Google Cloud Backup and DR-Actifio GO Sky On-Premises Deployment Guide

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Google Cloud Backup and DR-Actifio GO Sky

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1 Requirements for Installing an Actifio Sky Appliance on VMware

The following sections provide the requirements for installing an Actifio Sky Appliance on a VMware server:

- vSphere Server Requirements on page 1
- Actifio Sky Appliance Memory Requirements on page 3
- Actifio Sky Appliance Storage Requirements on page 4
- Actifio Sky Appliance Networking Requirements on page 5
- Enabling Google Backup and DR Service consumption based billing for On-Premises Deployments on page 6
- Register with Google Cloud Backup and DR CBB on page 8

vSphere Server Requirements

An Actifio Sky Appliance must be installed on a vSphere server configured specifically for a Sky Appliance.

Ensure the vSphere host has **sufficient memory and CPUs/Cores reserved** to accommodate your Actifio Sky model. See Actifio Sky Appliance Memory Requirements on page 3 for details.

Do not share the Actifio Sky Appliance's resources with other VMs.

Sky Appliances on Licensed/Unlicensed vSphere Host

If an appliance is installed on an unlicensed (free) vSphere host, the Policy Templates for that Sky Appliance **CANNOT** capture other VMs and applications installed on that vSphere host.

If an appliance is installed on an unlicensed (free) vSphere host, the Policy Templates for that Sky Appliance **CAN** capture and access VMs and applications on licensed vSphere hosts and applications on physical servers.

If an appliance is installed on a licensed vSphere host, the Policy Templates for that Sky Appliance **CAN** capture VMs and applications on the vSphere host on which the Sky Appliance is installed. Policy Templates for that Sky Appliance can also capture VMs and applications on other licensed vSphere hosts and applications on physical servers.

vSphere Host Power Management Off

Power management can interfere with the operation of a Sky Appliance. Ensure that power management for the ESX host is set to **High Performance**.



vSphere NTP

Do not use VMware Tools periodic time synchronization for the Sky Appliance's VM. Use NTP instead.



Actifio Sky Appliance Memory Requirements

This table allows you to compare the requirements and capabilities of Sky models.

Requirement		Model	
	60ТВ	120TB	200TB
CPUs required. ^a	4	6	8
CPUs required for encryption at rest. ^a	6	8	10
Minimum Reserved Memory	16GiB	32GiB	48GiB
Minimum Disk Space for Primary Pool ^b		200GiB	
Minimum Disk Space for Snapshot Pool		10GiB	
Required Disk Space for Dedup Pool		100GiB	
Maximum VDisks		10,000	

- a. Minimum 2 GHz per CPU. The CPUs **must be reserved** and the balloon driver must be turned off. Any paging or swapping will cause significant performance impact and in some cases result in the appliance deadlocking.
- b. See Actifio Sky Appliance Storage Requirements on page 4. Must be Thick Provision Eager Zeroed.

Actifio Sky Appliance Storage Requirements

The Sky Appliance uses three storage pools: Primary Pool, Snapshot Pool, and the Dedup Pool. Each pool **MUST:**

- Reside on a separate RAID-6 array that supports at least 100 IOPS per disk.
- Use 7200 RPM disks, 10,000 RPM disks are preferred.
- Have a performance profile of 35 random reads per second per TB with 64KB read size or 10 random writes per second per TB with 64 KB write size.

Note: Run the IOPerf tool prior to Sky Appliance installation to ensure adequate performance. ActifioNOW contains documentation on how to run IOP.

Use Thick Provision Eager Zero disks.

Note: Using thin provisioned disks can result in data loss.

To size a Sky Appliance, you must consider the amount of data to be captured, its type, change rate, growth, and how long it will be retained. These variables and others are considered in the VDP solution sizing tool.

The sizing tool will recommend how to allocate space for at least three **Thick Provisioned Eager Zero** disks:

- **Primary Pool:** One 200 GiB disk used by the Actifio Sky Appliance.
- **Snapshot Pool:** Accommodates the full copies (snapshots) to be retained, plus enough space for future growth. A minimum of 10 GiB is required. You can add additional disks in vSphere to accommodate growth. The Snapshot Pool requires its own SCSI controller set to VMware Paravirtual. See Adding SCSI Controllers on page 18 for details.
- Dedup Pool: A minimum of 100 GiB is required. You can add additional disks in vSphere to accommodate growth.

Note: Do not resize disks for Snapshot Pools. If additional storage is needed, add disks.

When creating disks, ensure that the **Mode** is set to **Independent** and **Persistent**.

Actifio Sky Appliance Networking Requirements

Sky Appliances require the following network settings:

- Static IPs: You must provide static IPs for all NICs on Sky Appliances.
- **VMXNET3**: Sky Appliance models 30, 50, 120, and 200 must use the VMXNET3 Ethernet adapter. These adapters enable 10GB performance.
- Adding NICs: By default, the Sky Appliance comes with a single NIC. To add additional NICs, see Adding and Configuring Additional Network Interfaces on page 27.

Actifio Sky Network Protocol support

Actifio Sky supports storage presentation (as part of backup/recovery and mount operations) over iSCSI or NFS. The configuration requirements for each of these protocols is detailed below

- **NFS**: As long as you have a network connection from both the Sky Appliance and the vSphere host that the VM resides on, all backups and mounts using NFS will proceed normally. You can use NFS over your network without configuring iSCSI.
- **iSCSI**: The Sky Appliance uses iSCSI to mount data. Ensure that iSCSI is turned on for the Sky Appliance's vSphere host, and for the servers that host the data the Sky Appliance will capture and manage.

When capturing an entire vSphere VM, iSCSI does not need to be configured on the vSphere host that hosts the VM to be captured. Once the VM has been captured, to present the VM to another vSphere host, including the vSphere host from which it was captured, the vSphere host must have iSCSI configured.

When capturing individual applications on a VM, rather than capturing the entire VM, iSCSI must be configured on the VM's vSphere host.

