Enabling Retreat Mode and Disabling HA on a vSphere vSAN Cluster

PowerChute can execute powershell scripts via the Event Command File feature to enable Retreat Mode prior to placing the hosts into maintenance mode. When PowerChute re-starts, a separate script file is executed to disable Retreat Mode, which will re-instate the vCLS VMs.

There are 2 sets of scripts provided depending on whether PowerChute is installed on a Windows machine or you have deployed the PowerChute Linux based Virtual Appliance to an ESXi host.

Please enable VM Prioritization and add all VMs except the vCLS VMs to priority groups. Configure the Un-prioritized group with a zero second duration for VM Shutdown and VM Startup:

Set VM Shutdown Duration

⚠ Values entered here will override the Duration values on the Virtualization Settings page

High	120	seconds
Medium	120	seconds
Low	0	seconds
Group 1	0	seconds
Group 2	120	seconds
Un-prioritized	0	seconds

▸ Set VM Startup Duration

Apply   Undo

Set VM Startup Duration

⚠ Values entered here will override the Duration values on the Virtualization Settings page

High	120	seconds
Medium	120	seconds
Low	0	seconds
Group 1	0	seconds
Group 2	120	seconds
Un-prioritized	0	seconds

Apply   Undo

In vCenter Server Advanced settings, add the a new entry with the name **config.vcls.clusters.domain-c<number>.enabled** and value = **True.**

To obtain a value for domain-c<number> navigate to the Cluster which has vCLS running on it in the vSphere Web UI and copy the domain-c<number> from the URL e.g. the URL will be something like: https://<fqdn-of-vCenter-server>/ui/app/cluster;nav=h/urn:vmomi:ClusterComputeResource:**domain-c10001**:eef257af-fa50-455a-af7a-6899324fabe6/summary.

Copy the part in bold – in this case **domain-c10001**

← → C ⌂ 🔒 Not secure | 10.179.14.249/ui/app/cluster;nav=h/urn:vmomi:ClusterComputeResource:domain-c10001:abcc10f-12b3-46d4-abe2-5f1eba04664c/configure/drs

▦ Apps 📁 Imported 📁 CLOUD 📁 Imported (1) 📁 DSPLOAD 📁 DSPPreview1 📁 DSPPreview2 👋 Log in - Schneider... 📁 PCNS 📁 HyperFlex

vm vSphere Client   Menu ∨   🔍 Search in all environments

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∨ 🔁 10.179.14.249
  ∨ 📁 Datacenter
    📘 **Cluster**
      🖥 10.179.14.153
      🖥 10.179.14.155
      📦 Dummy

📘 **Cluster**   ACTIONS ∨

Summary   Monitor   Configure   Permissions   Hosts   VMs   Datastores   Networks   Updat

Services	∨
vSphere DRS	
vSphere Availability	
Configuration	∨

vSphere DRS is Turned ON

> DRS Automation   Partial

> Additional Options   Expan

Edit Advanced vCenter Server Settings   ✕

⚠ Adding or modifying configuration parameters is unsupported and can cause instability. Configuration parameters cannot be removed once they are added. Continue only if you know what you are doing.

Name ▼	Value ▼	Summary ▼
alarms.version	-1	Default alarm upgrade version
alarms.versionEx	111.0.18	Default alarm extended version
config.alarms.vim.version	vim.version.v7_0_1_1	--
config.drs.kvstore.local	False	--
config.license.client.lsNotificationsSync Seconds	30	--
config.license.client.oldServerLsNotific ationsSyncSeconds	600	--
config.log.compressOnRoll	true	--
config.log.level	info	--
config.log.maxFileNum	30	--
config.log.maxFileSize	52428800	--

1 - 10 of 900 settings |< < 1 / 90 > >|
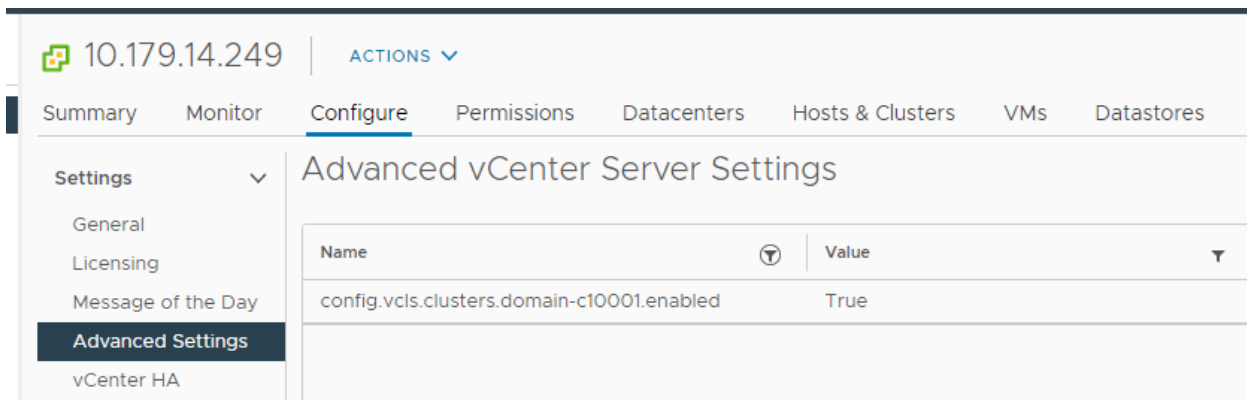
Name * : config.vcls.clusters.domain-c1   Value : True

[ADD]   CANCEL   **SAVE**

Name must start with 'config.' For example: config.log

The following sections outline the steps required for configuring PowerChute to execute the scripts for the PowerChute Virtual Appliance (Linux CentOS 8) or for a Windows Installation.

