portworx

The business value of Portworx

Reduce infrastructure costs by 30-60%. Reduce risk. Accelerate containerization initiatives.

Enterprises are under intense pressure to deploy new applications quickly in an ever-changing, multi-cloud world. To achieve this agility, businesses must move to modern application architectures which rely on containers. Gartner estimates that by 2020, 50% of global organizations will be running containers in production and that by 2020, more than 20 percent

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AT A GLANCE

- Reduce compute costs by 40-60%
- Reduce storage costs by 30% or more
- Reduce ops and support costs by $1.8 million annually

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of enterprise primary storage capacity will be deployed to support container workloads, up from less than one percent today. However, traditional storage solutions for distributed containerized environments are complex, costly, and likely to fail.

That's why modern enterprises like GE Digital, Comcast, Verizon and more trust Portworx to manage data for mission critical containerized applications across multiple clouds with zero downtime or data loss, while dramatically reducing infrastructure costs.

PORTWORX IS TRUSTED IN PRODUCTION BY GLOBAL FORTUNE 1000 ENTERPRISES INCLUDING:

COMCAST   GE Digital   NIO

Lufthansa Systems   LLOYDS BANKING GROUP   verizon

SAVE 40-60% ON COMPUTE COSTS

Containers are dramatically more lightweight than virtual machines. This feature allows you to increase the density of applications per host by up to 4x depending on your environment.[1] Due to increased average density, enterprises report being able to reduce their total server footprint overall by half through containerization initiatives. Portworx plays a critical role in these infrastructure savings by increasing the number of databases and other stateful services that can run on a single host, and in some cases even reduces the number of individual containers required to run a multi-node stateful service by 40-60%.

[1] For example, the Ubuntu Docker image is 184 MB compared to 845 MB for the non-Docker image. While image size is only one factor determining how many containerized applications you can run per host, by sharing a host operating system among containers, you save on compute and storage resources, which translates into increased density of applications per host.

Learn more at **portworx.com**

The benefits of moving stateful services into containers are compelling, however, running stateful services in containers requires enterprises to solve problems not addressed by legacy storage systems or cloud block storage. For instance, it is impossible to use cloud block storage to run 50 or 100 databases per cloud VM because Linux-based operating systems limit the number of block volumes per host to 40. Even more importantly, containers are simply more dynamic than virtual machines–coming online, shutting down, and automatically moving based on constantly shifting resource availability. This increase in dynamism of operations renders manual processes for provisioning and management insufficient. Achieving infrastructure savings through containerization requires a cloud native storage solution optimized for container environments.

> " With Portworx, I can reduce Kafka brokers from 5 to 3, a 40% savings, for the same level of reliability."
>
> beco
>
> - Jeffery Zampieron, CTO, Beco

In addition to solving the critical challenges of container storage which facilitate a first wave of cost savings, Portworx can further enable a reduction in infrastructure costs by reducing the number of containers required to run a multi-node stateful service in a performant, highly available manner. For example, a typical modern database like PostgreSQL or Kafka will use replication to store copies of its data on other hosts in the cluster. If a host with one of those data copies is lost, the database will repopulate that copy from other hosts in the cluster. This process is called application-level replication and has two significant costs.

First, application-level replication consumes I/O that would otherwise be used for database requests, slowing down your application during the rebuild. Second, it requires that you run more containers than is strictly necessary to serve your database requests, in effect, forcing you to overprovision compute.

The conclusion of this testing is that Portworx gives you the reliability and performance of a three-container MongoDB deployment with only a single container, saving you 60% of compute costs per database.

Configuration	# of containers	# of writes	% improvement
MongoDB without Portworx	1	15,343	
MongoDB replica set without Portworx	3	45,169	294%
MongoDB with portworx	1	49,014	319%

The table above summarizes testing we conducted using MongoDB.[2] Compared to a single MongoDB container, Portworx improves write performance by 319%. Additionally, compared to a MongoDB replica set of three containers, Portworx increases write performance by 10% but consumes only one third of the compute resource. For a resource intensive database like MongoDB, the cost savings associated with using Portworx can exceed $1000/month/database, more than offsetting the cost of the Portworx license.

[2] See https://portworx.com/kubernetes-failover-mongodb/

There are cases in which you may want to use application-replication to increase read throughput across a greater number of hosts. Even in these instances, Portworx can help. You can reduce the number of replicas from 5 containers to 3 containers (40% savings), or 8 to 5 (38% savings). In all cases, Portworx enables you to reduce your compute footprint for stateful services, driving infrastructure savings beyond what you can achieve from containerization alone.

