EMC ScaleIO

Version 2.0.x

Stateless ESXi Mode Technical Notes

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EMC²

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CHAPTER 1

Running ScaleIO in ESXi Stateless Mode

This document describes how to run ScaleIO in ESXi Stateless mode. Topics include:

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Stateless ESXi overview

The stateless ESXi feature in vCenter allows managing and monitoring ESXi installations. When a host is configured as stateless, it does not preserve its state across reboots, and prevents live installations of VIBs. Each time the ESXi boots, it is reinstalled from a predefined image. Stateless ESXi simplifies updates to the hypervisor and VIB since they can be managed from one central point, without the need to update and install each host manually.

VMWare provides the PowerCLI tool, which is used to build ESXi image profiles and to apply them to a host using deploy rules. After the image profile is created and the deploy rules are configured, the hosts will boot up and the configured image profile will be installed on each host.

In order to preserve essential settings on the ESXi when it is reinstalled, such as network configuration and kernel module parameters, vCenter manages entities called host profiles. Host profile contains settings that can be applied to multiple hosts. Multiple hosts can be attached to a single host profile, with some customization allowed for each individual host. Some settings, such as the kernel module parameters, are configured per host profile and are applied to all hosts attached to this profile. Other settings, such as IP addresses and IQN identifiers, are configured individually for each host.

Important information for using Stateless ESXi in ScaleIO v2.0.1.4

The VMware stateless ESXi (Host Profile) feature provided in ScaleIO v2.0.1.3 is not compatible with ScaleIO v2.0.1.4. You can continue to use the feature with ScaleIO v2.0.1.3, but to upgrade SDC nodes to v2.0.1.4, you must contact Customer Support.

In v2.0.1.4, this feature will be available (tested for ESXi 5.5 and 6.5 only) when VMware releases a compatible ESXi version. VMware is expected to release ESX6.5 that supports the host profile by the end of 2017.

Configuring ScaleIO with stateless ESXis overview

Using stateless mode for the ESXis that host the SDCs allows for automated host configuration, and ensures that the hosts are configured consistently.

The following steps are necessary to configure the ScaleIO system with stateless ESXis:

1. Use PowerCLI to configure the base ESXi host with the settings you wish to replicate for the remaining ESXis.

   Note

   Stateless systems cannot run hyper-converged, sharing local storage.

2. Create a profile based on the base ESXi.
3. Edit the profile to configure the MDM IP addresses and other SDC settings.
4. Attach the ESXis to the profile.
5. Verify that the SDCs installed on these ESXis are connected to the ScaleIO system.

Prepare the base ESXi image

Prepare an ESXi with the base configuration.

Before you begin

Ensure you have the following:

- vCenter with several ESXis.
- Offline bundle file with the appropriate ESXi image
- Offline bundle of the SDC

Use VMware's PowerCLI to run the following commands:

Procedure

1. Connect to the vCenter: `Connect-VIServer -Server <VC_IP> -Protocol https -User <VC_username> -Password <VC_password>`

   where:

   - *<VC_IP>* is the IP address of the vCenter server.
   - *<VC_username>* is the username to log in to the vCenter.
   - *<VC_password>* is the password.

2. Clean previous deployment rules:

   a. Retrieve the list of deployment rules: `Get-DeployRule`

   b. Delete the list of deployment rules: `Remove-DeployRule --delete`

3. Run `Add-EsxSoftwareDepot` to add the following files to the ESXi depot:

   - Offline bundle with ESXi image
   - Offline bundle of the SDC

4. Create a new image profile:

   a. Create a new image profile: `New-EsxImageProfile -CloneProfile <IMAGE_PROFILE> -Name "<PROFILE_NAME>" -Vendor DELLEMC`

   where:

   - *<IMAGE_PROFILE>* is the name of the image profile you want to clone.
   - *<PROFILE_NAME>* is the name you wish to call the ESXi image profile.

