

IBM block storage CSI driver  
1.2.0

*Release Notes*



**First Edition (June 2020)**

This edition applies to version 1.2.0 of the IBM® block storage CSI driver software package. Newer document editions may be issued for the same product version in order to add missing information, update information, or amend typographical errors. The edition is reset to 'First Edition' for every new product version.

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# Overview

IBM block storage CSI driver is leveraged by Kubernetes persistent volumes (PVs) to dynamically provision for block storage used with stateful containers.

IBM block storage CSI driver is based on an open-source IBM project ([CSI driver](#)), included as a part of IBM storage orchestration for containers. IBM storage orchestration for containers enables enterprises to implement a modern container-driven hybrid multicloud environment that can reduce IT costs and enhance business agility, while continuing to derive value from existing systems.

By leveraging CSI (Container Storage Interface) drivers for IBM storage systems, Kubernetes persistent volumes (PVs) can be dynamically provisioned for block or file storage to be used with stateful containers, such as database applications (IBM Db2®, MongoDB, PostgreSQL, etc) running in Red Hat® OpenShift® Container Platform and/or Kubernetes clusters. Storage provisioning can be fully automatized with additional support of cluster orchestration systems to automatically deploy, scale, and manage containerized applications.

IBM storage orchestration for containers includes the following driver types for storage provisioning:

- The IBM block storage CSI driver, for block storage (documented here).
- The IBM Spectrum Scale CSI driver, for file storage. For more information on Spectrum Scale and the Spectrum Scale CSI driver see the [IBM Spectrum® Scale knowledge center website](#) ([ibm.com®/support/knowledgecenter/STXKQY](http://ibm.com®/support/knowledgecenter/STXKQY)).

For details about volume provisioning with Kubernetes, refer to [Persistent volumes on Kubernetes](#) ([kubernetes.io/docs/concepts/storage/volumes](http://kubernetes.io/docs/concepts/storage/volumes)).

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**Note:** For the user convenience, this guide might refer to IBM block storage CSI driver as CSI driver.

