

HyperFlex Boost Mode

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Introduction

HyperFlex™ Boost Mode increases the available storage IOPs of a Cisco HyperFlex (HX) cluster. It does this by increasing the number of vCPUs allocated to the storage controller Virtual Machine (VM) by four. The availability of this feature starts with Cisco HyperFlex Release 4.0.1b.

HyperFlex Boost Mode is a manual process that is supported for the limited set of configurations enumerated below. Customers are responsible for ensuring their clusters meet these requirements.

There are no license requirements for enabling the HyperFlex Boost Mode.

VMware CPU settings explained

In the settings of the VM, you can set CPU variables:

- **CPU:** Number of virtual CPUs (vCPUs).
- **Cores:** Number of cores per virtual CPU.
- **Reservation:** Guaranteed minimum amount of CPU cycles for the VM. If the VM is not using all cycles, other VMs can use the unused resources at that time.
- **Limit:** Maximum amount of CPU cycles for the VM.
- **Shares:** Depending on the amount of shares a VM has, when there is resource contention the CPU cycles are shared among the shares. Shares are a relative metric for allocating CPU cycles.

Configuration requirements

A HyperFlex All-Flash with nonboost mode configuration needs eight vCPUs with one core per socket and a reservation of 10,800 MHz.

The HyperFlex All-NVMe needs 12 vCPUs in nonboost mode.

To enable HyperFlex BoostMode, add four additional vCPUs to the controller VM.

For changing the number of vCPUs of the HyperFlex Controller VM, you will need the **Virtual Machine, Configuration, Change CPU Count** privilege in your vCenter account.

Requirements

- Supported hardware:
 - HyperFlex All-NVMe
 - HyperFlex All-FlashHXAF240 andHXAF220
- Hypervisor: ESX only
- HyperFlex Boost Mode requires the following number of vCPUs on the controller VM
 - HyperFlex All-NVMe: 16
 - HyperFlex All-FlashHXAF240 andHXAF220: 12

- CPU: The number of physical cores must be at least the new number of controller vCPUs. In the vSphere Client, click on the host, then Configure, then Processors, and verify “Processor cores per socket”. (See Figure 1.)
- [Table 1](#) has a list of supported CPUs.