The Snapshot pool and the Dedup pool must each have their own SCSI controller set to VMware Paravirtual.

Enabling Google Backup and DR Service consumption based billing for On-Premises Deployments

This page explains how to enable Google Backup and DR Service consumption based billing (CBB).

Note: To migrate to Google Cloud Backup and DR Service CBB, log a support case in the Google cloud support portal. Customer support can assist you for setting up CBB.

Prerequisites

The following are the prerequisites that must be met before enabling Google Backup and DR Service CBB.

- Update the AGM and Sky appliances
- Create a service account
- Create a service account key
- Generate a one time password
- Allow Backup and DR domains

Update the AGM and Sky appliances

Before enabling the CBB, ensure that the AGM is on **10.0.5.6820** and Sky appliances is on **10.0.5.7250** or later versions and you have subscribed to Google Cloud Backup and DR Service.

If you intend to protect only on-prem workload and not cloud workloads, **stop** the backup/recovery appliance with the instruction.s listed in the Stop a VM section.

Create a service account

A service account is a special kind of account used by an application or compute workload, such as a Compute Engine virtual machine (VM) instance, rather than a person. A service account is identified by its email address, which is unique to the account.

Use the following instructions to create a service account.

- 1. In the Google Cloud console, go to the **Create service account** page.
- 2. Select a Cloud project.
- 3. Enter a service account name to display in the Google Cloud console. The Google Cloud console generates a service account ID based on this name. Edit the ID if necessary. You cannot change the ID later.
- 4. Optional: Enter a description of the service account.
- 5. If you don't want to set access controls now, click **Done** to finish creating the service account. To set access controls now, click **Create and continue** and continue to the next step.
- 6. Assign the role Backup and DR On-Prem Metrics Agent to the service account. You can find the correct role by typing "Backup and DR" and then selecting the role when it appears.



- 7. When you're done adding roles, click **Continue**.
- 8. Click **Done** to finish creating the service account.

Create a service account key

To use a service account from outside of Google Cloud, such as on-premises, you must first establish the identity of the service account. Public/private key pairs provide a secure way of accomplishing this goal. When you create a service account key, the public portion is stored on Google Cloud, while the private portion is available only to you. Refer to the instructions in the Create a service account key to download the service account keys.

Note: Do **not** set any expiration time for your service account key. The on-premises AGM will not be able to upload the data after the expiry time and it requires re-registration with the key. See instructions.

Generate a one time password

After deploying the management console, you need to generate the one time password (OTP) to provide the authentication for your management console to register CBB. The generated OTP is valid only for 30 minutes. To generate the OTP, users must be assigned with the Backup and DR admin role.

Copy and paste the following URL in your browser:

https://bmc-<xxx>.backupdr.googleusercontent.com/onprem/admin/onboard/generateOTP

Then replace <xxx> with the URL of the Backup and DR Service management console,

So the URL to generate the OTP should look like this:

https://bmc-123.45.67.89-us-central1.backupdr.googleusercontent.com/onprem/admin/onboard/generateOTP

The output renders as follows: {"otp" : "563f3724b75fc1922bdd93"}

An OTP is generated; enter this OTP in the Register with Google Cloud Backup and DR CBB screen.

Allow Backup and DR domains

Consumption billing for Backup and DR Service requires AGM to periodically communicate usage information to the management console. In order to enable this, ensure that AGM can communicate over port 443 to the following domains:

- backupdr.googleapis.com
- backupdr.googleusercontent.com
- backupdr.actifiogo.com
- oauth2.googleapis.com

Note: If the backupdr.actifiogo.com domain doesn't work, try allowlisting the whole URL.

Register with Google Cloud Backup and DR CBB

Use these instructions to register with Google Backup and DR after meeting all the prerequisites.

- 1. In the AGM, go to Manage and select Billing.
- 2. Click **Register for Backup and DR CBB**. The consumption based billing registration form is displayed as below.

ctifio	Dashboard	Backup & Recover +	Test Data Management +	App Manager +	SLA Architect -	Manage -	Report	Monitor -
onsumptio	n Based Bi	lling - Registra	tion Form					
n the following fi	elds to register for a	consumption based billing						
Service Accourt	nt Key JSON *	Browse my-project	3673d1f8439ajson					
Project ID *		my-project						
Management 0	Console Location *	us-central1						
OTP *		563/3724b75fc1922bdd	93					
Note: As part of reg	potratian process, a semp	le file will be splitaded to confirm	activation of consumption based billing					
						Register		

- 3. In the **Service Account Key JSON** field, click Browse and upload the JSON key that is downloaded in the Create a service account key section.
- 4. Enter the **Project ID** that you created in the Google Cloud console for the CBB.
- 5. Enter the Management Console Location that you have deployed in the Google Cloud Backup and DR Service.
- 6. Enter the **OTP** that is generated in the Generate a one time password section.
- 7. Click **Register**. After the registration is successfully added, a success dialog displays.
- 8. Click Okay.

The Consumption Based Billing Configuration page shows billing registered details such as Project ID, status, management console URL, location of the deployed management console, and timestamp of the last uploaded data, along with troubleshooting tips.

The consumption billing troubleshooting helps to:

- o Re-register either to the same or a different management console.
- o Test the configuration between AGM and Backup and DR billing service. Messages are displayed based on the status of the configuration Success or Error.

Note: After registering with Google Cloud Backup and DR CBB, the timestamp is displayed as N/A. Initially, it takes 5 minutes to upload the data from on-premises AGM to the Backup and DR billing service and reflect the uploaded timestamp.

2 Actifio Appliance VMware vSAN Requirements

If the Actifio Sky Appliance will use VMware's vSAN storage, then you must consider the VMware vSAN storage policy used when you deploy the Sky Appliance OVA. The best practice is to use the vSAN Default Storage Policy.

VMware provides detailed step-by-step instructions on how to create and modify VMware vSAN storage polices.