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# Kubernetes Cluster

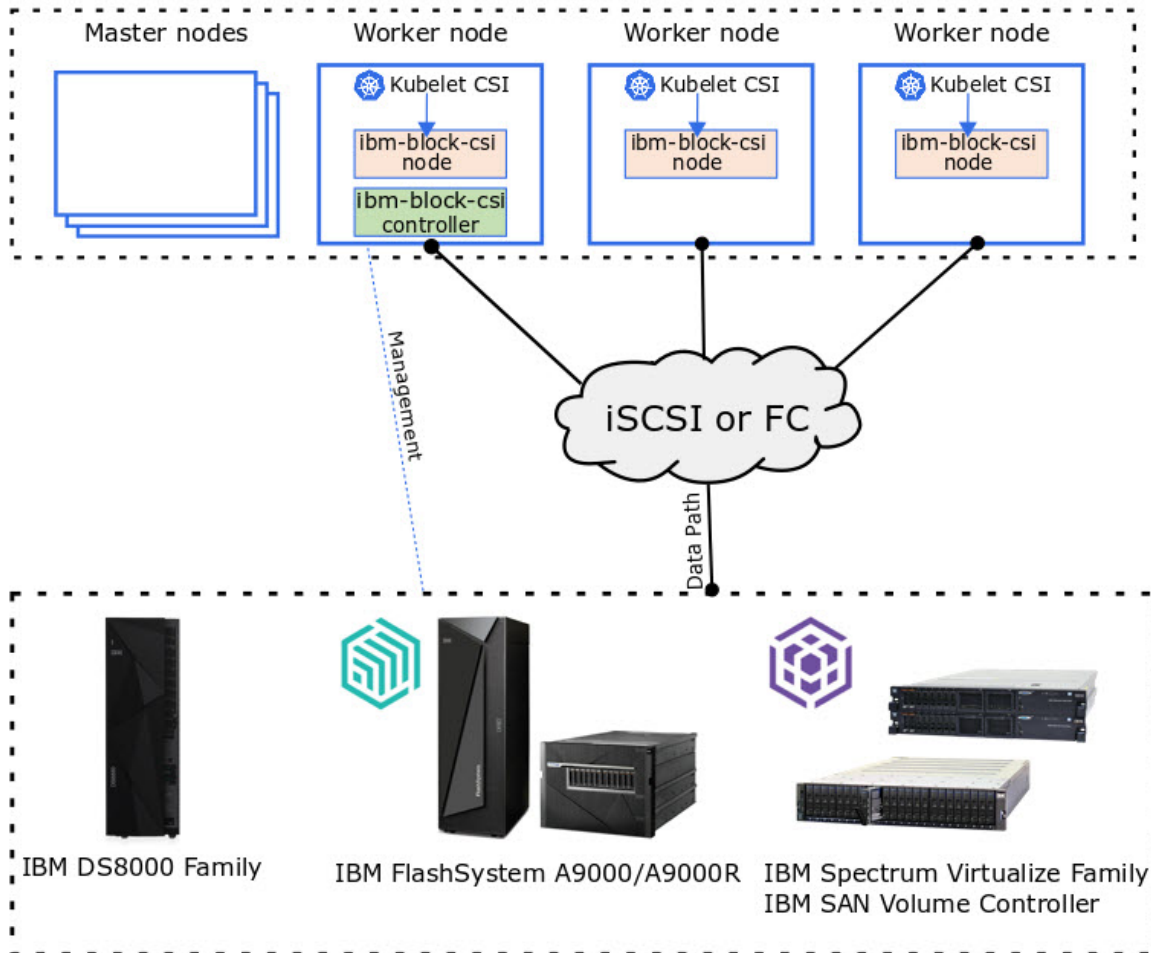


Figure 1. Integration of IBM block storage systems and CSI driver in a Kubernetes environment

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# What's new in 1.2.0

IBM block storage CSI driver 1.2.0 introduces a range of enhancements and fixes, as detailed in the following sections.

**General availability date:** 30 June 2020

## **IBM block storage CSI driver support for volume snapshots (IBM FlashCopy function)**

This version adds support for volume snapshots for PersistentVolumeClaims (PVCs).

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### **Note:**

- IBM FlashCopy® function is referred to as the more generic volume snapshots within this documentation set. Not all supported products use the *FlashCopy function* terminology.
  - For volume snapshot support, the minimum orchestration platform version requirements are Red Hat OpenShift 4.4 and Kubernetes 1.17.
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## **More supported orchestration platforms for deployment**

This version adds support for orchestration platforms Kubernetes 1.17 and Red Hat OpenShift 4.4, suitable for deployment of the CSI (Container Storage Interface) driver.

## **Additional IBM Z architecture support**

This version adds IBM Z® support for Red Hat OpenShift 4.3.

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**Note:** Refer to the User Guide for specific installation instructions of the CSI driver on OpenShift Container Platform with IBM Z.

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## **IBM PowerPC architecture support for Spectrum Virtualize Family storage systems**

This version adds IBM PowerPC® support for Red Hat OpenShift 4.3 running on Spectrum Virtualize Family storage systems.

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**Note:** Refer to the User Guide for specific installation instructions of the CSI driver on OpenShift Container Platform with IBM PowerPC.

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## **New operator (and driver) installation support from OperatorHub.io**

IBM block storage CSI driver 1.2.0 adds support for operator installations from [OperatorHub.io](https://operatorhub.io). The CSI driver installation is a part of the operator installation process.





# Compatibility and requirements

This section specifies the compatibility and requirements of version 1.2.0 of IBM block storage CSI driver.

## Supported storage systems

IBM block storage CSI driver version 1.2.0 supports different IBM storage systems as listed in the following table.

Table 1. Supported storage systems	
Storage system	Microcode version
IBM FlashSystem A9000	12.x
IBM FlashSystem A9000R	12.x
IBM Spectrum Virtualize Family including IBM FlashSystem® family members built with IBM Spectrum Virtualize (FlashSystem 5010, 5030, 5100, 7200, 9100, 9200, 9200R) and IBM SAN Volume Controller (SVC) models SV2, SA2	7.x, 8.x
IBM Spectrum Virtualize as software only	7.x, 8.x
IBM DS8000® Family	8.x and higher with same API interface

### Note:

- Newer microcode versions may also be compatible. When a newer microcode version becomes available, contact IBM Support to inquire whether the new microcode version is compatible with the current version of the CSI driver.
- The IBM Spectrum Virtualize Family and IBM SAN Volume Controller storage systems run the IBM Spectrum Virtualize software. In addition, IBM Spectrum Virtualize package is available as a deployable solution that can be run on any compatible hardware.

