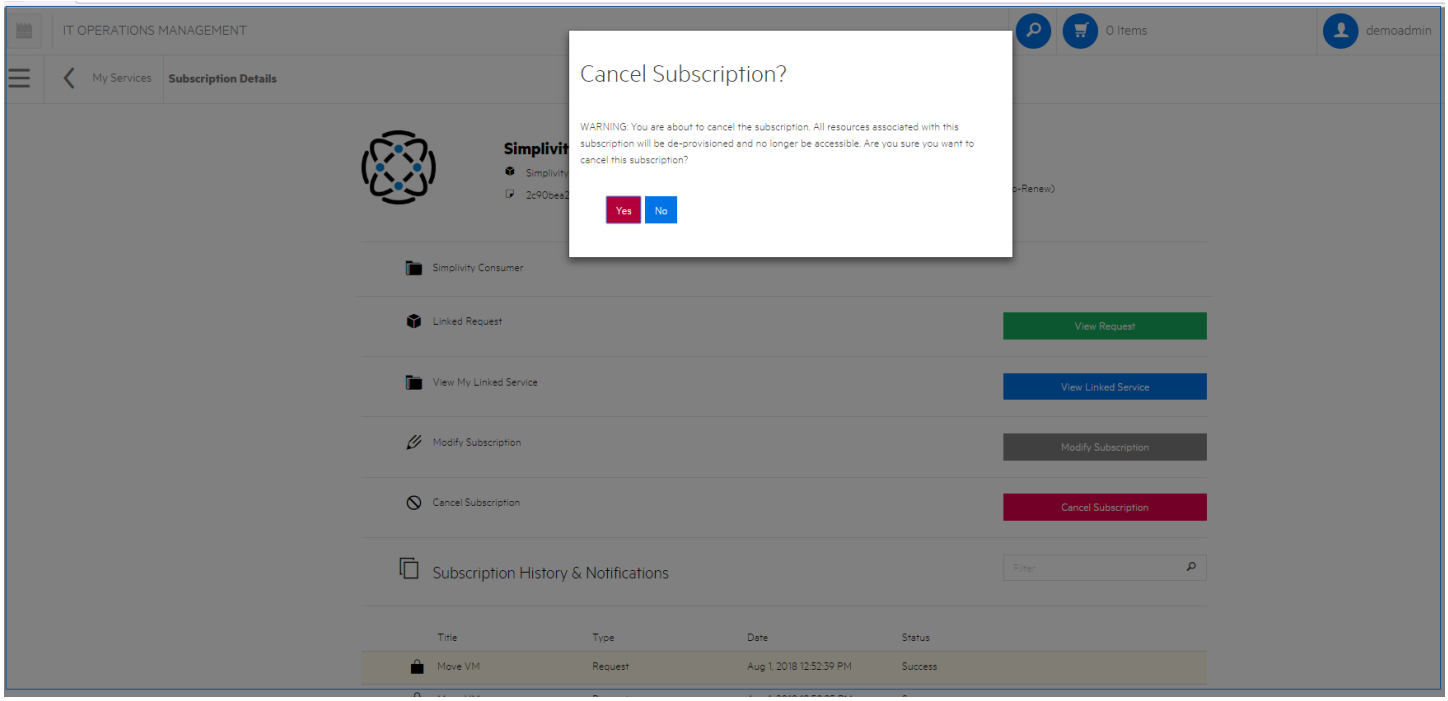
Delete backup policy

The SimpliVity Delete Backup Policy workflow deletes an existing backup policy. Backup policies that are in-use by virtual machines or datastores cannot be deleted.

1. In Micro Focus HCM dashboard, go to “My Services”
2. Select the service corresponding to the backup policy that needs to be deleted
3. Click on “Manage Subscription” and select “Cancel Subscription” for deleting the backup policy

HPE SimpliVity Delete Backup Policy by performing a “Cancel Subscription” of the service request.

Figure 5: Cancel subscription screen



Update Backup Policy

1. In Micro Focus HCM dashboard, go to “My Services”
2. Select the service corresponding to the backup policy to delete
3. Click on “Manage Subscription” and select “Modify Subscription” and “Submit Subscription” for updating the backup policy.

Figure 6: Update backup policy Modify Subscription

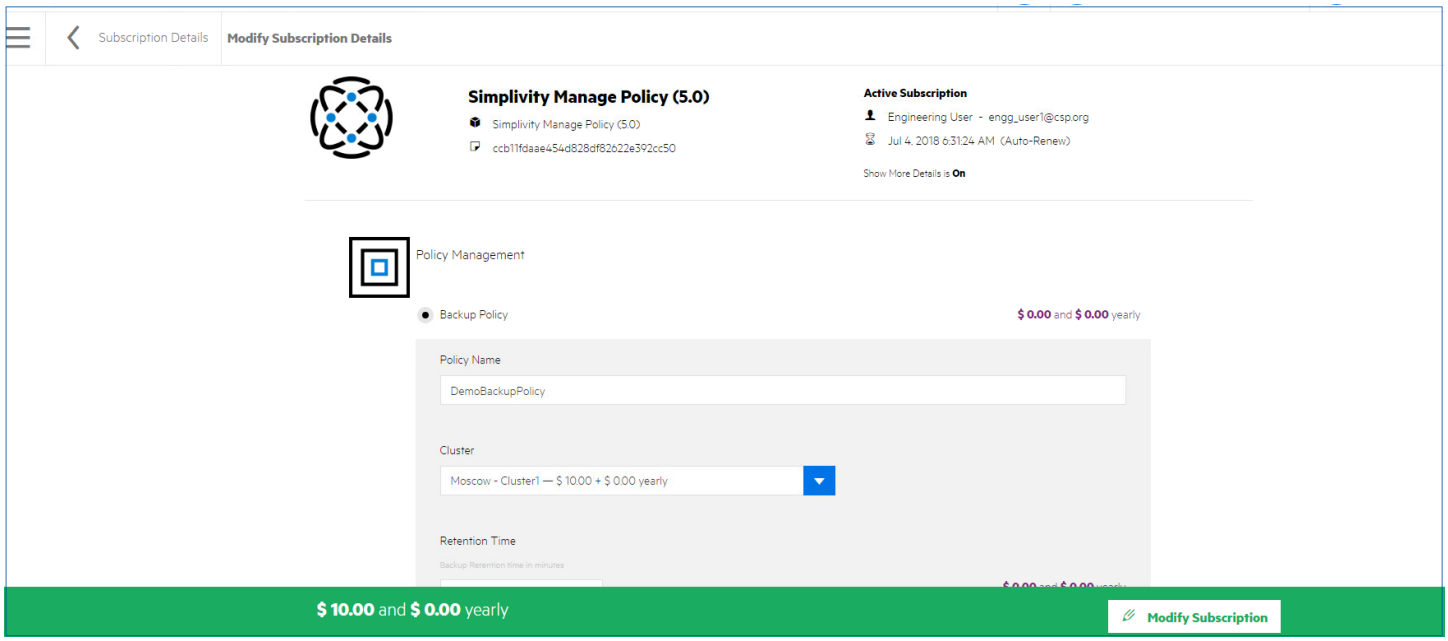
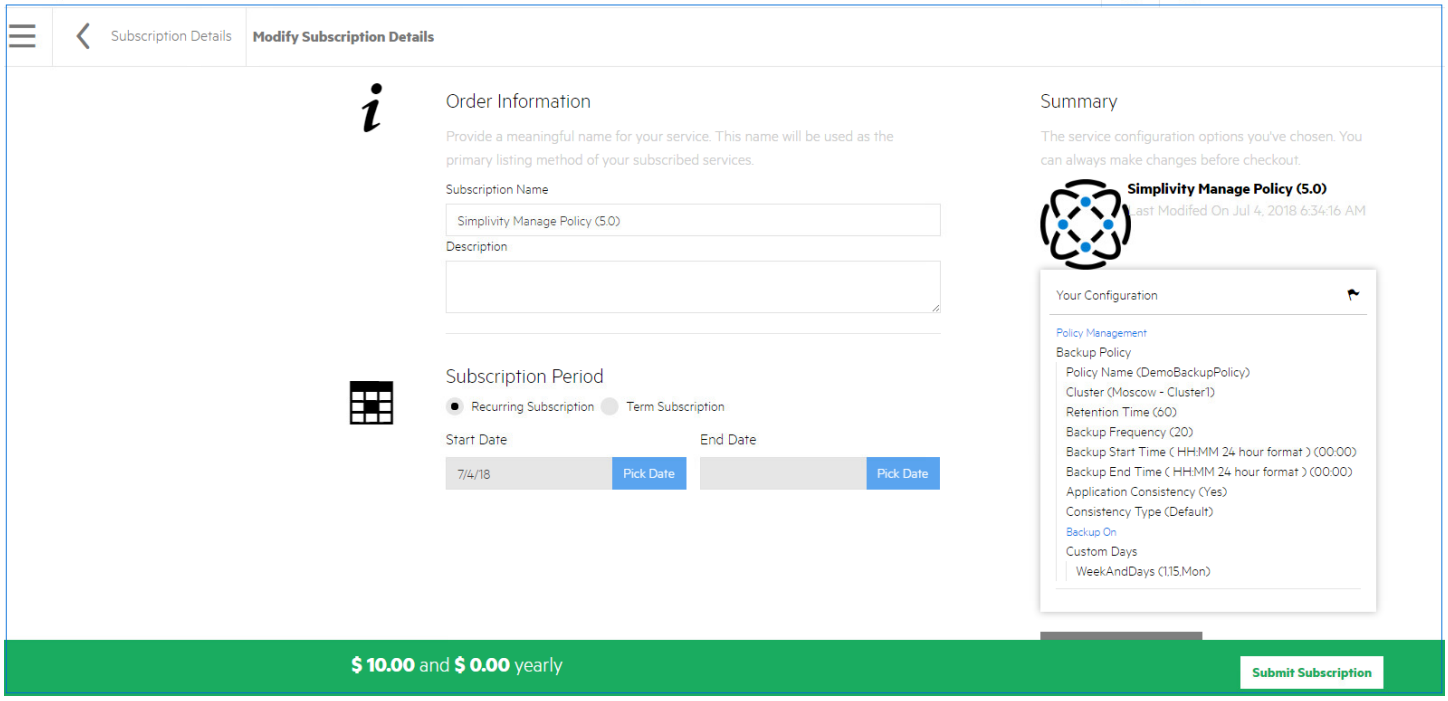


