IBM Storage Driver for OpenStack
Version 1.7.0

Release Notes

IBM

Contents

iii

Overview

The IBM® Storage Driver for OpenStack is a software component that integrates with the OpenStack cloud environment and enables utilization of storage resources provided by supported IBM storage systems.

After the driver is installed on the OpenStack Cinder (OpenStack Block Storage) nodes, storage volumes can be allocated by the Cinder nodes to the Nova-compute nodes. Virtual machines on the Nova-compute nodes can then utilize these storage resources.

You can download the IBM Storage Driver for OpenStack software package at any time from the IBM Fix Central website (www.ibm.com/support/fixcentral).

Compatibility and requirements

This section specifies the compatibility and requirements of version 1.7.0 of the IBM Storage Driver for OpenStack.

Supported storage systems

Version 1.7.0 of the IBM Storage Driver for OpenStack supports the IBM storage systems, as detailed in the following table.

Storage system	Microcode version	Connectivity
IBM DS8870	7.5 SP4 or later, 7.5 with RESTful API patch	Fibre Channel (FC)
IBM DS8880	8.1	Fibre Channel (FC)
IBM XIV® Storage System	11.1.x, 11.2.x, 11.3.x, 11.4.x, 11.5.x, 11.6.x	Fibre Channel (FC) or iSCSI
IBM Spectrum Accelerate	11.5.x	iSCSI
IBM FlashSystem A9000	12.0	Fibre Channel (FC) or iSCSI
IBM FlashSystem A9000R	12.0	Fibre Channel (FC) or iSCSI

Attention:

- XIV, Spectrum Accelerate or FlashSystem A9000/9000R storage systems cannot be used together with DS8000® systems by the same IBM Storage Driver installation. Accordingly, determine in advance which system type best suits your OpenStack cloud environment, and use the IBM Storage Driver only with XIV technology systems (XIV, Spectrum Accelerate and FlashSystem A9000/9000R) or only with DS8000 systems.
- DS8870 users, using a microcode below the version, appearing in the table above, can use the RESTful API self-upgrade feature to update only the RESTful API without a full microcode upgrade. The special patch allows for full compatibility with this version of the IBM Openstack Storage Driver and is available on IBM Fix Central.

Supported OpenStack releases

Version 1.7.0 of the IBM Storage Driver for OpenStack supports the following OpenStack release:

- OpenStack Mitaka release (www.openstack.org/software/mitaka)

Note:

- The OpenStack Folsom, Grizzly, Havana, Icehouse, Juno, Kilo and Liberty releases are not supported by version 1.7.0. Accordingly:
  - If you are using OpenStack Liberty nodes, use version 1.6.x of the IBM Storage Driver for OpenStack.
  - If you are using OpenStack Kilo nodes, use version 1.5.x of the IBM Storage Driver for OpenStack.
  - If you are using OpenStack Juno nodes, use version 1.4.1.1 of the IBM Storage Driver for OpenStack.
  - If you are using OpenStack Icehouse nodes, use version 1.3.1.1 of the IBM Storage Driver for OpenStack.
  - If you are using OpenStack Havana nodes, use versions 1.3.1.1 of the IBM Storage Driver for OpenStack.
  - If you are using OpenStack Grizzly nodes, use version 1.2.0 of the IBM Storage Driver for OpenStack.
  - If you are using OpenStack Folsom nodes, use version 1.1.1 of the IBM Storage Driver for OpenStack.

Required software on the OpenStack nodes

The IBM Storage Driver requires the following software on the OpenStack Cinder and Nova-compute nodes.

