SUSE Virtualization, Portworx Enterprise by Everpure

SUSE Virtualization with Portworx Enterprise by Everpure on Bare Metal

A reference design for a modern virtualization platform

SUSE Virtualization
Portworx Enterprise by Everpure

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Summary

This reference configuration provides guidance for deploying SUSE® Virtualization with Portworx® Enterprise by Everpure™ and Everpure™ FlashArray™ on bare metal infrastructure. It outlines architecture, storage, and networking best practices to deliver a scalable, resilient platform for running virtual machines and containerized workloads with enterprise-grade performance and data protection.

Contents

1 Introduction

This document is intended as a supplement to Modern Virtualization with SUSE Virtualization and Everpure: Integrating Portworx Enterprise by Everpure and Everpure FlashArray Storage with SUSE Virtualization (https://documentation.suse.com/trd/everpure/html/gs_virtualization_portworx_everpure-flasharray/index.html). It provides additional design and deployment considerations for running SUSE Virtualization with Portworx Enterprise by Everpure in bare metal environments.

The objective is to help organizations seamlessly integrate SUSE Virtualization with Portworx Enterprise by Everpure, ensuring deployments that deliver optimized performance, scalability, and reliability for virtualized workloads.

1.1 Scope

This document provides

- architectural guidance for deploying SUSE Virtualization with Portworx Enterprise by Everpure on bare metal.
- best practices for installation, scaling, monitoring, and lifecycle management.
- recommendations for running stateful, virtualized workloads backed by Everpure FlashArray storage.

1.2 Audience

This guide is intended for platform engineers, system administrators, DevOps engineers, and IT professionals responsible for designing, deploying, managing, and maintaining IT infrastructure solutions to support cloud native and virtual machine workloads.

Familiarity with Kubernetes, virtualization, and storage concepts is assumed.

2 Business aspect

Enterprises are under pressure to modernize IT infrastructure while maintaining high levels of performance, resilience, and cost efficiency. Deploying SUSE Virtualization with Portworx Enterprise by Everpure and Everpure FlashArray on bare metal helps address these challenges by providing a scalable and reliable foundation for virtualized workloads. This integrated solution reduces operational complexity, protects critical data, accelerates workload deployment, and maximizes infrastructure investments, enabling organizations to support digital transformation with confidence.

2.1 Business problem

Enterprises are facing increasing challenges in managing modern, data-intensive applications while supporting diverse infrastructure needs across data centers, edge sites, and hybrid environments. Traditional virtualization and storage approaches often lack the agility, scalability, and resilience required for today's workloads, creating bottlenecks that affect multiple stakeholders.

- **Developers** struggle with slow provisioning and lack of persistent storage for stateful applications.
- **IT operators and platform engineers** face complexity in managing storage, ensuring high availability, and handling disaster recovery across distributed environments.
- **Line of business managers** are impacted by delays in application delivery, leading to missed opportunities and reduced competitiveness.
- **C-suite executives** must balance modernization with cost efficiency, risk reduction, and alignment to digital transformation goals.

These challenges highlight the need for an integrated solution that simplifies operations, enhances resilience, and delivers enterprise-grade scalability for virtualized and cloud-native workloads.

2.2 Business value

By addressing the complexity, scalability, and resiliency limitations of traditional virtualization and storage, SUSE Virtualization with Portworx Enterprise and Everpure FlashArray on bare metal empowers organizations to streamline operations while preparing for future growth. Developers gain faster access to persistent storage, enabling rapid innovation and accelerated application delivery. IT operators and platform engineers benefit from simplified management, automated scaling, and built-in data protection, all of which significantly reduce operational overhead.

SUSE Virtualization enhances infrastructure efficiency by supporting both container and virtual machine workloads on the same platform. This unified approach minimizes infrastructure sprawl, optimizes resource utilization, and simplifies operations across diverse environments.

For business leaders, these capabilities translate into improved agility, faster time-to-market, and stronger returns on infrastructure investments, while also reducing overall business risk. Together, SUSE Virtualization and Portworx by Everpure provide a robust foundation not only for current enterprise workloads but also for forward-looking initiatives such as hybrid cloud expansion, edge computing, and digital transformation.

3 Architecture

This section provides a planning and architecture overview for deploying SUSE Virtualization (https://www.suse.com/products/rancher/virtualization/) ↗ with Portworx (https://docs.portworx.com/portworx-enterprise/provision-storage/kubevirt-vms/manage-kubevirt-vms-rwx-block/suse-virtualization) ↗ on bare metal. The focus is to describe a high-level design that ensures scalability, reliability, security, and performance by identifying key architectural components and their interactions. Additionally, it highlights how this integrated solution effectively supports your production workloads.

The integration brings together SUSE Virtualization and Portworx Enterprise by Everpure (https://portworx.com/products/portworx-enterprise/) ↗ to deliver compute, storage, and orchestration layers for a modern, adaptable, and scalable, enterprise virtualization solution. Rather than focusing on low-level hypervisor internals, the architecture highlights how SUSE Virtualization and Portworx Enterprise work together to provide a flexible, scalable, and enterprise-grade platform.