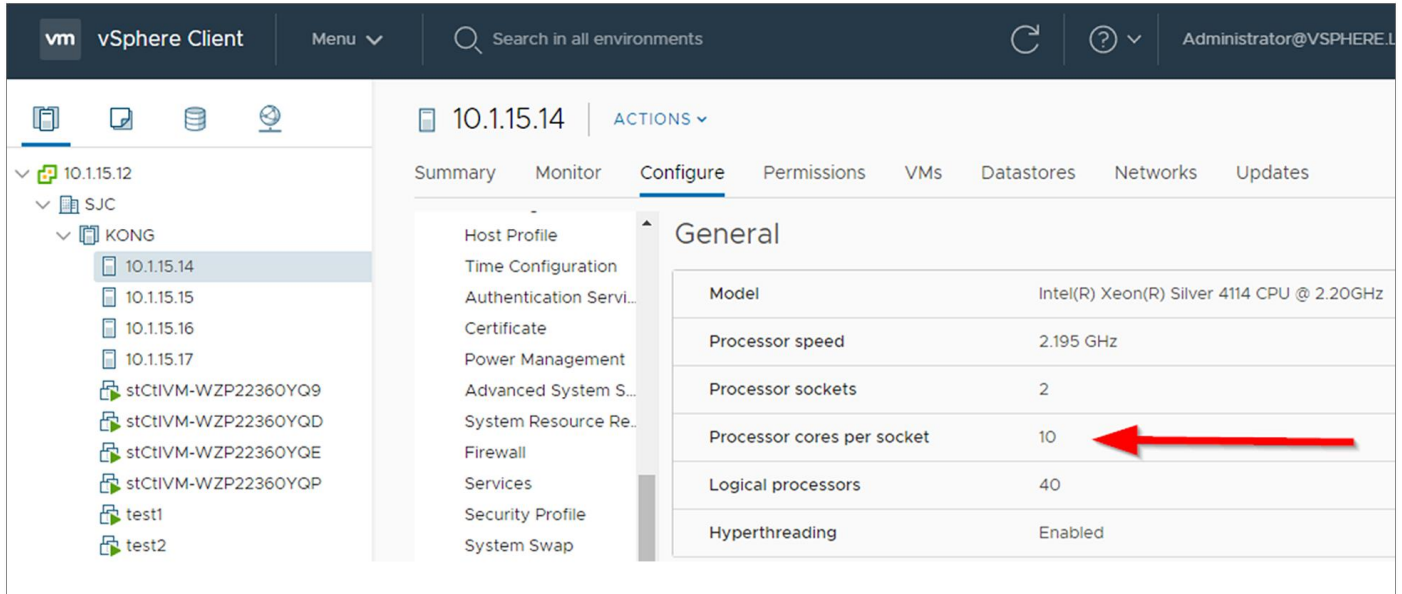


Figure 1.
Verifying number of processor cores per socket in a HyperFlex ESXi host

Enable HyperFlex Boost Mode

The implementation is like a rolling upgrade of the HyperFlex Controller VM (HX CVM).

Figure 2 shows the workflow to enable HyperFlex Boost Mode.



Figure 2.
Workflow to enable HyperFlex Boost mode

Configuration of HyperFlex Boost Mode:

Step 1. Verify that the HyperFlex cluster is Healthy:

Go to HyperFlex Connect – Dashboard; the **Resiliency Health** should be “**Healthy.**”

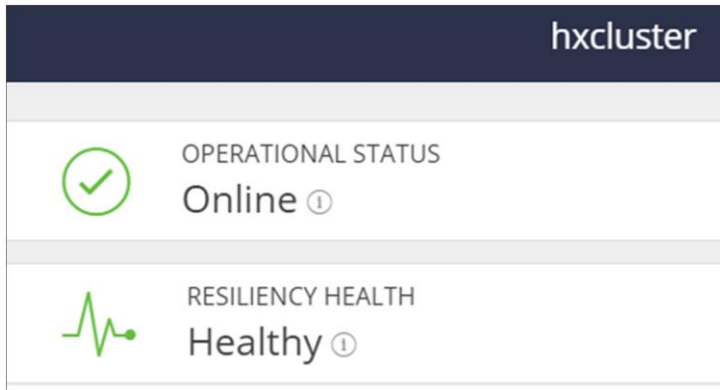


Figure 3.
Verifying the HyperFlex cluster is in a healthy state

Step 2. Stop the HyperFlex CVM gracefully via: **Shutdown Guest OS.**

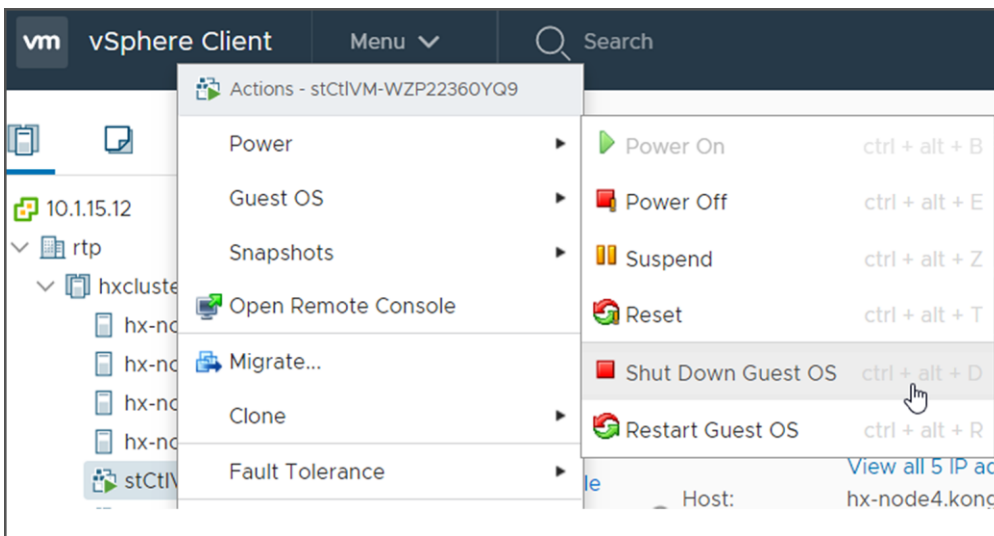


Figure 4.
Graceful shutdown of HyperFlex Controller VM (CVM)

