
HPE GREENLAKE FOR BLOCK STORAGE RELEASE 3

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CONTEXT

Hewlett Packard Enterprise (HPE) has announced the general availability of Release 3 of HPE GreenLake for Block Storage, built on HPE Alletra Storage MP.

This new release represents a significant advancement in block storage technology. It offers the industry's first disaggregated, scale-out block storage with a 100% data availability guarantee.

BACKGROUND: HPE GREENLAKE

HPE GreenLake is HPE's flagship offering, a set of as-a-service solutions that deliver cloud-like agility and scalability to on-premises environments with a flexible consumption-based model. HPE GreenLake provides various IT solutions and services, including computing, storage, networking, and advanced data analytics. This approach allows businesses to manage their IT resources more flexibly, aligning costs with actual consumption and reducing the need for upfront capital investment.

GreenLake's key feature is its ability to offer the benefits of the public cloud—such as rapid deployment, scalability, and simplified IT operations—while retaining the control, security, and performance advantages of on-premises infrastructure. It also integrates advanced analytics and AI-driven insights to optimize performance and predict and prevent issues, streamlining management and improving efficiency.

Essentially, HPE GreenLake aims to provide a hybrid IT solution that brings the best of both cloud and on-premises worlds, tailored to enterprises' specific needs and workloads, making it a versatile choice for businesses looking to modernize their IT infrastructure.

BACKGROUND: HPE GREENLAKE FOR BLOCK STORAGE

HPE GreenLake for Block Storage is a sophisticated storage solution that caters to the demands of modern data storage, particularly in enterprise environments. This

solution is part of the HPE GreenLake platform, which provides cloud-like experiences on-premises.

Here are the key features and aspects of HPE GreenLake for Block Storage:

- **As-a-Service Model:** HPE GreenLake for Block Storage adopts an as-a-service model, allowing businesses to leverage advanced storage capabilities on-premises with the flexibility and economic model of the cloud. This approach aligns storage costs with actual usage, reducing capital expenditure and optimizing operational expenses.
- **Disaggregated Scale-Out Architecture:** A standout feature is its disaggregated scale-out architecture, which allows independent scaling of performance and capacity. This flexibility is crucial for handling varying workload demands and offers a more efficient utilization of resources compared to traditional, monolithic storage systems.
- **High Performance and Scalability:** The platform is designed for high performance, leveraging all-NVMe (Non-Volatile Memory Express) technology to provide fast data access speeds and low latency. Its architecture supports scaling up and out, enabling businesses to quickly expand storage capacity and processing power as their needs evolve.
- **AI-Driven Operations:** HPE GreenLake for Block Storage integrates advanced AI operations (AIOps) for infrastructure management. This AI-driven approach simplifies storage management, enhances performance optimization, and predicts and prevents disruptions.
- **Data Availability and Resiliency:** The platform offers high levels of data availability and resiliency, crucial for mission-critical applications. Its design minimizes the risk of data loss and ensures continuous data accessibility, even in the event of hardware failures.
- **Advanced Data Reduction Technologies:** To maximize storage efficiency, the solution employs advanced data reduction and compaction technologies, including deduplication and compression. These technologies help optimize storage capacity utilization and can reduce the total cost of ownership.
- **Flexible Connectivity Options:** HPE GreenLake for Block Storage supports various connectivity options, including NVMe over Fabrics (NVMe-oF), Fibre Channel, and iSCSI. This flexibility ensures compatibility with a wide range of network environments and facilitates seamless integration into existing IT infrastructures.
- **Cloud-like Experience On-premises:** The solution delivers a cloud-like operational experience, offering ease of use, simplicity in management, and agility in scaling, akin to public cloud services.
- **Enhanced for Modern Workloads:** It is specifically designed to meet the demands of modern workloads, which often require real-time processing, high throughput, and massive scalability.

HPE GreenLake for Block Storage provides a comprehensive, high-performance storage solution that brings cloud-like flexibility and scalability to on-premises environments. Its as-a-service model, advanced AI operations, scalability, and

performance features, make it well-suited for enterprises looking to modernize their data storage infrastructure while maintaining control and security.

NEW: RELEASE 3

Release 3 of HPE GreenLake for Block Storage, built on HPE Alletra Storage MP, introduces several new features and enhancements, reinforcing its position as a cutting-edge solution for block storage.

The key updates in this release include:

- **Disaggregated, Scale-Out Architecture:** A significant advancement is the introduction of a disaggregated, scale-out block storage architecture. This design enables independent scaling of performance and capacity, offering a more flexible and efficient approach to storage.
- **Enhanced Performance:** The new release boasts up to 2X higher performance than earlier versions. This improvement is due to adding new multi-node switched models, strengthening the system's overall efficiency and throughput.
- **Increased Storage Capacity:** Release 3 supports 2.5X more capacity than the previous version. It includes support for up to eight JBOF (Just a Bunch Of Flash) expansion shelves, allowing a scale from 15.36TB to approximately 2.8 PB without disruption.
- **Advanced Connectivity Options:** The release adds NVMe over Fabrics (NVMe-oF)/TCP support, complementing the existing Fibre Channel, NVMe-oF/FC, and iSCSI connectivity options. This update unlocks NVMe's full capabilities for Ethernet networks.
- **Improved AI-Driven Management:** Enhanced AI-based performance reporting and analytics are included, offering a more straightforward cloud management experience. These improvements aid in troubleshooting, insights, and storage optimization.
- **Data Compaction Guarantee:** A new 4X data compaction guarantee program is introduced, which aims to provide greater cost efficiency by reducing physical storage requirements and improving flash media endurance.
- **Shared Everything Architecture:** The architecture ensures that all controllers across a high-speed network can share storage SSDs, eliminating silos and enhancing the system's resilience to multiple node failures.
- **AI-Driven Cloud Operational Experience:** Powered by AIOps, the solution reduces management complexity and enhances predictive support automation.