Figure 7: Update backup policy Submit Subscription



Note
With the integration plugin, SimpliVity Manage Datastore is an admin offering in MicroFocus HCM.

SimpliVity Manage VM

Manage VM service is available for both service administrator and service consumer users in MicroFocus HCM with the HPE Simplivity integration plugin. Service administrators or a service consumer user can subscribe to Simplivity Manage VM service. Refer MicroFocus documentation for more details on user roles (Hybrid Cloud Management roles section).

Figure 8: Catalog details

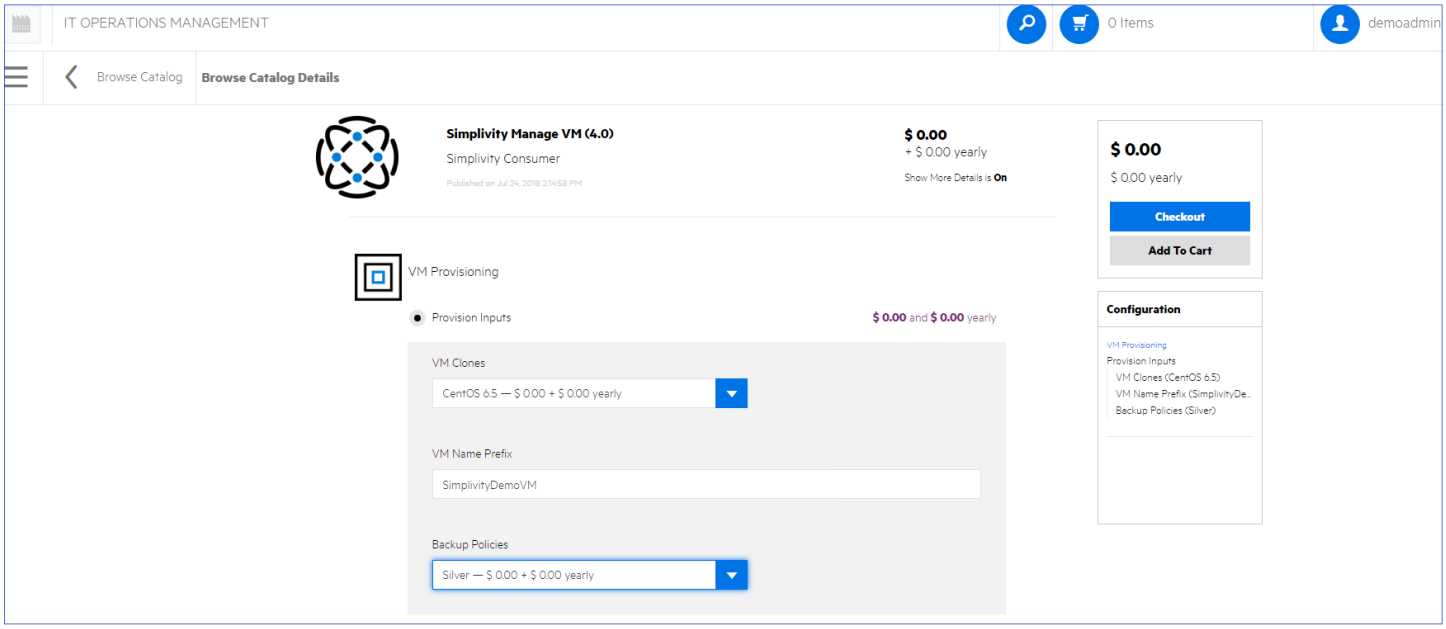


Figure 9: Service checkout

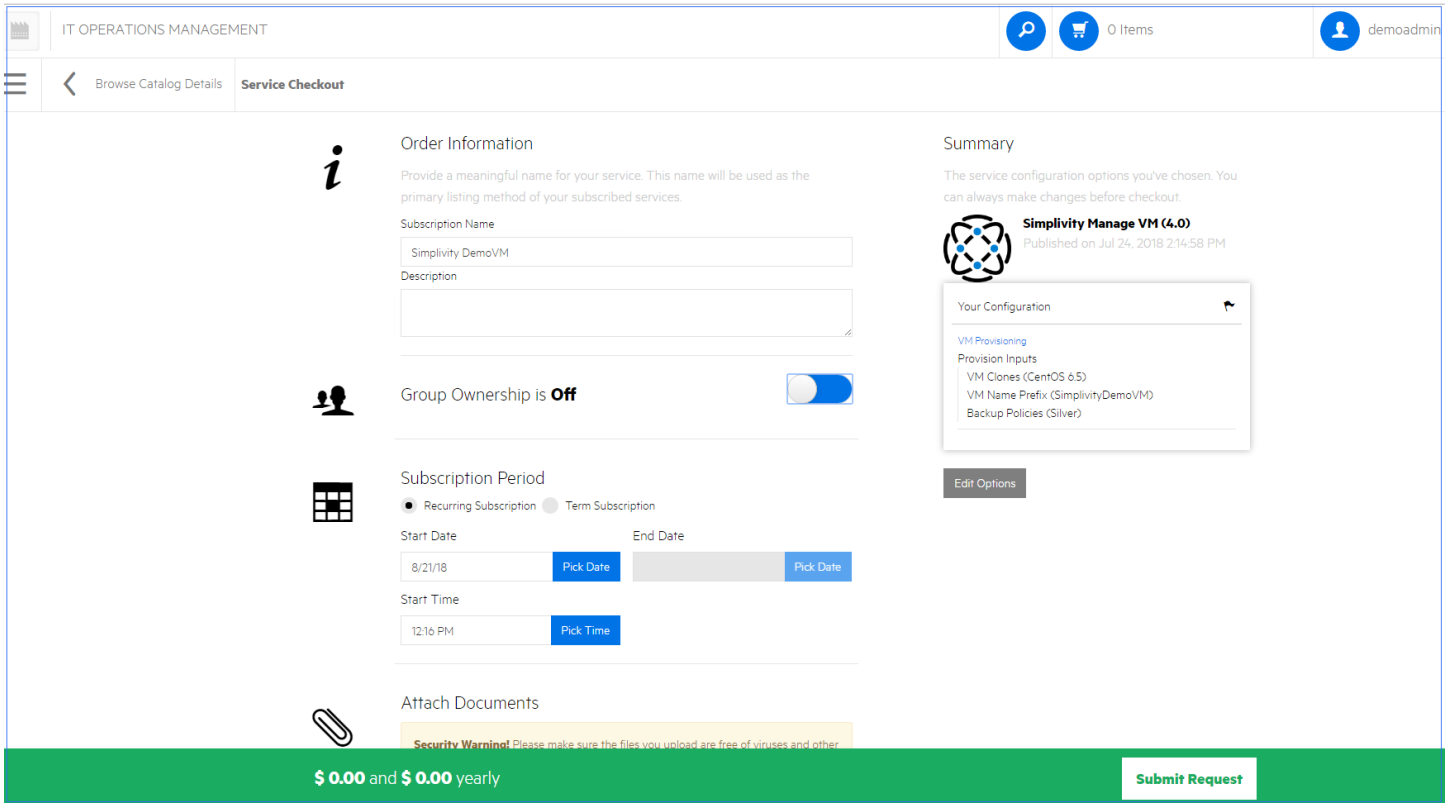
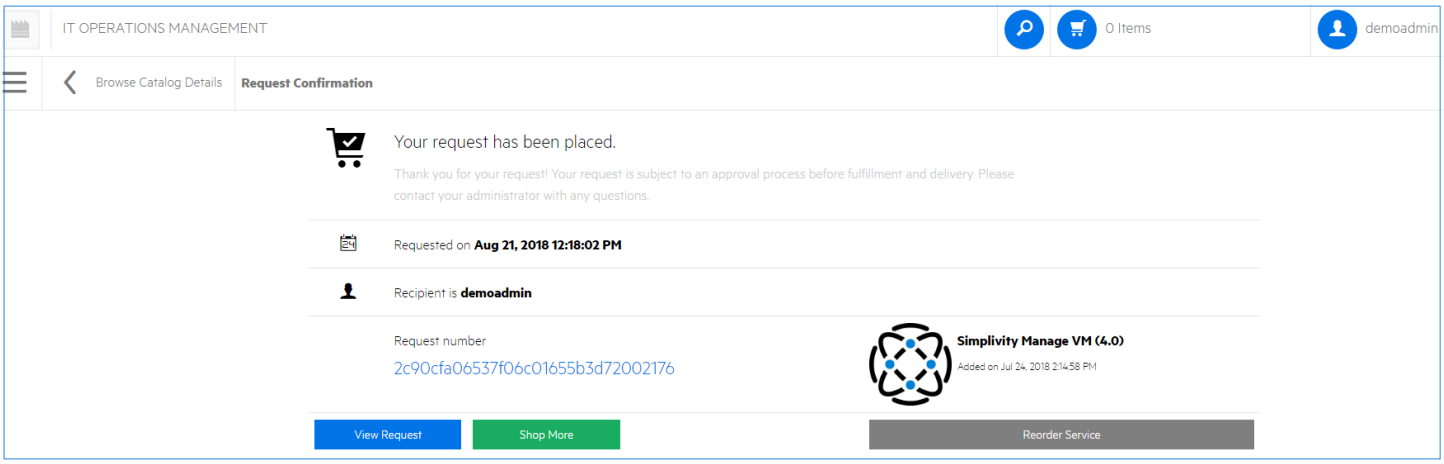
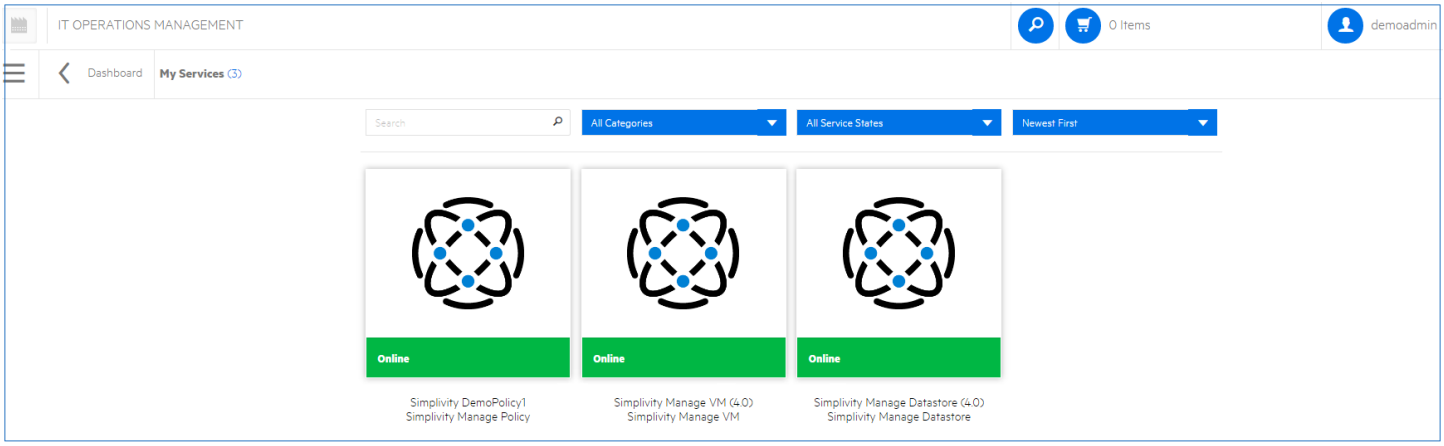


Figure 10: Request Confirmation



On successful completion of SimpliVity Manage VM service subscription and the service status becomes “Online” the VM is available for use.

Figure 11: VM availability screen



Simplivity Manage VM - Virtual Machine Lifecycle Operations

The life cycle operations like backup/restore VM, clone VM, Move VM, set backup policy to VM, start/stop VM and so on is available as VM life cycle operations which the user can exercise as required from the MicroFocus HCM dashboard.

Set backup policy on a virtual machine

The SimpliVity Set Backup Policy VM workflow sets the backup policy for a VM. A backup policy enables you to schedule VM backup operations and control the frequency and number of backups retained. Users can create on-demand backup at any time.

By default, each VM inherits the backup policy assigned to the datastore in which the VM resides. If you change the VM's backup policy to a different policy from the datastore default, any changes to the datastore default policy are ignored by the VM.

Note
You can assign only one backup policy to a VM. However, a backup policy can have multiple rules.