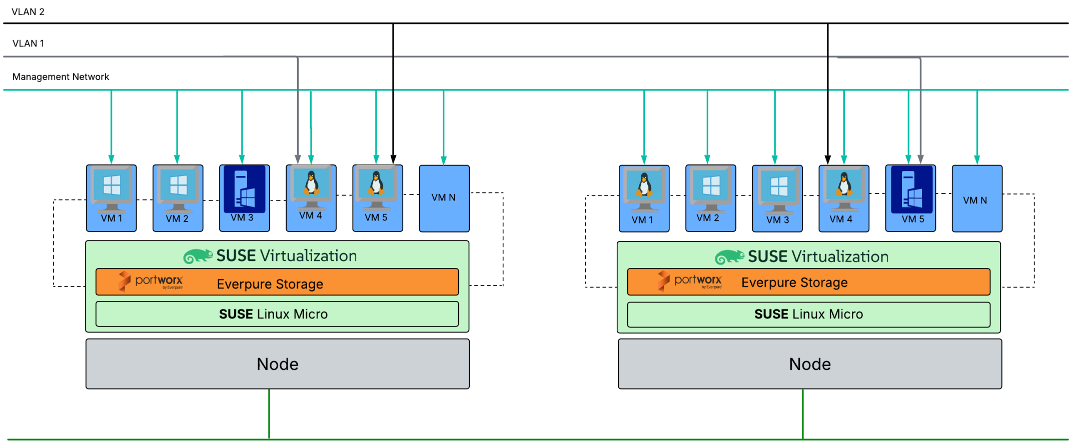

FIGURE 1: GENERAL ARCHITECTURE OF SUSE VIRTUALIZATION WITH PORTWORX BY EVERPURE

3.1 SUSE Virtualization

SUSE Virtualization (https://www.suse.com/products/rancher/virtualization/) ↗ is a lightweight, hyperconverged infrastructure solution,enabling the management of virtual machines and containers side-by-side on a unified, cloud-native platform. To ensure a secure and optimized base, SUSE Virtualization is deployed on SUSE Linux Micro, an immutable, enterprise-grade operating system purpose-built for containerized and virtual workloads. Furthermore, the platform integrates natively with SUSE Rancher Prime (https://www.suse.com/products/rancher/) ↗. This integration equips the architecture with centralized authentication, access control, observability, and built-in security, empowering operators to manage diverse workloads across data center and edge environments using a consistent operational model.

3.2 Portworx® Enterprise by Everpure™

Portworx (https://portworx.com/products/portworx-enterprise/) ↗ Enterprise serves as the enterprise-grade storage layer for both VM and container workloads. It ensures consistent storage reliability across on-premises, hybrid, and edge deployments by delivering persistent volumes, high availability, automated failover, backup and disaster recovery, performance optimization, and encryption. A critical component to this deployment is the Portworx Operator. Deployed natively into the cluster, the Portworx Operator is designed to efficiently automate and manage the installation, configuration, and ongoing upgrade workflows of all Portworx components.

3.3 Compute platform

The entire solution is deployed on bare-metal physical infrastructure. This includes the host and worker nodes, networking components (switches, NICs, load balancers), and enterprise storage devices such as an Everpure FlashArray. These physical components provide the raw performance, connectivity, and resiliency required to support large-scale virtualized and containerized workloads.

4 Design considerations

The diagram below shows a high-level, reference design for SUSE Virtualization integrated with Portworx Enterprise deployed on bare-metal nodes along with an Everpure FlashArray. By implementing this design, a platform engineering team can automate the provisioning of a well-defined architecture following best practices that includes high availability, operations management, observability, business continuity, performance, and security.

