

## Integrating Cisco UCS with vSphere Distributed Power Management

In the current economic and environmental climate there is a focus on increasing the efficiency of IT infrastructure by increasing the utilization of hardware through techniques like virtualization, and actively reducing the power consumption when workload levels are low.

vSphere's Distributed Power Management (DPM) is a technique to actively manage down power consumption of a vSphere cluster by shrinking the amount of powered up servers when workload levels are low. vSphere can turn Cisco UCS blades on and off via the Intelligent Platform Management Interface (IPMI).

This article explains how to configure both vSphere and UCS to create the IPMI connections and enable vCenter to manage down the power consumption of Cisco UCS during low workloads.

There are four steps to integrating UCS with vSphere DPM via IPMI:

1. Define the IPMI Policy in Cisco UCS
2. Connect the IPMI Policy to the ESX host Service Profile
3. Discover the Service Profile server's BMC IP and MAC address
4. Configure IPMI in vCenter

Additional useful resources are provided at the end.

- This note is part of the Cisco Support Community post you can find on the web at <https://supportforums.cisco.com/docs/DOC-8582>

### Author

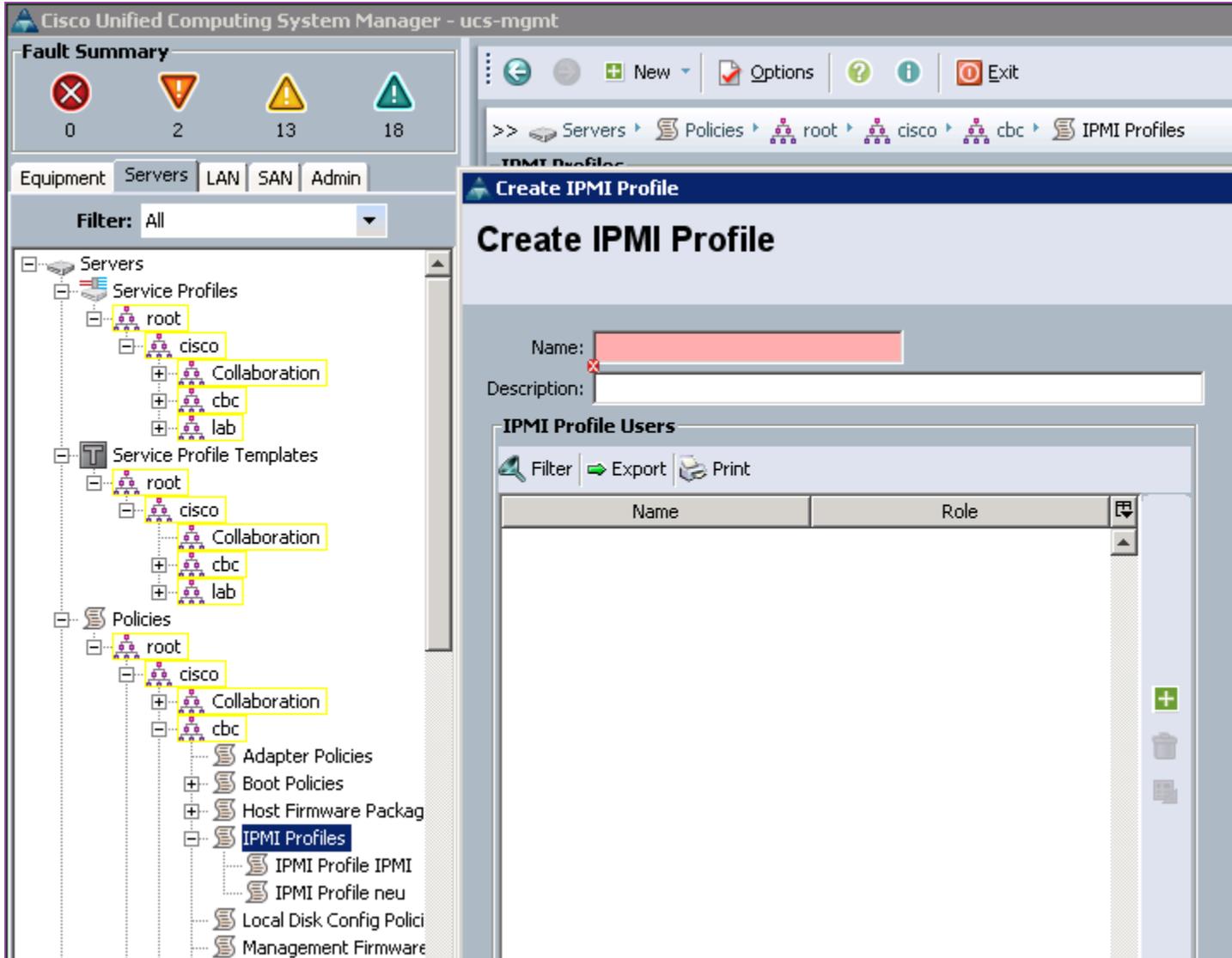
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### 1. Define the IPMI Policy in Cisco UCS