Note: If the original HyperFlex system is HXDP Release 4.0.1a or lower, and you upgraded this HyperFlex cluster to later releases, then the HyperFlex Controller VM (HX CVM) is controlled via the vSphere ESX Agent Manager. This means that the agent always wants to have the HX CVM up and running. If you shut down the HX CVM, there is a possibility that the HX CVM will power on automatically.

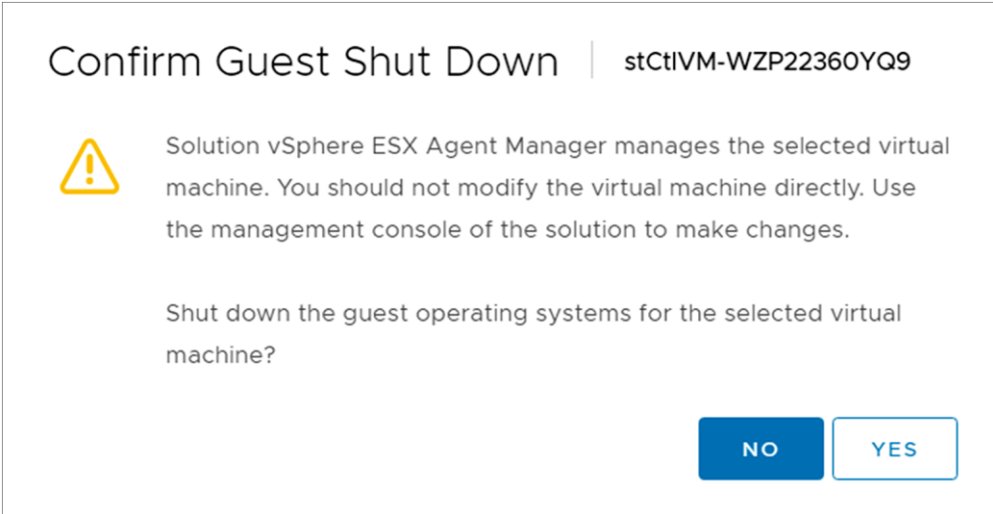


Figure 5.
Confirm shutdown of HyperFlex Controller VM

Note: A vCenter API call to shut down the Guest OS of the HX CVM is not possible.

Note: When you put a HyperFlex node into Maintenance mode, you are unable to change the HX CVM CPU settings.

Step 3. Wait until the HyperFlex Controller VM is powered off:

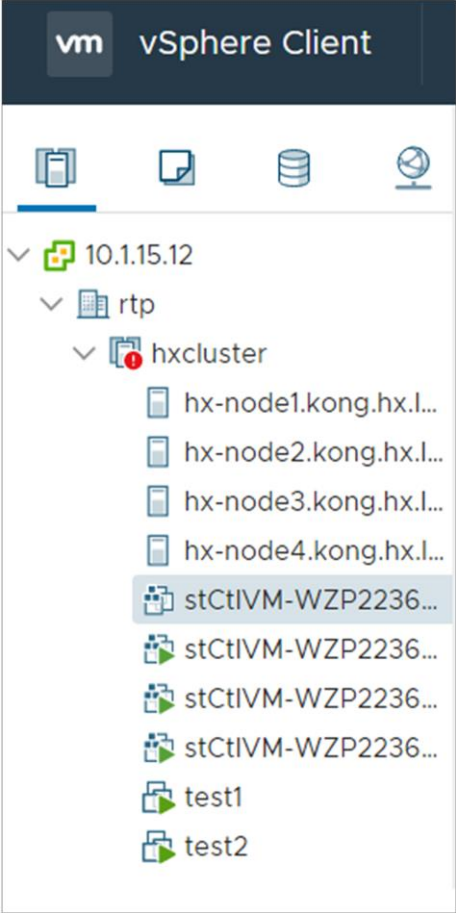


Figure 6.