PowerChute Virtual Appliance

Login to the PowerChute appliance via SSH or using VMware Remote Console and install Powershell per the intstructions in the following link - https://docs.microsoft.com/en-us/powershell/scripting/install/installing-powershell-core-on-linux?view=powershell-7.1

See section Cent OS7.

Next you need to install VMware PowerCLI – in the terminal type "pwsh" and then –

Install-Module -Name VMware.PowerCLI

To carry out an offline installation – on a machine with internet access run the command "Save-Module -Name VMware.PowerCLI -Path <path to download files>". Transfer the downloaded Module folders to the PowerChute appliance via SCP and copy to the following path - ***/opt/microsoft/powershell/7/Modules/***

Edit the .ps1 files using a text editor like vi and change the variables below to match your setup details:

$server = "<vCenter Server IP address>"

$user = "<vCenter Server username"

$password = "<vCenter Server password"

$cluster = "<Name of the Cluster as it appears in vSphere Web Client UI>"

Save the changes and then make the scripts executable by running the command –

chmod +x <filename.ps1>

Launch the PowerChute UI, open the Event Configuration page and click on Run Command File action for the event that you want to trigger a cluster shutdown for. Set the delay to match the delay which is set for the shutdown action.

Enter the full path to the powershell script and set a duration for the command file e.g. 300 seconds.

NOTE: This duration must allow time for the 3 vCLS VMs to be shut down and then removed from the inventory when Retreat Mode is enabled before PowerChute starts the Maintenance mode tasks on each host.

NOTE: From PowerChute Network Shutdown v4.4 the script files must be placed in the /opt/APC/PowerChute/user_files folder.

After the UPS Critical event has been resolved, an event driven command file can be used to disable retreat mode and re-instate the vCLS VMs on the cluster. It is recommended to use the following event in the pcnsconfig.ini file for this:

event_MonitoringStarted_enableCommandFile = true

event_MonitoringStarted_commandFilePath = /opt/APC/PowerChute/user_files/enableRetreatAppliance.ps1

event_MonitoringStarted_commandFileDelay = X

event_MonitoringStarted_commandFileDuration = 300

This event will be triggered when the PowerChute Appliance starts up.

You can also the event below for an advanced configuration where the PowerChute Appliance is running on a Host outside the cluster:

event_CriticalEventResolved_commandFileDelay = X

event_CriticalEventResolved_commandFilePath = /opt/APC/PowerChute/user_files/enableRetreatAppliance.ps1

event_CriticalEventResolved_commandFileDuration = 300

For example, you might have PowerChute deployed on a Management Host running the vSAN Witness Appliance with an Advanced UPS Configuration – in this scenario only the UPS protecting the Cluster Host switches to battery power so the PowerChute VM will not get re-started. In this case, the 2nd event type (CriticalEventResolved) can be used to disable retreat mode.

NOTE: In both cases, vCenter Server must be available before the powershell script can be used so the commandFileDelay value needs to allow enough time for the vCenter Server VM to power back up fully before the script is executed.

PowerChute on Windows

Install VMware PowerCLI on the windows machine where PowerChute is installed. Open powershell and type the command – *Install-Module -Name VMware.PowerCLI*.

Alternatively, use the instructions in the following Kbase for an offline installation - https://blogs.vmware.com/PowerCLI/2018/01/powercli-offline-installation-walkthrough.html

Edit the powershell files (.ps1) using a text editor like notepad to set the following variables for your environment:

$server = "<vCenter Server IP address>"

$user = "<vCenter Server username"

$password = "<vCenter Server password"

$cluster = "<Name of the Cluster as it appears in vSphere Web Client UI>"

Save both powershell script files.

Launch the PowerChute UI, open the Event Configuration page and click on Run Command File action.

Enter the full path to the disable.cmd file and set a duration for the command file e.g. 300 seconds.

NOTE: This duration must allow time for the 3 vCLS VMs to be shut down and then removed from the inventory when Retreat Mode is enabled before PowerChute starts the Maintenance mode tasks on each host.

NOTE: From PowerChute v4.4 the command files must be saved to C:\Program Files\APC\PowerChute\user_files folder.

The powershell scripts (.ps1 files) should be saved to the C:\ drive. Alternatively, you can edit the cmd file to point to a different location.