First of all you need to enable IPMI on a blade. To do so you create a new IPMI policy. Within UCS Manager, go to the Server tab and drill down to the organization where you want to create this policy, then click on the green "Add" icon on the right and select "Create IPMI Profile".



In the new window you provide a name, in this example "ESX". Then you need to add a user to this profile. In our example we specify "vmware" as username and "cisco123" as password. The BMC chip on our blade will ask for these credentials.

**Create IPMI Profile User**

Name:

Password:

Confirm Password:

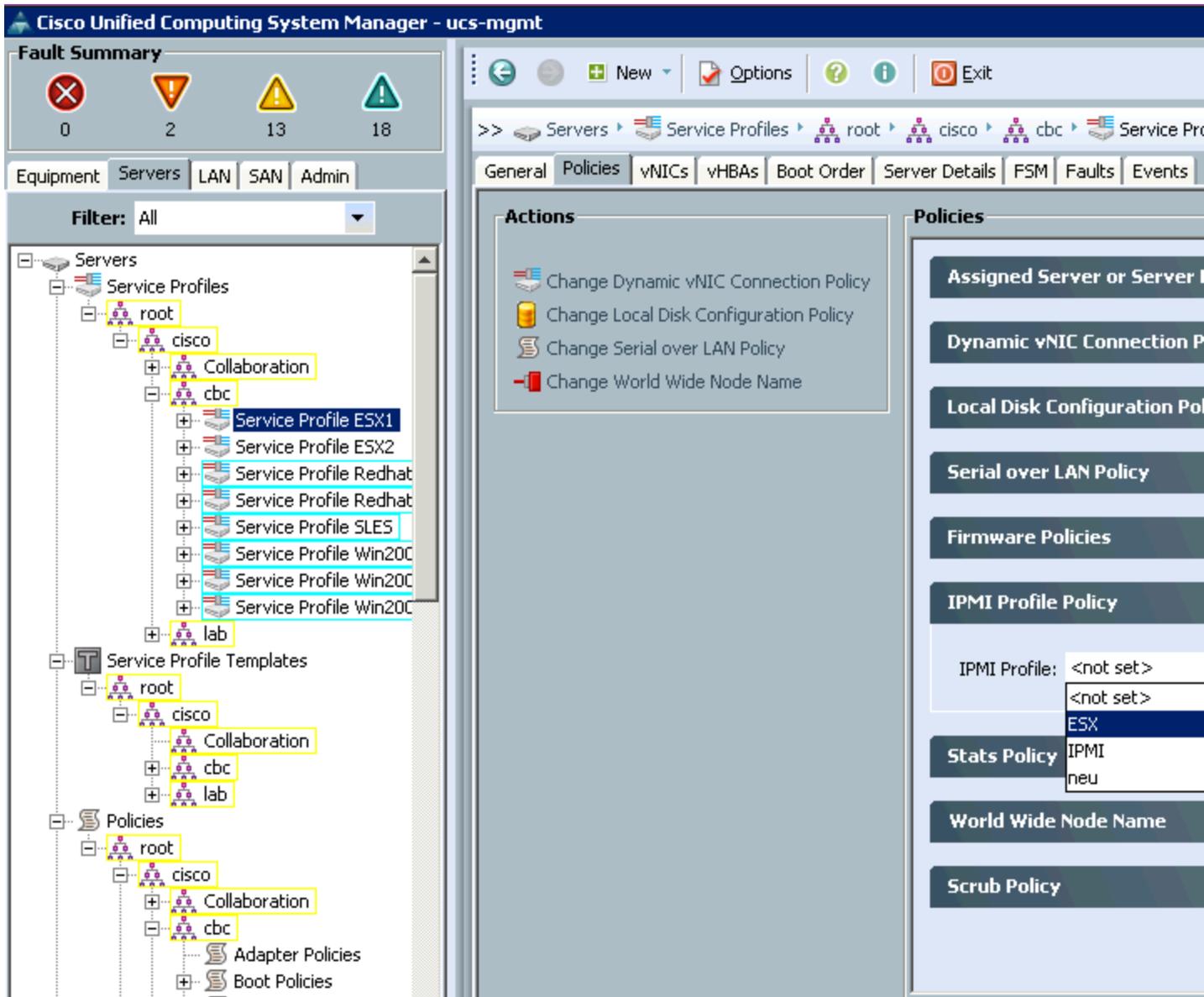
Role:  readonly  admin

OK Cancel

Once you are done you can confirm all windows. Done!

## 2. Connect the IPMI Policy to the ESX host Service Profile

To enable the new IPMI policy you have to add it to your Service Profile. In our example I select the ESX Service Profile and click on Policies, then select the new ESX IPMI policy from the dropdown list:



To submit the change you have to click on "Save Changes". This does not require a reboot and will be in place immediately.

