

HYPER-V CLUSTERING

SOWMYA KRISHNAN



Who are we?



- *Has been contributing and driving PRs / features in community*
- *Prior to that, through Citrix*
- *Committed to community*



Hyper-V support evolution over releases

CloudStack 4.3

Both Hyper-V Server(non GUI) and Windows Server

- Initial support
- SMB
- Basic support for VM, storage and networking

Hyper-V support evolvment over releases

CloudStack 4.4

- VPC
- Storage Migration
- Zone Wide Primary Storage
- Multiple Nics

Hyper-V Clustering

- HA using Failover Clusters
- Cluster Shared Volume
- iSCSI

Failover Cluster

- Independent nodes of a cluster working together to increase availability of services
- In conjunction with Cluster Shared Volume
- Multiple nodes read from and write to the same Cluster Shared Volume
- Multiple nodes can access files from same volume at the same time

Cluster Shared Volume

- Failover Cluster
- Volumes in CSV can be accessed by all nodes in the Failover Cluster
- All nodes in cluster have files in the same volume

Quorum Configuration

- To avoid single point of failure
- Number of failures that are allowed in a cluster
- Different Quorum choices based on capacity



Select features

DESTINATION SERVER
HYPERVCLLOUD13.blr.cloudstack.org

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Confirmation

Results

Select one or more features to install on the selected server.

Features

- Client for NFS
- Data Center Bridging
- Direct Play
- Enhanced Storage
- Failover Clustering (Installed)
- Group Policy Management
- IIS Hostable Web Core
- Ink and Handwriting Services
- Internet Printing Client
- IP Address Management (IPAM) Server
- iSNS Server service
- LPR Port Monitor
- Management OData IIS Extension
- Media Foundation
- Message Queue

Description

Failover Clustering allows multiple servers to work together to provide high availability of server roles. Failover Clustering is often used for File Services, virtual machines, database applications, and mail applications.

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Next >

Install

Cancel



- Failover Cluster Manager
 - CI1.blr.cloudstack.org
 - Roles
 - Nodes
 - Storage
 - Disks**
 - Pools
 - Networks
 - Cluster Events

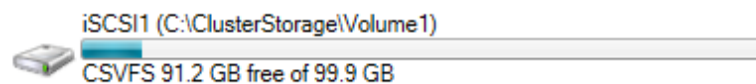
Disks (1)

Name	Status	Assigned To	Owner Node	Disk Number	Capacity	Informa
ClusterDisk1	Online	Cluster Shared Volume	HYPERVCLLOUD13	1	100 GB	



ClusterDisk1

Volumes (1)



Actions

Disks

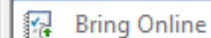
- Add Disk
- Move Available Storage

View

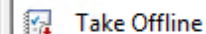


Help

ClusterDisk1



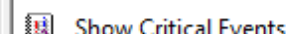
Bring Online



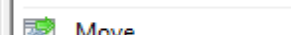
Take Offline



Information Details...



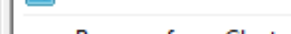
Show Critical Events



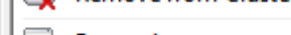
Move



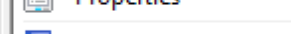
More Actions



Remove from Cluster Shared Vo...



Properties



Help

Activate Windows
Go to System in Control Panel to activate Windows.

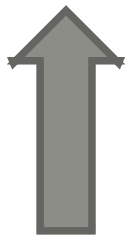


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Disks (1)

Search Queries ▼ 📄 ⌵

Name	Status	Assigned To	Owner Node	Disk Number	Capacity	Informa
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< ||| >

ClusterDisk1

Volumes (1)

iSCSI1 (C:\ClusterStorage\Volume1)
CSVFS 91.2 GB free of 99.9 GB

Actions

Disks

- Add Disk
- Move Available Storage
- View
- Refresh
- Help

ClusterDisk1

- Bring Online
- Take Offline
- Information Details...
- Show Critical Events
- Move
- More Actions
- Remove from Cluster Shared Vo...
- Properties
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Disks (1)

Search Queries Save Dropdown

Name	Status	Assigned To	Owner Node	Disk Number	Capacity	Information
ClusterDisk1	Online	Cluster Shared Volume	HYPERVCLLOUD13	1	100 GB	

ClusterDisk1

Volumes (1)

iSCSI1 (C:\ClusterStorage\Volume1)
CSVFS 91.2 GB free of 99.9 GB



Actions

- Disks
 - Add Disk
 - Move Available Storage
 - View
 - Refresh
 - Help
- ClusterDisk1
 - Bring Online
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 - Information Details...
 - Show Critical Events
 - Move
 - More Actions
 - Remove from Cluster Shared Vo...
 - Properties
 - Help