Verifying the HyperFlex Controller VM is shutdown

Step 4. In HyperFlex Connect, you will see the current status changed to “**Warning**” for the HyperFlex cluster. Now the HyperFlex cluster is still Online, but not Healthy.



Figure 7.

Verifying health of the HyperFlex cluster

Step 5. Edit settings of HyperFlex Controller VM:

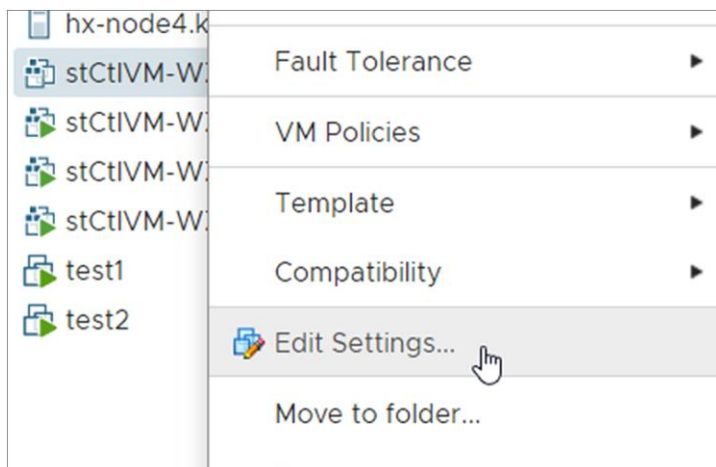


Figure 8.

Edit Settings of HyperFlex Controller VM

Step 6. After the controller VM is powered down, increase the number of vCPUs by four in the vSphere Client.

Click **Edit Settings** for the VM and the **CPU** value.

