



# Introducing vSphere Lifecycle Management (vLCM)

VMware Lifecycle Management

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## Introducing vSphere Lifecycle Management (vLCM)

### Overview

We greatly improved lifecycle management in vSphere 7. The new innovations for lifecycle management in vSphere 7 make it easy for customers to have consistent and up-to-date systems. The major lifecycle management improvements in vSphere 7 are vCenter Server Profiles, vCenter Server Update Planner and vSphere Lifecycle Manager (vLCM).

vCenter Profiles is way to ensure configuration and version consistency across multiple vCenter Server instances. Update Planner helps in making sure the latest updates are checked for product interoperability and installed for the vCenter Server Appliance (VCSA). vLCM is a comprehensive collection of abilities in vSphere 7 for consistency across ESXi hosts and easier ways to update hosts. This article focuses on vSphere Lifecycle Manager (LCM).

## vSphere Lifecycle Manager (vLCM)

Consistency across ESXi hosts is essential for creating reliable and high performing platforms, but is difficult to obtain, especially at scale. vLCM solves the complexity by enforcing consistency across ESXi hosts in a cluster using a declarative model. vLCM not only accomplishes this by using an ESXi base image but extends it with the desired state for firmware and driver versions as well.

The goal is to remove variability between ESXi hosts. This will enable customers to have more efficient upgrades, improved reliability and performance, and easier overall maintenance. The most important capabilities of vLCM are its desired state model, the integration with hardware vendors for full-stack firmware updates, and simplified OEM image customizations, along with automatic compatibility checks.



## Declarative ESXi Cluster Management

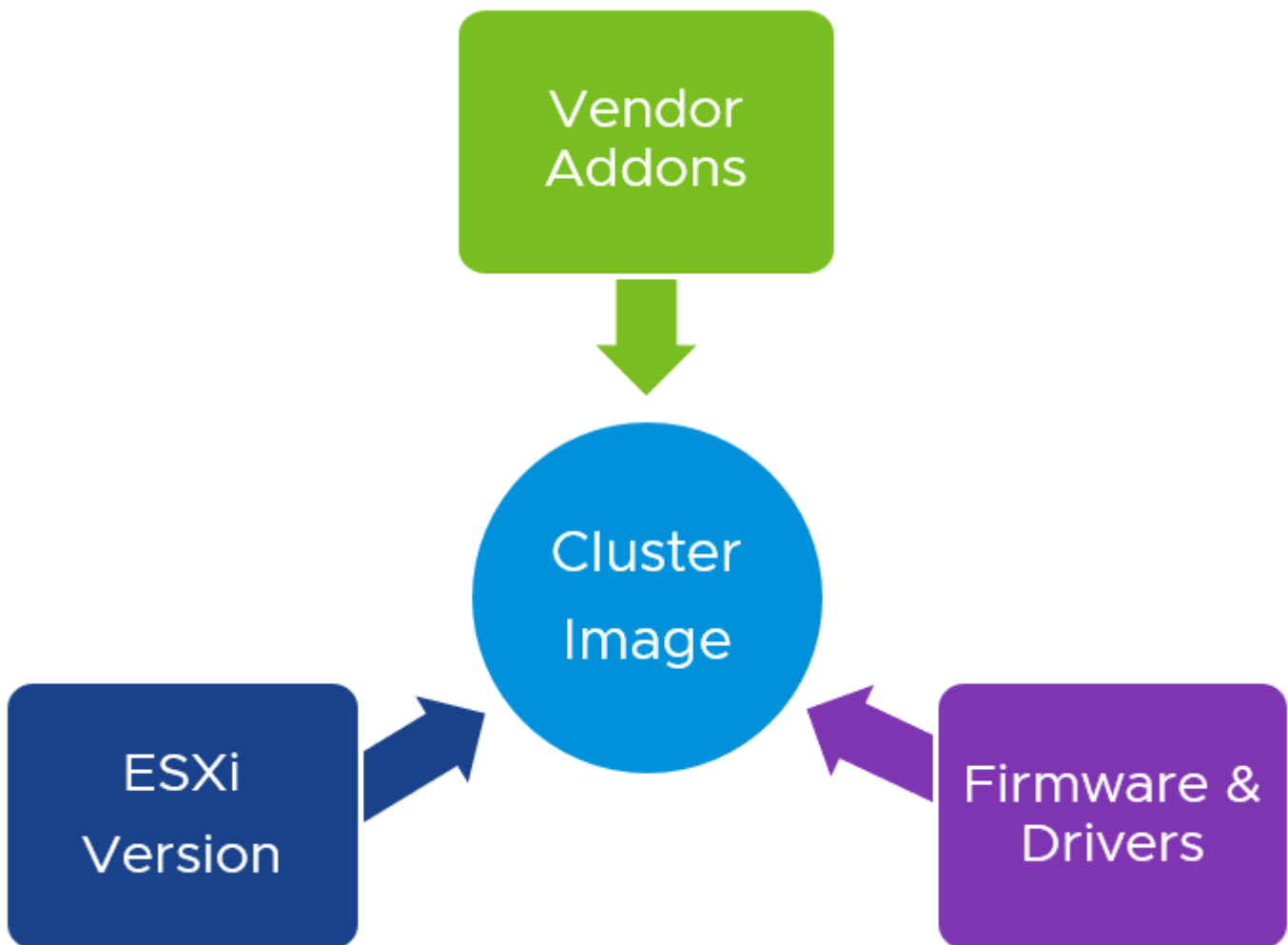
The foundation of vLCM is the declarative cluster lifecycle management. The vLCM desired state of an ESXi host represents the target ESXi version, and firmwares & drivers version for the host as opposed to the versions that it currently runs. Once vLCM and cluster image management is enabled for a cluster, a desired state is set up. All the ESXi hosts in the cluster adhere to the desired state. When a host drifts from the desired state, the host is remediated to be compliant to the desired state.

