Scale out a 13th Generation XC Series Cluster Using 14th Generation XC Series Appliance

Abstract

This paper outlines the ease of deployment steps taken by our deployment services team for adding a 14th generation XC Series appliance to an existing 13th generation XC Series cluster. Specifically, adding XC640 appliance to an existing XC630 Series Cluster.

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Revisions

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<th>Date</th>
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<td>March 2018</td>
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Executive summary

The Dell EMC XC Series family of hyper-converged appliances integrate our proven PowerEdge x86 server platform and Nutanix software into purpose built enterprise-class solutions for virtualized environments. Backed by Dell EMC’s Global Service and Support organization, these 1U and 2U appliances consolidate storage, compute, networking, and virtualization into a turnkey platform enabling application and virtualization teams to quickly and simply deploy new workloads. The XC Series, with pay-as-you-grow flexibility, is easily expanded one node at a time for predictable scale-out expansion. By combining the hardware resources from each server appliance into a shared-everything model for simplified operations, improved agility, and greater flexibility, Dell EMC and Nutanix together deliver simple, cost-effective solutions for enterprise workloads.

The XC Series appliance is hypervisor agnostic, and supports your choice of hypervisor. With a focus on ease-of-use and the ability to rapidly deploy multiple virtualized workloads the XC Series is the preferred platform for many enterprises and midmarket customers alike. The XC Series appliance uses the Nutanix Distributed Storage Fabric (DSF) which delivers a unified pool of storage from all appliances across the cluster, using techniques including striping, replication, auto-tiering, error detection, failover, and automatic recovery. XC Series delivers storage through multiple protocols such as NFS, SMB, and iSCSI while leveraging standard network infrastructure.

This paper explains how easy it is to scale compute/storage resources of XC Series as needed without any downtime. This paper focusses on how to expand your 13th generation XC Series cluster built with XC630 ESXi nodes with a 14th generation XC640 ESXi node. This paper focuses on an ESXi hypervisor; however, you can expand any XC Series hypervisor environment in the same fashion. This solution showcases how you can preserve the existing XC Series 13th generation investment while expanding with 14th generation appliances.

This paper provides a high-level overview of the process for expanding 13th generation XC Series cluster with a 14th generation XC appliance. Dell EMC strongly recommends that you contact services/support to perform cluster expansion.
1 Overview

This paper explains the prerequisites and high-level steps to expand a Dell EMC XC Series 13th generation cluster with a Dell EMC XC Series 14th generation appliance. Additionally, we discuss how to preserve and expand your existing investment with your Dell EMC XC630 cluster using a Dell EMC XC640 appliance. The XC Series platform is hypervisor agnostic and supports hypervisor choice. All the nodes used in our example are on same Nutanix Acropolis Operating System (AOS) and ESXi hypervisor.

Based on the new generation of Dell EMC PowerEdge “Skylake” servers, 14th Generation XC Series appliances provide greater computation power than the previous generation. These processors also offer:

- Higher core counts
- Greater network throughput
- Improved power efficiency
- Up to 28 cores CPU and Max Memory of 1.5 TB / socket (3 TB total) with the speed of 2667 MT/s.

In addition, the 14th generation XC Series appliances include several other technology additions such as:

- Support for Boot Optimized Storage Subsystem (BOSS).
- Up to four times more performance with iDRAC9.
- Storage configurations of hybrid, all flash, and optional NVME+SSD configurations.

For more information about the benefits of the latest XC Series appliances, see Third Generation Dell EMC XC Series Appliances Based on 14th Generation Dell EMC PowerEdge Servers.

You must ensure all the prerequisites are met before expanding the 13th generation Dell EMC XC cluster with the 14th generation Dell EMC XC Series appliance. Any deviation from these requirements must be discussed with Dell EMC Services for risk mitigation. The steps included in this document provide a high-level overview of the scale-out capabilities of XC Series clusters using 13th generation and 14th generation XC Series appliances.

1.1 Upgrade benefits

When you expand using a 14th generation XC Series appliance, your entire cluster benefits by leveraging the compute, network, and storage capability of 14th generation XC Series appliances. Some of the other key benefits include:

- Significant performance improvement offered by 14th generation appliance
- Enables easier scaling
- Automatically expanded storage pools (applicable for AOS version 5.5 and above). No need to do additional storage configuration tasks from PRISM.
- Your 13th generation cluster investment is preserved when you expand the cluster with 14th generation appliances.
1.2 Audience
This document is intended for decision makers, managers, architects, and technical administrator of IT environments who want to understand the scaling capabilities of the XC Series cluster and who want to preserve and extend their existing 13th generation appliance investment.

Business and end-user readers of this document must be familiar with general IT and hyper-converged infrastructure (HCI) technologies.

1.3 Prerequisites
Dell EMC recommends the following guidelines for upgrading from a 13th generation cluster with a 14th generation node.

- Ensure the cluster is healthy before expanding using Nutanix Cluster Check (NCC) utility. The link to the NCC utility requires a log in. If any health checks are failing, then resolve the errors before expanding the cluster.
- The node you want to add must be at the same Nutanix AOS version as the cluster. Refer to the Nutanix Web Console Guide for further details.
- Verify the new 14th generation node configuration, IP, CVM details before adding it to the XC Series cluster. You can do this by adding the new node your Hypervisor’s node manager of choice.