Activate Windows
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Adding Hyper-V Failover Cluster to CloudStack

- Failover Cluster created by Admin and added to CloudStack
- 1-1 mapping between Failover Cluster and CloudStack Cluster
- Hosts to be added to the Failover Cluster before adding to CloudStack
- Use PreSetup Option to add CSV

Name
PS1

+ Add Primary Storage

Scope: Cluster

* Zone: HVCluster

* Pod: P1

* Cluster: CI1

* Name:

* Protocol: PreSetup
SMB/CIFS

* SR Name-Label: PreSetup

* Provider: DefaultPrimary

Storage Tags:

Cancel OK

Scope
CLUSTER

For XenServer, choose NFS, iSCSI, or PreSetup. For KVM, choose NFS, SharedMountPoint, RDB, CLVM or Gluster. For vSphere, choose VMFS (iSCSI or FiberChannel) or NFS. For Hyper-V, choose SMB/CIFS or PreSetup. For LXC, choose NFS or SharedMountPoint. For OVM, choose NFS or ocfs2.

Home > Service Offerings

Select offering: Compute Off

Name
Medium Instance
HAOffering
Small Instance

* Name: HA Offering

* Description: HA Offering

Storage Type: shared

Provisioning Type: thin

Custom:

* # of CPU Cores: 1

* CPU (in MHz): 500

* Memory (in MB): 512

Network Rate (Mb/s):

QoS Type:

Offer HA:

Storage Tags:

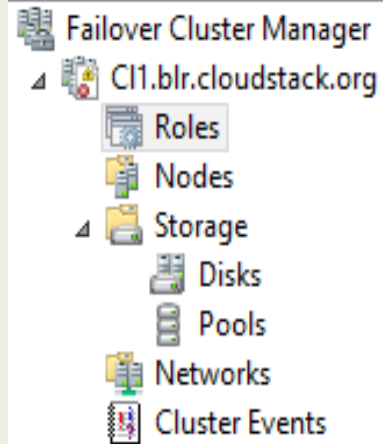
Host Tag:

CPU Cap:



	Order
	▲ ▼ ▲ ▼
	▲ ▼ ▲ ▼
	▲ ▼ ▲ ▼

If yes, the administrator can choose to have the VM be monitored and as highly available as possible



Roles (6)

Search

Queries

+ Add criteria

Name	Status	Type	Owner Node	Priority	Information
i-4-3-VM	Running	Virtual Machine	HYPERVCLLOUD13	No Auto Start	
i-4-5-VM	Running	Virtual Machine	HYPERVCLLOUD17	Medium	
i-4-6-VM	Running	Virtual Machine	HYPERVCLLOUD17	Medium	

HA VMs have higher priority

Non HA VMs added to Cluster with priority: 0 (No Auto Start)

HIGH AVAILABILITY



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Nodes (2)

Search



Queries



Name	Status	Assigned Vote	Current Vote	Information
HYPERVCLLOUD13	Up	1	1	
HYPERVCLLOUD17	Up	1	1	

Two node cluster

Failover Cluster Manager

File Action View Help

Failover Cluster Manager

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Roles (6)

Search

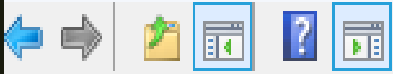
+ Add criteria

Name	Status	Type	Owner Node	Priority	Information
i-4-3-VM	Running	Virtual Machine	HYPERVCLLOUD13	No Auto Start	
i-4-5-VM	Running	Virtual Machine	HYPERVCLLOUD17	Medium	
i-4-6-VM	Running	Virtual Machine	HYPERVCLLOUD17	Medium	

Priority is assigned to HA Virtual machines running on Hyper-V cluster

Possible priority values: High (3000), Medium (2000): The default setting, Low (1000) or No Auto Start (0)



File Action View Help



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Nodes (2)

Search







Name	Status	Assigned Vote	Current Vote	Information
 HYPERVCLLOUD13	Up	1	1	
 HYPERVCLLOUD17	Down	1	1	

Node goes down










Roles (6)



+ Add criteria ▼

Name	Status	Type	Owner Node	Priority	Information
 i-4-3-VM	 Running	Virtual Machine	HYPERVCLLOUD13	No Auto Start	
 i-4-5-VM	 Running	Virtual Machine	HYPERVCLLOUD13	Medium	
 i-4-6-VM	 Running	Virtual Machine	HYPERVCLLOUD13	Medium	

