



**portworx**  
Enterprise

The Storage Platform  
for Kubernetes

Now available on  
 **IBM Cloud**



High performance storage, HA, DR,  
backup and security for IBM Services  
running on OpenShift and Kubernetes

By 2022, more than **20%** of enterprise primary storage capacity will be deployed to support container workloads, up from less than **1%** today

**Gartner**

**Portworx Enterprise** is the cloud native storage and data management platform that enterprises trust to manage data in containers.



\*Gartner, Docker Containers Will Impact Enterprise Storage Infrastructure, Julia Palmer, Arun Chandrasekaran, 08 February 2017

# Run mission critical AI and data services on OpenShift and Kubernetes with IBM Cloud and Portworx

In order to run stateful services and applications like Cognos, Watson Studio and DB2 Warehouse on OpenShift or Kubernetes, you need scalable persistent storage similar to what is used for VMs, but optimized for containers. Legacy storage systems don't scale to the levels achievable with Kubernetes.



## Now, with Portworx and IBM Cloud, you can:

- **Run any service offered on Cloud Pak for Data in production** with Portworx's high-performance storage, HA, DR, Backup and Security solutions.
- **Run any database or data-rich application on IBM Kubernetes Service**, even those that require strict performance, backup & DR, security and data mobility.
- **Improve application performance** and uptime by avoiding the limitations of storage platforms built for VMs, not containers.
- **Achieve Zero RPO and < 1 minute RTO Disaster Recovery** for mission-critical data services.
- **Seamlessly backup and migrate entire AI applications** between clouds and on-prem data centers.
- **Reduce storage costs** using Red Hat Certified Portworx Operator for Capacity Management.

# About this guide

This guide will help you learn more about containers, why high performance storage, HA, DR, Backup and Security optimized for containers is critical for enterprise application deployments on Kubernetes, and how Portworx integrates with IBM Cloud technologies, including IBM Cloud Pak for Data and IBM Kubernetes Service.

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# A new paradigm in computing. New requirements for storage.

## **As more enterprise workloads move to containers, can your storage keep up?**

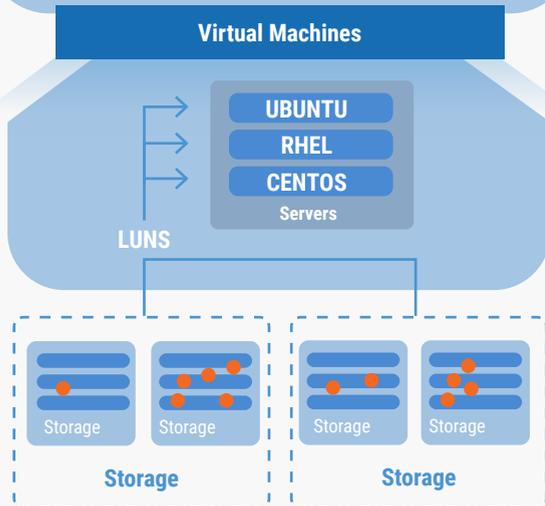
In a hybrid and multi-cloud world, where compute resources are distributed across public and private clouds, machines (even virtual ones) are no longer the right building blocks for applications.

Kubernetes and OpenShift provide the ability to rapidly deploy and scale enterprise applications like Watson Studio, Cognos and DB2 Warehouse across multiple VMs using lightweight containers. Containers free applications from the underlying OS, making them more portable and efficient at utilizing available compute resources, but require application-focused management technologies for critical capabilities like storage.