> Portworx increases performance and decreases resource consumption so much that for resource-intensive databases like MongoDB, savings can exceed $1000/db/mo... which more than offsets the cost of the Portworx license!
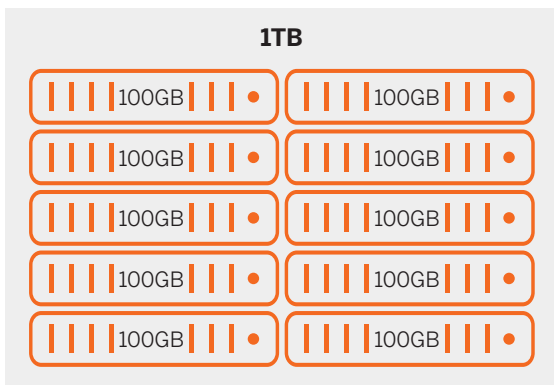
SAVE 30% OR MORE ON STORAGE COSTS

In addition to driving compute savings, Portworx cloud native storage can also reduce storage costs by 30% or more depending on configuration. These cost savings are driven by the following mechanisms:

Reduce storage over-provisioning

Portworx dynamic volume provisioning and on-demand storage resizing allow enterprises to avoid over-provisioning storage resources. Instead of provisioning storage for peak demand, extremely dense application clusters can over-subscribe storage resources, bringing additional storage capacity only when it is needed without any impact on app-level SLAs. For example, with Portworx, an internal IT team can provide 10 application teams with a PostgreSQL database of 100 GB max each. While most storage solutions would require you set aside 1 terabyte of capacity initially,

> Portworx enables you to reduce your compute footprint for stateful services, driving infrastructure savings beyond what you can achieve from containerization alone.

even though the vast majority of that storage will be underutilized, Portworx "thin provisions" the storage, such that, only a fraction need actually be provisioned, perhaps 700 GB. As the teams increase utilization, additional storage can be added to the cluster on demand in the form of additional nodes (scale out most common in bare metal deployment) or additional block devices added (scale up most common in cloud deployments).

Traditional over-provisioning — Thin-provisioning with Portworx

🔲 Storage actually provisioned and paid for   🔲 Thinly provisioned storage

By thin provisioning, you save at least 30% on storage costs

Storage tiering

Additional cost savings can be derived from placing workloads on the most cost-efficient storage. Using Amazon as a comparison, SDD (12¢/GB) storage is over 2x the cost of HDD (5.4¢/GB). Additionally, non-critical workloads can be backed up off of expensive primary storage to cheaper object storage (2.3¢/GB), which is only 50% the cost of HDD. Using Portworx to implement a dynamic, storage tiering model across flash, spinning disk and object storage allows organizations to significantly reduce storage costs while maintaining flexibility to meet app-level SLAs.