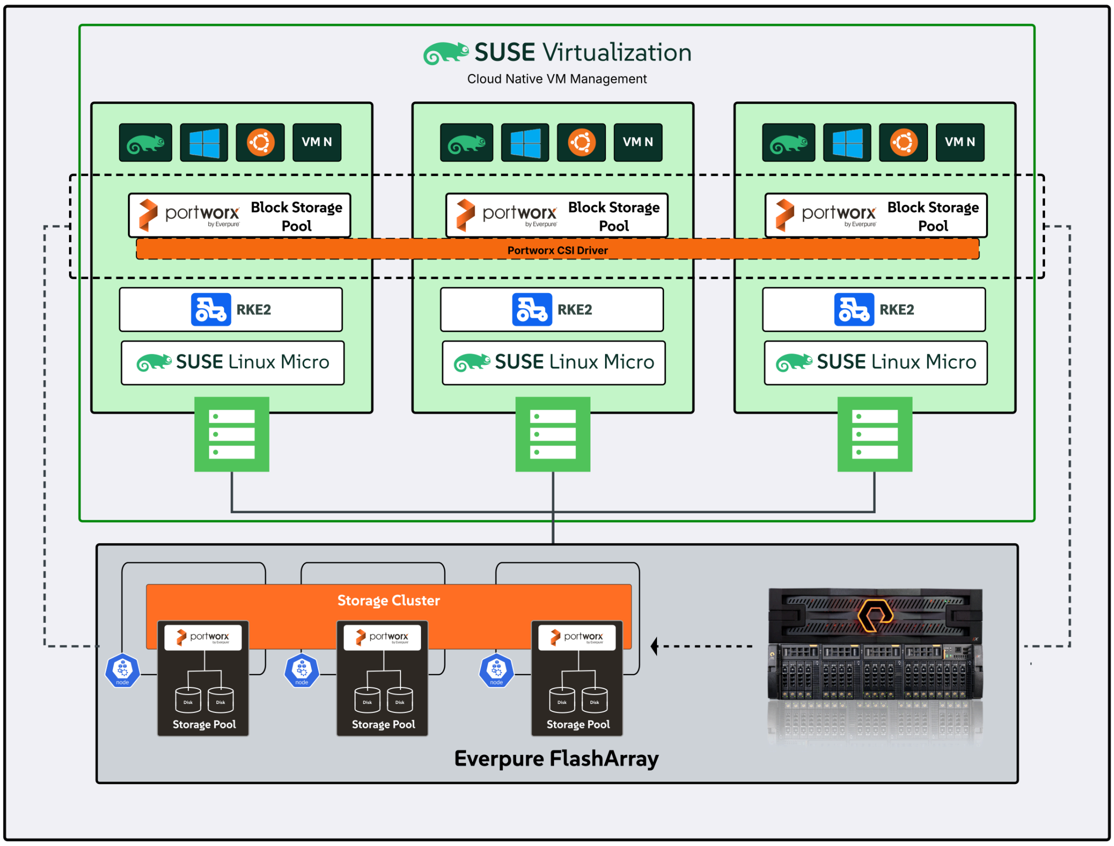

FIGURE 2: REFERENCE DESIGN

The foundation of the deployment is the bare metal compute nodes that will host both the SUSE Virtualization hypervisor and the Portworx storage layer.

4.1 Preparing the SUSE Virtualization environment

Before deploying Portworx, you must prepare the SUSE Virtualization platform and underlying nodes to ensure they meet the specific storage requirements. Review the following configurations to ensure a stable and performant integration.

- **Node Count**: While three storage nodes establish quorum, six nodes are recommended for production environments. In a six-node cluster, losing one node affects only one-sixth of its capacity, allowing the remaining nodes to distribute the load effectively.
- **Fault Domains**: Distribute nodes evenly across multiple availability zones or racks to ensure a single physical failure does not take down the entire storage cluster. If running SUSE Virtualization nested on top of other hypervisors, apply anti-affinity rules to prevent storage nodes from residing on the same physical host.
- **Resource Requirements**: Each bare metal node requires a minimum of 8 vCPUs and 32 GB of RAM. Verify that all nodes run the same kernel version and SUSE Linux Enterprise Server release to prevent compatibility issues.
- **OS Prerequisites**: Configure NTP for strict time synchronization, ensure proper DNS resolution, and disable swap on all storage nodes. Update firewall, SELinux, and AppArmor policies to permit Portworx communication ports.
- **Node Labeling**: Apply the label `portworx.io/node-type=storage` to all nodes contributing storage so the operator can automatically discover devices.

4.2 Storage and networking infrastructure

Designing a robust and efficient network is essential for achieving optimal performance and reliability when deploying Portworx with SUSE Virtualization. A well-planned network architecture ensures seamless communication between nodes, maintains data consistency, and supports high availability across the storage cluster. This section outlines the key networking considerations and best practices specific to Portworx running on SUSE Virtualization.

By carefully structuring the network layout particularly around management and data interfaces you can enhance both the stability and performance of your Portworx deployment. Additionally, properly configured firewall rules and VLAN segmentation can provide improved security and traffic isolation within your virtualized environment.

4.2.1 Management and data interfaces

When planning network configurations for Portworx on SUSE Virtualization, several best practices should be observed to ensure efficient data flow and scalability. Some considerations are noted below.

- **Dedicated network interfaces**: Assign separate virtual or physical NICs for management and data traffic. Management traffic (cluster operations, control plane) should be isolated from data plane traffic (replication, volume access) to prevent congestion and performance degradation.
- **Use of bridge or macvtap interfaces**: In KVM-based SUSE Virtualization environments, configure Linux bridges or MacvTap interfaces to provide direct network access to Portworx nodes. This reduces latency and improves throughput for data replication and I/O operations.
- **Consistent network configuration across hosts**: Ensure that all SUSE Virtualization hosts maintain identical interface names, IP schemes, and VLAN configurations. Consistency helps avoid issues when migrating or scaling Portworx nodes.
- **Jumbo frames and MTU settings**: For high-throughput storage workloads, enable jumbo frames (MTU 9000) on the data interfaces to improve performance, provided that the entire network path supports it.
- **Bandwidth and QoS**: Reserve sufficient bandwidth for Portworx data traffic. Implement Quality of Service (QoS) policies if the network is shared with other workloads, ensuring predictable latency and throughput.
- **Redundancy and bonding**: Use NIC bonding or teaming (for example, mode 4 LACP) for redundancy and load balancing across both management and data networks, ensuring high availability and fault tolerance.
- **Firewall and security rules**: Configure firewalls to allow required Portworx communication ports (control, data, and API) between nodes. Limit external access to management interfaces to secure administrative operations.