Figure 12: HPE SimpliVity Set Backup Policy VM

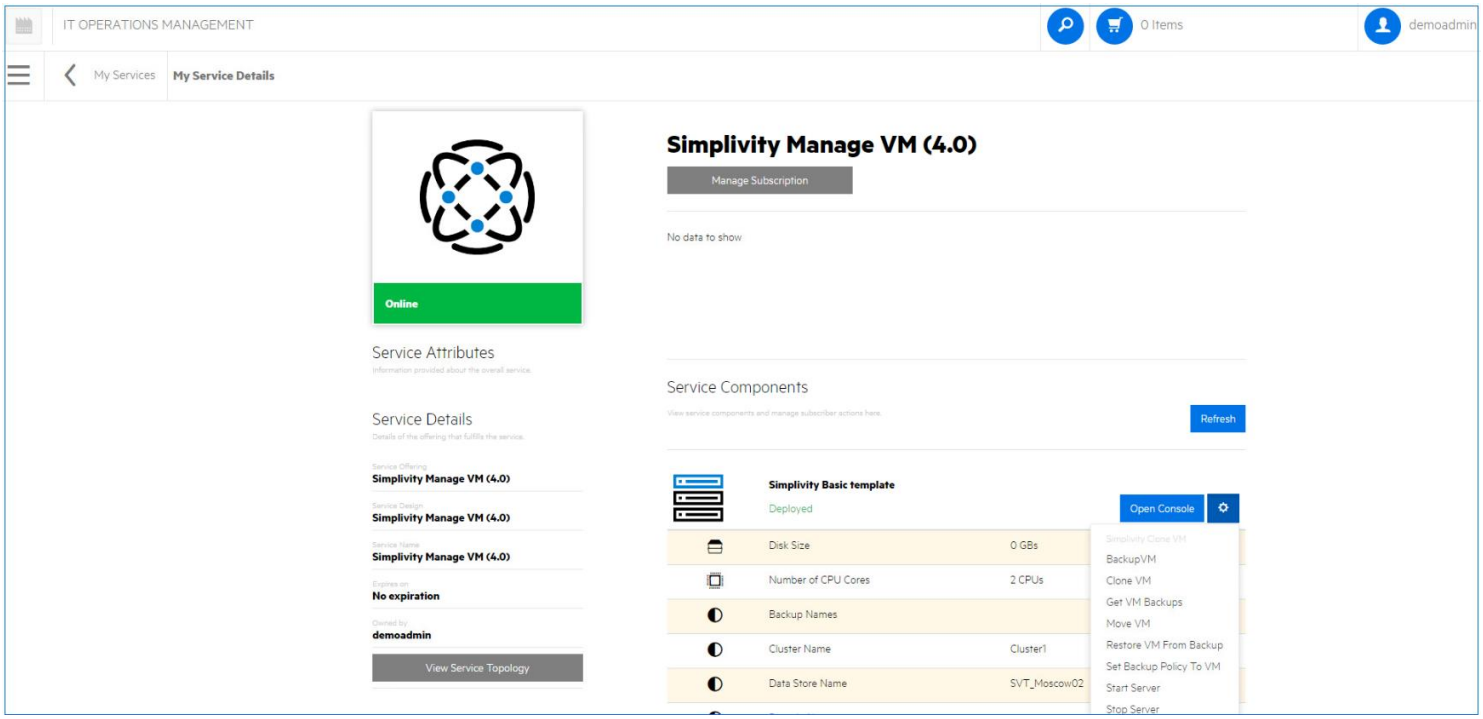
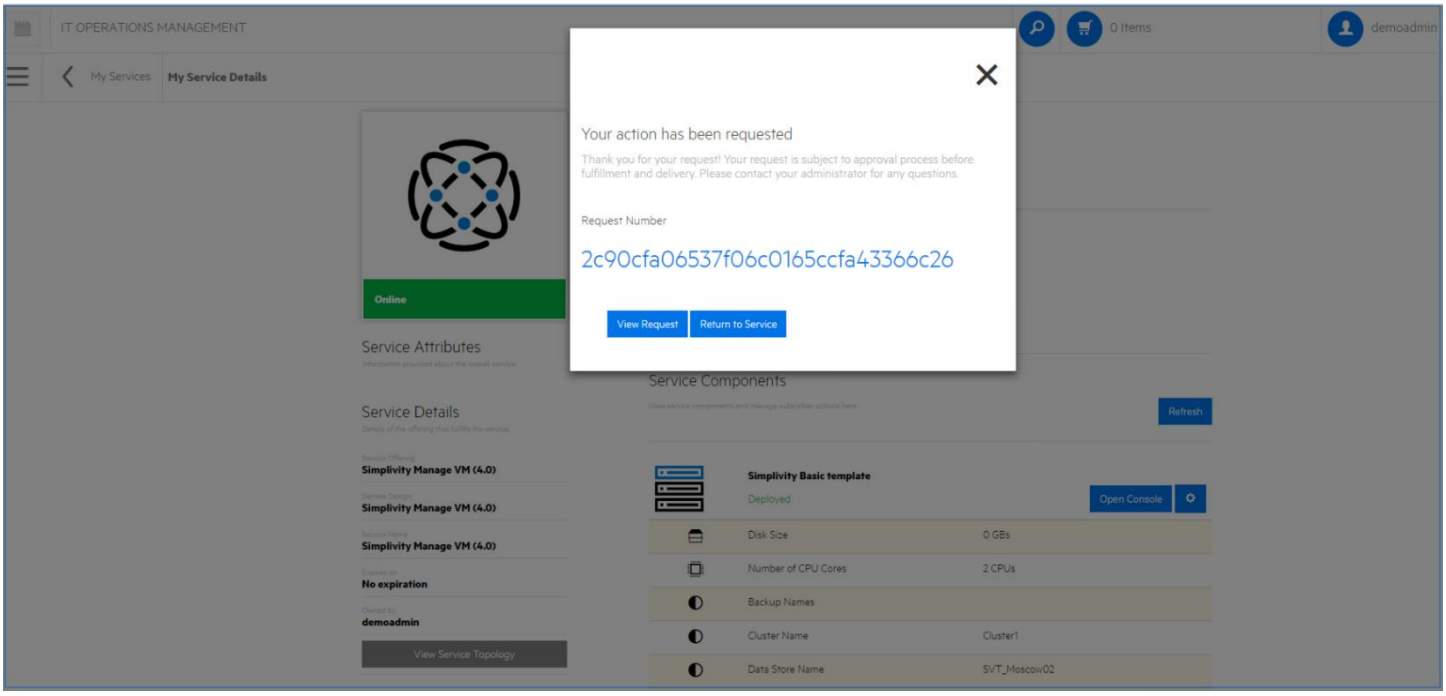


Figure 13: Set Virtual Machine Backup Policy



Backup a virtual machine

The **SimpliVity Backup VM** workflow creates a manual backup of a VM at the current time. A backup saves the state of the VM at the time the backup is created.

Unlike a policy backup, a manual backup is not deleted during the automatic cleanup performed by a backup policy. You must manually delete these backups to make sure that they do not consume excessive system resources.

The default operation is to take an instantaneous copy without using VMware operations. Manual backup options include:

- **Name**: By default, the command creates a unique name for the backup by appending a timestamp to the VM name. You can override the default by specifying a unique name for the backup.