## Machine-defined vs Application-defined

### Machine-defined World

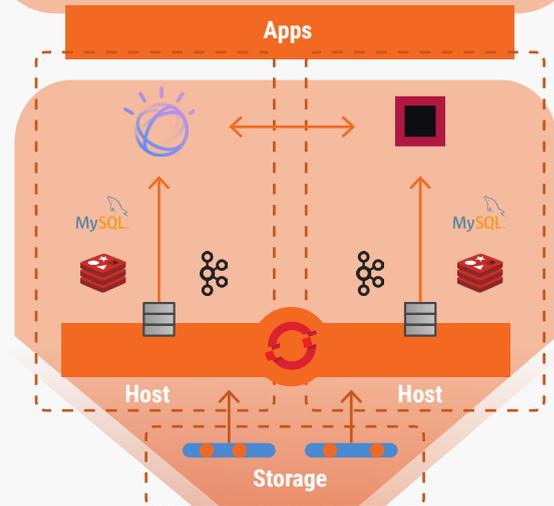
- ▶ Focus is on machine provisioning and lifecycle management.
- ▶ Driven by a VM, Storage and Network Admin



### App-defined World



- ▶ Focus is on app-aware infrastructure provisioning and lifecycle management.
- ▶ Driven by an end user (application owner)



## Overcome Data Gravity with Containerized Storage

Traditional enterprise storage revolves around the virtual machine. But when apps like Watson Studio, Cognos and DB2 Warehouse are packaged as containers and run on OpenShift across many different VMs, VM-based storage, backup, DR and data security solutions no longer apply.

You need the same performance, reliability and security provided by traditional storage, but optimized for the application-centric world of OpenShift and Kubernetes. That's what Portworx provides.

# Top 5 Production Operations Problems Solved by Portworx



Portworx solves the five most common problems DevOps teams encounter when running database containers and other stateful services in production.

## High availability

HA for all of your databases and stateful containers.

## Backup and recovery

Seamlessly backup any application running on OpenShift or Kubernetes to any S3-compatible object storage with the click of a button. Recover to any environment just as easily.

## Disaster recovery

No matter how essential your application is, run it with confidence on OpenShift or Kubernetes with Portworx. Achieve Zero RPO Disaster Recovery for data centers in a metropolitan area as well as continuous backups across the WAN for an even greater level of protection.

## Application migrations

Easily move entire applications, including their data, between clusters, clouds, and on-prem data centers.

## Data security

Highly secure, key-managed encryption and data access controls.

“Our Kubernetes environment relies on multiple SQL and NoSQL databases. We compared many cloud native storage solutions in order to provide the most reliable, performant and available service to our customers. After a rigorous evaluation, we chose Portworx not only because their technology is top notch, but because we can count on the Portworx team to support us through our cloud native journey.”

Dailymotion, a Vivendi Company

**dailymotion**

# Container-native storage—built for Kubernetes. Now available for IBM Cloud.

With Portworx Enterprise, IBM Kubernetes Service and Cloud Pak for Data development teams can spend less time on storage and data management and more time driving innovation. Portworx Enterprise enables mission critical stateful workloads, like databases and data analytics, to run on IBM Cloud with high performance and high availability throughout the entire application lifecycle.

## Available for:

IBM Cloud Kubernetes Service  
IBM Cloud Pak for Data  
IBM Cloud Pak for Data Systems



## Portworx for IBM Cloud Pak for Data

Portworx Enterprise natively deploys with a limited license on IBM Cloud Pak for Data that allows IBM customers to run Portworx Enterprise on up to 8 (eight) nodes. Additional nodes and add-ons for DR and Backup are available directly from IBM.

## Portworx for IBM Cloud Kubernetes Service

Portworx Enterprise can also be provisioned via the IBM Cloud Catalog for clusters on IBM Cloud Kubernetes Service and Red Hat OpenShift on IBM Cloud.