- **DNS and time synchronization**: Verify that all nodes have consistent DNS resolution and NTP synchronization, as Portworx relies on stable name resolution and accurate timekeeping for cluster operations.
- **NIC usage**: By default, Portworx uses the same network interface cards used by the Kubernetes cluster for both management traffic and data replication. This configuration simplifies the initial setup of the Portworx storage cluster but may lead to potential network congestion as both types of traffic share the same physical network resources. The default NIC for Portworx can be used for labs or development environments to simplify setup, but it should be avoided for production environments where storage performance is critical.

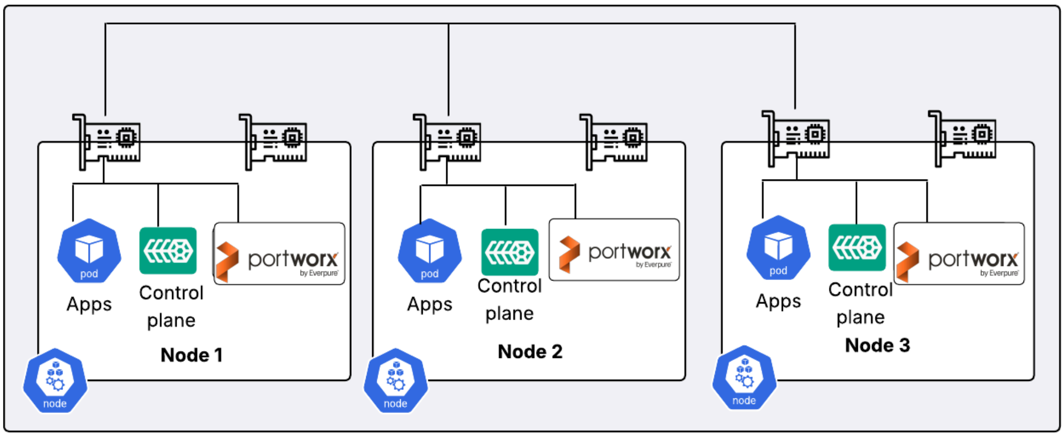

FIGURE 3: PORTWORX DEFAULT NETWORK CONFIGURATION

- **Dedicated data networks**: To optimize network performance and reduce congestion, Portworx can be configured to use a dedicated NIC specifically for handling data replication between nodes. This approach segregates data replication traffic from the management and application traffic, ensuring that the NICs used by SUSE Virtualization for managing VMs and containerized workloads, remain uncongested and perform efficiently. Implementing a dedicated data network can enhance the overall throughput and reliability of the storage cluster, especially with high data replication demands.

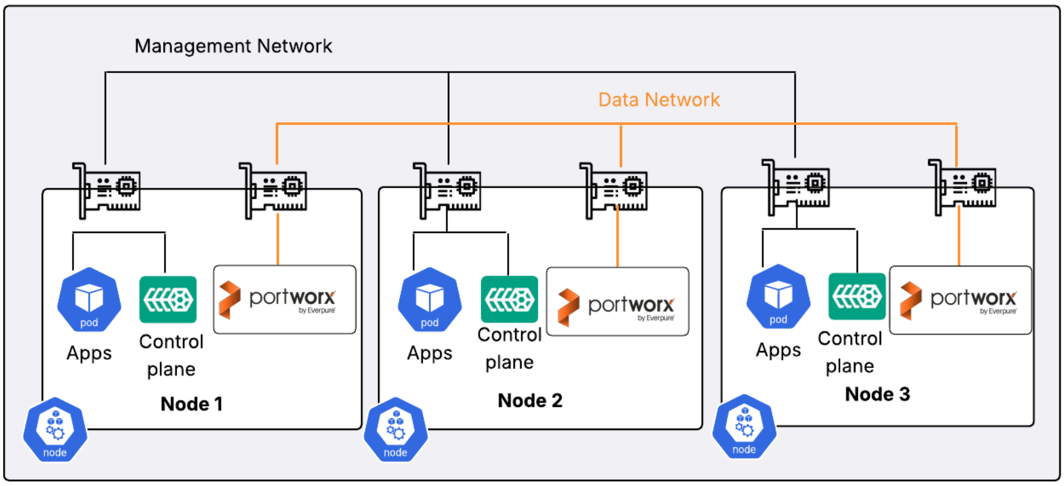

FIGURE 4: PORTWORX DEDICATED DATA NETWORK CONFIGURATION

4.2.2 Bandwidth and latency

The physical network infrastructure significantly impacts how efficiently data can be written and replicated across nodes in a SUSE Virtualization cluster using Portworx storage. Because Portworx must replicate data to a secondary node before confirming a write operation, both network bandwidth and latency directly affect application write performance and overall storage throughput. Some considerations are noted below.

- **Consistency**: Ensure that all storage nodes use network interfaces (NICs) of the same speed and configuration to maintain consistent and predictable performance.
- **Bandwidth**: 10 Gbps or higher is recommended for production environments. Data-intensive or latency-sensitive workloads may require 25 Gbps or greater. 1 Gbps may be sufficient for some non-production scenarios, such as configuration testing.
- **Latency**: 10 ms between storage nodes is required for synchronous replication.