Placing workloads on the right type of storage leads to dramatic cost savings

| SSD |
| SSD |
| SSD |
| SSD |
| 12¢/GB |

| HDD |
| HDD |
| 5.4¢/GB |

| Object Storage |
| 2.3¢/GB |
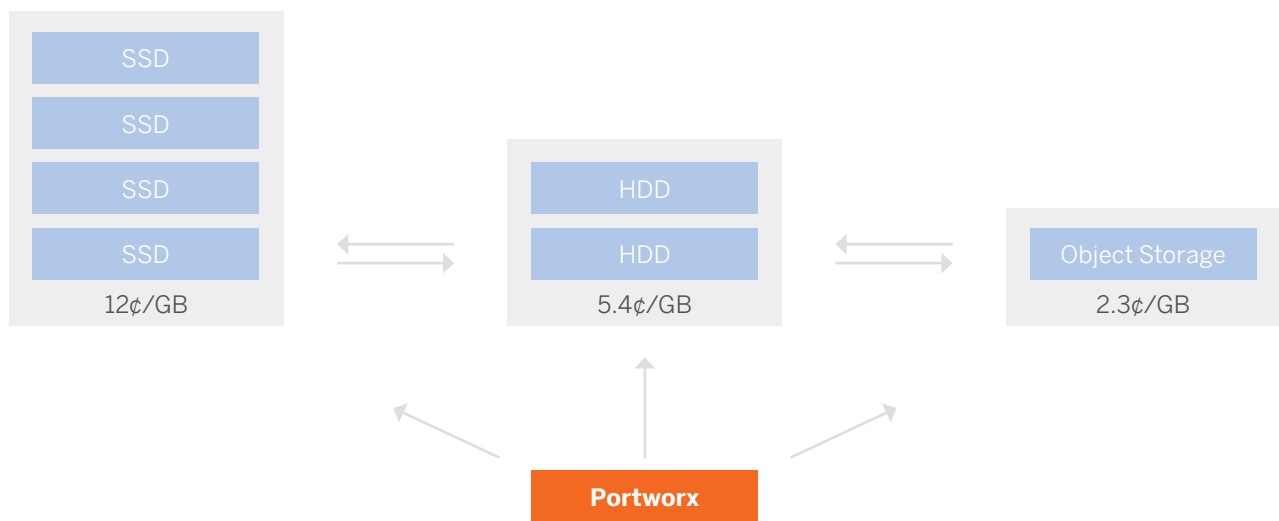
Portworx

Portworx dynamically places workloads on the right type of storage hardware to drive cost savings

Combined effects of reduced over-provisioning and storage tiering save 30% or more on storage costs

By combining more efficient use of EBS through reduced over-provisioning and moving some non-critical workloads to lower-cost secondary storage, you can save 30% or more depending on configuration.

For example, if we conservatively assume a 30% reduction in EBS volumes provisioned and we move 20% of our workloads from EBS SSD to EBS HDD, we will save 38% on total storage costs, or over $100,000 per year for 200 terabytes of storage.[3]

[3] Model assumptions- EBS gp2 SSD costs 12¢/GB/month ; EBS st1 HDD costs 5.4¢/GB/month. For a theoretical 500 GB of EBS gp2 SSD, the model calculates that we would only need to purchase 350 GB of EBS due to efficiency gains from right sizing. 80% of the 350 total EBS storage would be charged at the higher SSD cost, while the remaining would be charged at the lower HDD cost.
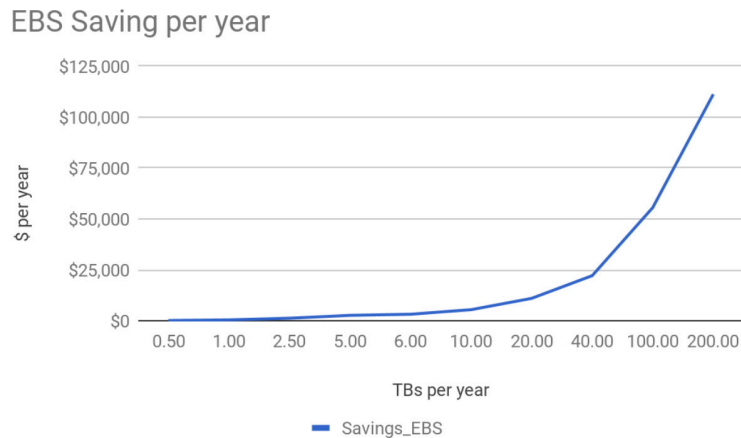
EBS Saving per year

Portworx enables storage cost savings of over $200,000 per year for 200 terabytes

SAVE MORE THAN $1.8 MILLION ANNUALLY ON OPERATIONS AND ENTERPRISE SUPPORT CONTRACTS

Thanks to an explosion of database and analytics options, a typical enterprise runs 10 or more different data stores as part of its container platform. Data stores include SQL options like MySQL and PostgreSQL, NoSQL options like MongoDB, Cassandra, and Couchbase, streaming and analytics options like HDFS, Spark, Kafka, and TensorFlow, as well as other popular options like Redis, ElasticSearch, and more. For any kind of scale, the unique operational patterns of each data store require specialized DevOps expertise, usually augmented by an Enterprise Support Agreement from the database vendor. For a typical set of 10 databases, the staff costs easily run well over $1.5 million,[4] and vendor support subscriptions to aid the team run well into the hundreds of thousands of dollars.[5] These costs, however, ignore the fact that in a hypercompetitive hiring environment, these specialized skills are often not available at any cost, leading to significant operational risk or ballooning support agreements with database vendors.