After the UPS Critical event has been resolved, an event driven command file can be used to disable retreat mode, re-instate the vCLS VMs and re-enable HA on the cluster. It is recommended to use the following event in the pcnsconfig.ini file for this:

event_MonitoringStarted_enableCommandFile = true

event_MonitoringStarted_commandFilePath = C:\Program Files\APC\PowerChute\user_files\disable.cmd

event_MonitoringStarted_commandFileDelay = X

event_MonitoringStarted_commandFileDuration = 300

This event will be triggered when the PowerChute Appliance starts up.

You can also the event below for an advanced configuration where the PowerChute Appliance is running on a Host outside the cluster:

event_CriticalEventResolved_commandFileDelay = X

event_CriticalEventResolved_commandFilePath = C:\Program Files\APC\PowerChute\user_files\enable.cmd

event_CriticalEventResolved_commandFileDuration = 300

NOTE: In both cases, vCenter Server must be available before the powershell script can be used so the **commandFileDelay** value needs to allow enough time for the vCenter Server VM to power back up fully, before it is executed.

SSH actions to prepare vSAN Cluster for Shutdown

Prior to placing the Hosts into the Maintenance mode and shut down, the following commands need to be executed:

1. esxcfg-advcfg -s 1 /VSAN/IgnoreClusterMemberListUpdates – this needs to be run on each host in the Cluster.
2. python /usr/lib/vmware/vsan/bin/reboot_helper.py prepare – this should only be executed on one host in the cluster. NOTE: this script will not run if there is a time drift > 2s between the various nodes so each host should be configured to use an NTP server to sync the time.

To run these commands, it is recommended to use SSH actions in PowerChute. Each SSH Action is executed sequentially:

For each host in the vSAN Cluster, create an SSH action to run before Host Shutdown that executes the command "esxcfg-advcfg -s 1 /VSAN/IgnoreClusterMemberListUpdates" – this can be stored as a text file in the PowerChute/user_files folder.

Then create an SSH action to run the reboot helper python script with prepare option. This should only be run on one host.

Next create an SSH action to run on startup that will run the reboot helper script with the recover option on startup on 1 host followed by SSH actions to run the command "esxcfg-advcfg -s 0 /VSAN/IgnoreClusterMemberListUpdates" on each host in the cluster.

SSH Actions

Name	host1_disable_updates
User Name	pcnsadmin
Password	••••••••••
SSH Key File Path	
SSH Key File Password	
IP Address/Hostname	10.179.232.150
Port	22
Path to SSH command file	h_disable_clustermember_updates.txt
SSH Action Delay	0 seconds
SSH Action Duration	30 seconds
Execute SSH Action	Before Host Shutdown
Enable SSH Action	☑

OK   Cancel

SSH Actions   ✖

Name	reboot_prepare
User Name	pcnsadmin
Password	••••••••
SSH Key File Path	
SSH Key File Password	
IP Address/Hostname	10.179.232.150
Port	22
Path to SSH command file	/opt/APC/PowerChute/user_files/rebo(
SSH Action Delay	0 seconds
SSH Action Duration	180 seconds
Execute SSH Action	Before Host Shutdown ⌄
Enable SSH Action	☑

OK   Cancel

SSH Actions   ✖

Name	reboot_recover
User Name	pcnsadmin
Password	••••••••
SSH Key File Path	
SSH Key File Password	
IP Address/Hostname	10.179.232.150
Port	22
Path to SSH command file	/opt/APC/PowerChute/user_files/rebo(
SSH Action Delay	0 seconds
SSH Action Duration	120 seconds
Execute SSH Action	On Startup ⌄
Enable SSH Action	☑

OK   Cancel

SSH Actions

Name	host2_enable_updates
User Name	pcnsadmin
Password	••••••••
SSH Key File Path	
SSH Key File Password	
IP Address/Hostname	10.179.232.151
Port	22
Path to SSH command file	/opt/APC/PowerChute/user_files/ssh_
SSH Action Delay	0 seconds
SSH Action Duration	30 seconds
Execute SSH Action	On Startup
Enable SSH Action	☑

OK   Cancel

Once the SSH actions have been configure, the pcnsconfig.ini file needs to be updated to set the ESXi host prompt so that the SSH action will execute. To do this add the following line to each SSH action "ssh_prompt_regex = \]\s" e.g.

```
[SSHAction4]
ssh_action_name = reboot_recover
ssh_target = 10.179.232.150
ssh_command_path = /opt/APC/PowerChute/user_files/reboot_helper_recover.txt
ssh_action_enabled = true
action_delay = 0
action_duration = 120
ssh_port = 22
ssh_action_sequence = startup
ssh_prompt_regex = \]\s

[SSHAction5]
ssh_action_name = host1_enable_updates
ssh_target = 10.179.232.150
ssh_command_path =
/opt/APC/PowerChute/user_files/ssh_enable_clustermember_updates.txt
ssh_action_enabled = true
action_delay = 0
action_duration = 30
ssh_port = 22
ssh_action_sequence = startup
ssh_prompt_regex = \]\s
```