- **Remote data center**: Specify a remote destination for the backup.
- **Consistency type**: Specify the consistency type of the backup instance. Acceptable values are default, none, and vss.
- **Application consistent:** Include a VMware application-consistent snapshot in the backup. This type of backup brings guest VM applications to a consistent state before taking a backup. Using application consistency increases the time required to complete a backup and you should not use it for guest VMs that have high I/O.
- **Retention:** Retain the backup, which never expires, unless you delete it or set a retention period and specify how long to retain the backup before deleting it automatically.

Note:
To back up VMs by using a regular schedule (for disaster protection), use a backup policy.

Figure 14: HPE SimpliVity backup VM

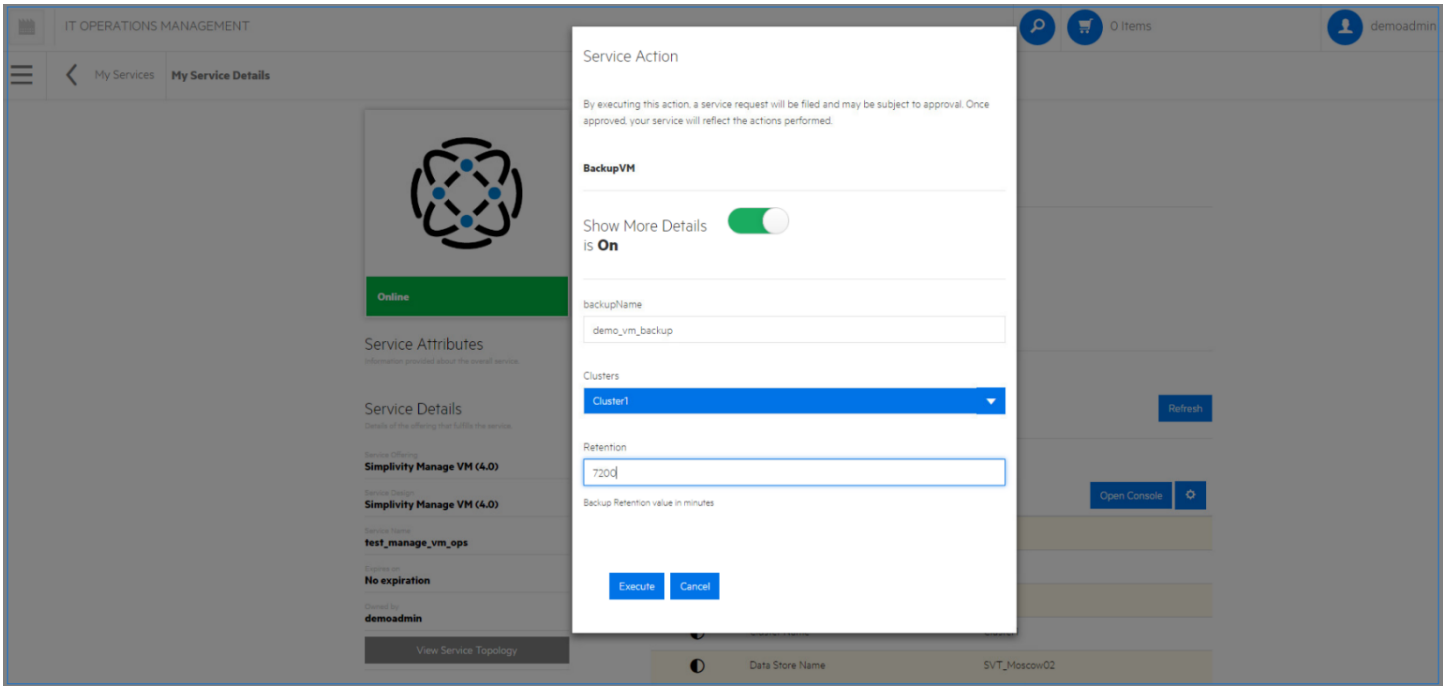
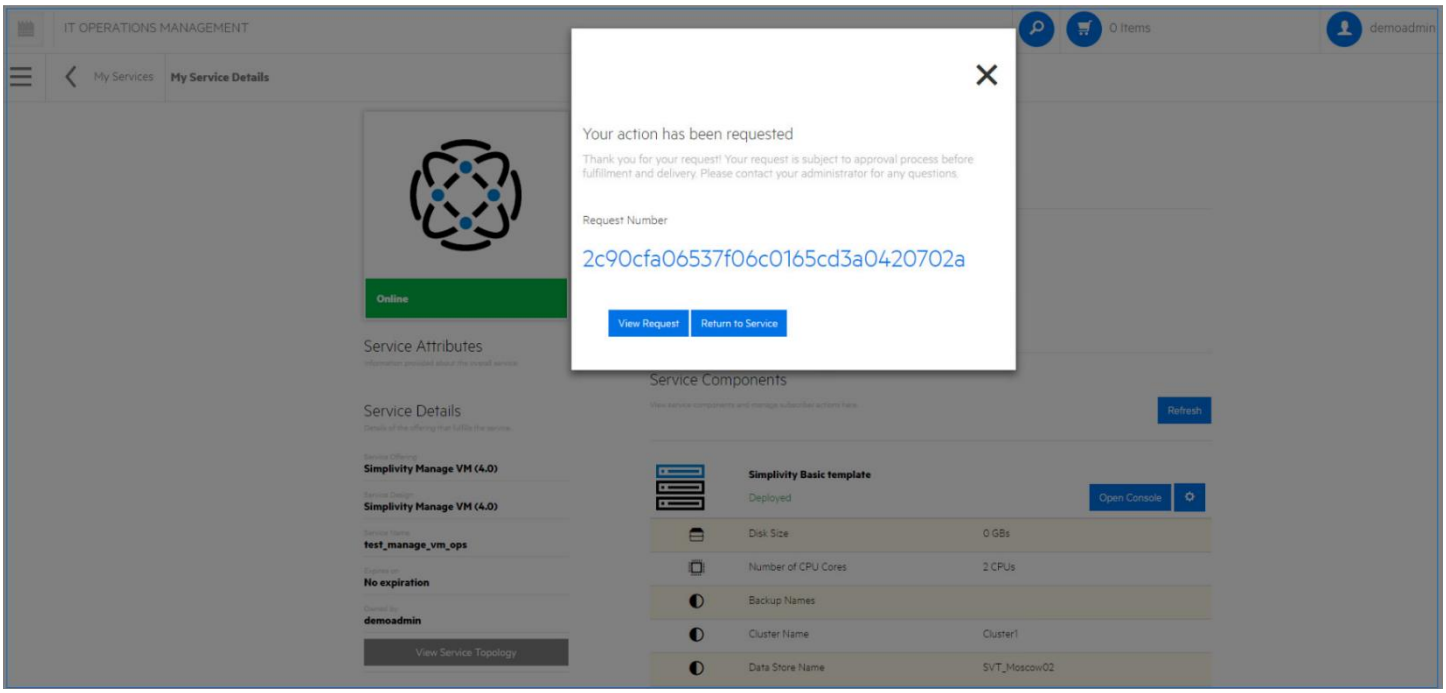