   For example:

   ```
   New-EsxImageProfile -CloneProfile ESXi-5.5.0-2015xxxxx-
   standard -Name "image_profile_2.0.1" -Vendor DELLEMC
   ```

   b. Display image profile details: `Get-EsxImageProfile`

5. Set the acceptance level of the image profile: `Set-EsxImageProfile -AcceptanceLevel CommunitySupported -ImageProfile <PROFILE_NAME>`

where *<PROFILE_NAME>* is the name of the image profile.

```
Set-EsxImageProfile -AcceptanceLevel CommunitySupported -
ImageProfile "image_profile_2.0.1"
```

6. Add the offline bundles to the current session: `Add-EsxSoftwarePackage -ImageProfile <PROFILE_NAME> -SoftwarePackage <SDC_OFFLINE_BUNDLE> -Force`

   where:

   - *<PROFILE_NAME>* is the name of the ESXi image profile created above.
   - *<SDC_OFFLINE_BUNDLE>* is the filename of the SDC offline bundle.

   For example:

```
Add-EsxSoftwarePackage -ImageProfile image_profile_2.0.1 -
SoftwarePackage scaleio-sdc-esx5.5 -Force
```

7. Create a rule that assigns the image profile to hosts that have a particular IPv4 address pattern:

   a. Create the new rule: `New-DeployRule -name "<RULE_NAME>" -Item <PROFILE_NAME> -pattern "mac=xx:yy:zz:aa:bb:cc"`

      where

      - *<RULE_NAME>* is a name for the new rule.
      - *<PROFILE_NAME>* is the name of the ESXi image profile created above.

      For example:

```
New-DeployRule -name "rule_image_profile_2.0.1" -Item
image_profile_2.0.1 -pattern "mac=90:e2:ba:74:36:6c"
```

   b. Add the rule to the working rule set and activate it: `Add-DeployRule <RULE_NAME>`

      where *<RULE_NAME>* is the name of the new rule created above.

      For example:

```
Add-DeployRule rule_image_profile_2.0.1
```

   c. Retrieve the current working rule set: `Get-DeployRuleSet`

8. Check whether each ESXi host is compliant with the new rule by running the following on each ESXi: `Test-DeployRuleSetCompliance`

   If you encounter an error with the rule compliance, perform the following for the relevant ESXi to clear any previous configurations:

   a. Repair the AutoDeploy cache to clear previous rules that may have been attached to the ESXi: `Repair-DeployImageCache`

   b. Create a variable for the host: `$<VAR_NAME>=Get-VMHost -Name <HOST_IP_ADDRESS>`

```
$host173=Get-VMHost -Name 192.168.110.161
```

c. Associate the specified image profile with the specified system: `Apply-ESXImageProfile -ImageProfile <NEW_PROFILE> -Entities <ESX_HOST>`

d. Test and repair the rule set compliance: `$host | Test-DeployRuleSetCompliance | Repair-DeployRuleSetCompliance`

e. Retest the rule set compliance: `Test-DeployRuleSetCompliance <HOST_IP_ADDRESS>`

9. Reboot the ESXi host.
10. Start the SDC and manually load temporary parameters:

a. Run the following commands in the ESXi command line:

```
esxcli system module parameters set -m scini -p
"IoctlIniGuidStr=<GUID> IoctlMdmIPStr=<MDM_IP>"
```

where:

- *<GUID>* is a temporary invalid GUID
- *<MDM_IP>* is a temporary invalid IP address for the MDM

For example:

```
esxcli system module parameters set -m scini -p
"IoctlIniGuidStr=12345678-90AB-CDEF-1234-567890ABCDEF
IoctlMdmIPStr=1.2.3.4"
```

b. Load the SDC:

```
esxcli system module load -m scini
```

c. Verify that the SDC has started correctly:

```
esxcli system module list | grep scini
```