Software	Required on
• Ubuntu Server version 14.04, x64 edition • Red Hat Enterprise Linux (RHEL) 7.x, x64 edition • CentOS Linux 7.x, x64 edition • KVM for IBM z Systems	All OpenStack Cinder nodes
One of the supported OpenStack releases (see "Supported OpenStack releases")	• All OpenStack Cinder nodes • All Nova-compute nodes
IBM Storage Host Attachment Kit for Linux	All OpenStack Cinder and Nova-compute nodes that connect to an XIV, Spectrum Accelerate or FlashSystem A9000/9000R storage system and use RHEL 7.x or CentOS Linux 7.x (see above)
Linux patch package	All OpenStack Cinder nodes
sysfsutils utility	All OpenStack Cinder nodes on FC network
iscsi-initiator-utils utility (RHEL and CentOS) or *open-iscsi* utility (Ubuntu)	All OpenStack Cinder nodes on iSCSI network

Important:

- The IBM Storage Driver for OpenStack should be installed on the Cinder nodes. For more information, refer to the user guide.
- Each Cinder node must reside on a controller node in order to enable the IBM Storage Driver functionality.

Change log

This section summarizes the changes made in different version releases of the IBM Storage Driver for OpenStack.

Version 1.7.0 (May 2016)

Version 1.7.0 introduces support for OpenStack Mitaka release. It also adds support for IBM FlashSystem® A9000 and IBM FlashSystem A9000R storage systems with microcode 12.0.

Additional changes in version 1.7.0:

Ticket ID	Description
NOVA-261085	**Enhancement**: Added support for OpenStack volume replication version 2.1. Refer to the user guide for the configuration instructions.
NOVA-261147	**Enhancement**: Added support for OpenStack volume QoS on FlashSystem A9000 and FlashSystem A9000R storage systems. The support includes configuration of bandwidth and IOPS per storage volume.
NOVA-261214	**Enhancement**: Added support for image-volume caching on DS8000 storage systems. This improves the process of volume creation from an image in comparison to retrieving the image from the OpenStack Glance repository.
NOVA-261073	**Fixed**: A user name that does not belong to the *admin* group is accepted during a DS8000 backend creation. However, the backend with a non-admin user may not function properly due to the insufficient access level.
NOVA-261106	**Fixed**: Backing up volumes or snapshots fails if this procedure is performed from a newly added backend.

Version 1.6.0 (December 2015)

Version 1.6.0 introduced support for OpenStack Liberty release. It also added support for newer versions of IBM storage systems.

Additional changes in version 1.6.0:

Ticket ID	Description
NOVA-261084	**Enhancement**: XIV and Spectrum Accelerate storage systems support OpenStack consistency groups.

Ticket ID	Description
NOVA-261154	**Enhancement**: Introduction of the RESTful API for DS8000 storage systems. The RESTful API replaces the Java-based ESSNI driver.
NOVA-261049	**Fixed**: When a DS8000 Hardware Management Console (HMC), managing two DS8870 controllers configured for a Cinder volume replication, is reset, the Cinder volume service does not reconnect automatically.
NOVA-261072	**Fixed**: Duplicate DS8000 backends can be created if the lower case 'p' and the upper case 'P' prefix are used with the same storage pool ID. The backend on a storage pool, added with a lower case 'p', will not be functional.
NOVA-261106	**Fixed**: During backend configuration, the Cinder backup service must be restarted manually.

Version 1.5.0.1 (October 2015)

Version 1.5.0.1 introduced support for KVM for IBM z Systems™ by DS8870 storage systems.

Version 1.5.0 (June 2015)

Version 1.5.0 introduced support for OpenStack Kilo release. It also adds support for IBM XIV Storage System with microcode version 11.6.x, and for IBM Spectrum Accelerate™ version 11.5.1.c.

Additional changes in version 1.5.0:

Ticket ID	Description
NOVA-254951	**Enhancement**: XIV storage systems can be accessed using multiple management IP addresses. The list of available management IPs is retrieved automatically, when running the configuration script.
NOVA-261059	**Enhancement**: DS8000 storage systems support snapshots with consistency groups for data protection.

Version 1.4.1.1 (March 2015)

Version 1.4.1.1 added support for IBM Spectrum™ Accelerate storage system deployments, enabling them to work with the OpenStack Juno release. In addition, version 1.4.1.1 resolved the following issues.

Ticket ID	Description
NOVA-260944	**Fixed**: The configuration script (`configure.sh`) might fail when an XIV or Spectrum Accelerate backend of version 11.5.x is added with a directory-based user account that uses LDAP authentication.
NOVA-260959	**Fixed**: Driver failure occurs, when volume replication for DS8870 storage systems is disabled.