These solutions enable IBM Cloud customers to run mission critical AI and data services on OpenShift and Kubernetes across multiple cloud and on premises environments with scalable, performant container storage that provides:

- Dynamically provisioned, high-performance storage
- High availability even across racks and AZs
- Seamless backup and recovery
- Zero RPO disaster recovery
- Data encryption and security
- Automated capacity management



# Storage for stateful workloads on IBM Cloud

**Portworx Enterprise container-native storage solution provides the following capabilities for stateful workloads on IBM Cloud:**

- Container-granular volumes with the ability to provision volumes as small as 1GB and dynamically expand to large multi-terabyte volumes as workloads grow.
- Declaratively specify the I/O profile of your application by leveraging one of the application-aware storage classes that are predefined by Portworx.
- Block and shared volume support.
- Globally namespaced volumes give support and availability of volumes across a multizone Kubernetes or OpenShift cluster.
- Replicated and synchronous volume support.
- Volume encryption via both IBM Key Protect and other key management systems.
- Local volume snapshots and volume snapshots in IBM Cloud Object Storage.
- Role-based access control.
- Application crash-consistent (multi-container) snapshots.
- Support for both hyper-converged and storage-rich deployment topologies.
- Ability to perform multi-cluster and multi-cloud application migrations for Kubernetes resources and data.

PORTWORX SUPPORTS ANY STATEFUL APP ON KUBERNETES

COGNOS



cassandra



elasticsearch



DB2



PX-CENTRAL



PX-SECURE



PX-MIGRATE



PX-AUTOPILOT



PX-DR



PX-BACKUP



PX-STORE



OPENSIFT



vm

PORTWORX RUNS ON ANY STORAGE HARDWARE

# Integrated and tested with IBM Cloud



## IBM Cloud Pak for Data

IBM Cloud Pak for Data, a fully integrated data and AI platform that modernizes how businesses collect, organize and analyze data, now includes a limited-license for Portworx Enterprise with every deployment.

**IBM Cloud Pak for Data customers have access to a free, limited use Portworx Enterprise license.** Contact your IBM sales representative for information on how to activate your Portworx license for IBM Cloud Pak for Data or to license for additional usage, including DR, Backup and Automated Capacity Management.

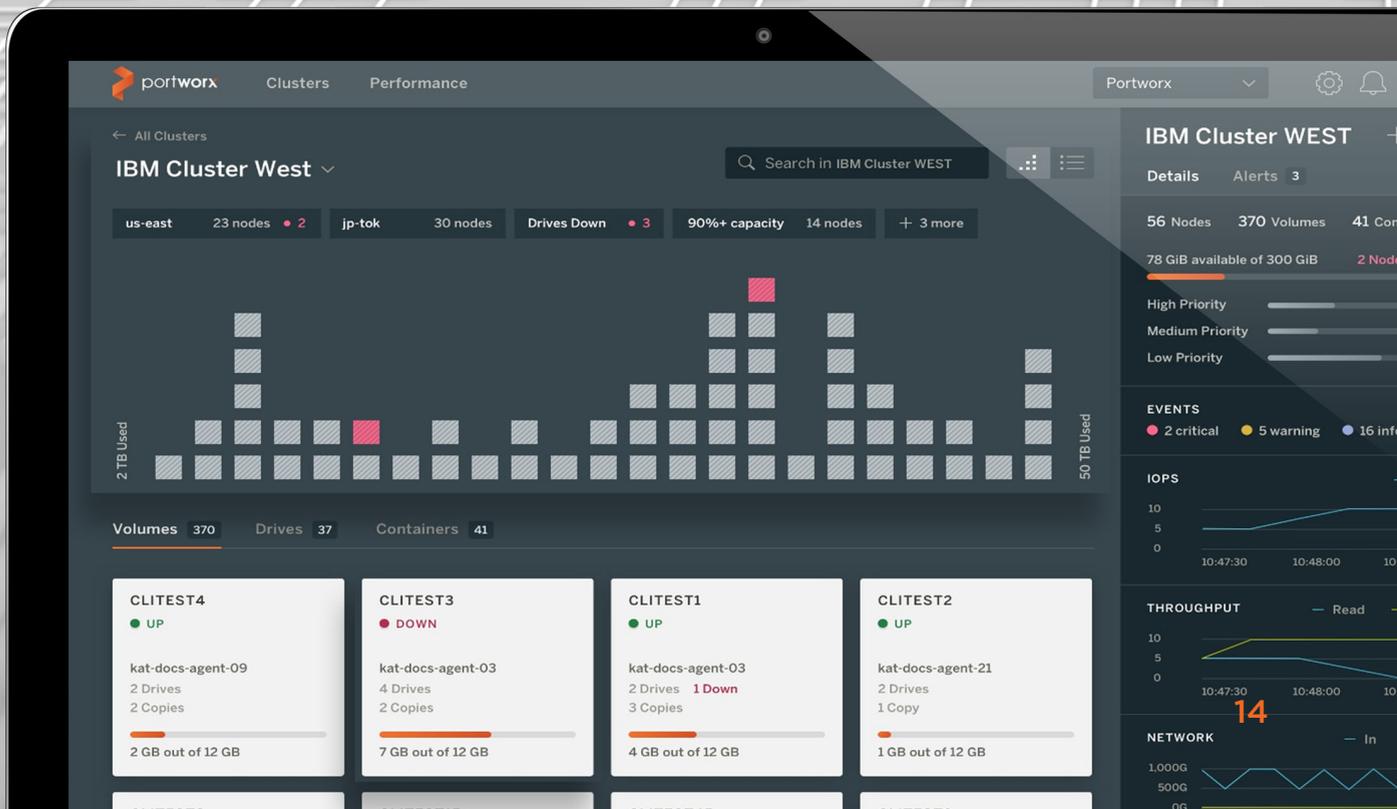
## IBM Cloud Kubernetes Service and Red Hat OpenShift on IBM Cloud