To enable a cluster with a declarative image, the following prerequisites must be met;

- All hosts in the cluster must be running ESXi 7.0 or higher.
- All hosts in the cluster must be from the same vendor, ideally same make and model.
- Hosts may not be stateless.

**Note:** NSX-T was not supported in the first vSphere 7. However, NSX-T support has been added with vSphere 7 Update 1 and NSX-T 3.1.

When a vSphere 7 cluster is configured to use a single cluster image, vLCM will replace the baseline methodology used in vSphere Update Manager (VUM).



A cluster image consists of the following components:

- **ESXi version:** A base ESXi image supporting vSphere ESXi 7.0 or later.
- **Vendor Addon (optional):** Package provided by the supported host vendor that potentially includes hardware providers and drivers. All components that are used in the vSphere kernel.
- **Firmware Integration (optional):** vLCM integrates with selected vendor OEM tooling to manage full-stack firmware updates for host devices like PCIe devices (for example storage controllers, NICs), BIOS, out-of-band tooling and more.



## Configure vLCM

When upgrading to, or installing, vSphere 7, customers are still using vSphere Update Manager (VUM). vLCM can be enabled per cluster. Enabling vLCM by configuring a cluster image is easy, following the wizard under Cluster > Updates > Setup Image. The compatibility check includes verification of currently installed vib (kernel modules). For example, you might see warnings about vib when you are using a vendor specific ISO. These modules can be added as vendor add-on in the image. Please note that **QuickBoot** is supported for vLCM, but has to be enabled manually.

The screenshot displays the vSphere Client interface for a cluster configuration. The left-hand navigation pane shows a tree view of environments, including 'NH-VCSA-01.vmware.lab' and its sub-items like 'Lab' and 'Cluster'. The main content area is titled 'Cluster' and has tabs for 'Summary', 'Monitor', 'Configure', 'Permissions', 'Hosts', 'VMs', 'Datastores', 'Networks', and 'Updates'. The 'Summary' tab is selected, showing the following information:

- Cluster Summary:**
  - Total Processors: 112
  - Total vMotion Migrations: 101
  - Fault Domains: (represented by an icon)
- Resource Usage:**
  - CPU:** Free: 239.91 GHz, Used: 5.82 GHz, Capacity: 245.73 GHz
  - Memory:** Free: 1.36 TB, Used: 139.72 GB, Capacity: 1.49 TB
  - Storage:** Free: 10.38 TB, Used: 566.28 GB, Capacity: 10.93 TB
- Related Objects:**
  - Datacenter: Lab
- Tags:** (empty)
- Cluster Resources:**
  - Hosts: 4 Hosts
  - EVC mode: Disabled
- vSphere DRS:**
  - Cluster DRS Score: 100%
  - VM DRS Score: 8 VMs at 100%
  - DRS recommendations: 0
  - DRS faults: 0
- Cluster Consumers:**
  - Resource pools: 2
  - vApps: 0

## The Cluster is Up-to-date

When the cluster is managed collectively using the same image and all hosts are remediated, vLCM shows everything is up to date.