Results

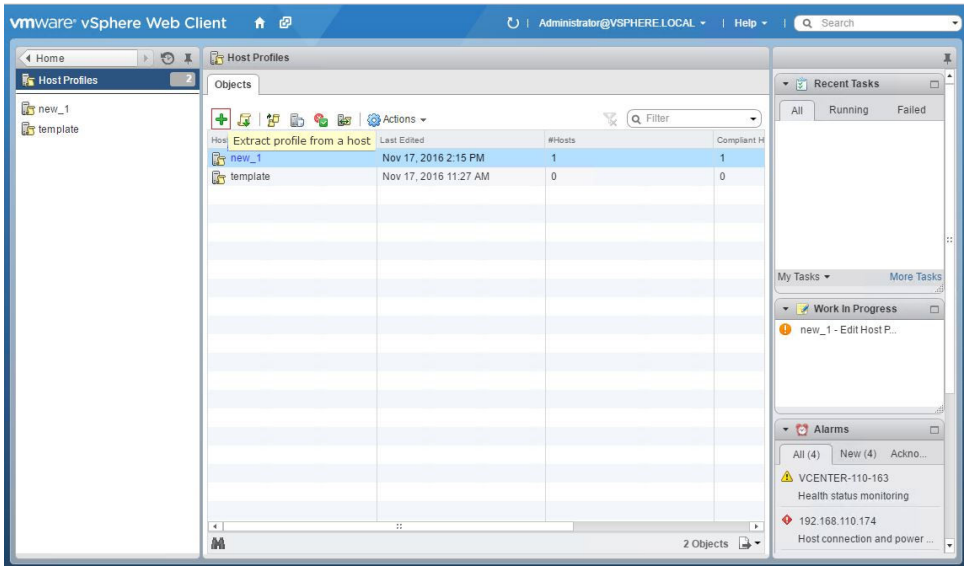
The ESXi image profile is created with the necessary rules, but the SDC is not yet connected to the ScaleIO cluster until creating the host profile.

Prepare the host profile

Prepare the host profile settings based on the previously configured ESXi.

Procedure

1. Open the vSphere Web Client.
2. Navigate to the Host profiles view.
3. Click the **Extract Profile from a Host** icon (+).



4. Select the previously configured ESXi from which to extract the profile settings and click **Next**.
5. Type the name and enter a description for the new profile and click **Next**.
6. Review the summary information for the new profile and click **Finish**.

Edit the host profile

In the vSphere Web Client, edit the host profile's settings.

Before you begin

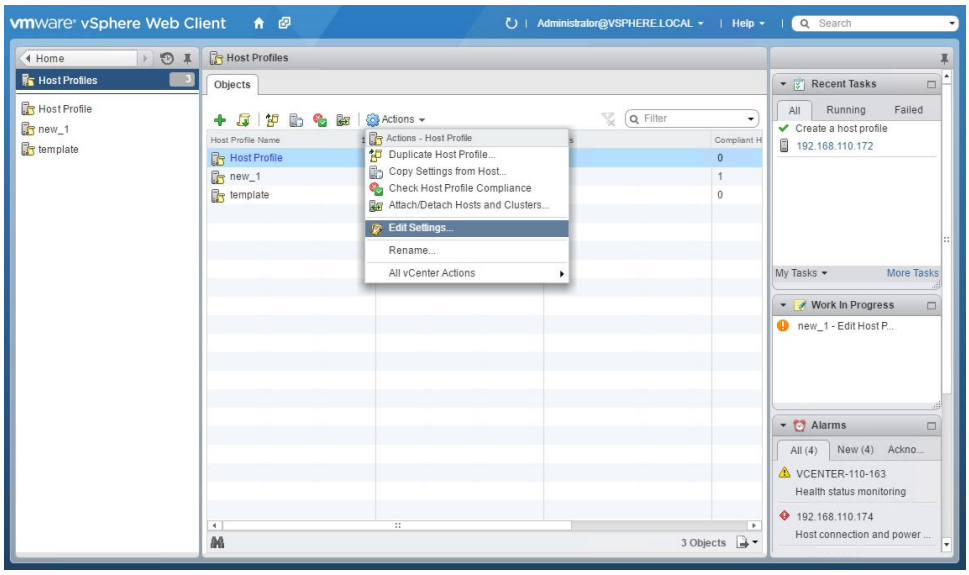
Ensure you have

- The IP addresses for the MDMs in the cluster, or the virtual IP address for the MDM cluster.
- GUID for each ESXi's SDCs

Edit the host profile's settings to include the IP addresses for the MDMs. This allows the stateless ESXi to serve as an SDC. You can optionally configure other SDC options.