## Supported operating systems

The following table lists operating systems required for deployment of the IBM block storage CSI driver.

Table 2. Operating systems	
Operating system	Architecture
Red Hat Enterprise Linux® (RHEL) 7.x	x86
Red Hat Enterprise Linux CoreOS (RHCOS)	x86, IBM Z, IBM PowerPC <sup>1</sup>

<sup>1</sup>IBM PowerPC architecture is only supported on Spectrum Virtualize Family storage systems.

## Supported orchestration platforms

The following table details orchestration platforms suitable for deployment of the IBM block storage CSI driver.

Table 3. Orchestration platforms		
Orchestration platform	Version	Architecture
Kubernetes	1.16 <sup>1</sup>	x86

<i>Table 3. Orchestration platforms (continued)</i>		
<b>Orchestration platform</b>	<b>Version</b>	<b>Architecture</b>
Kubernetes	1.17	x86
Red Hat OpenShift	4.3 <sup>1</sup>	x86, IBM Z, IBM PowerPC <sup>2</sup>
Red Hat OpenShift	4.4	x86

<sup>1</sup>For volume snapshot support, the minimum orchestration platform version requirements are Red Hat OpenShift 4.4 and Kubernetes 1.17.

<sup>2</sup>IBM PowerPC architecture is only supported on Spectrum Virtualize Family storage systems.

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# Change log

This section summarizes the changes that were made in each released version of the IBM block storage CSI driver.

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**Note:** New functional features of these versions are only briefly summarized. For a detailed summary of the new functional features of a specific version, refer to the 'What's new' section of its release notes.

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## 1.2.0 (June 2020)

IBM block storage CSI driver 1.2.0 provides a range of enhancements:

- Now supports volume snapshots (IBM FlashCopy function)
- IBM PowerPC architecture support
- Additional support for Kubernetes 1.17 and Red Hat OpenShift 4.4
- Additional support of IBM Z for Red Hat OpenShift 4.3
- New operator installation support from OperatorHub.io

## 1.1.0 (March 2020)

IBM block storage CSI driver 1.1.0 provided a range of enhancements:

- Added support for DS8000 Family storage systems
- RHCOS support
- Now supports Kubernetes 1.16 and Red Hat OpenShift 4.3
- IBM Z architecture support
- Raw block volume support for Kubernetes
- Automatic iSCSI login

## 1.0.0 (November 2019)

IBM block storage CSI driver 1.0.0 was the initial release of this new driver, supporting a range of functional CSI (Container Storage Interface) component features.

The following functional CSI (Container Storage Interface) component features were included in the initial release of the IBM block storage CSI driver:

- CSI parameters:
  - **Operator**
  - **Identity**
  - **Controller**
  - **Node**
- RWO (read/write once) access mode
- Both xfs and Ext4 file system types



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# Limitations

As opposed to known issues, limitations are functionality restrictions that are part of the predefined system design and capabilities in a particular version.

## **Volume snapshot limitations**

The following limitations apply when using volume snapshots with the IBM block storage CSI driver:

- When deleting a PersistentVolumeClaim (PVC), the persistent volume (PV) remains until all snapshots of the specific PV are deleted.
- When using the CSI (Container Storage Interface) driver with Spectrum Virtualize Family products, a snapshot can only be used to provision a new volume of equal size.



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## Known issues

This section details the known issues in IBM block storage CSI driver 1.2.0, along with possible solutions or workarounds (if available).