1. From a vSAN data center's top bar drop down menu, select Policies and Profiles:



2. From VM Storage Policies, either create a new policy or select and edit an existing policy:



3. The vSAN policy sets the rules for fault tolerance (Primary level of failures to tolerate). You must consider how the fault tolerance settings will impact storage.

A policy with a Primary level of failures to tolerate set to 1 or more will allow the Sky Appliance fault tolerant operations across the ESX cluster. Setting the value of Primary level of failures to tolerate to a value of "n" will increase the storage requirements "n" times. For example, if a policy has 100 GB of storage and a level of 1, then it will require 200 GB of storage.

From the policy editor, set Primary level of failures to tolerate to the required level. Pay attention to how your setting impacts storage.

Contractor	1000	12 station from the second state	All Contant			
Navigator		12 Yann belaun storage Poncy	VSAN Default Storage Polic	y: Edit VM Storage Policy		0
VSAN Detault Storage Policy Vortual Machines		Getting Started Summary Monitor P	Name and description	Rule-set 1 Select a storage type to place the VM and a are placed on datastores from the selected	dd rules for data services provided by data: I storage type. Adding tags to the rule-set w	stores. The rule-set will be applied when VMs
W Templates in Felders		List several data services in the WH stor policy to define storage requirements to unaut disks and configuration lise of a matchine. Cick Edit VM Storage Policy to modify the of data services for a WE storage policy.	Storage compatibility	Placement Storage Type: Primary level of failuries to tolerate Mumber of disk stripes per object Force provisioning Object space reservation (%) Flash read cache reservation (%) Flash read cache reservation (%)	VSAN *	Storage Consumption Model A virtual disk with size 100 GB would consume: Storage space 000 GB Missay reserved storage space 000 B Reserved fish space 000 B
						OK Cancel

- 4. Make other settings as needed.
- 5. Click **OK** and the policy is complete.

3 Deploying the Actifio Sky Appliance OVA

This chapter provides instructions for deploying and configuring the Sky Appliance Open Virtual Appliance (OVA) using the best practices detailed in Chapter 1, Requirements for Installing an Actifio Sky Appliance on VMware.

Deploying the Sky Appliance OVA on page 12 Configuring CPUs and Memory on page 14 Adding SCSI Controllers on page 18 Adding Disks on page 19 Adding Network Interfaces on page 20 Turning the Balloon Driver Off on page 21

Note: At this point the VM must be powered down. Later on, you will power on the VM.

Downloading the OVA

Before you can install a Sky appliance, you must download the OVA file from the portal. To download the OVA, open the dashboard and click **Download Sky OVA**.

actifiogo	Hybrid Mode	Dashfarain Manitor Need Help? • bodab+131gsgoogle.com •
Looking to backup workloa	ids running in GCP? Please check	cout Google Cloud's Backup and DR service
Using Actific GO for on-pre	emises workloads.	
Actifio GO requires a dedic backups of on-premises we	ated management server for on-p orkloads.	remise workloads. Google managed AGM does not support managing
OVA files can be download	ed using the link below.	
Download AGM OVA	ownload AGM mdS	
Download SKY OVA	ownload SKY mdS	
Please refer to the AGM, S	KY deployment guide to understa	nd the next steps that need to be taken after downloading OVA files.
In case you encounter any include your ActifioGO use	issues while downloading OVA fi r name and your company name	les, please send an email to Actifio60-cs@google.com. Request you to please in the email.

Deploying the Sky Appliance OVA

Once you have obtained a copy of the Sky Appliance OVA:

- 1. From the vSphere web client, select the host for the Sky Appliance VM.
- 2. From the vSphere web client's Actions drop-down menu, select Deploy OVF Template.

Navigator	Ŧ	7 172.17.75.6	🙆 Actions 🗸 📃 🔫 🍞	Work In Progress
 ✓ Back ✓ Back ✓ Coventer65.sqa.actflo.com ✓ Arun ✓ 172.16.11.8 ✓ 172.16.121.30 ✓ 172.16.121.32 ✓ 172.16.121.40 ✓ 172.172.65 		G., Su., M., C., Pe., V., What is a Host? A host is a computer that uses withuitable software, such as ESX and ESX, to run wir machines. Hosts provide the CPU and memory resources that wirtual machines u and give wirtual machines access to storary and network connectivity.	Actions - 172.17.75.6 New Virtual Machine New VApp New Resource Pool Opely OVF Template Connection Maintenance Mode Power Certificates	1 - Edit S.

- 3. Browse to the OVA file.
- 4. Complete the deployment like any other OVF template including:
 - o Enter a name for the Sky Appliance.
 - o Select the cluster/host to store the Sky Appliance.

1 Select template 2 Select name and location	Select storage Select location to store the	files for the deployed template			
3 Select a resource	Select virtual disk format:	Thick provision eager zeroed			
4 Review details	VM storage policy:	vSAN Default Storage Policy	•		
5 Select storage	Show datastores from	Storage DRS clusters			
6 Select networks	Filter				
7 Customize template					
8 Ready to complete	Datastores Datastore	Clusters			
			(9 📡 📑 (q Fil	iter .
	Name	1 A Status	VM storage policy	Capacity	Free
	 Image: Second state Image: Second state<	Normal	VM Encryption P	14.55 TB	9.74 TB
	4				