Ticket ID	Description
NOVA-260967	**Fixed**: LUN mapping range is limited to 100–299. The new mapping range is 1–511.

Version 1.4.1 (December 2014)

Version 1.4.1 allowed DS8000 storage systems to work with the OpenStack Juno release and added a comprehensive support for DS8000 synchronous (Metro Mirror) volume replication. In addition, version 1.4.1 resolved the following issue.

Ticket ID	Description
NOVA-260593	**Fixed**: Volumes that are larger than 2 Terabytes cannot be created from the OpenStack environment side on DS8000 systems.

Version 1.4.0 (November 2014)

Version 1.4.0 added support for the OpenStack Juno release and also added a broad range of enhancements, as listed below.

Ticket ID	Description
NOVA-248261	**Enhancement**: Two scripts are available to install and configure the IBM Storage Driver for OpenStack. You can run the new script, `configure.sh`, after the installation script to add backends and configure the driver. The new script also allows you to remove a single backend, remove all backends, list backends, or change the password of a backend.
NOVA-260636	**Enhancement:** Added support for modifying volume type. This may result in volume migration if the current backend can not support the requested type.
NOVA-260677	**Enhancement:** Added support for OpenStack `manage_existing` and `unmanage` driver functions to enable managing already-existing volumes into OpenStack.
NOVA-260726	**Enhancement:** Added support for storage assisted volume migration between backends within the same storage, for improved performance.
NOVA-260742	**Enhancement**: Added multi-tenancy support for XIV microcode version 11.5 or later. Multi-tenancy support allows both storage-admin and domain-admin (if available) to interact with the IBM Storage Driver.
NOVA-260759	**Enhancement:** Use events instead of metadata for improved performance and improved visibility.
NOVA-260815	**Enhancement:** Improved security by means of validating storage certificates to avoid MITM attacks.

Version 1.3.1.1 (August 2014)

Version 1.3.1.1 added support for Red Hat Enterprise Linux (RHEL) 7.0.

Version 1.3.1 (April 2014)

Version 1.3.1 added support for the OpenStack Icehouse release, along with support for Red Hat Enterprise Linux (RHEL) 6.5 and for additional DS8000 storage system versions.

Additional changes in version 1.3.1:

Ticket ID	Description
NOVA-260672	**Enhancement**: Option for increased security with CHAP authentication over iSCSI for XIV systems. When this feature is enabled, CHAP names and secrets are generated automatically per host and are used for establishing the iSCSI connectivity.

Version 1.3.0 (November 2013)

Version 1.3.0 added support for IBM System Storage® DS8000 in addition to the already supported IBM XIV Storage System. It also provides support for the OpenStack Havana release, which introduces the OpenStack online volume migration feature along with new volume copy and cloning features.

Additional changes in version 1.3.0:

Ticket ID	Description
NOVA-260508	**Enhancement**: Added support for Red Hat Enterprise Linux (RHEL) 6.4.
NOVA-260596	**Enhancement**: A newly added script, `create_volume_types.sh`, can be run after the installation to automatically define volume types that can be chosen when creating new volumes.

Version 1.2.0 (June 2013)

Version 1.2.0 provided support for the OpenStack Grizzly release, allowing the creation of multiple volume back-ends during the driver installation.

Additional changes in version 1.2.0:

Ticket ID	Description
NOVA-260511	**Enhancement**: An option for unattended installation by using a predefined configuration file has been added. For more information, refer to the installation guide.
NOVA-254930	**Fixed**: The IBM Storage Driver does not renew the connection to the XIV storage system after a session disconnection.

Version 1.1.1 (January 2013)

Version 1.1.1 included the following enhancements and fix.

Ticket ID	Description
NOVA-235459	**Enhancement**: Support for XIV volume snapshot functions.
NOVA-253698	**Enhancement**: Unattended installation option, allowing no user interaction during the installation.
NOVA-251454	**Fixed**: Storage pools that contain capital letters are not recognized by the IBM Storage Driver.