4.2.3 Backing disks and storage arrays

When configuring a Portworx storage cluster on SUSE Virtualization, the choice and configuration of backing disks are critical for achieving optimal performance, reliability, and scalability. Below are key considerations to guide you in selecting and configuring backing disks for your Portworx storage cluster:

- **Block devices**: Portworx requires block storage devices as the backing storage for the Portworx storage cluster. Each storage node must be provisioned with raw block devices rather than pre-formatted file systems or logical volumes. These block devices can be sourced from local disks within the bare metal worker nodes. Alternatively, they can be sourced from a hardware storage array, such as an Everpure FlashArray or other SAN systems, that can present block devices to the servers. Ensure that the block devices to be used by Portworx are recognized by the host operating system of the worker nodes.

- **Disk type and performance**: The block devices used by Portworx determine the overall capacity, I/O performance, and throughput of the storage cluster. When selecting disks, consider the type, size, and performance capabilities. Faster devices, such as NVMe SSDs, provide better performance for Kubernetes applications using Portworx for persistent volumes (PVs) compared to slower devices like traditional hard disks.

- **Disk redundancy and fault tolerance**: Portworx allows application owners to specify the level of redundancy for their stateful data through replication factors. This ensures that replicas are stored on multiple nodes in the cluster. Additionally, implementing a RAID configuration (such as RAID1) at the hardware controller level can provide per-node disk redundancy. This setup allows a node to tolerate single disk failures without triggering a replica re-sync across the cluster. However, this extra layer of protection does incur higher hardware costs.

- **Capacity planning**: The size and configuration of the backing disks determines the total capacity of the Portworx storage cluster. While Portworx requires a small amount of overhead for metadata and journal writes, most of the capacity is used for persistent volumes and replicas. When planning capacity, consider the expected number of replicas per application to ensure sufficient storage. Disks can be resized, or additional devices can be added to expand the total storage cluster capacity for future needs.

- **Storage pool configuration**: Portworx requires at least one storage pool to operate, but multiple pools can be configured to segregate different types of workloads or create storage tiers for performance optimization. Each storage pool should consist of drives with identical specifications to ensure consistent storage performance across the nodes in the cluster. This configuration helps maintain uniformity in storage performance for all replicas.

By carefully considering these factors, you can ensure that your Portworx storage cluster on SUSE Virtualization is well-equipped to handle the demands of your applications, providing high performance, reliability, and scalability.

4.2.4 Storage pools and single-volume strategy

By following these guidelines, organizations can deploy a robust and scalable Portworx architecture on SUSE Virtualization, ensuring high availability and optimal performance for their applications.

A storage pool in Portworx is a logical grouping of a node's physical drives. Portworx uses the space in these storage pools to dynamically create virtual volumes for containers. Storage pools consist of a collection of drives with the same capacity and type. When you create a pool, Portworx categorizes it based on its latency and performance in random and sequential IOPS.

To set up a storage pool, you need a minimum of one disk per node. Portworx evaluates each disk through a benchmark process, categorizing it based on its throughput into one of three I/O priorities: low, medium, or high. Disks that share the same I/O priority and size within a node are grouped into a pool. This categorization allows you to align various applications with the appropriate tier of storage based on their performance requirements. For example, database applications can be placed on flash devices for high performance, while applications managing logging data can utilize less performant options.

For future scalability, consider the methods available to increase storage capacity in the cluster. This can be either by expanding an existing disk (vertical scaling) or by adding additional disks to the storage pool (horizontal scaling). While both methods increase capacity, horizontal scaling necessitates an intensive and time-consuming rebalancing process Vertical scaling is preferred, as it does not require rebalancing. In an enterprise setting, the "disk" in the storage pool is often provided by a logical unit in a storage array, simplifying capacity expansion and providing other enterprise features like centralized management.

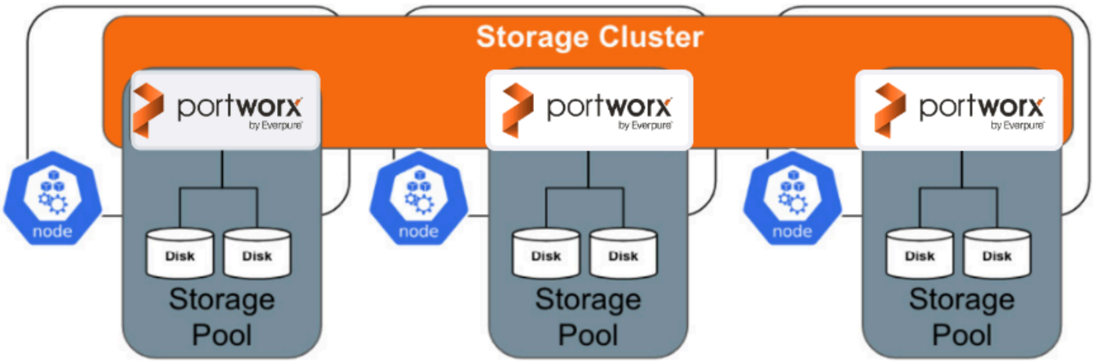

FIGURE 5: PORTWORX STORAGE POOL ARCHITECTURE

4.2.5 Journal devices

A journal device is dedicated storage used to improve the performance and reliability of write operations by logging these operations before they are finalized in main storage volumes. **Configuring a journal device is recommended**. Some additional recommendations are provided below.