- 5. When selecting storage: Select *Thick provisioned eager zero* and ensure that the storage selected has enough room to accommodate the 130 GB OS Volume.
- 6. If the Sky Appliance uses VMware vSAN (recommended), then select the vSAN policy created for the appliance's fault tolerance requirements. See Actific Appliance VMware vSAN Requirements on page 9 for details.
- 7. Select the network for the management interface. For appliances that require multiple networks, you will add those networks after the Sky Appliance is completely installed.
- 8. For network settings, enter a static IP, Gateway, DNS, and Netmask. DO NOT use DHCP.
- 9. Click **Next** and review your settings:

vmware vSphere Web	Client f i≘	U Administrator@VSPHERE.LOCAL + Help + Q Search
Navigator	¥ 🖪	172.17.75.6 🛛 😹 🕞 🕞 🔯 🦓 Actions 👻 🗮 💌 Work In Progress
A Rack	6	Come Marco Come Marco Come Marco Cover Template
OPPLOY OVF Template	_	3 >>
 1 Select template 2 Select name and location 	Ready to complete Review configuration data.	
✓ 3 Select a resource	Name	Sky8.0.0-1576
✓ 4 Review details	Source VM name	Sky8.0.0-1576
✓ 5 Select storage	Download size	4.2 GB
✓ 6 Select networks	Size on disk	130.0 GB
✓ 7 Customize template	Folder	Discovered virtual machine
8 Ready to complete	Resource	172.17.75.6
	 Storage mapping 	1
	 Network mapping 	1
	 IP allocation settings 	IPv4, Static - Manual
	Properties	DNS = 172.16.1.10 Default Gateway = 172.16.1.1 Network 1 P Address = 172.16.216.33 Network 1 Netmask = 255.255.55.0
		Back Next Finish Cancel
AWS-SMS-Connector		

You can use the Back button to go back and make changes.

10. Click **Finish** and your Sky Appliance VM will be deployed.

Configuring CPUs and Memory

Once the VM has been deployed, reserve and configure its CPUs and memory according to your license requirements. See Actifio Sky Appliance Memory Requirements on page 3 for details.

- Configuring Memory Reservation
- Configuring CPU Reservation
- Configuring CPU Cores Per Socket

Configuring Memory Reservation

1. Select the Actifio Sky VM.

lavigator	Ŧ	🚯 Sky8.0.0DocTest 🛛 💕 🕞 📕	Actions → =▼	📝 Work In Progress
Back ▶ Image: Sky-75-100-vcenter Image: Sky-75-100-vcenter Image: Sky-75-110-vcenter Image: Sky-75-115-KlaskFu Image: Sky-75-115-KlaskFu Image: Sky-75-15-KlaskFu	•	Getti Sum Monitor Confl Perm What is a Virtual Machine? A virtual machine is a software computer that, like a physical computer, runs an operating system and applications. An operating system stalled on a virtual machine is called a guest operating system. Because every virtual machine is an isolated computing environment, you can use virtual machines as desikop or workstation environments, as testing environments, or to consolidate server applications. In vCenter Server, virtual machines run on hosts or clusters. The same host can run	Actions - Sky8 0.0DocTest Power Guest OS Snapshots Poper Console Migrate Clone Template Fault Tolerance VM Policies Compatibility Export System Logs	Deploy OVF Template NetAppEdgeC1 - Edit S
Grupprade_wm_HOS14_mounika workerter Applicates 6.0 WM_Mount_Del Win2k12 Win2k124 Win2k3-6 Recent Objects X	• 15ks	many virtual machines.	Edit Resource Settings Edit Settings Move To Rename Edit Notes Tags & Custom Attributes Add Permission	Alarms (4) New (4) Acknowledged. win2012-artemis /irtual machine CPU usage

2. From the **Actions** drop down menu, select **Edit Settings**. The Edit Settings dialog box is open to the Virtual Hardware tab:

Virtual Hardware VM Options	SDRS Rules vApp Options
🕨 🖬 CPU	2 0
Memory	16384 • MB •
Hard disk 1	130 GB V
▶ I SCSI controller 0	LSI Logic Parallel
Network adapter 1	VM Network
Video card	Specify custom settings
VMCI device	
 Other Devices 	
▶ Upgrade	Schedule VM Compatibility Upgrade
New device:	Select
Compatibility: ESX/ESXi 4.0 and	later (VM version 7) OK Cancel

3. Expand Memory and check Reserve all guest memory (All locked).

Virtual Hardware VM	Options	SDRS Rules	vApp	Options		
CPU	2		-	0		
Memory	_					
RAM	1024	40	-	MB	-	
Reservation (*)	102	10240		MB	-	
	R	eserve all guest	memo	ry (All lock	ed)	
Limit	Unli	mited	-	MB	-	
Shares	Norr	Normal		102400	+	
Memory Hot Plug	Er	able				
Hard disk 1	130	130		GB	-	
SCSI controller 0	LSI L	ogic Parallel				
Network adapter 1	PRI	ATE NETWORK	K FOR	RAC	-	Connect
Video card	Spe	cify custom settin	ngs		-	
VMCI device						
Other Devices						
Upgrade	So	hedule VM Com	patibil	ity Upgrad	e	
New device:		Select			•	Add

- 4. Select OK.
- 5. Review the Hardware Summary to ensure you have properly reserved memory.

Configuring CPU Reservation

1. Select the Actifio Sky VM.



2. From the **Actions** drop down menu, select **Edit Settings**. The Edit Settings dialog box is open to the Virtual Hardware tab:

Sky8.0.0DocTest - Edit Setti	ngs	? H
Virtual Hardware VM Options	SDRS Rules VApp Options	
🕨 🗖 CPU	2 0	
Memory	16384 v MB v	
Hard disk 1	130 GB V	
SCSI controller 0	LSI Logic Parallel	
Network adapter 1	VM Network 🖌 VM Connected	
Video card	Specify custom settings	
VMCI device		
 Other Devices 		
 Upgrade 	Schedule VM Compatibility Upgrade	
New device:	Select Add	
Compatibility: ESX/ESXi 4.0 and	later (VM version 7) OK Car	ncel

3. Expand **CPU**, specify the CPU's reservation value and units.

Sky-9.0.2 - Edit Settings						?	+	
/irtual Hardware	VM Options	SDRS Rules	vApp Opti	ions				
CPU *CPU		4		0				ŀ
Cores per Socket (*) CPU Hot Plug Reservation (*) Limit Shares		4 Sockets: 1			1			
		Enable CPU Hot Add						1
		0	-	MHz	-			
		Current value	: 0 MHz	MHz	-			1
		Minimum:	0 MHz	4000	-			1
CPUID Mask	6	Maximum:	47544 M	guest	-	Advanced		
Hardware vir	tualization	Expose hardware assisted virtualization to the guest OS					0	
Performance	counters	Enable virtualized CPU performance counters						1
CPU/MMU		Automatic			-			1
		ESXi can autor hardware supp and the virtual the automatics Note: If a select with existing vi	matically dete oort for virtual machine. Ho selection can cted setting is rtual machine	ermine if a lization ba wever, for provide b not supp e settings,	orted the s	al machine should use n the processor type a workloads, overriding performance. by the host or conflicts etting is ignored and the		

- 4. Select **OK**.
- 5. Review the Hardware Summary to ensure you have properly reserved CPU.