The new CPU value for a **HyperFlex All-FlashCluster** will be: **12 CPU**

The new CPU value for a **HyperFlex All-NVMe** will be: **16 CPU**

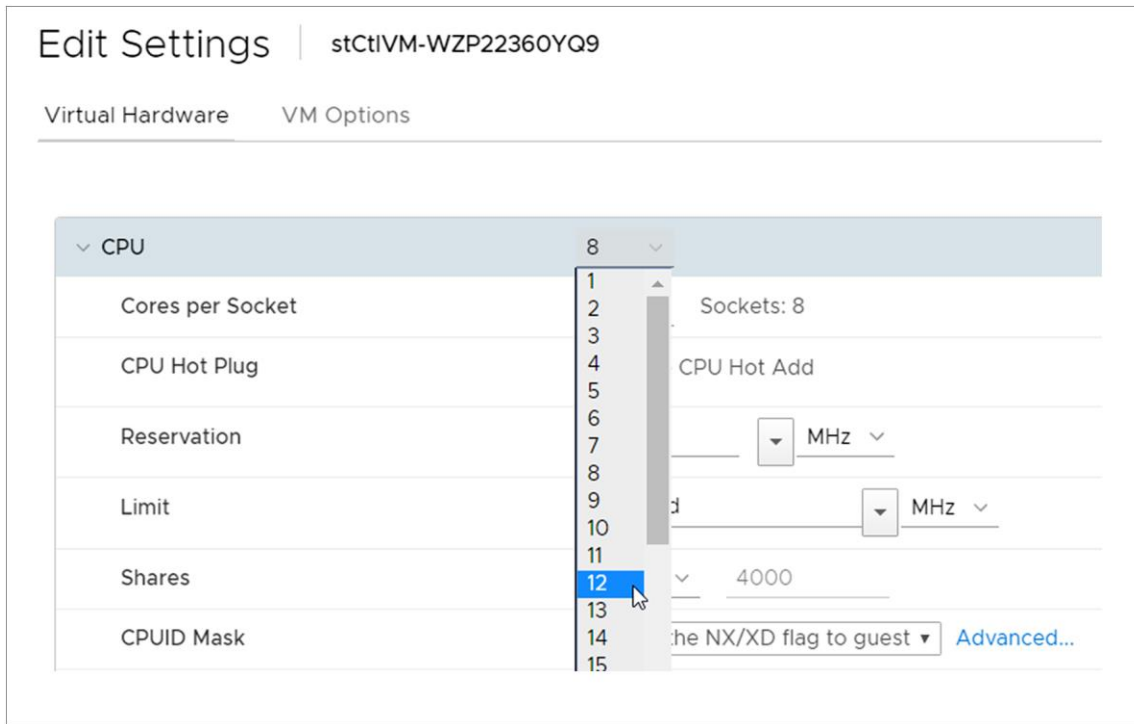


Figure 9.
Changing the number of CPUs on the HyperFlex Controller VM

Note: It is tempting to enable the CPU Hot Add for future usage. Don't enable this feature, because, by doing so, you will change the vNUMA, which affects the performance of the HyperFlex cluster in a negative way.

Step 7. Power on the HyperFlex Controller VM:

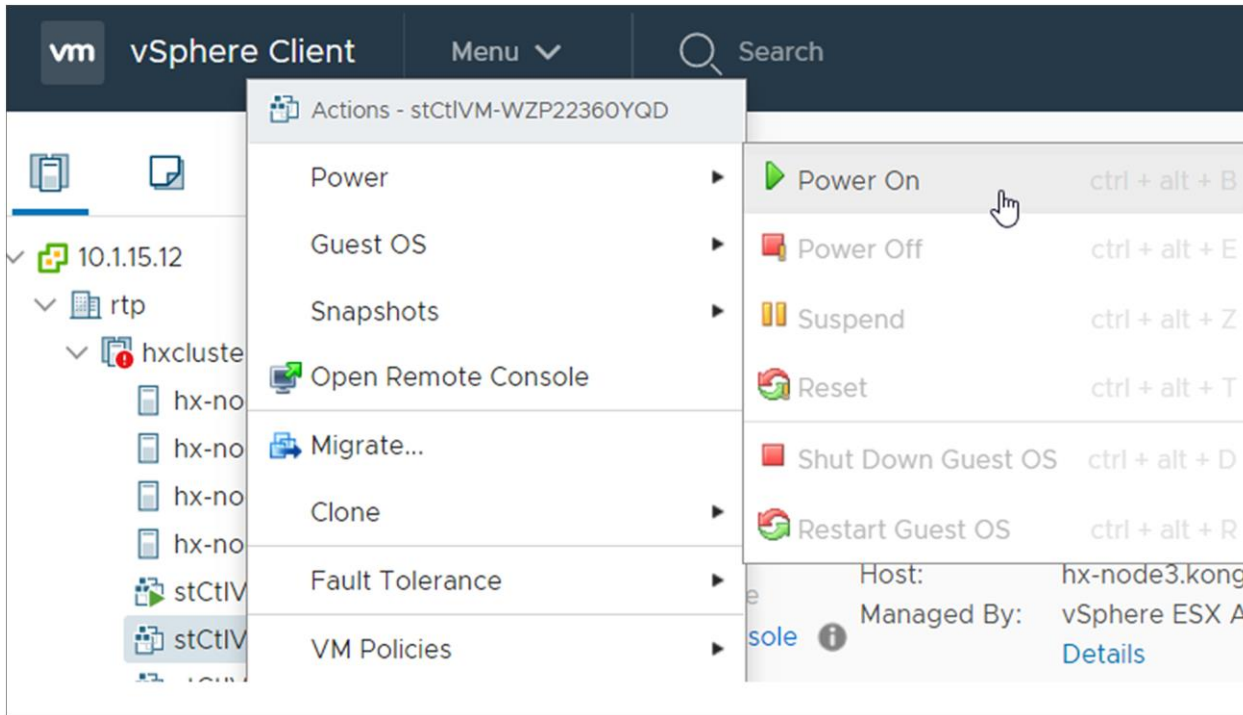


Figure 10.
Powering on the HyperFlex Controller VM

Step 8. Go to HX Connect - Dashboard, and wait for the cluster to become healthy again.