Figure 15: Backup virtual machine request



Restore a virtual machine

The SimpliVity Restore VM workflow restores the virtual machines from a backup. The backup still exists after the restore operation. Based on the input selection, this workflow replaces the contents of the existing virtual machine with the contents that existed at the time the backup was created, or creates a new virtual machine from the contents of the backup. There is an option to choose the datastore when a new VM is created from the backup.

If the restored VM was powered on at the time of the restore operation, it is powered off during the operation and is then powered on when the operation is complete.

Important
Restoring a VM deletes any data changes that have occurred since the creation of backup.

Figure 16: Restore virtual machine

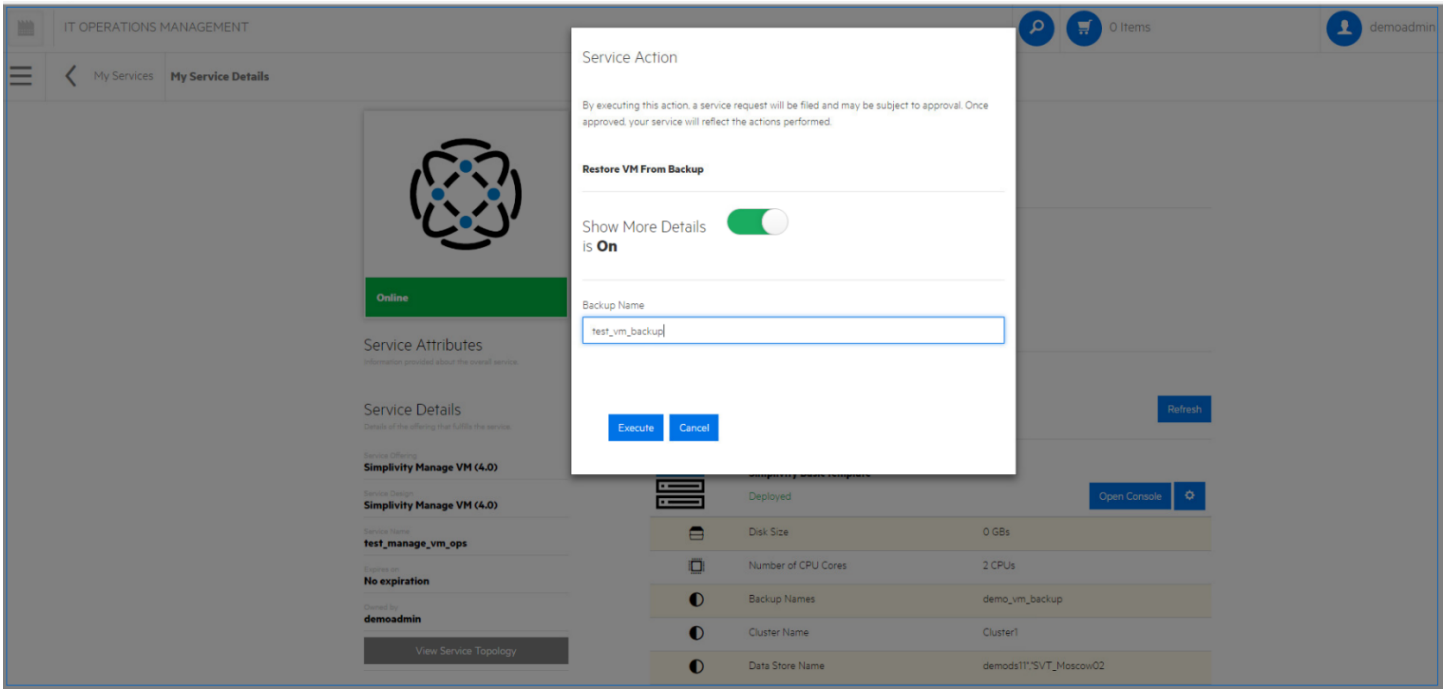
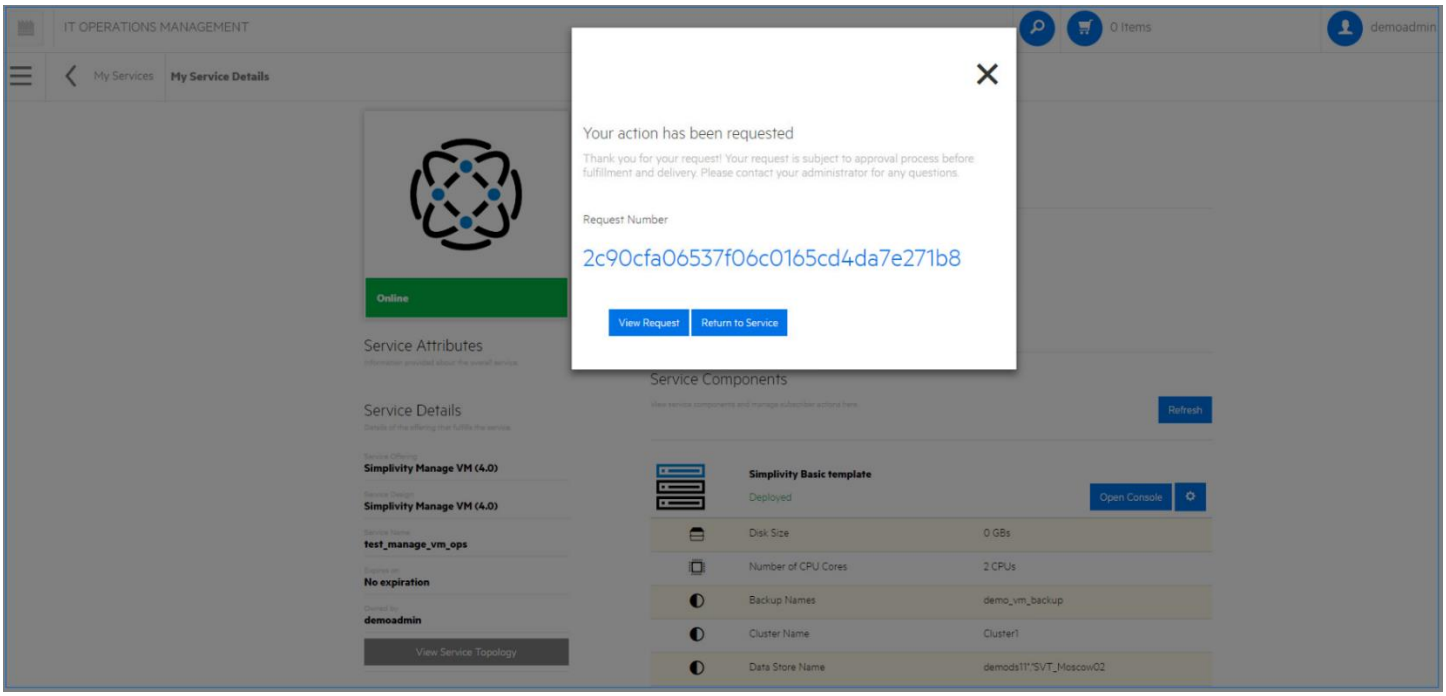