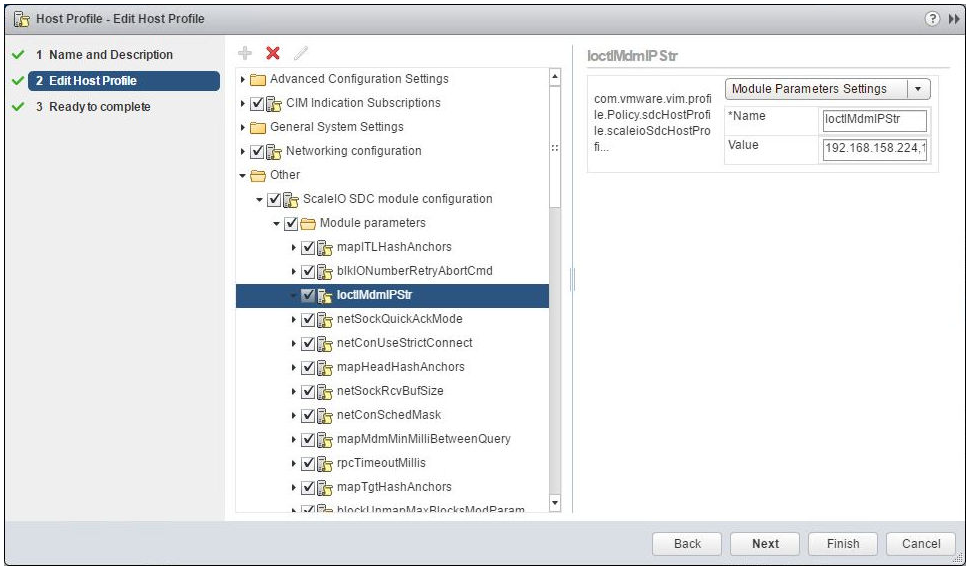
Procedure

1. In the vSphere Web Client, navigate to the Host Profiles view and select the host profile name.
2. Click **Actions** > **Edit Settings...**.



3. In the **Name and Description** screen, select the host profile you wish to edit and click **Next**.
4. In the **Edit Host Profile** screen, expand the **General System Settings** folder.
5. Expand **Kernel Module Configuration**.
6. In the list of modules, locate the **scini** module, and expand it.
7. Expand the **Kernel Module Parameter** folder.
8. In the list of kernel parameters, identify the setting that updates the MDM IP addresses.

   In the right pane, the parameter name is displayed as **IoctlMdmIPStr**.



9. In the **Value** field below the setting name, enter the MDM IP addresses, and click **Next**.

   Use commas to separate the IP address of each MDM, or use a virtual IP address for the MDM cluster.

10. Locate the parameter **IoctlIniGuidStr**. From the drop-down menu, select **come.vmware.vim.profile.PolicyOption.kernelModule...**

