

with Amazon EKS Hybrid Nodes and Dell PowerFlex

December 2nd, 2024 | Read Time: 4 minutes



Tony Foster

(/author/c8e06ba5-531b-4470-a3fa-647c390aff6b/

Tony-Foster/)



Kiran RK

(/

author/1610b089-5331-4d80-8260-2e95a4b7c7e9/Kiran-RK/)

Curtis Rissi-Amazon
Curtis-Rissi-Amazon/)

(/author/aece9e9e-9b28-4727-ac11-fc4f540ee4f6/



“What if?”

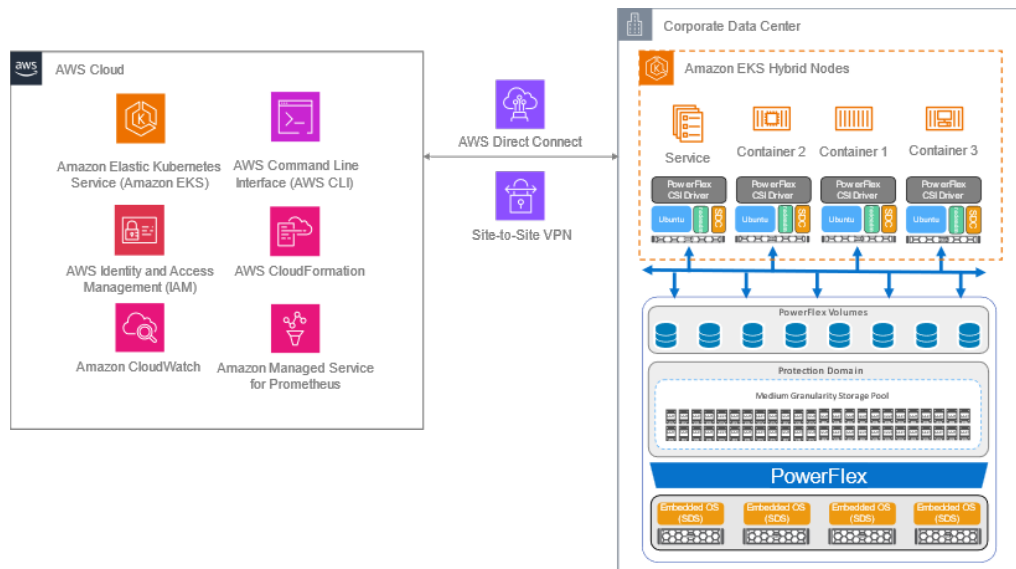
These two simple words hold immense power, driving change and innovation across industries, including IT. For instance, what if you could extend your Amazon EKS environment into your data center on to your Dell PowerFlex infrastructure and still use the same cloud-based control plane? This would allow your EKS workloads run efficiently in your data center, without the need to allocate separate systems for management overhead.

That’s no longer a “what if” with Amazon EKS Hybrid Nodes (EKS-H).

You might be curious as to what Amazon EKS Hybrid Nodes are. EKS-H allows you to integrate your on-premises and edge-based infrastructure as nodes within EKS clusters. With EKS-H, AWS manages the Kubernetes control plane for you in the cloud, significantly reducing the operational effort for running hybrid Kubernetes applications. You can seamlessly leverage the same EKS clusters, features, and tools you're accustomed to in the AWS Cloud, while extending them to your own infrastructure, providing you with more opportunities to explore “what if.”

EKS-H adopts a “bring your own infrastructure” model, enabling the use of Dell PowerFlex compute-only nodes in your cluster. This hybrid architecture seamlessly integrates your on-premises infrastructure with the EKS cluster. To do this, it requires:

A sample EKS-H architecture using Dell PowerFlex is shown in the following diagram. In the diagram we can see PowerFlex storage-only nodes providing storage to the EKS-H (Dell PowerFlex compute-only nodes) on-premises, while connecting to the EKS control plane which resides in the AWS cloud. This setup demonstrates the powerful integration of on-premises resources with cloud-based management.



This hybrid environment enables consistent tools and management regardless of workload location, simplifying operations, and allowing EKS nodes to be managed identically across environments. This also means that the EKS Hybrid Nodes can leverage the capabilities of PowerFlex software defined storage.

The significance of this architecture becomes apparent when considering demanding use-cases, such as data processing. Processing large data volumes is most efficient when the data is close to the processing systems, reducing latency and processing times. If data is stored in AWS, it's likely more efficient to process it from EKS in the cloud. On the other hand, if the data is stored on-premises, benefits are gained from processing it locally.

Moreover, EKS Hybrid Nodes offers a compelling solution for organizations with strict data residency requirements. This feature allows data and processing operations to remain on-premises, satisfying organizational and regulatory policies while providing a consistent, unified management interface that bridges the gap between on-premises and cloud environments. That unlocks powerful

business growth.

To explore some “what ifs,” we conducted practical tests using a real-world enterprise application. We deployed PostgreSQL on EKS Hybrid Nodes with PowerFlex software defined storage, utilizing PowerFlex Container Storage Interface (CSI) drivers for high-performance, reliable storage within Kubernetes.

To simulate a real world workload, we used pgbench (<https://www.postgresql.org/docs/current/pgbench.html>) to test the limits of our PostgreSQL database.

Our testing demonstrated that PostgreSQL performed as expected on Amazon EKS Hybrid Nodes with PowerFlex storage. Accross our tests we were able to attain 238,804 read IOPS with a 0.638 ms read latency. It also showed that it could support a high number of concurrent sessions without significant bottlenecks. Soon we will be releasing a white paper on “EKS Hybrid Nodes with PowerFlex and PostgreSQL,” on its release we will update the blog.

With exceptional performance, Amazon EKS Hybrid Nodes with PowerFlex storage are an ideal choice for organizations looking for:

- Unified management across environments
- Reduced operational overhead
- Enhanced flexibility and scalability
- Optimized resource utilization and cost savings
- Improved data compliance and security
- Streamlined application deployment

Amazon EKS Hybrid Nodes with Dell PowerFlex empowers organizations to explore new “what if” scenarios, transforming environments beyond current limitations. To discover more about EKS Hybrid Nodes with Dell PowerFlex revolutionize your IT infrastructure, contact you’re your Dell representative.

Author: Tony Foster – LinkedIn (<https://linkedin.com/in/wondernerd>)

Tags: **Kubernetes** **PowerFlex** **Amazon EKS**