### 3. Discover the Service Profile server's BMC IP and MAC address

Later on we will have to specify the IP and MAC address of the BMC on our blade. We can get this from the Inventory tab of our blade. Your Service Profile is associated to a blade server. Pick that blade server from the hardware list or via the Service Profile (there is a link to it on the "General" page of the Service Profile). On the Server you click on "Inventory" and then on "BMC". On this page you will see the associated IP and MAC address:

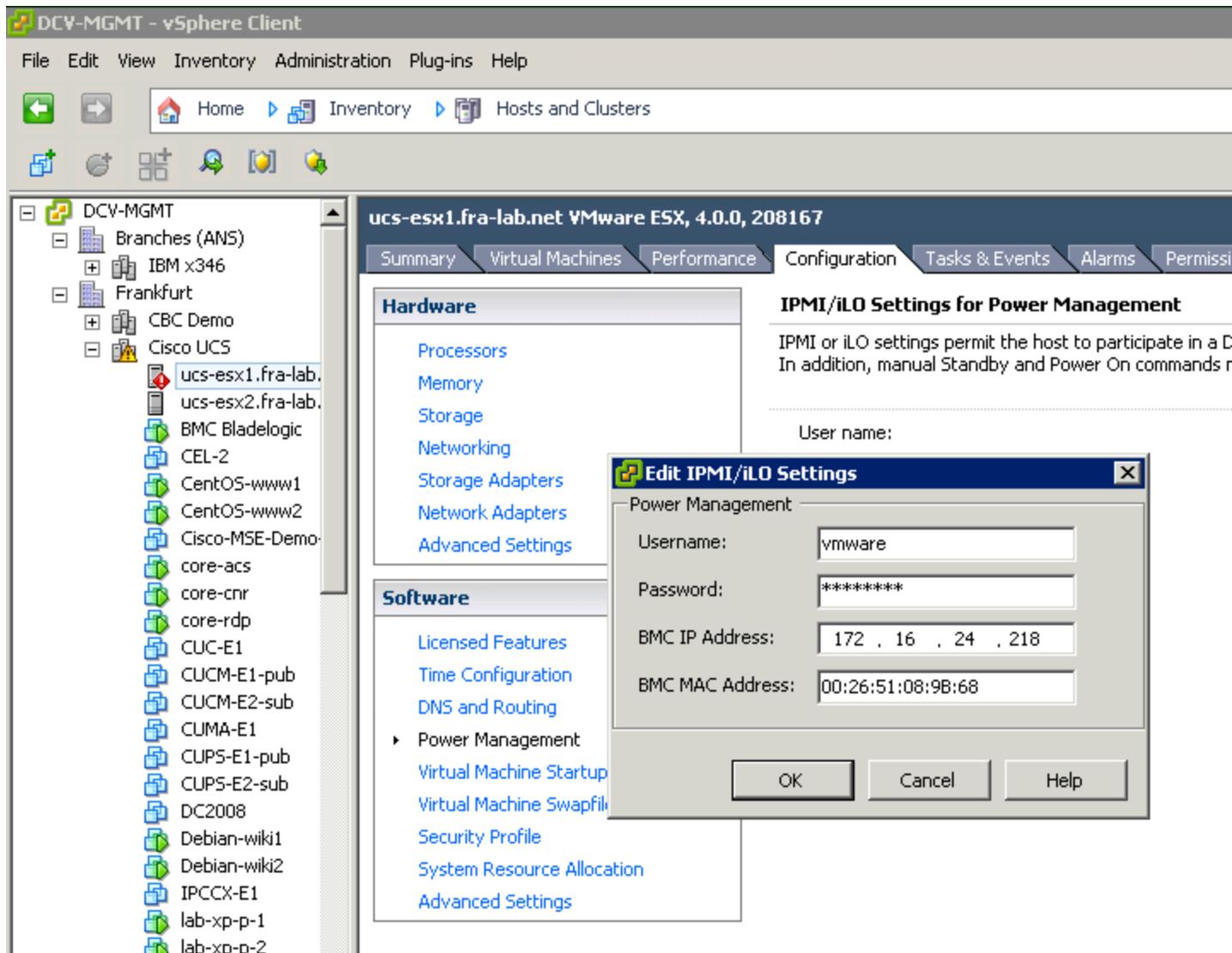
The screenshot shows the Cisco Unified Computing System Manager (UCS-Mgmt) interface. The main window displays the 'Properties for: Chassis 1 / Server 1' configuration. The 'BMC' tab is selected, and the 'Management Interface' section is highlighted with a red box. The IP address is 172.16.24.218, the Subnet Mask is 255.255.255.0, the Default Gateway is 172.16.24.1, and the MAC address is 00:26:51:08:9B:68. The 'Management Logs' section shows a table with one entry: ID 0, Type SEL, and Cap available.