Figure 17: HPE SimpliVity Restore VM request submitted



Move a virtual machine

The **SimpliVity Move VM** workflow enables you to relocate a VM to a federation datastore in a different data center or a different datastore in the same data center.

Considerations when moving VMs are:

The virtual machine guest OS will be shut down and the VM powered off as part of the move operation. After moving a VM, set its boot sequence so that it powers on after the virtual controller during startup, and shuts down before the virtual controller during shutdown.

Any pre-move backups associated with the VM will show the VM as DELETED after the move is complete. You can recover the VM from these backups. If the VM is subject to policy backups, you cannot move a VM while a policy backup is in progress.

By default, the command uses the original VM name to name the moved VM. You can override the default by specifying a unique name for the moved VM. You can move a VM to and from a remote data center.

Figure 18: HPE SimpliVity Move VM

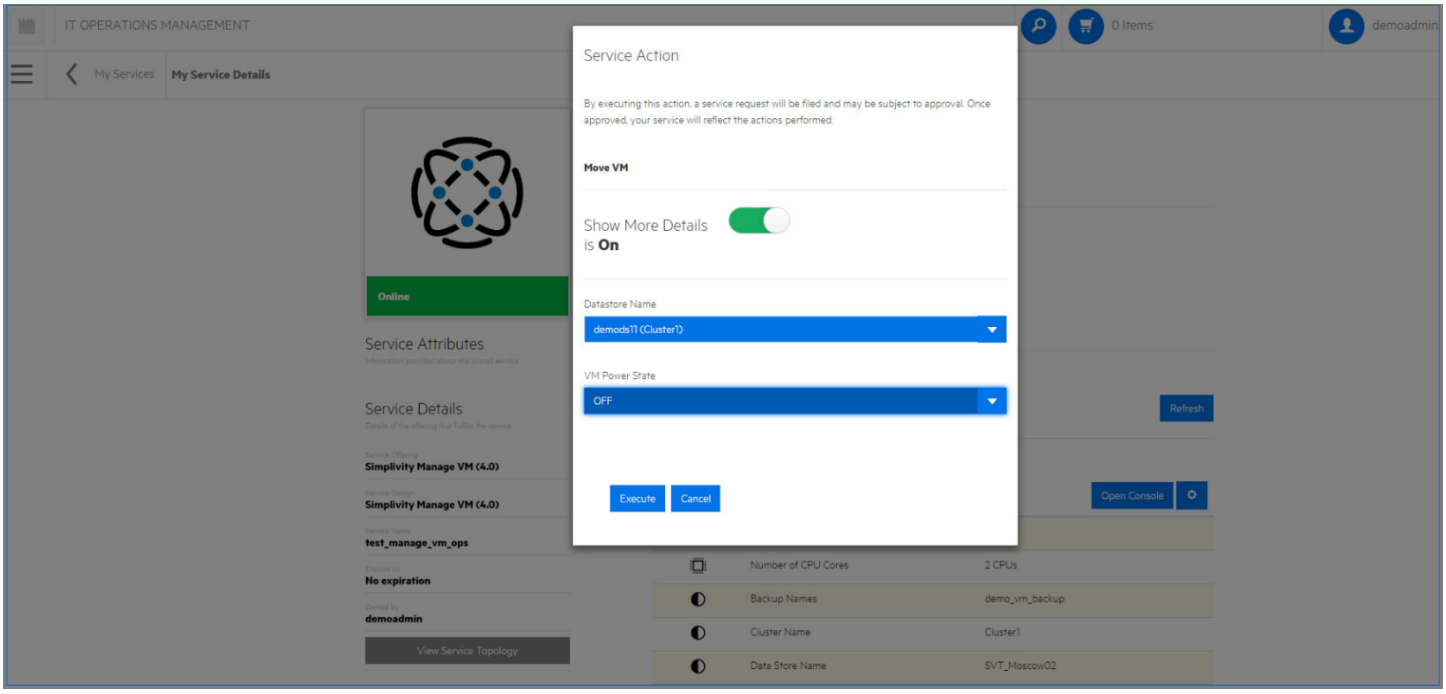
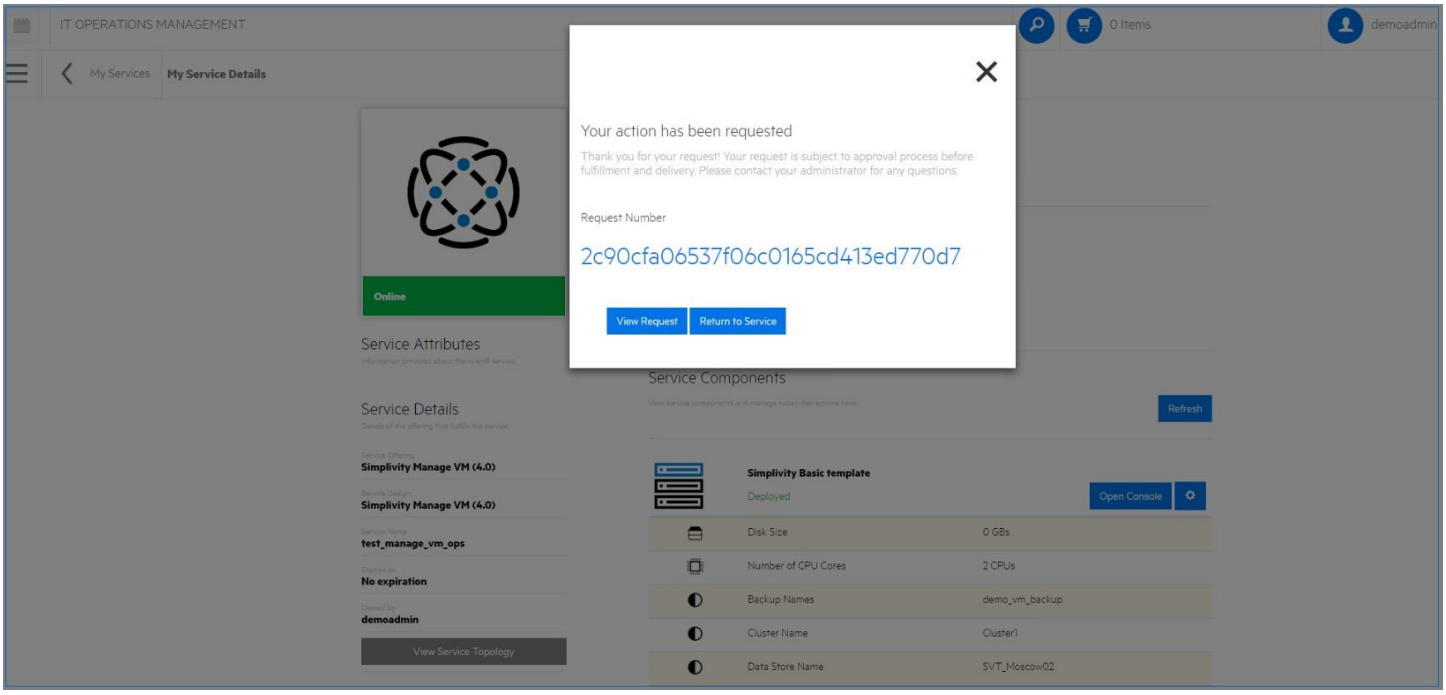


Figure 19: HPE SimpliVity Move VM request confirmation



Clone a virtual machine

The SimpliVity Clone VM workflow creates a new VM that contains the same contents of an existing VM. The new VM has a different name but resides in the same datastore as the original VM.