The following severity levels apply to known issues:

- **HIPER** – High Impact Pervasive. A critical issue that IBM has either fixed or plans to fix promptly. Requires immediate customer attention or code upgrade.
- **High Impact** – Potentially irrecoverable error that might impact data or access to data in rare cases or specific situations/configurations.
- **Moderate** – Limited functionality issue and/or performance issue with a noticeable effect.
- **Service** – Non-disruptive recoverable error that can be resolved through a workaround.
- **Low** – Low-impact usability-related issue.

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### Important:

- **The issues listed below apply to IBM block storage CSI driver 1.2.0.** As long as a newer version has not yet been released, a newer release notes edition for IBM block storage CSI driver 1.2.0 might be issued to provide a more updated list of known issues and workarounds.
  - When a newer version is released for general availability, the release notes of this version will no longer be updated. Accordingly, check the release notes of the newer version to learn whether any newly discovered issues affect IBM block storage CSI driver 1.2.0 or whether the newer version resolves any of the issues listed below.
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Table 4. Known issues

Ticket ID	Severity	Description
CSI-702	Service	Modifying the controller or node <b>affinity</b> settings may not take effect.  <b>Workaround:</b> If needed, delete the controller StatefulSet and/or the DaemonSet node after modifying the <b>affinity</b> settings in the IBMBlockCSI custom resource.
CSI-645	Low	In some cases, during high-scale operations, such as pod creation with many PersistentVolumeClaims (PVCs), the "ibm-block-csi-controller-0" controller pod restarts.  <b>Workaround:</b> No workaround is necessary as the pod restarts automatically.

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## Related information and publications

You can find additional information and publications related to IBM block storage CSI driver on the following information sources.

- [IBM SAN Volume Controller on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STPVGU) (ibm.com/support/knowledgecenter/STPVGU)
- [IBM Spectrum Scale on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STXKQY) (ibm.com/support/knowledgecenter/STXKQY)
- [IBM FlashSystem 5000, 5100, and Storwize® V5000E on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STHGUJ) (ibm.com/support/knowledgecenter/STHGUJ)
- [IBM FlashSystem 7200 and Storwize V7000 on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/ST3FR7) (ibm.com/support/knowledgecenter/ST3FR7)
- [IBM Spectrum Virtualize as Software Only on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STVLF4) (ibm.com/support/knowledgecenter/STVLF4)
- [IBM FlashSystem 9200 and 9100 on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STSLR9) (ibm.com/support/knowledgecenter/STSLR9)
- [IBM FlashSystem A9000 on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STJKMM) (ibm.com/support/knowledgecenter/STJKMM)
- [IBM FlashSystem A9000R on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/STJKN5) (ibm.com/support/knowledgecenter/STJKN5)
- [IBM DS8880 on IBM Knowledge Center](https://ibm.com/support/knowledgecenter/ST5GLJ) (ibm.com/support/knowledgecenter/ST5GLJ)
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- [Persistent volumes on Kubernetes](https://kubernetes.io/docs/concepts/storage/volumes) (kubernetes.io/docs/concepts/storage/volumes)
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- [IBM Spectrum Access for IBM Cloud® Private Blueprint](https://ibm.com/downloads/cas/KK5PGD8E) (ibm.com/downloads/cas/KK5PGD8E)  
Used as the FlexVolume driver based solution for OpenShift 3.11, using [IBM Storage Enabler for Containers](https://ibm.com/support/knowledgecenter/SSCKLT) (ibm.com/support/knowledgecenter/SSCKLT)
- [IBM Storage for Red Hat OpenShift Blueprint](http://www.redbooks.ibm.com/abstracts/redp5565.html?Open) (http://www.redbooks.ibm.com/abstracts/redp5565.html?Open)



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- [#get-help\\_csi](#) Slack channel
- [IBM website](#) (ibm.com)
- [IBM Support Portal website](#) (ibm.com/support/entry/portal/support?brandind=Hardware~System\_Storage)
- [IBM Directory of Worldwide Contacts website](#) (ibm.com/planetwide)

Use the Directory of Worldwide Contacts to find the appropriate phone number for initiating voice call support. Select the Software option, when using voice response system.

When asked, provide your Internal Customer Number (ICN) and/or the serial number of the storage system that requires support. Your call will then be routed to the relevant support team, to whom you can provide the specifics of your problem.



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