ID	Type	Cap
0	SEL	available

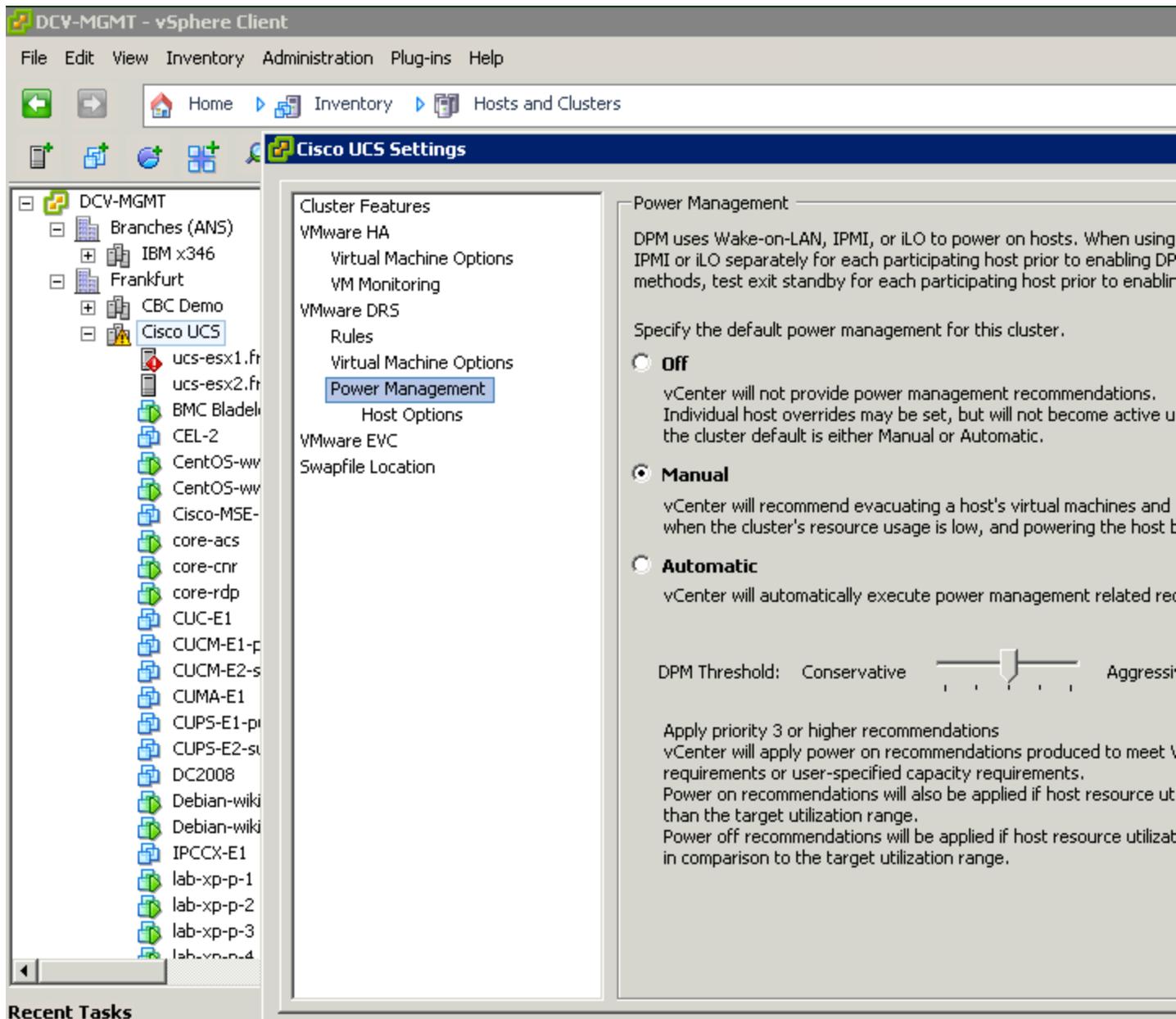
Write down the IP and MAC address of the Management Interface.