**i** Cluster is up to date! There are no new recommended cluster images available for this cluster [View Details](#) ✕  
04/13/2020, 11:48:50 AM

---

**Image** EDIT ...  
Last checked recommendations on 04/13/2020, 11:48:50 AM

Hosts in this cluster are managed collectively. This image below will be applied to all hosts in this cluster.

<b>ESXi Version</b>	7.0 GA - 15843807
<b>Vendor Addon</b> <b>i</b>	DellEMC addon for PowerEdge Servers running ESXi 7.0 A00
<b>Firmware and Drivers Addon</b> <b>i</b>	None
<b>Components</b> <b>i</b>	No additional components <a href="#">Show details</a>

The Image Depot in vCenter Server is used as a repository for all vLCM components. When the vCenter Server is connected to the internet, it will automatically download ESXi base images and vendor components. If a proxy is required, vLCM uses the proxy settings from vCenter Server Appliance. If there's no direct internet access, the Update Manager Download Service (UMDS) can be used, or updates to the image depot can be imported manually.



## Full Stack Firmware Updates

A Hardware Support Manager (HSM) may be used to integrate with vSphere to check, but also update firmwares and drivers on the system, directly from within the vSphere Client!

The HSM is software provided by the hardware vendor as i.e. an OVF image. It includes a plug-in that registers itself as a vCenter Server extension. Hardware vendors provide and manage the firmware & driver updates that are accessed by vLCM using the HSM.

As of the vSphere 7 update 1 release, [Dell OpenManage](#), [HP IIO Amplifier](#) and [Lenovo XClarity](#) are supported. Check out this demo to see how vLCM with HSM is used to remediate ESXi hosts and updates firmwares and drivers:

<https://youtu.be/R4NGT12hvSM>

## Simplified OEM Customization

vLCM allows for customers to streamline OEM vendor components into the image. The vendor components and the ESXi image are disassembled in vLCM, making it easier to update the vendor specific components when a new vSphere release is issued. Effectively replacing the need for vendor specific ISOs as this capability replaces this. Vendor addons include vendor customizations for selected servers.

**Vendor Addons**

	Name	Version
<input type="radio"/>	DellEMC addon for PowerEdge Servers running ESXi 7.0	A00
<input checked="" type="radio"/>	HPE Customization for HPE Servers	700.0.0.10.5.0-108

**HPE Customization for HPE Servers**

Version 700.0.0.10.5.0-108

*Hewlett Packard Enterprise • 04/02/2020*

Category: Enhancement

HPE customization created for HPE Servers

<http://www.hpe.com/info/vmware/proliant-docs>

Added Components ⓘ

Agentless Management Component	700.3.5.0-26
Broadcom Emulex Connectivity Division lpfc driver for FC adapters	12.6.147.6-1
cru driver for vmkernel	700.10.16
Fiber Channel and Storage Enablement Bundle	700.3.5.0.40-1
Smart Storage Administrator CLI for ESXi	4.18.1.0

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## Cluster Quickstart Workflow



When configuring a new cluster, customers have the ability to implement a declarative ESXi host image for the cluster immediately. The image setup in the cluster quickstart workflow allows for choosing an ESXi base image and the optional vendor addons.

### New Cluster | Lab ✕

Name	<u>New Cluster</u>
Location	 Lab
 vSphere DRS	<input checked="" type="checkbox"/>
 vSphere HA	<input checked="" type="checkbox"/>
vSAN	<input checked="" type="checkbox"/>

These services will have default settings - these can be changed later in the Cluster Quickstart workflow.

Manage all hosts in the cluster with a single image 

<b>Image setup</b>	
ESXi Version	<u>7.0 GA - 15843807</u> 
Vendor Addon (optional)	<div style="border: 1px solid #ccc; padding: 2px;">                 DellEMC addon for PowerEdge Servers running  <ul style="list-style-type: none"> <li>None</li> <li style="background-color: #0070C0; color: white;">DellEMC addon for PowerEdge Servers running ESXi 7.0</li> <li>HPE Customization for HPE Servers</li> </ul> </div>

The cluster image can be fully declarative...

CANCEL
OK

Creating the cluster using quickstart with single image cluster management allows customers to benefit from vLCM capabilities from the start.