**Note:** If you upgrade to the latest AOS version and hypervisor, hardware resource requirements may have increased for your 13th generation appliances. You may need to include hardware upgrades in your upgrade planning. Contact Dell EMC Services.

- Hypervisor version for all nodes within the cluster must be the same. If any mismatch exists, then an option is provided during node addition for upgrade or re-image (this may not be necessary for minor version difference).

1.3.1 XC Series clusters with ESXi hypervisor
- If the added 14th generation node has a different processor class than the existing 13th generation nodes in the cluster, then you must enable Enhanced vMotion Compatibility (EVC) for the XC Series cluster from vSphere. Without enabling EVC, vMotion or live migration of virtual machines is not possible. For instructions on enabling EVC, refer to vSphere vCenter documentation.
- There might be minimal cluster downtime required while enabling EVC, depending on processor class of the added node. Refer the Nutanix Web Console Guide to ensure all the pre-requisites are met before expanding the XC Series cluster.
2 Configuration

This paper provides an overview of adding a 14th generation XC640 Series appliance to 13th generation 3-node XC630 Series cluster.

<table>
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<tr>
<th>Model</th>
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<th>AOS version</th>
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<tr>
<td>XC630</td>
<td>ESXi 6.5.0 build-596930</td>
<td>5.5.0.2</td>
</tr>
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<td>XC640</td>
<td>ESXi 6.5.0 build-596930</td>
<td>5.5.0.2</td>
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**Note:** Even though this paper specifically explains the scale out of XC Series clusters with the ESXi hypervisor, the high-level approach for performing the procedure is the same on other hypervisors as well.

2.1 Cluster details

Cluster details are shown here with a three-node XC Series cluster running the ESXi hypervisor. The best practice is to have AOS at the same version across the XC630 and XC640 nodes.

![Cluster hardware summary](image)

**Figure 1** Cluster hardware summary.
2.2 Virtual machine details

The list of running VMs and CVMs in 13th generation XC cluster from PRISM console.

Figure 2  Cluster hardware details in Table View from Nutanix PRISM

Figure 3  CVMs are listed along with VMs.
Configuration overview

This section represents Dell EMC XC cluster expansion by adding an XC640 node to an existing XC630 cluster using Nutanix PRISM. After expanding the cluster with the 14th generation node, you must use your hypervisor's node management tool to add the new node to your existing XC Series storage pool. Once the new XC640 node is added to the cluster then you can migrate the virtual machines from the XC630 to an XC640 node and vice versa.

3.1 Using Nutanix Prism to expand the cluster with an XC640 node

1. Open Nutanix Prism by entering the Nutanix cluster IP (not the ESXi cluster IP) in your browser.
2. The IP Address is the IP given during cluster formation of XC630 Cluster.
3. In the PRISM login screen, type the credentials for the admin user and log in.
4. From the PRISM Home page, click the Gear icon and select Expand cluster.

5. In the Expand Cluster dialog, select the node that should be added as part of cluster expansion.

6. Click Next.
7. Click Run Checks, then wait for 100% complete. Pre-Expand Cluster Checks should be green. If any errors occur during the Pre-Expand Cluster Checks, then you must fix those errors. Then perform the Pre-Expand Cluster Checks again.
8. Click **Expand Cluster**. Once cluster expansion is completed, then the 100% complete screen is displayed.
9. Once the cluster is expanded with 100% success, click Close.
10. On the Home tab, select Hardware.

11. The Hardware overview tab shows 4 nodes after the new node addition and cluster hardware will show the increases in CPU and memory.
12. The **Hardware Table** tab shows details of all 4 nodes in the cluster.
13. Select VM from PRISM drop-down on the left side of the screen.

14. In VM details screen, select the **Table** tab to get the CVM and VM details for the cluster.

15. Here the four CVMs are listed, after the cluster expansion with CPU, memory, and storage details.
3.2 Using vCenter to add the XC640 node to the XC630 cluster

1. Open VMware vSphere Web Client.

2. Using the Home icon, select Hosts and Clusters.

3. Right click the cluster and select Add Host.
4. In the **Add Host** screen, enter all required details.
   - **Host/Node Name** is IP address of the newly added XC640 node.
   - **Version** is the version of the ESXi hypervisor.
   - **License** is as per the available/purchased license.
   - **Network** and **Datastore** as configured for the XC630 cluster.
   - **Lockdown mode** is chosen based on the cluster requirement.

5. Click **Finish**.
6. The new XC640 node is added to the ESXi cluster.
Configuration overview

Figure 5  Screen showing the added 14th generation node.
Conclusion

The architecture of the 14th generation of Dell EMC™ XC Series appliances provides an outstanding way for customers to meet performance and growth requirements. Adding nodes to an existing XC Series cluster without system downtime enables growth to existing compute and storage resources in a linear fashion. This allows you to provide the right size for existing applications and rely on proven linear scale for future needs.

Enabling the addition of a 14th generation XC Series appliance to a 13th generation XC Series cluster also helps to protect your existing investment by expanding using 14th generation nodes.

4.1 Related Resources

See the following referenced or recommended resources related to this document:

Note: The links below are open to customers although some may require registration for access.

- Nutanix Bible: [http://nutanixbible.com](http://nutanixbible.com)

4.2 Additional Resources

Support.dell.com is focused on meeting your needs with proven services and support.

- For XC Series product documentation, see [Dell.com/XCSeriesmanuals](http://Dell.com/XCSeriesmanuals).