The Portworx software-defined storage solution for IBM Cloud Kubernetes Service and Red Hat OpenShift on IBM Cloud can be provisioned in Kubernetes or OpenShift clusters via the IBM Cloud Catalog.

Access Portworx via an **IBM Cloud Pay-As-You-Go or Subscription account**, in which charges incur on an hourly basis and integrated billing for Portworx is supported.

“As an industry-leading cloud-native storage solution, Portworx plays a key part in our customers’ ability to run mission-critical databases and analytics applications on Kubernetes in and across the IBM public and private clouds.”

- Jason McGee, IBM Fellow, VP, and CTO, IBM Cloud



# Lighten up. Compute more.

Containers are dramatically more lightweight than virtual machines. This allows you to significantly increase the density of applications per host, depending on your environment.

Due to increased average density, enterprises report being able to reduce their total server footprint overall 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. Portworx delivers all this, on the latest storage hardware, without impacting performance or stability.

Up to  
**40%**  
reduction

## **in compute footprint**

When using application replication to increase read throughput across a greater number of hosts, Portworx can reduce your compute footprint for stateful services. For example, with Portworx you can reduce the number of replicas from 5 containers to 3 containers (40% savings).



# 3.2X increase

## **in write performance**

In performance tests compared to a single MongoDB container, Portworx improved write performance by 319%. Additionally, compared to a MongoDB replica set of three containers, Portworx increased write performance by 10% but consumed only one third of the compute resource.

**(Portworx benchmark test for MongoDB, 2018. See <https://portworx.com/kubernetes-failover-mongodb/>)**

# Up to 1M IOPS

Using NVMe (non-volatile memory express) storage on IBM next generation hardware, Portworx Enterprise delivers up to 1 million IOPS (input/output operations per second).

**(Portworx Performance Benchmark Test, 2019)**

# Automate Kubernetes Storage Management

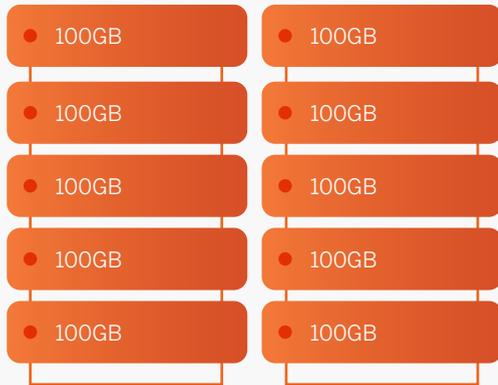
**Portworx dynamic volume provisioning and on-demand storage resizing allow enterprises to avoid over-provisioning storage resources.**

Portworx PX-Autopilot enables you to reduce cloud storage costs by intelligently provisioning storage only when it is needed, eliminating the inefficiency of paying for cloud storage when it is provisioned, rather than when it is actually consumed.