Configuring CPU Cores Per Socket

1. Select the Actifio Sky VM.

Image: Section	Navigator	Ŧ	🚯 Sky8.0.0DocTest 🛛 💕 🕞 📕	🐼 Actions 👻 🤫	🖘 🛛 📝 Work In Progress
		*	Getti Sum Monitor Confl Perm What is a Virtual Machine? A virtual machine is a software computer that, like a physical computer, runs an operating system installed on a virtual machine is called a guest operating system. Because every virtual machine is an isolated computing environment, you can use virtual machines as desktop or vorkstation environments, as lesting environments, or to consolidate server apolications.	Actions - Sky6.0.0DocTest Power Guest OS Snapshots Open Console Migrate Clone Template Fault Tolerance VM Policies	Deploy OVF Template NetAppEdgeC1 - Edit S
Recent Objects I Recent Tasks Add Permission Viewed Created Created Created	한 Itcentos3 광 Unknown (inaccessible) 광 Unknown (inaccessible) 광 Vocenter Appliance 6.0 광 VM_Mount_Del 광 WinZk12 공 WinZk3-4 중 WinZk3-6		In vCenter Server, virtual machines run on hosts or clusters. The same host can run many virtual machines.	Compatibility Export System Logs Edit Resource Settinos Feldt Retings Move To Rename Edit Notes Tags & Custom Attributes	Alarms 4) New (4) Acknowledged vin2012-artemis /irtual machine CPU usage
	Recent Objects	sks		Add Permission Alarms	Q Filter

2. From the **Actions** drop down menu, select **Edit Settings**. The Edit Settings dialog box is open to the Virtual Hardware tab:

Virtual Hardware	VM Options	SDRS Rules	vApp Options		
CPU		2	• 0		
Memory		16384	▼ MB		
Hard disk 1		130	GB	-	
🕨 🛃 SCSI controlle	er O	LSI Logic Parall	el		
🕨 📻 Network adap	ter 1	VM Network		✓ Connected	
Video card		Specify custom	i settings	v	
VMCI device					
 Other Devices 					
 Upgrade 		Schedule VN	1 Compatibility Up	grade	

3. Expand **CPU**, click **Cores per Socket** and select the number of cores from the drop down list.

Virtual Hardware	VM Options	SDRS Rules	vApp Opti	ons			
- 🔲 •СРU 🖌		4	•	0			•
📏 Cores per S	ocket (*)	4	-	Sockets	: 1		
CPU Hot Plu	g (Enable CPU	Hot Add				
Reservation		0	•	MHz	-		
Limit		Unlimited	-	MHz	-		
Shares		Normal		4000	*		
CPUID Mask		Expose the NX	/XD flag to g	quest	-	Advanced	

- 4. Select **OK**.
- 5. Review the Hardware Summary to ensure you have properly reserved cores.

Adding SCSI Controllers

The Sky Appliance VM requires two disks, each with its own SCSI controller:

- The VM's operating system and the Primary pool disk can both use the 0:0 controller.
- The Snapshot Pool uses the 1:0 controller. Disks assigned to the Snapshot Pool will use 1:x. The controller for the Snapshot Pool must be set to VMware Paravirtual.

A controller can accommodate up to 16 disks. If you find it necessary to create more than 15 disks for a pool, you will need to define a new controller.

To add SCSI controllers as VMware Paravirtual:

- 1. Select the Sky Appliance VM.
- 2. From the Actions drop-down menu, select **Edit Settings.** The Edit Settings dialog box is open to the **Virtual Hardware** tab.
- 3. From the New Device drop down-menu at the bottom of the dialog box, select **SCSI controller**.

Virtual Hardware	VM Options	SDRS Rules	vApp Options
🕨 🔲 CPU		2	- 0
Memory		16384	v MB v
Hard disk 1		130	GB V
SCSI control	ler 0	LSI Logic Parall	el
Network adapter 1		VM Network	Connected
Video card		Specify custom	settings 👻
WMCI device			
Other Devices			
 Upgrade 		Schedule VN	Compatibility Upgrade
INEW O		SCSI Col	
Compatibility: ESX/	ESXI 4.0 and I	later (VM version	OK Cancel

- 4. Click Add and the options for the SCSI controller are displayed.
- 5. Expand the options under the New SCSI Controller. Select **VMware Paravirtual** and then click **OK**.

Virtual Hardware VM	Options SDRS Rules	vApp Options		
F 🔲 CPU	2	• 0		
Memory	16384	• MB •		
+ 🛄 Hard disk 1	130	GB V		
► 🛃 SCSI controller 0	LSI Logic Paral	LSI Logic Parallel		
Network adapter	1 VM Network	VM Network 🗸 🗸 Connected		
Video card	Specify custor	Specify custom settings		
VMCI device				
 Other Devices 				
Upgrade	Schedule VI	M Compatibility Upgrade		
→ 🔄 New SCSI contro	oller VMware Paravi	irtual		
SCSI Bus Sharing	g None	None 🗸 🚺		
Change Type	VMware Parav	virtual 🔹		

- 6. Add another SCSI Controller as needed.
- 7. Click **OK** to close the Edit Settings dialog box.

Once you have defined the controllers, you can add disks and assign them to their respective controllers. See Adding Disks on page 19.

Adding Disks

Once the SCSI controllers are created and are configured, configure the VM's disks as follows.

Note: The disks defined here will be placed into storage pools later.