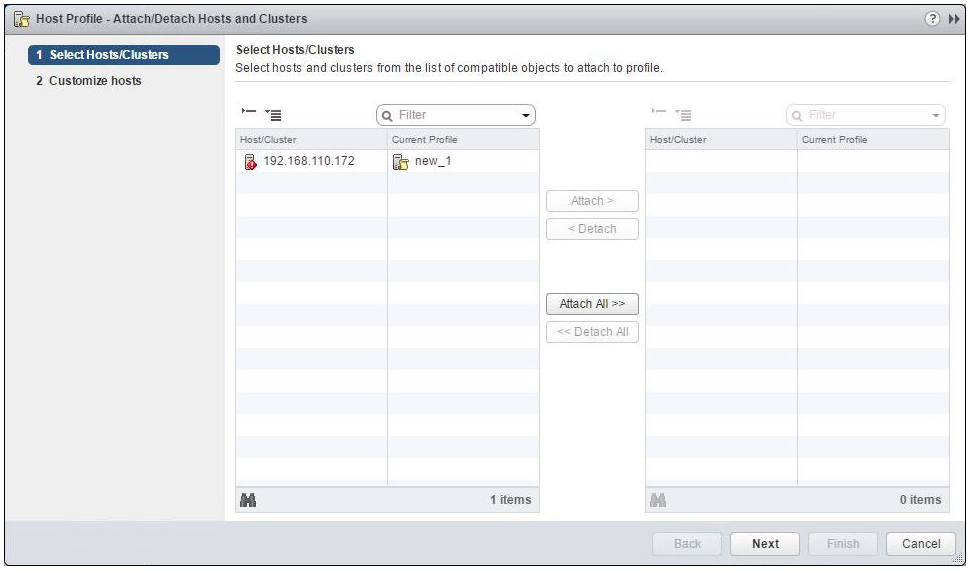
11. Paste the string **loctIIniGuidStr** into the **parameterName** field.
12. Review the summary information for the edited profile and click **Finish**.

Attach the ESXi hosts to the host profile

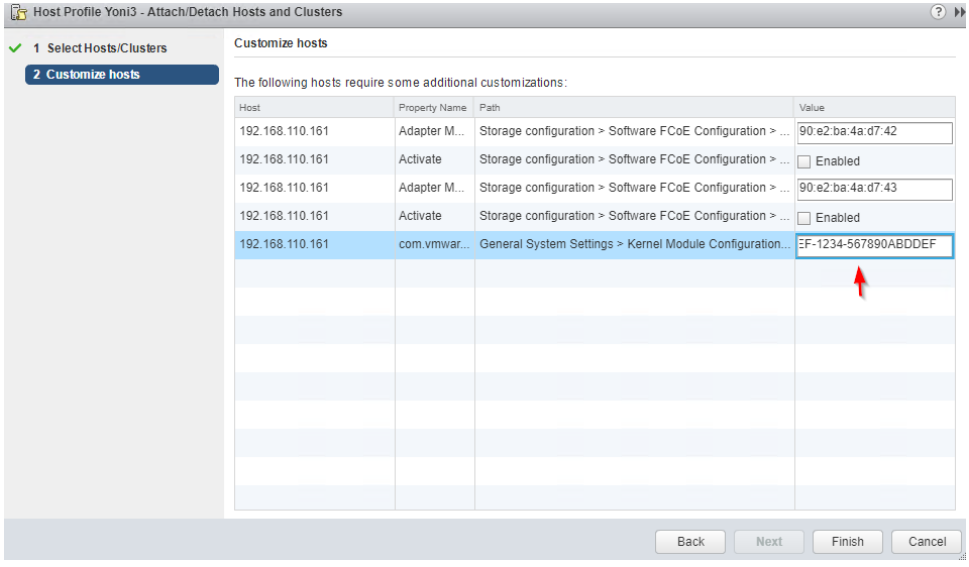
Attach the ESXis to the host profile.

Procedure

1. In the vSphere Web Client, navigate to the Host Profiles view.
2. Select the created host profile.
3. Select **Actions** > **Attach/Detach Hosts and Clusters**.
4. In the **Select Hosts/Clusters** screen, select the ESXis you wish to attach to the host profile and click **Next**.



5. In the **Customize hosts** screen, enter the host GUID.



6. Reboot all ESXis that were attached to the profile.

Verify that the ESXis hosting SDCs are connected

Use the ScaleIO GUI to verify that the ESXis are connected to the system.

Before you begin

Ensure that you have:

- The management IP address or hostname of the MDM.
- The username and password to log in to the ScaleIO GUI.

Procedure

1. Open the ScaleIO GUI.
2. Log in using the MDM IP address or hostname and the ScaleIO username and password.
3. In the **Frontend** > **SDCs** view, verify that all of the ESXis hosting SDCs are connected.