- Since journal writes are small and frequent, fast storage, like a solid-state drive (SSD) or NVMe device is strongly recommended. The journal device must be at least as fast as the fastest storage device on the node participating in the Portworx storage cluster. If the journal device performs slower, the overall cluster write performance will be limited to the speed of the journal device.
- The journal device should have a capacity of 3 GB, as Portworx uses only this amount of space for journaling. Allocating a larger device does not improve performance unless the increased capacity also provides additional IOPS, such as in many cloud environments.
- For nodes using **local drives** as backing disks, configure the journal device to be **automatically created** from existing disks rather than dedicating a separate physical disk for the 3 GB requirement. This reduces hardware cost and complexity.
- For environments using **storage arrays** that can easily provision and present multiple volumes or LUNs to worker nodes, create a **dedicated 3 GB volume** specifically for the journal device. This separation is done to achieve better metadata write performance.

Tip

Using a high-performance SSD or NVMe device for journaling can significantly improve metadata throughput and overall I/O responsiveness in Portworx storage clusters.

4.2.6 Portworx KVDB

Portworx relies on a **key-value database (KVDB)** to store critical operational data such as cluster state, configuration, and volume metadata. Because this information is essential to cluster operation, it must be highly available, resilient, and protected from node or device failures. When deploying Portworx on SUSE Virtualization, you can configure the KVDB using one of the following options:

- **Internal KVDB**
  The **internal KVDB** is integrated directly into the Portworx deployment and is the **recommended configuration** for most environments.
  This approach simplifies deployment by removing the need for an external database cluster, reducing management overhead and potential points of failure. The internal KVDB provides a stable and efficient mechanism for maintaining cluster metadata and configuration state.

- **External etcd cluster**
  Alternatively, Portworx can utilize an **external etcd cluster** as its KVDB.
  This option is suitable for organizations that already maintain a production etcd infrastructure or require advanced features, such as **SyncDR (Synchronous Disaster Recovery)**.

Note

SyncDR depends on an external etcd cluster to maintain **data consistency and high availability** across geographically distributed sites. However, using an external etcd cluster introduces additional setup and management complexity. When using this option, ensure the etcd cluster is deployed across **multiple fault domains** to maintain quorum during node or site outages.

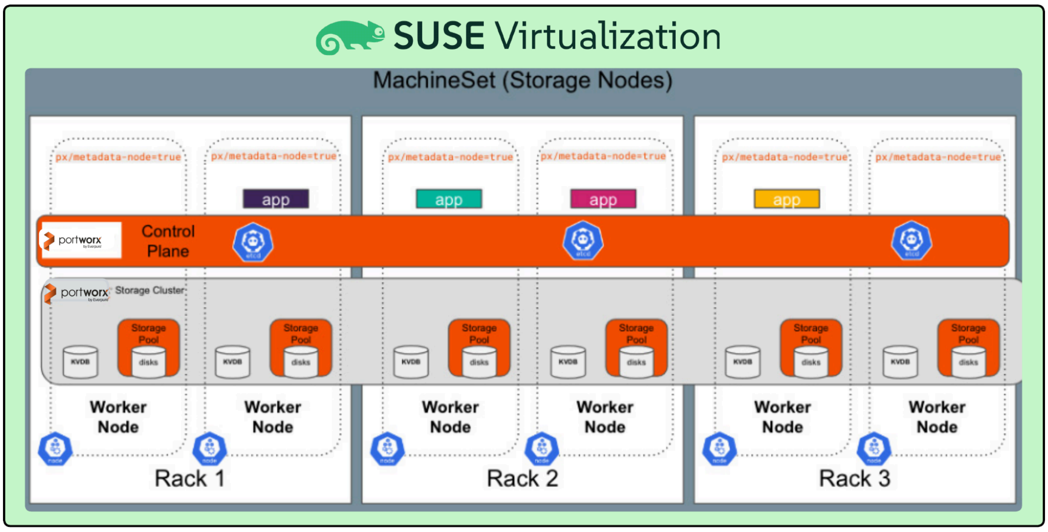

FIGURE 6: KVDB REFERENCE

4.2.7 Third-Party Storage Considerations

A hardware storage array can be used to provide the block devices as backing disks for the Portworx storage cluster. A storage array is a centralized storage system that consists of multiple storage devices (HDDs, SSDs, NVMe devices) to provide expanded storage capacity for servers and applications, often with high performance, redundancy, scalability features. A storage array may offer other benefits, such as deduplication and compression, that can lower total cost of ownership when hosting replicas for a Portworx storage cluster.

When providing backing disks to Portworx storage nodes from a hardware array, special considerations should be taken. This section outlines design considerations when using an external storage array for Portworx backing disks.