1. On the Virtual Hardware tab, select Add:

Virtual Hardware VM Options	SDRS Rules VApp Options
▶ □ CPU	2 0
Memory	16384 V MB V
+ 🛄 Hard disk 1	130 GB V
SCSI controller 0	LSI Logic Parallel
SCSI controller 1	VMware Paravirtual
Network adapter 1	VM Network 🖉 Connected
Video card	Specify custom settings
VMCI device	
 Other Devices 	
▶ Upgrade	Schedule VM Compatibility Upgrade
👻 🛄 New Hard disk	400 GB V
Maximum Size	7.10 TB
VM storage policy	Datastore Default
Location	Store with the virtual machine
Disk Provisioning	Thick provision eager zeroed 🔹
Sharing	Unspecified v
Shares	Normal 🚽 1,000
Limit - IOPs	Unlimited •
Disk Mode	Independent - Per 🔹 🛈
Virtual Device Node	SCSI controller 1 V SCSI(1:1) V
New device:	Add
Compatibility: ESX/ESXi 4.0 and	later (VM version 7) OK Cancel

2. In the Add Hardware dialog, select **Hard Disk**.

Note: Disks **MUST BE THICK PROVISIONED EAGER ZEROED**. Thin provisioned disks may cause capture operations to fail and the loss of data.

Your Sky Appliance requires at least three Thick Provision Eager Zeroed disks.

To size your Sky Appliance, you considered the amount of data to be captured, its type, change rate, growth and how long it would be retained. This same information is required to allocate space for the Sky Appliance's disks.

- o One 200 GiB disk for the Primary Pool. This disk is used by the Sky Appliance.
- One disk for the Snapshot Pool. Allocate enough space to accommodate the full copies (snapshots) to be retained, plus enough space for growth. A minimum of 10 GiB is required. You can add additional disks in vSphere to accommodate growth.
- o One 100 GiB disk for the Dedup Pool. This disk is used by the Sky Appliance.

Note: The pool names for these disks are used in Configuring an Actifio Sky Appliance.

- 4. For the disks that will be assigned to the Snapshot Pool from the Virtual Device Node drop down menu, select the SCSI controller 1:x.
- 5. Under Mode, check Independent and accept the default of Persistent.
- 6. Click **OK** and the disk is configured. Once you have finished configuring all of the disks, you can power up the VM.

Note: Do not resize disks for pools. If additional storage is needed, add disks.

Adding Network Interfaces

Once the Sky Appliance is up and running, you can add additional network interfaces. For environments that require multiple NICs (for example, one NIC for data storage and another NIC for management), you must manually add network adapters to the Sky Appliance VM and then configure the additional adapters through the System Management user interface. See Adding and Configuring Additional Network Interfaces on page 27 for details.

For Sky Appliance network requirements, see Actifio Sky Appliance Networking Requirements on page 5.

Worker Thread Errors

Worker Thread errors such as:

```
2016-05-26 13:21:39.138 INFO Worker_Thread_Job_0593710 SC6164: Error: 1732: Worker thread failed: write failed for "\\?\C:\Windows\act\Staging_584181\SPARK CRM04\F_2016-03-01T211433.vhd": The storage device is unresponsive [0x8003020a]
```

Indicate either:

- Memory for the Sky Appliance has been incorrectly allocated.
- The bandwidth for the network on which the Sky Appliance resides is consumed by other devices.

Turning the Balloon Driver Off

Once the VM has been configured, before you can configure the Sky Appliance, you must power down the Sky Appliance VM and turn off the Ballooning Driver. The balloon driver must be turned off because any paging or swapping will cause significant performance impact, and in some cases result in the Sky Appliance deadlocking.

To turn off the ballooning driver:

- 1. Log into the vSphere host as a user with administrative rights.
- 2. Shut down the Sky Appliance.
- 3. From the Actions drop-down menu, select Edit Settings.
- 4. Click the VM Options tab.
- 5. On the left-hand side of the VM Options tab, click Advanced.
- 6. Click Edit Configuration.



- 7. In the space provided for Name, enter sched.mem.maxmemctl.
- 8. In the space provided for Value, enter **0**.
- 9. Click Add. Ballooning is turned off.

Navigator	🖡 🗗 Sky8.0.0DocTest	📑 🕨 🔲 🍘 🚑 🚳 Actions 🗸	1	💵 📝 Work In Progress		
Back	Getting Summary	Monitor Configure Permissio Snapshots	Datastores Networks Update	🛄 🖆 Sky8.0.0DocTest - Edit		
U 🖻 🖻 🧕	Sky8.0.0DocTest - Edit Set	tings	? **	Deploy OVF Template (1)		
 ▶ 172.16.121.40 ➡ 172.17.75.6 	Virtual Hardware VM Options	SDRS Rules VApp Options		Deploy OVF Template NetAppEdgeC1 - Edit S		
Actifio Resiliency Director VM-1666	 VMware Tools 	Configuration Parameters				
AGM / 1.5.105 AGM1038 AGM_BETA	Power management Boot Options	Modify or add configuration parameters as needed for experimental features or as instructed by technical support. Empl values will be removed (supported on ESXI 6.0 and later).				
CentOS				Q Filter -		
IOV_2k12_perfrajesh	Advanced	Name	Value			
An LinuxVM Symdks	Settings	userCPUID.0	0000000d756e65476c6	5746e49656e69 *		
A III		userCPUID.1	000206d700200800029	1822030fabfbff		
Dracle-host(dont delete)	Debugging and statistics	userCPUID.80000001	000000000000000000000000000000000000000	0000128100800		
🗗 Original all	Swap file location	virtualHW.productCompatibility	hosted			
POC-machine4XD		ymci filter enable	true			
RHEL 7.0 Target			00			
Sky-7.1.1-808-1		vmcio.pciSiotNumber	32			
aky-75-100-vcenter		vmotion.checkpointFBSize	4194304			
Sky7.1.1-766		vmware.tools.internalversion	9216			
Sky7.1.2-195		vmware.tools.requiredversion	9349			
A Sky8.0.0-1571		sched.mem.maxmemctl				
Sky8.0.0DocTest						
D Solaris	Configuration Parameters					
sp-smallvm	Latency Sensitivity	Name:	Value:	Add		
Recent Objects 🛛 🖡 🗙 🛐 Recent	Tasi					
Viewed Created				UK Cancel		
Sky8.0.0DocTest	Compatibility: ESX/ESXi 4.0 and	l later (VM version 7)	OK Cancel Queued For	Start Time 1 • Comole		
HTD 47 75 0	thus machine	Dectort	VSPUEPELOCALIN	6 mc 10/20/2017 9:04:26 10/20		

- 10. Click **OK** and exit out of the Edit Settings dialog boxes.
- 11. Power up the Sky Appliance VM and continue on to Chapter 4, Configuring an Actifio Sky Appliance.