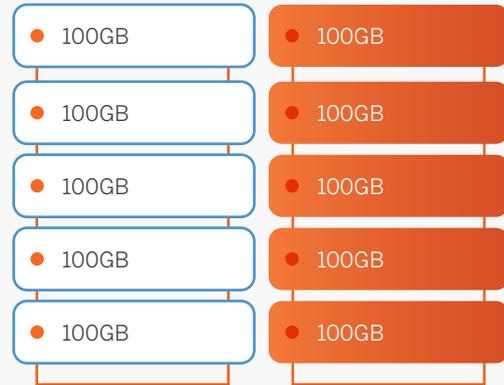
# By thin provisioning, you can save up to 50% on storage costs

- Storage actually provisioned and paid for
- Thinly provisioned storage

Traditional over-provisioning



Thin-provisioning with Portworx PX-AutoPilot



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, 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 500 GB.

# About Portworx

Portworx is the Kubernetes storage platform enterprises rely on to manage mission critical data services in containers. By enabling data availability, data security, backup and disaster recovery for Kubernetes-based applications running on-prem or across clouds, Portworx has helped dozens of Global 2000 companies such as Carrefour, Comcast, GE Digital, Lufthansa, T-Mobile, and SAIC run containerized data services in production.

“Specifically designed for cloud native workloads and applications, the Portworx platform shows unmatched flexibility and scalability when compared to traditional storage solutions, leaving the end user the possibility to move applications and data from on-prem to hybrid and multi cloud seamlessly.”

~ Enrico Signoretti, Senior Data Storage Analyst at GigaOm

## Portworx Customers

Portworx is used in production more than any cloud native storage solution for containers, and is trusted by many of the world’s most sophisticated IT organizations including:



# Why Customers Choose Portworx



“Portworx provides infrastructure-agnostic features — such as volume persistence, high availability, data security and automation — that are valuable to a business like GE Digital.”



## Lufthansa

“With Portworx, our containers have fewer moving parts, fewer commands to understand, and fewer things to break.”

## T-Mobile

“We looked for a partner that would provide us a stable performing environment for critical data on Kubernetes and Portworx checked all those boxes.”

# Partner Certifications

Portworx is an IBM validated solution provider and a certified technology for Red Hat OpenShift and Kubernetes.



Portworx Enterprise is an IBM Validated Solution for IBM Data and AI, IBM CloudPak for Data, and IBM DB2.



Portworx Enterprise has achieved Red Hat certification for Red Hat OpenShift Container Platform and is available in the Red Hat Container Catalog.



Portworx is a Level 5 certified operator for OpenShift. Red Hat OpenShift Certified Operators deliver enterprise applications with consistent packaging, deployment and lifecycle management across all OpenShift footprints.



Portworx is a Kubernetes certified service provider. Portworx solves the challenges of running stateful services on Kubernetes-- stuck volumes, downtime, manual backups and migrations, lost data and more-- with cloud native storage and data management built from the ground up for Kubernetes.

# Ready to build the next generation of enterprise applications on IBM Cloud?

**To learn more and get started with Portworx Enterprise on IBM Cloud, please visit:**

[Portworx.com/IBM](https://portworx.com/IBM)



You'll find an array of resources, including:

- Reference Architecture
- Tutorials and Setup Guides
- Customer Case Studies
- Video learning guides
- Product Demo

“Platforms like Portworx offer a coherent ecosystem for automating data management and protection of Kubernetes-based workloads, combining the flexibility of containers with enterprise-class business continuity and disaster recovery capabilities.”

**Steven Hill, senior analyst at 451 Research.**

**Let's work together**

Request a demo and get your free trial for Portworx on IBM Cloud at:

[portworx.com/IBM](https://portworx.com/IBM)