Step 9. Repeat steps 1-8 for each HyperFlex Controller VM in the cluster.

Note: When the HyperFlex Cluster is expanded after HyperFlex Boost Mode is enabled, all new nodes require to have the above steps applied.

Disable HyperFlex Boost Mode

HyperFlex Boost Mode can be disabled by reducing the number controller VM vCPUs back to 12 (for All-NVMe) or 8 (for All-Flash HXAF240 and HXAF220) by following the implementation steps above. In Step 6, decrease the number of vCPUs by four.

Supported CPUs

In Table 1, you will see a list of CPUs. This list shows if the CPU supports the HyperFlex Boost Mode for a HyperFlex All-Flash or HyperFlex All-NVMe cluster.

Table 1. Supported CPUs

HX CL PID	HX Boost All-Flash	HX Boost All-NVMe	Cores	Speed
HX-CPU-I4208	No	No	8	2.1
HX-CPU-I4210	No	No	10	2.2
HX-CPU-I4214	Yes	No	12	2.2
HX-CPU-I4216	Yes	Yes	16	2.1
HX-CPU-I5215	No	No	10	2.5
HX-CPU-I5217	No	No	8	3
HX-CPU-I5218	Yes	Yes	16	2.3
HX-CPU-I5220	Yes	Yes	18	2.2
HX-CPU-I6226	Yes	No	12	2.8
HX-CPU-I6230	Yes	Yes	20	2.1
HX-CPU-I6234	No	No	8	3.4
HX-CPU-I6238	Yes	Yes	22	2.1
HX-CPU-I6240	Yes	Yes	18	2.6
HX-CPU-I6242	Yes	Yes	16	2.8
HX-CPU-I6244	No	No	8	3.6
HX-CPU-I6248	Yes	Yes	20	2.5
HX-CPU-I6254	Yes	Yes	18	3.1
HX-CPU-I8260	Yes	Yes	24	2.4
HX-CPU-I8268	Yes	Yes	24	2.9
HX-CPU-I8270	Yes	Yes	26	2.6
HX-CPU-I8276	Yes	Yes	28	2.3
HX-CPU-I8280	Yes	Yes	28	2.7
HX-CPU-I6240M	Yes	Yes	18	2.6
HX-CPU-I8260M	Yes	Yes	24	2.3
HX-CPU-I8276M	Yes	Yes	28	2.2
HX-CPU-I8280M	Yes	Yes	28	2.7

HX CL PID	HX Boost All-Flash	HX Boost All-NVMe	Cores	Speed
HX-CPU-I5215L	No	No	10	2.6
HX-CPU-I6240L	Yes	Yes	18	2.6
HX-CPU-I6238L	Yes	Yes	22	2.4
HX-CPU-I8260L	Yes	Yes	24	2.3
HX-CPU-I8276L	Yes	Yes	28	2.2
HX-CPU-I8280L	Yes	Yes	28	2.7
HX-CPU-3106	No	No	8	1.7
HX-CPU-4108	No	No	8	1.8
HX-CPU-4110	No	No	8	2.1
HX-CPU-4114	No	No	10	2.2
HX-CPU-4116	Yes	No	12	2.1
HX-CPU-5115	No	No	10	2.4
HX-CPU-5117	Yes	No	14	2
HX-CPU-5118	Yes	No	12	2.3
HX-CPU-5120	Yes	No	14	2.2
HX-CPU-6126	Yes	No	12	2.6
HX-CPU-6130	Yes	Yes	16	2.1
HX-CPU-6132	Yes	No	14	2.6
HX-CPU-6134	No	No	8	3.2
HX-CPU-6136	Yes	No	12	3
HX-CPU-6138	Yes	Yes	20	2
HX-CPU-6140	Yes	Yes	18	2.3
HX-CPU-6142	Yes	Yes	16	2.6
HX-CPU-6144	No	No	8	3.5
HX-CPU-6146	Yes	No	12	3.2
HX-CPU-6148	Yes	Yes	20	2.4
HX-CPU-6150	Yes	Yes	18	2.7