Deleting an Actifio Sky Appliance VM

To delete an Actifio Sky Appliance VM:

- 1. From AGM, power down the Sky Appliance VM.
- 2. From the vSphere Web Client's left-hand navigation frame, select the Sky Appliance VM to be deleted.



- 3. From the VMware Web Client's Action drop down menu, select **Delete from Disk**. This option is only available if the VM is powered down.
- 4. When you click Delete from Disk, a confirmation message is displayed. Ensure that the VM name displayed in the confirmation message is the name of the Sky Appliance VM you want to delete.



5. If the name in the confirmation message matches the name of the Sky Appliance VM that you want to delete, then click **Yes** and the Sky Appliance VM and its disks will be deleted.

4 Configuring an Actifio Sky Appliance

After the VM is configured and powered up, it is ready to be configured as an Actifio Sky Appliance.

Note: For the following procedure you will need the IP address of the VM. The VM's IP is on the VM's vSphere Summary page.

- 1. Open a browser and in the address space, enter the IP of the newly configured Sky Appliance VM: http://<VM IP address>/.
- 2. The installer opens the first of three tabs:

STEP 1: Setup Network Con	iguration STEP 2: Setup Storage Configuration	STEP 3: Review and Complete Installation	
All Items marked with (*) ar	required.		
Public IP			
IPv4 address for cloud config	uration.		
Appliance IP (*)	172 . 17 . 205 . 106		
IPv4 address on port 1 for A joining this appliance with of	tifio Desktop and CLI clients. Also used for her PAS appliances.		
Appliance Name (*)	localhost.localdom		
DNS Server	172.17.1.10		
Subnet Mask	255 . 255 . 0 . 0		
Gateway	172 . 17 . 1 . 1		
NTP Server			
Infrastructure	VMWare V		
Timezone	Africa/Abidjan 🔻		
Sustan wid (*)			
system duid (')	1415068751:c222a0bd-e7bd-37cc-913a- 04a9cfd86f4b:a4b7b9d7		
.icense	Evaluation license: Dedup pool size is set to STB with no encryption for 30 days from the start of installation. Please contact Actifio to upgrade to production licenses.		
	Validate License		
Create Admin Password (*)			
Confirm Admin Password (*)		Next >	

- 3. If your Sky Appliance will sit behind a firewall, enter the Public IP Address in the spaces provided.
- 4. Ensure that the auto-discovered Sky Appliance IP address is correct.
- 5. In the space provided, enter a name for the Sky Appliance.

- 6. Ensure that the auto discovered network IP addresses are correct.
- 7. From the Infrastructure drop down menu, select VMware.
- 8. Set the time zone as needed.
- 9. Capture the system UUID and include it in an email license key request for each install to Actifio Support. Actifio will use the UUID to generate the Sky Appliance license key.
- 10. In the space provided, paste the license key you obtained from the Actifio representative.
- 11. Click Validate License to ensure the validity of the license entered.
- 12. If you are using a Sky model encryption license, a Pass phrase field is displayed. Enter a pass phrase, record the pass phrase and keep it in a secure location.
- 13. In the spaces provided create a password for the first Admin user of the Sky Appliance.
- 14. Click **Next**, and the Step 2 tab contents are displayed:

200	PRIMARY POOL	Required Size: 400 GB	Available Disks (3) 😜	
GB			Size: 400.00 GB	
10 GB	SNAPSHOT POOL Size: 100.00 GB	Required Size: 100 GB	sdc Size: 1024.00 GB	
100 GB	DEDUP POOL Size: 1024.00 GB	Required Size: 1024 GB		

< Back

Validate Installation

- 15. Select and drag the Available Disks to the pools for which they were created.
- 16. Click **Validate Installation**. The Sky Appliance installer validates the settings, and if no issues are encountered, advances to the third tab. Any issues will appear in a yellow field at the top of the page 2.
- 17. The third tab provides the opportunity to review choices and go back to make changes as needed.



18. Once choices are verified, click **Complete Installation** and the Sky Appliance will reboot. The reboot may take several minutes. The user interface will become responsive before the appliance is ready for use. Do not attempt any operations until the Dedup light on the Dashboard shows green.

A Adding and Configuring Additional Network Interfaces

Adding additional network interfaces to an Actifio Sky Appliance requires:

Adding a New Network Adapter Configuring a Sky Appliance VM Network Adapter

Adding a New Network Adapter

To add a new network adapter to a Sky Appliance VM:

1. In vSphere, select the Sky Appliance VM.

vmware [®] vSphere Web Client		U Admin	iistrator@VSPHERE.LOCAL ▼ Help ▼	Q Search -	
Navigator	¥ 🖧	. Sky8.0.0DocTest 📑 👂 🔳 🌍 🚑	🙆 Actions 👻 📃 📃	Work In Progress	
Back Back Sky-7.11-008-1 Sky-7.11-008-1 Sky-7.5100-vcenter Sky-7.11-7.66 Sky7.1.2-195 Sky7.1.2-195 Sky7.1.5-155-AlexFu Sky8.0. Solaris Sys8.0. Solaris Sp-smallvm Git tcentos 3 Giunknown (inaccessible) Giunknown (inaccessible)	Ge	etti Sum Monitor Confl Perm What is a Virtual Machine? Avirtual machine is a software computer that, like a physical computer, runs an operating system and applications. An operating system installed on a virtual machine is called a guest operating system. Because every virtual machine is an isolated computing environment, you can use virtual machines as desktop or workstation environments, as testing environments, or to consolidate server applications. In vCenter Server, virtual machines run on hosts or clusters. The same host can run	Actions - Sky8.0.0DocTest Power Guest OS Snapshots Open Console Migrate Clone Template Fault Tolerance VM Policies Compatibility Export System Logs	Deploy OVF Template NetAppEdgeC1 - Edit S	
VIL_Nount_Del Win2k12 Win2k3-4 Win2k3-6	•		Edit Nesture Jetitios Edit Nettings Move To Rename Edit Notes Tags & Custom Attributes	Alarms ¥ × (4) New (4) Acknowledged vin2012-artemis Artual machine CPU usage	
🗑 Recent Objects I X 😨 Recent Task	E)		Add Permission	I ×	
Viewed Created Sky8.0.0DocTest Task Name		Target Status	Alarms Remove from Inventory Delete from Disk	Q Filter - Queued For Start Time	
Arun Ritz.16.121.40 AGM_GA_367 RHEL68-2 Wein212.electro			All vCenter Orchestrator plugin Actions Update Manager		
Catalog					

- 2. From the **Actions** drop-down menu, select **Edit Settings.** The Edit Settings dialog box is open to the Virtual Hardware tab.
- 3. From the **New Device** drop-down menu at the bottom of the page, select **Network**.

	Virtual Hardware VM Options	SDRS Rules VApp Options							
	▶ 🔲 CPU	2 • 0							
	▶ IIII Memory	16384 v MB v							
es	► → Hard disk 1	130 GB V							
DS	▶ 🛄 Hard disk 2	10 GB V							
.e	▶ G SCSI controller 0	LSI Logic Parallel							
	▶ SCSI controller 1	VMware Paravirtual							
	▶ m Network adapter 1	VM Network							
	Video card	Specify custom settings							
	VMCI device								
	 Other Devices 								
	▶ Upgrade	Schedule VM Compatibility Upgrade							
	👻 🥅 New Network	VM Network							
	Status	Connect At Power On							
ed	Adapter Type	VMXNET 3							
	MAC Address	Automatic 🚽							
	New device:	对 Network 🔽 Add							
	Compatibility: ESX/ESXi 4.0 and later (VM version 7) OK Cancel								

- 4. Click Add.
- 5. Expand the options under the New Network and ensure it is using the **VMXNET3** option.
- 6. Click **OK** on the Edit Settings dialog box and the new network adapter is added.
- 7. Once the network adapter is added, use the System Management user interface to configure the network. You can reach the System Management user interface from the Actifio Resource Center (at the IP address of the Sky Appliance).

Configuring a Sky Appliance VM Network Adapter

The System Management user interface is used to configure Sky Appliance network adapters. You access the System Management user interface from the appliance's Actifio Resource Center.

To display the Sky Appliance's resource page:

1. Open a browser to the Sky Appliance's Resource Center HTTP://<appliance IP address>/.

SYSTEM & NETWORK MANAGEMENT	CONNECTORS	
System & Network Management Login Page	🚰 Windows Connector	Oeployment guide
	alX Connector	View all connectors
DOCUMENTATION	HP-UX Connector	
Release Notes and Product Documentation via the Actific	📫 Ubuntu Connector	
NOW Website (Login Required)	Solaris Connector SPARC X89	
Download zipped Actifio Documentation Library	Linux Connector 32.84 64.84 PPC	
	SNMP RESOURCES	
	MB	
	LICENSES	
	Additional Software Licenses	

- 2. Click System & Network Management Login Page.
- 3. Log in using the Sky Appliance's administrator credentials, and the System Management interface is displayed.

ostname, DNS, NTP	IPs & Interfaces O	Putbound Policies Troubles	hooting Host Resolution
NETWORK	SETTINGS		
DNS Domain *		Primary DNS *	172.25.4.150
DNS Suffix	Add DNS Suffix	Secondary	
Search	services.actifio.coi 😑	DNS	
		NTP Server *	time.actifio.com

- 4. Ensure that the DNS and NTP settings are correct.
- 5. Click the IPs and Interfaces tab, and the IP and Interfaces settings are displayed:

EM M	IANAGEMENT					📥 admin	LOGOUT	
Hostna	ame, DNS, NTP	IPs & Interfac	es C	Outbound Policies	Troubleshoot	ing Host R	esolution	
Defa	ult Interface	none 🔻	Save	Ø				
					Add	Modify	Delete	
Configured IPs								
	Туре	Node	Interface	IP Address	Network Mask	Gateway	MTU	
	node	node0	eth0	172 25 2 250	255 255 0 0	172 25 1 1	1500	

6. Click **Add** and the Configure IP dialog box is displayed:

			👗 admin	LOGOUT 🕞
	CONFIGURE IP			
Hostname, DNS, NTP	Туре	node 🔻	Host Res	olution
	Node *	node0 v		
Default Interface	Interface *	eth1 •		
	IP Address *			Delete
Configured IPs	Network Mask *			
Ty no	Gateway			IP Address 172.25.2.25
	MTU			
		Cancel		

- 7. Ensure Type is set to **Node**.
- 8. Ensure Node is set to **Node0**.
- 9. Select the interface you created on the Actifio Sky Appliance VM. In this example it is ethl.
- 10. In the spaces provided enter:
 - o A static IP address
 - o A network mask
 - o A Gateway
 - o MTU (Maximum Transmission Unit) can be used to tune the performance characteristics of traffic on an interface. There are many dependencies to consider when adjusting the MTU, as all network devices and servers involved in passing network traffic must support the specified MTU, and there must be space reserved for protocol overhead. If you are not sure what value to use, leave this at the default value of 1500.
- 11. Click Add and the interface is configured.