HA VMs get migrated to other Host

 Information	11-05-2017 12:00:12	Hyper-V-VMMS	20418	None
 Information	11-05-2017 12:00:12	Hyper-V-VMMS	20418	None
 Information	26-04-2017 14:22:52	Hyper-V-VMMS	20415	None
 Information	26-04-2017 14:22:44	Hyper-V-VMMS	20413	None
 Information	26-04-2017 14:00:04	Hyper-V-VMMS	20407	None
 Information	26-04-2017 14:00:04	Hyper-V-VMMS	20407	None
 Information	26-04-2017 14:00:02	Hyper-V-VMMS	20407	None
 Information	26-04-2017 13:57:07	Hyper-V-VMMS	13002	None
 Information	26-04-2017 13:57:05	Hyper-V-VMMS	13003	None

Event 20418, Hyper-V-VMMS

General Details







The Virtual Machine Management service successfully completed the live migration of virtual machine 'i-4-5-VM' (VMID 95601FD1-816C-413B-8D6B-89C0104A20B9), received from IP address: '10.102.192.17'.

Live Migration from Event Viewer

Roles (6)

Search

+ Add criteria ▼

Name	Status	Type	Owner Node	Priority
 i-4-3-VM	 Running	Virtual Machine	HYPERVCLLOUD13	No Auto Start
 i-4-5-VM	 Running	Virtual Machine	HYPERVCLLOUD13	Medium
 i-4-6-VM	 Running	Virtual Machine	HYPERVCLLOUD13	Medium

HA VMs migrated to host13

2017-05-11 14:41:47,678 INFO [c.c.v.VirtualMachineManagerImpl] (DirectAgentCronJob-303:ctx-99440fa4) (logid:749b2562) **Detected out of band VM migration from host 2 to host 1**

2017-05-11 14:41:47,692 DEBUG [c.c.c.CapacityManagerImpl] (DirectAgentCronJob-303:ctx-99440fa4) (logid:749b2562) VM state transitted from :Running to Running with event: FollowAgentPowerOnReportvm's original host id: 1 **new host id: 1 host id before state transition: 2**

2017-05-11 14:41:47,692 DEBUG [c.c.v.VirtualMachinePowerStateSyncImpl] (DirectAgentCronJob-303:ctx-99440fa4) (logid:749b2562) VM state report. host: 1, vm id: 6, power state: PowerOn

2017-05-11 14:41:47,709 DEBUG [c.c.v.VirtualMachinePowerStateSyncImpl] (DirectAgentCronJob-303:ctx-99440fa4) (logid:749b2562) VM state report is updated. host: 1, vm id: 6, power state: PowerOn

2017-05-11 14:41:47,713 INFO [c.c.v.VirtualMachineManagerImpl] (DirectAgentCronJob-303:ctx-99440fa4) (logid:749b2562) **Detected out of band VM migration from host 2 to host 1**

2017-05-11 14:41:47,729 DEBUG [c.c.c.CapacityManagerImpl] (DirectAgentCronJob-303:ctx-99440fa4) (logid:749b2562) VM state transitted from :Running to Running with event: FollowAgentPowerOnReportvm's original host id: 1 **new host id: 1 host id before state transition: 2**

2017-05-11 14:41:48,516 INFO [o.a.h.i.c.DefaultHttpClient] (DirectAgent-306:ctx-9dd9ce8b) (logid:a52ac500) I/O exception (java.net.NoRouteToHostException) caught when connecting to {s}-
>https://10.102.192.17:8250: **No route to host**



Project: Default View



Dashboard

Instances

Affinity Groups

Storage

Network

Templates

Events

Home > Instances >

Filter by All

+ Add Instance

<input type="checkbox"/>	Name	Internal name	Display Name	Zone Name	State	Quickview
<input type="checkbox"/>	HAVM2	i-4-6-VM	HAVM2	HVCluster	Running	
<input type="checkbox"/>	HAVM1	i-4-5-VM	HAVM1	HVCluster	Running	
<input type="checkbox"/>	sowmyavm1	i-4-3-VM	sowmyavm1	HVCluster	Running	

- Admin needs to first add Host to the Failover Cluster
- Use the 'presetup' option while adding CSV
- When user creates HA VM it is added to Failover Cluster
- When user creates non-HA VM it is added to Failover Cluster with priority as 0
- VMs migrated (HA-ed) to other hosts will be automatically synced by VM Sync
- Any other VM and Volume operations work normally

Thank You