Characteristics of the cloned VM are:

Power status: The clone is powered off. Make sure you have sufficient CPU and memory resources before powering on the VM,

Backup: You can back up a cloned VM using a policy or a manual backup.

Figure 20: HPE SimpliVity Clone VM

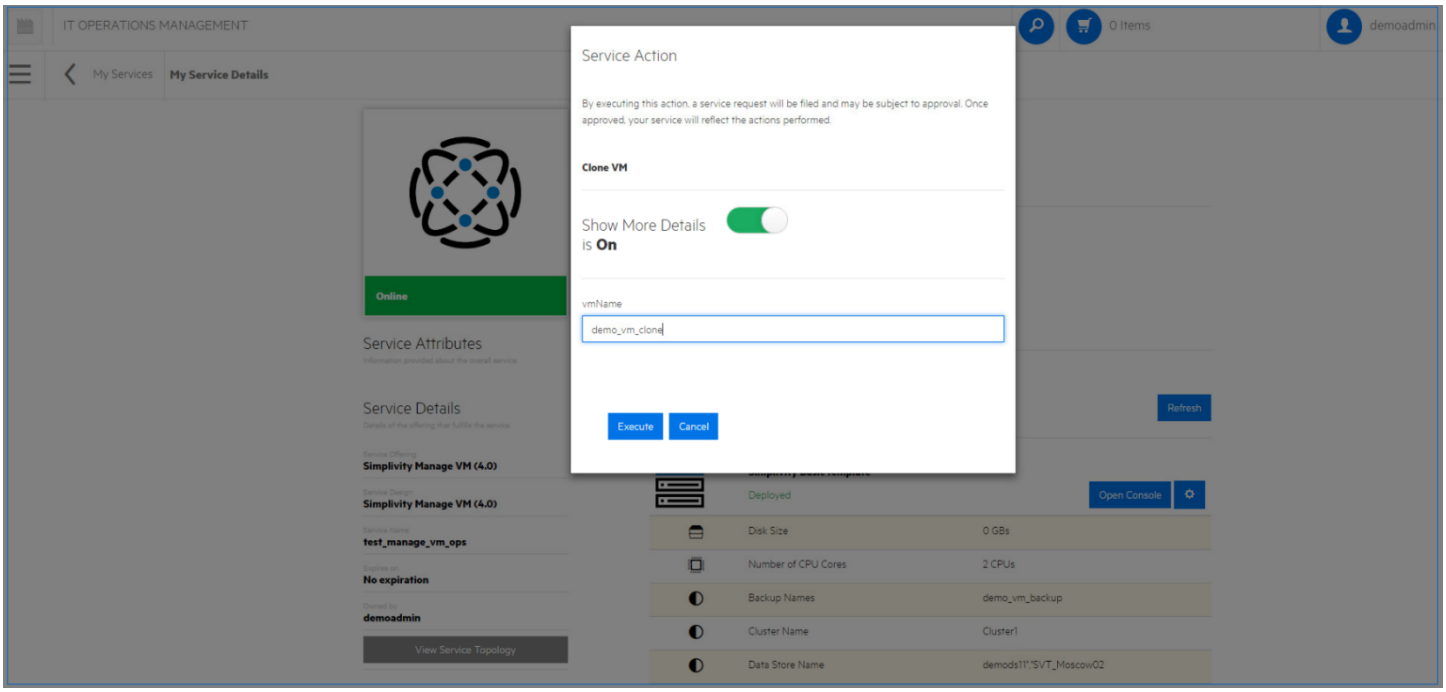
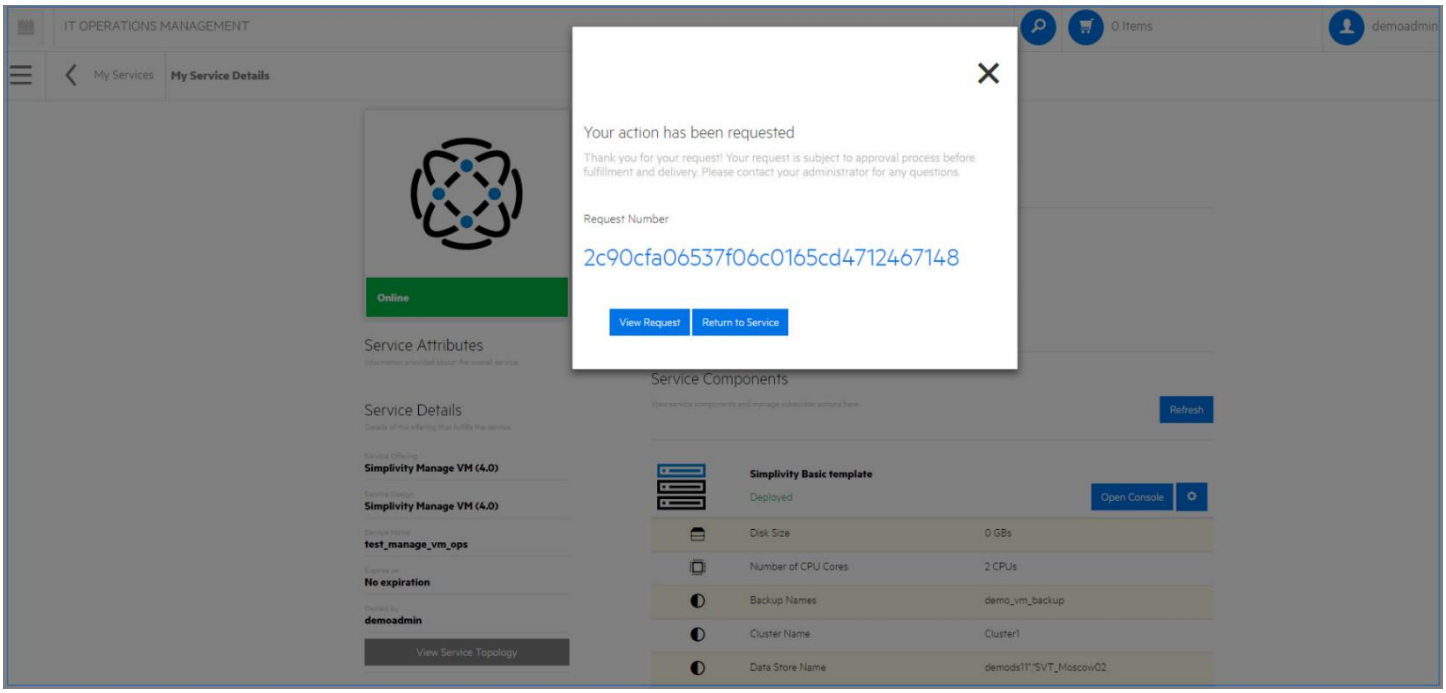


Figure 21: Clone Virtual Machine request submitted



Get VM backups

The **SimpliVity List VM Backups** size workflow will list the backup of a virtual machine along with its size. This workflow contains two input steps. VM is selected in the first step, which fetches the list of backups and its sizes associated with the VM and displays in a text box as prepopulated tabular format.