Because PX-Enterprise provides a single data storage and management layer for any stateful service, a single operations staff member can easily operate multi-data stores, without any specialized database-specific knowledge. Additionally, because PX-Enterprise automates the deployment, upgrade, scaling, high availability, and backup and recovery for any containerized stateful service, the need for specialized support contracts from database vendors is dramatically reduced or even eliminated. In conclusion, with PX-Enterprise providing storage for 10 stateful services, a typical enterprise can save nearly $2 million dollars in Operations and Enterprise Support Agreement costs, more than covering the cost of Portworx licensing.

[4] For example, 10 database operations staff members could be necessary to manage 10 different types of data stores 24x7, including multiple instances of each type, assuming each team member is cross-trained across multiple data store types. An average cost of $150,000 per year (compensation plus benefits, office, equipment, etc.) per team member equals $1,500,000 in annual staff costs.

[5] Software support subscriptions for data stores commonly cost from $1,000 to $10,000 per year depending on type and scale of nodes supported. An example cost would be 10 data stores with an average 5 instances per type over an average of 6 nodes at $1,000 per node = $300,000 per year in subscription support costs.

## Costs dramatically reduced or eliminated by using PX-Enterprise

	Unit cost per year	Total cost per year for 10 data stores
FTE costs for a skilled Ops Engineer	$150,000 including salary and benefits	$1,500,000 for 10 staff engineers
Enterprise Support Agreement	$1000/node/year	$300,000 for 30 nodes

REDUCE THE RISK OF FAILED CONTAINER PROJECTS

Reducing infrastructure costs is always a good thing, but in the hypercompetitive business landscape, cost-cutting alone doesn't drive success. Containers are a key to building an agile IT organization, but without a proven cloud native storage solution, teams struggle to containerize large numbers of applications, at best limiting the impact of container investments. At worst, multi-million dollar container investments fail.

Portworx reduces integration risk

Successfully deploying stateful applications in containers requires the integration of infrastructure (compute, network, storage), container orchestration, and applications. There are many moving pieces and the chance of failure is high, especially for mission critical stateful applications like databases. By providing cloud native storage that was built from the ground up for containers, Portworx automatically manages common operational failures like lost nodes, network partitions, and disk failures when other solutions require frequent and costly interventions. Additionally, by providing application-consistent snapshots, Portworx allows for true, multi-cloud backup and recovery.
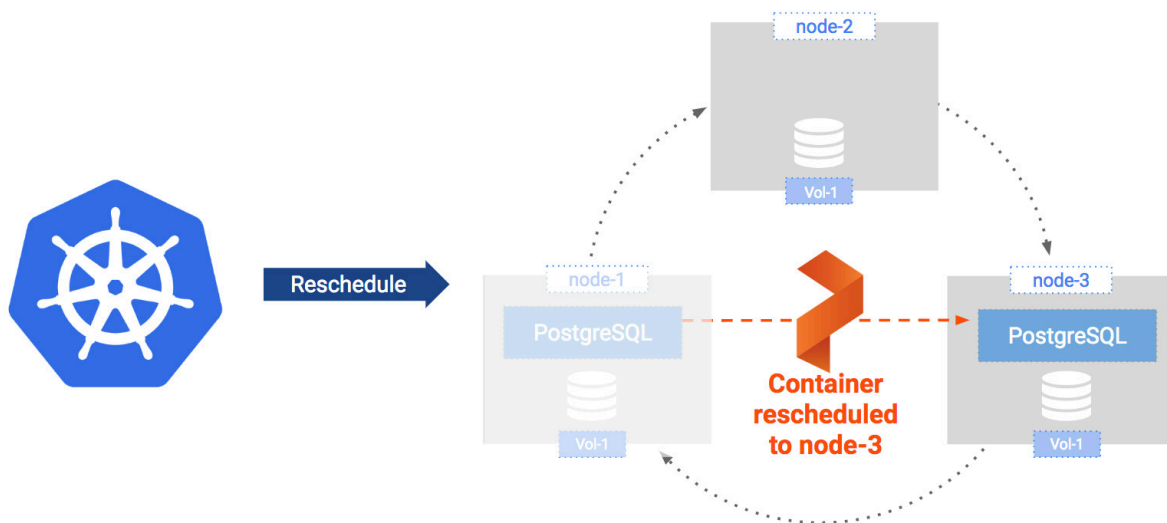
Portworx automates Day 2 operations like High Availability driving significant operations cost savings

Reduce performance risk

Many storage solutions claim to provide "support for containers." However, when you actually deploy and test these solutions, you find that they are ill-suited to high-performance database workloads. For instance, GlusterFS CPU and Memory usage scale linearly as volumes are added while providing extremely low I/O throughput. Ceph, which stripes data across hosts to provide HA, can't run hyper-converged with containers, which imposes network latency.