HX CL PID	HX Boost All-Flash	HX Boost All-NVMe	Cores	Speed
HX-CPU-6152	Yes	Yes	22	2.1
HX-CPU-6154	Yes	Yes	18	3
HX-CPU-8153	Yes	Yes	16	2
HX-CPU-8158	Yes	No	12	3
HX-CPU-8160	Yes	Yes	24	2.1
HX-CPU-8164	Yes	Yes	26	2
HX-CPU-8168	Yes	Yes	24	2.7
HX-CPU-8170	Yes	Yes	26	2.1
HX-CPU-8176	Yes	Yes	28	2.1
HX-CPU-8180	Yes	Yes	28	2.5
HX-CPU-6134M	No	No	8	3.2
HX-CPU-6140M	Yes	Yes	18	2.3
HX-CPU-6142M	Yes	Yes	16	2.6
HX-CPU-8160M	Yes	Yes	24	2.1
HX-CPU-8170M	Yes	Yes	26	2.1
HX-CPU-8176M	Yes	Yes	28	2.1
HX-CPU-8180M	Yes	Yes	28	2.5

Verification of HyperFlex Boost Mode.

You cannot verify if HyperFlex Boost Mode is enabled via HyperFlex Connect, HyperFlex API, HXCLI, STCLI, or Cisco Intersight™.

Manual verification via vCenter is needed. You must verify that all of the HX CVMs of the HyperFlex cluster have the right number of vCPUs.

If you have a **HyperFlex All-Flash** cluster, in the vCenter settings of the HyperFlex CVM you must see:

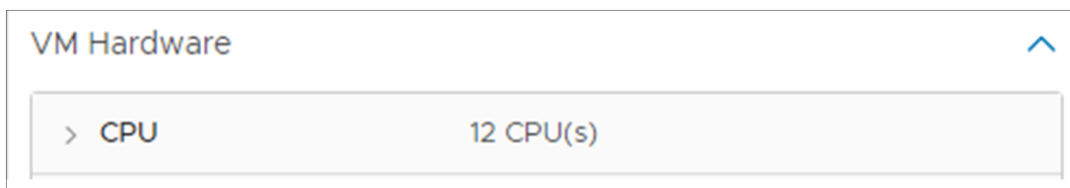


Figure 11.
Verifying that HyperFlex BoostMode is enabled on a HyperFlex All-Flash cluster

If you have a **HyperFlex All-NVMe** cluster, in the vCenter settings of the HyperFlex CVM you must see:

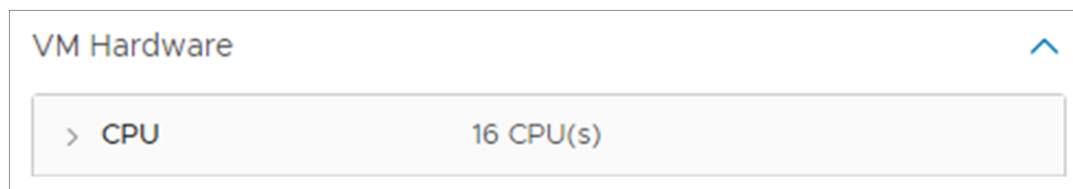


Figure 12.

Verifying that HyperFlex Boost Mode is enabled on a HyperFlex All-NVMe cluster

Conclusion

To gain more performance on your HyperFlex All-Flash or All-NVMe cluster, you can enable HyperFlex Boost Mode by adding four vCPUs to each controller on the nodes.

HyperFlex Boost Mode is supported when the number of physical cores is at least the same as the new number of the HyperFlex storage controller VM vCPUs.

HyperFlex Boost Mode does not require any additional licenses.

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