Consider the following guidance when using a storage array to provide backing for your Portworx storage cluster:

- **Block devices** are typically presented to physical hosts (SUSE Virtualization worker nodes) via Fibre-Channel or iSCSI connections.
- **Interface redundancy:** Portworx recommends using a minimum of two iSCSI or Fibre-Channel interfaces per node to present storage to the cluster. A pair of interfaces provides high availability in the case of hardware failure, and with multi-pathing, can deliver additional bandwidth to the backing storage array.

- **Fibre-Channel configuration:** Ensure proper zoning in the Storage Array Network Fabric for the nodes.
- **iSCSI configuration:** Dedicate Ethernet interfaces solely for storage traffic, rather than sharing them with SUSE Virtualization traffic. Configure jumbo frames on these interfaces and any in-line network devices, including physical switches and the storage array, to enhance performance.

For storage cluster disks, Portworx recommends presenting **a single volume per storage node** based on your sizing decisions. Using a single volume reduces performance impact if resizing operations are required later. If your storage array supports volume resizing, these volumes can be expanded to increase the total storage of the Portworx storage cluster This expansion **avoids triggering a rebalancing task**, which is a costly storage operation involving data copying.

Creating additional volumes of a desired size is straightforward with an external hardware array. In scenarios using an external hardware array, Portworx recommends creating **3 GB volumes** from the array and presenting them to the worker nodes to be used as the **journal device**.

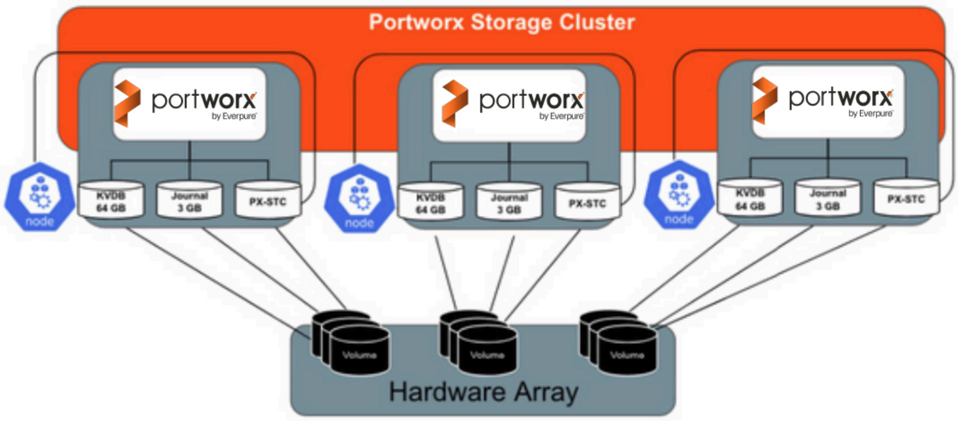

FIGURE 7: THIRD-PARTY ARRAY DIAGRAM

5 Deployment

This section outlines the high-level deployment workflow. For complete step-by-step instructions, exact commands, and configuration files, refer to Modern Virtualization with SUSE and Everpure: Integrating Portworx Enterprise and Everpure FlashArray Storage with SUSE Virtualization (https://documentation.suse.com/trd/everpure/html/gs_virtualization_portworx_everpure-flasharray/index.html).

5.1 Preparatory configurations

1. **Multipath setup:** Deploy a Harvester CloudInit resource to configure node-level `udev` rules and multipath settings tailored for the Everpure FlashArray, then restart the cluster nodes to apply the changes.
2. **Array credentials:** Configure user access within the Everpure FlashArray and create a corresponding Kubernetes secret in the Portworx namespace to securely store these credentials.

5.2 Generate the Portworx installation specifications

1. **Portworx Central configuration:** Access the Portworx Central Web portal to generate a customized installation spec for the Everpure FlashArray platform.
2. **Basic and storage settings:** Define your Kubernetes environment details, select the built-in `etcd` option, and configure your storage parameters (such as enabling PX-StoreV2, selecting Fibre Channel, and defining capacity mapping and maximum node distribution).
3. **Network and customization:** Ensure the Portworx services starting port is correctly assigned, select the Rancher Kubernetes Engine (RKE) environment, and generate the installation specifications.

5.3 Install the Portworx Operator and `StorageCluster`

1. **Deploy the Portworx Operator:** Execute the first generated installation spec on the SUSE Virtualization management node.
2. **Configure the Stork snapshot (Optional):** If you are running a compatible version of SUSE Virtualization (`v1.6.0` or higher), configure and apply a Stork Snapshot `StorageClass`.
3. **Deploy the Portworx `StorageCluster`:** Execute the second generated spec to initiate the deployment of the actual Portworx `StorageCluster`.

5.4 `StorageClass` and CSI driver configuration

1. **Add the `StorageClass`:** Create and apply a new default Kubernetes `StorageClass` configured to use the Portworx provisioner. Ensure any pre-existing default storage classes (such as Longhorn) are unset to prevent conflicts.
2. **Update SUSE Virtualization UI settings:** Navigate to the advanced settings within the SUSE Virtualization UI (under `csi-driver-config`) to map the new CSI driver provisioner and define the appropriate volume snapshot class name.