CPU Usage %

Memory Consumption %
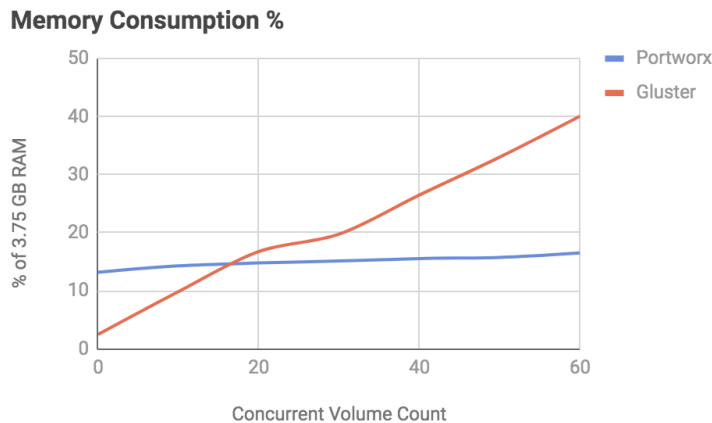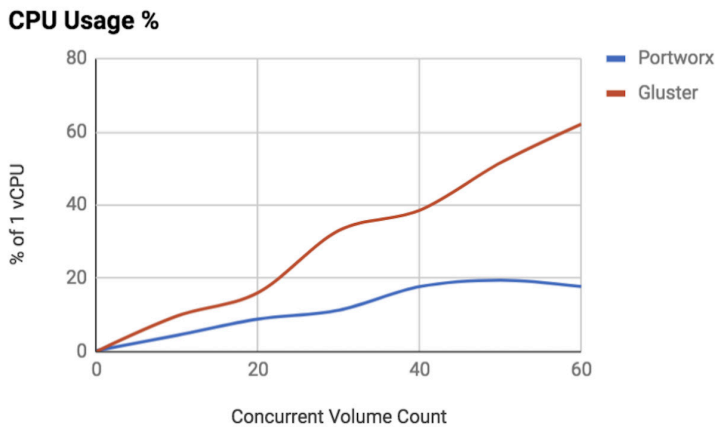
Each new GlusterFS volume increases CPU and Memory usage, leading to heavy infrastructure resource utilization

> "After spending a year testing and researching a solution for persistent storage for containers, we found Portworx, which in the locked-down, secure government environment that we find ourselves in seems to be the shoe-in for allowing us to utilize the resources we have to get the outcome we want."

- Cris Fairweather, Architect, WCG Solutions for Space and Naval Warfare Systems Command

Unlike legacy storage solutions, Portworx provides high I/O throughput for high-performance databases on bare metal servers and in virtualized environments. Additionally, Portworx enables you to run hyperconverged infrastructure where your data and your containers both run on the same physical hosts, maximizing your performance. Portworx can even maintain hyperconvergence during both scheduled and unscheduled maintenance operations by providing the scheduler information about where replicas are located in the cluster. This way, your containers are not scheduled onto a host without a local copy of the data.

CONCLUSION

As pressure to deploy new applications quickly mounts, Portworx enables enterprises to accelerate their container initiatives while dramatically reducing infrastructure costs and operations costs. That's why modern enterprises like GE Digital, Comcast, Verizon and more trust Portworx to manage data for mission-critical containerized applications.

By efficiently managing infrastructure, Portworx reduces compute costs of containerized stateful applications by 40-60% and reduces storage costs by 30% or more. Additionally, Portworx reduces risk to container initiatives by automatically managing common failure scenarios while ensuring consistent, high performance for stateful workloads. Schedule a demo with Portworx today at portworx.com/request-a-demo.

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There are a few critical areas in your stack where you cannot afford a failure. Storage is one such area. We evaluated open-source options for cloud-native storage, but they were not as stable for our high-performance use case. We chose Portworx because it is a stable, mature, container-native storage option with one of the most responsive engineering and support organizations I've ever worked with."

∧ NIO

- Satya Komala, head of autonomous vehicle cloud and enterprise architecture, NIO

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