Figure 22: HPE SimpliVity List VM backups request

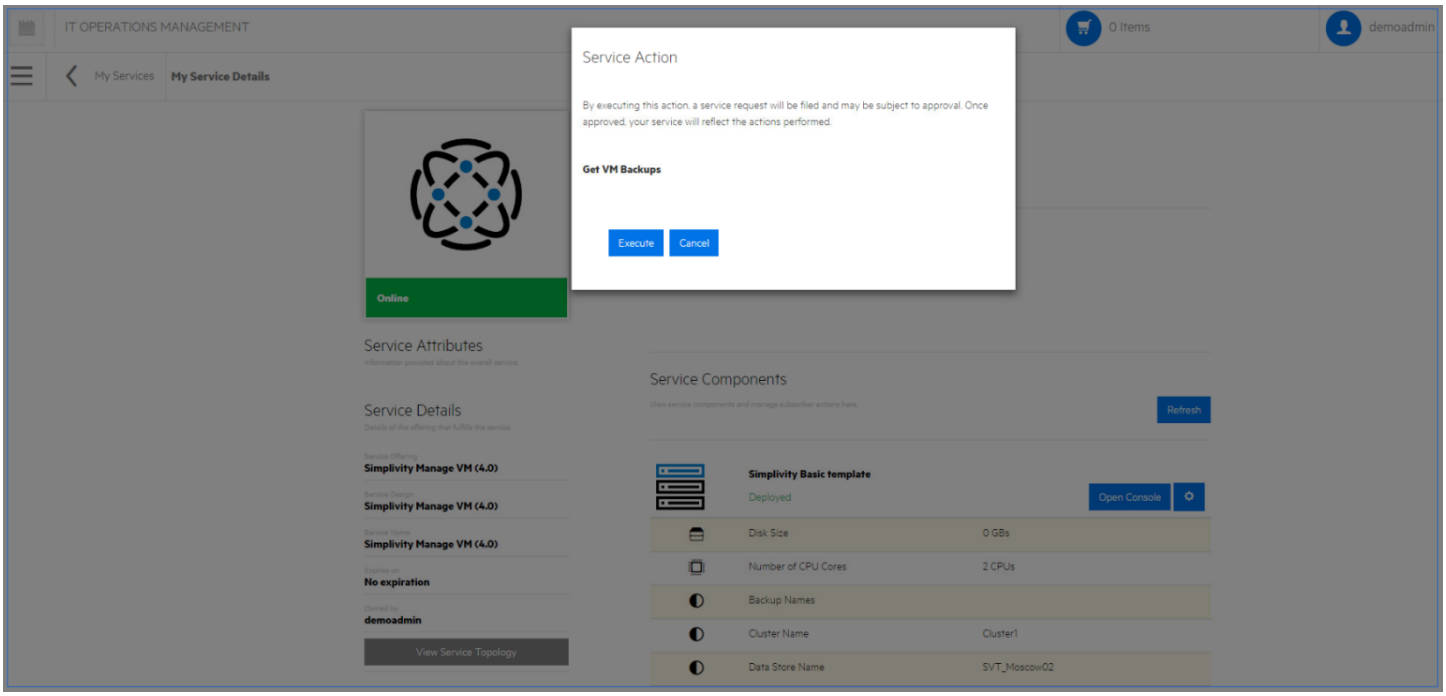
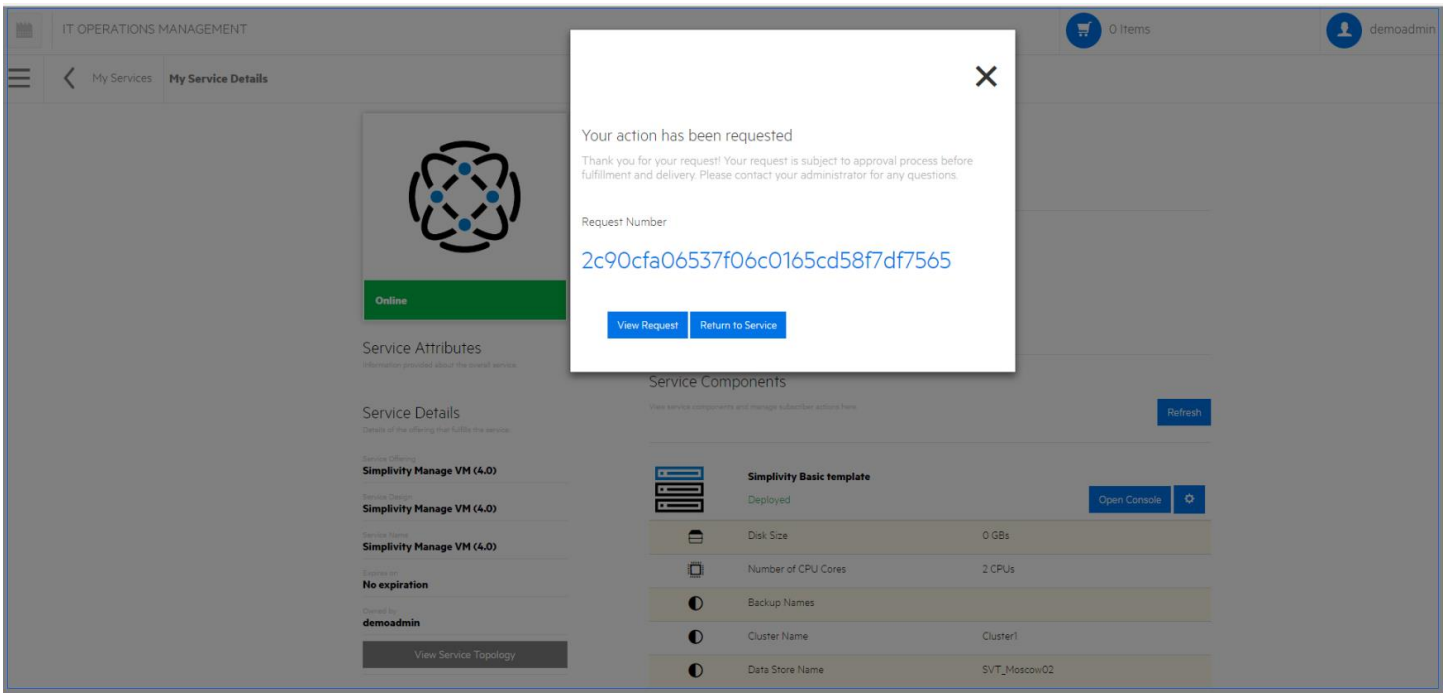


Figure 23: HPE SimpliVity List VM backups request submitted



Conclusion

The HPE SimpliVity is a complete hyperconverged platform in the market. It is uniquely designed to provide superior deployment in a private cloud. The integration plugin of this solution combines this powerful infrastructure platform with the self-service capabilities of MicroFocus HCM. HPE SimpliVity assimilates storage, compute, networking, hypervisor, real-time deduplication, compression, and optimization along with powerful data management, data mobility, data protection (storage HA, clones, and backup), and disaster recovery capabilities. With this integrated solution, customer can realize fast, time-to-cloud value, and increased IT efficiency as well as respond to market demands quickly and economically.

This document has shown real-world customer-based strategies for self-service private cloud design and deployment and provides designs that are unique to HPE SimpliVity Federations. Built into the HPE SimpliVity platform are the following breakthrough technologies that enable a superior design:

Hyperconvergence: A single shared resource pool abstracting applications and virtual machines from the underlying hardware across not just server, storage, and network but also backup, disaster recovery, WAN optimization, and cloud enablement.

Scale-out architecture: The ability to grow the infrastructure by adding building blocks to an existing deployment while the application remains online.

Data virtualization platform: Inline deduplication, compression, and optimization of all data at inception, once and forever across all stages of the data lifecycle.

Global federated architecture: Manage all resources globally from a single pane of glass, provide VM-centricity, and mobility to backup, restore, and move virtual resources—and their associated data—with a click of a button. There are no manual efforts of the past around LUNs, shares, volumes, disk groups, masking, mapping, or others.

Glossary

HPE SimpliVity Cluster	A collection of one or more HPE SimpliVity hyperconverged nodes typically located at the same physical site connected over a standard Ethernet network collectively providing a single storage pool to the hypervisor on each node. An HPE SimpliVity Cluster can also be extended across two physical sites, commonly known as a stretched cluster, over low latency metro networks for disaster recovery and business continuity
HPE SimpliVity Federation	A collection of one or more HPE SimpliVity Clusters and the main construct within which data is managed.
HPE SimpliVity OmniStack Virtual Controller (OVC)	The software stack, implemented as a single VM per node, which controls all aspects of HPE SimpliVity hyperconverged infrastructure.
Hybrid Cloud Management	self-service delivery for deploying, automating and managing multi-cloud environments.
MicroFocus HCM Suite	Micro Focus Hybrid Cloud Management (HCM) Suite is a DevOps-ready, multi-cloud management and orchestration software solution that drives cloud-service agility. With the HCM Suite, customers can manage a full spectrum of hybrid environments—across any infrastructure(bare metal, virtual machines, and containers), any cloud (private or public), and any workload (traditional, cloud-enabled, or cloud-native).

References/Additional links:

HPE Reference Architectures, hpe.com/info/ra

HPE Servers,

hpe.com/servers

HPE Networking, hpe.com/networking

Learn more at
hpe.com/info/ra

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