6 Validation

This section outlines the high-level validation workflow. For detailed validation steps and troubleshooting guidance, refer to the complete deployment documentation.

1. **Environment readiness:** Verify that the Portworx Operator and `StorageCluster` are in a healthy state and that the Portworx CSI driver is registered. Confirm that the Portworx `StorageClass` is available and set as the default.
2. **Provision a test VM:** From the SUSE Virtualization UI, create a virtual machine and assign its primary writable root disk to the Portworx `StorageClass`.
3. **Verify provisioning:** Confirm that the `PersistentVolumeClaim` is successfully created and bound to a Portworx-provisioned volume using the correct CSI driver.
4. **Validate operation:** Start the virtual machine and verify that it reaches a running state with the root disk attached and accessible.

Note

Optional checks: * If snapshot functionality is enabled, validate snapshot creation. * Optionally, restart the VM to confirm storage persistence.

7 Conclusion

As organizations accelerate the modernization of their applications and infrastructure, they increasingly transition from traditional virtual machine deployments to cloud-native technologies like containers and Kubernetes. SUSE Virtualization meets this demand by providing a flexible, unified platform where containerized and virtualized workloads coexist seamlessly side-by-side. By integrating Portworx Enterprise by Everpure, this architecture gains resilient, scalable, and highly efficient storage services tailored for mission-critical operations—fully supporting enterprise availability, data mobility, and robust protection needs. Together, SUSE Virtualization and Portworx equip enterprises with a dependable, future-proof infrastructure foundation capable of driving their most demanding workloads.

This guide has detailed the core architectural concepts, configuration steps, and validation methods required to successfully implement this integration using an Everpure FlashArray. By bridging these technologies, organizations can confidently eliminate infrastructure silos and streamline operations.

To continue your learning journey, explore the following technical resources:

- SUSE Virtualization documentation (https://documentation.suse.com/cloudnative/virtualization/latest/en/introduction/overview.html)
- Manage Portworx RWX Block Volumes on SUSE Virtualization (https://docs.portworx.com/portworx-enterprise/platform/provision-storage/kubevirt-vms/manage-kubevirt-vms-rwx-block/suse-virtualization)
- Pure Storage FlashArray (https://support.purestorage.com/category/m_flasharray)

8 Frequently Asked Questions (FAQs)

1. **What problem does SUSE Virtualization with Portworx on bare metal solve?**
   This solution addresses the challenges of running modern, stateful virtualized workloads with high availability, performance, and operational consistency. It provides a unified platform to run virtual machines and containers together while ensuring enterprise-grade persistent storage, resiliency, and simplified lifecycle management.

2. **Why deploy SUSE Virtualization on bare metal instead of a traditional hypervisor stack?**
   Deploying on bare metal removes unnecessary abstraction layers, improves performance, and provides greater control over hardware resources. It also enables tighter integration with Kubernetes, allowing organizations to manage virtual machines and containers using the same cloud-native operational model.

3. **How does Portworx integrate with SUSE Virtualization?**
   Portworx integrates as the persistent storage layer for SUSE Virtualization by providing block storage volumes to both virtual machines and container workloads. It runs as a Kubernetes-native service and manages replication, failover, backup, and storage lifecycle operations transparently.

4. **Is Everpure FlashArray required for this architecture?**
   Everpure FlashArray is recommended and validated in this reference configuration because of its performance, reliability, and enterprise features. However, Portworx can also work with other supported hardware storage arrays or local disks, provided they can present raw block devices to the SUSE Virtualization nodes.

5. **What is the minimum cluster size for production deployments?**
   Portworx requires a minimum of three storage nodes to establish quorum. For production environments, six storage nodes are recommended to improve fault tolerance, capacity distribution, and I/O performance during node failures or maintenance operations.

6. **Can this architecture support both virtual machines and containers?**
   Yes. SUSE Virtualization is designed to run virtual machines and Kubernetes workloads side by side on the same cluster. Portworx provides persistent storage services for both workload types, enabling consistent data management across VMs and containers.

7. **Is a dedicated storage network required?**

A dedicated storage network is strongly recommended for production environments. Separating management and data traffic reduces contention and improves storage replication performance. For high-performance workloads, 25 Gbps or higher network bandwidth is preferred.

8. **What are the recommended storage pool and backing disk configurations?**
   Portworx recommends using a single backing disk per node to create the storage pool. This approach simplifies capacity expansion, especially when using external storage arrays that support volume resizing, and avoids costly data rebalancing operations.

9. **How does this architecture support future scalability and growth?**
   The solution supports horizontal scaling by adding nodes and vertical scaling by expanding backing disks. It also provides a foundation for hybrid cloud, edge deployments, and mixed VM/container workloads without requiring architectural changes.

10. **Does this reference configuration support disaster recovery?**
    Yes. Portworx provides built-in backup and disaster recovery capabilities. Advanced DR features, including synchronous replication across sites, are supported when integrated with an external etcd cluster and appropriate network connectivity.

11. **Is this solution suitable for edge or remote deployments?**
    Yes. SUSE Virtualization and Portworx are well-suited for edge environments because of their lightweight footprint, Kubernetes-native management, and ability to operate consistently across centralized data centers and remote locations.

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