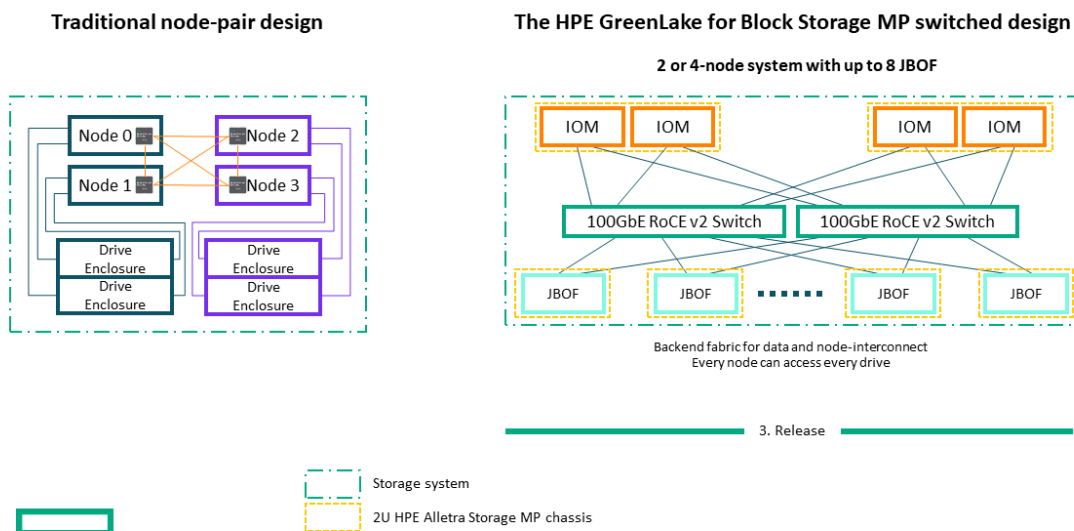
In summary, Release 3 of HPE GreenLake for Block Storage is a significant technological leap, offering improved performance, scalability, and efficiency. Its enhancements cater to the growing and unpredictable demands of modern workloads, positioning HPE GreenLake for Block Storage as a leading solution in the block storage market.

MULTI-NODE SWITCHED MODEL

The multi-node switched model introduced in Release 3 of HPE GreenLake for Block Storage is a significant innovation in storage architecture. This model moves away from traditional storage designs often relying on a pair of high-availability controller nodes connected to dedicated drives within a single hardware chassis.

In contrast, the multi-node switched model in HPE GreenLake employs a disaggregated, scale-out approach.

HPE storage evolution—from purpose built to composable



Here are the key features of this multi-node switched model:

- **Disaggregated Architecture:** This architecture separates compute (controller nodes) and storage capacity (NVMe expansion shelves/JBOFs) elements. Such disaggregation allows for more flexible performance and capacity scaling, independently catering to specific workload requirements.
- **Scale-Out Capabilities:** The multi-node switched model enables the system to scale efficiently. Users can add controller nodes to boost performance and include more drives or JBOFs (Just a Bunch of Flash) to expand storage capacity. This scalability is crucial for adapting to the changing demands of modern applications and workloads.
- **Shared-Everything Environment:** In this model, storage SSDs are shared across all controllers via a high-speed network. This design eliminates data silos and ensures that the system can tolerate multiple node failures without impacting data availability or performance.

- **High-Speed, Redundant Back-End Switch Fabric:** The controller nodes and storage shelves are interconnected through a high-speed, redundant NVMe-over-Fabric (NVMe-oF) back-end switch fabric. This setup ensures optimal data transfer rates and reliability.
- **Enhanced Performance:** The multi-node switched models offer significantly higher performance—up to 2x compared to previous switchless configurations. This is achieved by adding new 2-controller and 4-controller node models, available in 16-core or 32-core configurations.
- **Flexible Configuration:** Starting with a cost-efficient two-node entry-level configuration, the system allows for scaling up to multi-node switched configurations. This flexibility is critical for optimizing investments and meeting specific enterprise storage needs.

In summary, the multi-node switched model in HPE GreenLake for Block Storage represents a modern approach to enterprise storage, focusing on flexibility, scalability, and performance. It addresses the limitations of legacy architectures and is well-suited for the demanding requirements of contemporary data environments.

ANALYSIS

HPE GreenLake for Block Storage is just the latest example of how HPE continually tunes its GreenLake offerings to meet the increasing customer demand for a cloud-like experience from on-prem as-a-service and consumption-based solutions.

HPE delivers a cloud-like storage model by incorporating several key elements typically associated with cloud computing into its on-premises solution. This approach aims to provide the flexibility, scalability, and operational ease of the cloud while allowing businesses to retain control over their data and infrastructure by deploying on-prem. That's powerful.

While Dell, NetApp, Pure Storage, and Lenovo all have consumption-based storage offerings, HPE's GreenLake for Block Storage is the only one built around a disaggregated architecture that resembles how public cloud providers build storage. This approach allows HPE to seamlessly scale to meet its customers' shifting needs without those customers being concerned with the underlying hardware. Competing solutions can achieve this, but they require effort that HPE's approach doesn't.

With its innovative disaggregated, scale-out architecture, enhanced performance capabilities, and AI-driven operational efficiency, HPE GreenLake for Block Storage stands out as a solution that not only meets the current demands of enterprise storage but also paves the way for future growth and technological advancements. Its latest release is another proof point in HPE's commitment to innovation and



customer-centricity, offering a storage solution that is both powerful and flexible enough to adapt to the dynamic landscape of enterprise data management.