Version 1.1.0 (November 2012)

Version 1.1.0 of the IBM Storage Driver for OpenStack was the first product version that introduced support for the IBM XIV Storage System in the OpenStack cloud environment.

Known issues

This section details the known issues in version 1.7.0, along with possible solutions or workarounds (if available).

Ticket ID	Description
NOVA-247919	Volumes that were manually renamed on an XIV storage system (using the XIV GUI or XCLI) could be used remotely from the OpenStack environment side, even if these volumes were originally created from the OpenStack environment side. **Workaround:** To avoid this problem, do not rename XIV volumes that are used by OpenStack nodes.
NOVA-260879	Connection to all XIV storage systems fails if one of the certificate files is invalid. **Workaround:** Remove any invalid certification authority files from the relevant paths. Refer to the user guide for more information.
NOVA-261071	A user password for a backend configured via the DS8000 CLI utility cannot be changed using the `configure.sh` command. **Workaround:** To resolve this situation, remove the backend, add in again and change the password using the `configure.sh` command
NOVA-261200	If *volume_name_template* in cinder.conf is used with a value different from the default one (*volume-%s*), creating a consistency group from a consistency group snapshot fails. **Workaround:** To avoid this situation, use the default volume name template in cinder.conf.
NOVA-261257	A cached volume cannot be created or resized, if volume replication is enabled. **Workaround:** To resolve this issue, create a volume from a cached image, when replication is disabled. Then enable volume replication.

Ticket ID	Description
NOVA-261287	If pool is removed on a storage system, a recurrent exception is stored in `volume.log`. **Workaround:** To avoid this situation, do not remove the pool, or recreate the pool after the failure.
NOVA-261289	The unattended configuration mode does not support replication parameters. **Workaround:** To avoid this situation, use the interactive configuration mode.
NOVA-261291	Configuration in unattended mode will always use an IP address, even if a hostname is specified This results in an unclear Cinder volume service name. **Workaround:** To avoid this situation, use the interactive configuration mode.

Related information and publications

You can find additional information and publications related to the IBM Storage Driver for OpenStack on the following information sources.

- IBM DS8870 on IBM Knowledge Center
- IBM DS8880 on IBM Knowledge Center
- IBM Spectrum Accelerate on IBM Knowledge Center
- IBM XIV Storage System on IBM Knowledge Center
- IBM FlashSystem A9000 on IBM Knowledge Center
- IBM FlashSystem A9000R on IBM Knowledge Center
- OpenStack Block Storage (Cinder) reference page (wiki.openstack.org/cinder)
- OpenStack Storage reference page (www.openstack.org/software/openstack-storage)
- OpenStack Documentation (docs.openstack.org)

Getting information, help, and service

If you need help, service, technical assistance, or want more information about IBM products, you can find various sources to assist you. You can view the following websites to get information about IBM products and services and to find the latest technical information and support.

- IBM website (ibm.com®)
- IBM Support Portal website (www.ibm.com/storage/support)
- IBM Directory of Worldwide Contacts website (www.ibm.com/planetwide)
- IBM developerWorks Answers website (www.developer.ibm.com/answers)
- IBM service requests and PMRs (www.ibm.biz/BdEkWE)

Notices

These legal notices pertain to IBM Storage Host Software Solutions product documentation.

This information was developed for products and services offered in the U.S.A. This material may be available from IBM in other languages. However, you may be required to own a copy of the product or product version in that language in order to access it.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte character set (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be

incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation
Attn: Office of Legal Counsel
650 Harry Road
San Jose, CA 95120-6099
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Copyright and trademark information website (www.ibm.com/legal/us/en/copytrade.shtml).

OpenStack is a trademark of OpenStack LLC. The OpenStack trademark policy is available on the OpenStack website (www.openstack.org/brand/openstack-trademark-policy).

Java and all Java-based trademarks and logos are trademarks or registered trademarks of Oracle and/or its affiliates.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Other product and service names might be trademarks of IBM or other companies.

IBM ®

Printed in USA