

Run VMs and containers alongside bare-metal servers

How to build and deploy clusters as a service with VMware vSphere and Bright Cluster Manager

Why Bright Cluster Manager?

“Bright Computing helps address the big question in HPC: how to match diverse resources to diverse workloads in a way that is both efficient today and future-proof for tomorrow.”

—Intersect360 Research¹

Provide more flexible HPC resources, more easily

Over the past several years, high performance computing (HPC) workloads have evolved from a consistent and well-known set of applications for modeling and simulation into a widening array of artificial intelligence (AI), machine learning (ML) and other data analytics applications.

These new applications are increasing demand for HPC resources, as well as changing the nature of the underlying infrastructure so that it can support emerging workloads and new types of HPC system users. Today’s HPC clusters need to be much more dynamic, capable of:

- Leveraging new types of processors and accelerators
- Incorporating heterogeneous infrastructure
- Integrating with hybrid, multi-cloud environments
- Extending HPC to the edge
- Enabling self-service HPC for a widening variety of users

Running HPC on virtualized clusters can help answer these challenges. And in recent years, advances in VMware® vSphere® and CPU virtualization support have closed the performance gap with bare-metal deployments and made virtual clusters built from virtual machines (VMs) and containers viable for a growing set of HPC applications.

However, running VMs and containers alongside bare-metal servers raises the bar for most HPC shops, and certainly for the growing ranks of commercial HPC environments. These factors are driving the need for a professional, supported cluster management software that spans hardware, software, and consumption models for the new era of HPC.

Bright Cluster Manager® is a perfect fit, with built-in features to simplify building and managing heterogeneous virtualized clusters for HPC, AI/ML and analytics at enterprise scale. VMware and Bright Computing validated this architecture on Dell EMC infrastructure to help you design and deploy VMware virtualized HPC clusters and offer them as a service to a variety of users.

¹ Intersect 360 Research, [Managing Multiple Paths to Innovation](#), May 2020.

Use cases

- Resource consolidation
- Isolation between users and groups
- Full control for power users
- Application development

Learn more

[Get the architecture
delltechnologies.com/hpc](https://delltechnologies.com/hpc)

Solution partners



The “easy button” for clusters

Deploying clusters as a service (CaaS) with Bright Cluster Manager on Dell EMC vSAN Ready Nodes gives teams the ability to easily spin up clusters as needed to increase access to HPC resources that drive innovation. The solution gives you:

- **Agility:** Respond instantly to user demands, automatically reassigning resources based on policies. Enable quick provisioning of self-serve resources for authorized users.
- **Simplicity:** Automatically build a cluster from bare metal—setting up networking, user directories, security, DNS, and more. Even users without VMware experience can typically set up a cluster in just a few minutes.
- **Flexibility:** Manage resources across on-premises, cloud and edge environments.
- **Cost savings:** Enhance utilization via virtualization while reducing administration and hardware costs and public cloud usage.

Plus, you get the peace of mind of using an engineering-validated, commercially supported and enterprise-ready solution.

Solution technical specifications

The architecture describes designing and deploying virtualized clusters with Dell EMC vSAN Ready Nodes with Bright Cluster Manager.

Compute	Storage	Networking	Software
Management cluster: 3x R440 vSAN Ready Nodes Compute nodes: 8x C6420 vSAN Ready Nodes	4x PowerScale Isilon H500	4x PowerSwitch S4048	<ul style="list-style-type: none">• VMware ESXi™• VMware vSAN™• VMware vCenter®• Bright Cluster Manager

The solution gives IT the freedom to access the IT resources they need, when and how they need them. In any case, you don't have to go it alone. Access one of the Dell Technologies [Customer Solution Centers](#) worldwide to design, build and test. [Dell Technologies Services](#) — ranging from consulting and education to deployment and support — are also available when and where you need them.