#### 4. Configure IPMI in vCenter

Within your vCenter, select the corresponding ESX host on which you enabled IPMI earlier in the UCS Manager. Click on "Configuration", then "Power Management". You are now in the right place to do the IPMI/iLO Settings for Power Management. Click on "Properties" to define the settings. Right here you fill in the values that you wrote down in the previous step: username and password from the IPMI profile, IP and MAC address from the BMC:



That's all! vCenter will verify the values and throw an error message if something is wrong (i.e. IP or MAC address). You could now try the features by selecting your ESX cluster and modify the Power Management options. You can first try with "Manual" and then put your host in Standby mode. It should work :)



### Important Note

The BMC IP of each blade is dynamically assigned when a Service Profile is associated to a blade in UCSM. If a Service Profile is disassociated from a blade and then re-associated it is likely to get a different BMC IP from the pool of Management IPs, even if the Service Profile is applied to the same physical blade.

So, if you disassociate/associate a Service Profile for a vSphere OS that is being accessed via IPMI by vCenter, you must manually perform steps 3 and 4 above again to make sure that vCenter is using the correct (new) IP.

**Why?** This is by design because the system should allow for many Service Profiles to be created with the understanding that not all of them will be active at one time (over-commitment).

**What impact does this have?** If you don't keep the vCenter and UCSM configurations synchronized then you have the possibility that DPM is managing the "wrong host". This happens when you disassociate your ESX Service Profile from a blade and the Mgmt/BMC IP is released back into the pool. Then another ESX Service Profile could pull that out of the pool and be managed by DPM even if that's not the intention.

**What can you do about it?** If you think you can manage the synchronization manually between vCenter and UCSM, so that when an ESX Service Profile is disassociate and then associated (e.g. when a blade needs hardware maintenance), then make sure your Standard Operational Procedures for Service Profile disassociation/association include this "DPM Synchronization" Step.

In a future release of UCSM the Mgmt IP of the blade BMC that is assigned to the Service Profile dynamically upon association will be made "sticky" to avoid this problem: NOTE, however, this means that if you are overcommitting your hardware with more Service Profiles than blades, then you need many more Mgmt IPs – as always, it's a balance 😊

## Resources

- [vSphere DPM Performance Best Practices](#)
- [Cisco UCS IPMI](#)
- [IPMI on Wikipedia](#)