

IBM Storage Driver for OpenStack  
Version 1.2.0

*Installation Guide*



**Note**

Before using this document and the product it supports, read the information in “Notices” on page 11.

**Edition notice**

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## About this guide

This guide describes how to install the IBM® Storage Driver for OpenStack.

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## Who should use this guide

This guide is intended for system administrators who are familiar with the OpenStack cloud environment and the IBM XIV® Storage System.

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## Conventions used in this guide

These notices are used in this guide to highlight key information.

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**Note:** These notices provide important tips, guidance, or advice.

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**Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice appears before the instruction or situation in which damage can occur.

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## Related information and documentation

For additional information related to the IBM Storage Driver for OpenStack, refer to the following information sources.

- IBM Storage Host Software Solutions Information Center ([publib.boulder.ibm.com/infocenter/strhosts/ic](http://publib.boulder.ibm.com/infocenter/strhosts/ic))
- IBM XIV Storage System Information Center ([publib.boulder.ibm.com/infocenter/ibmxiv/r2](http://publib.boulder.ibm.com/infocenter/ibmxiv/r2))
- OpenStack Block Storage (Cinder) reference page ([wiki.openstack.org/Cinder](http://wiki.openstack.org/Cinder))
- OpenStack Storage reference page ([www.openstack.org/software/openstack-storage](http://www.openstack.org/software/openstack-storage))
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  - Exact publication title and version
  - Publication form number (for example: GC00-1111-22)
  - Page, table, or illustration numbers that you are commenting on
  - A detailed description of any information that should be changed



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## Chapter 1. Introduction

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 the IBM XIV Storage System.

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

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### Concept diagram

The following figure illustrates how the IBM XIV Storage System provides storage resources to the OpenStack cloud environment when the IBM Storage Driver for OpenStack is installed on the Cinder nodes.

The OpenStack cloud is connected to the XIV storage system over iSCSI or Fibre Channel. Remote cloud users can issue requests for storage resources from the OpenStack cloud, and these requests are transparently handled by the IBM Storage Driver, which communicates with the XIV storage system and controls the storage volumes on it. The XIV storage resources are then provided to the Nova-compute nodes.

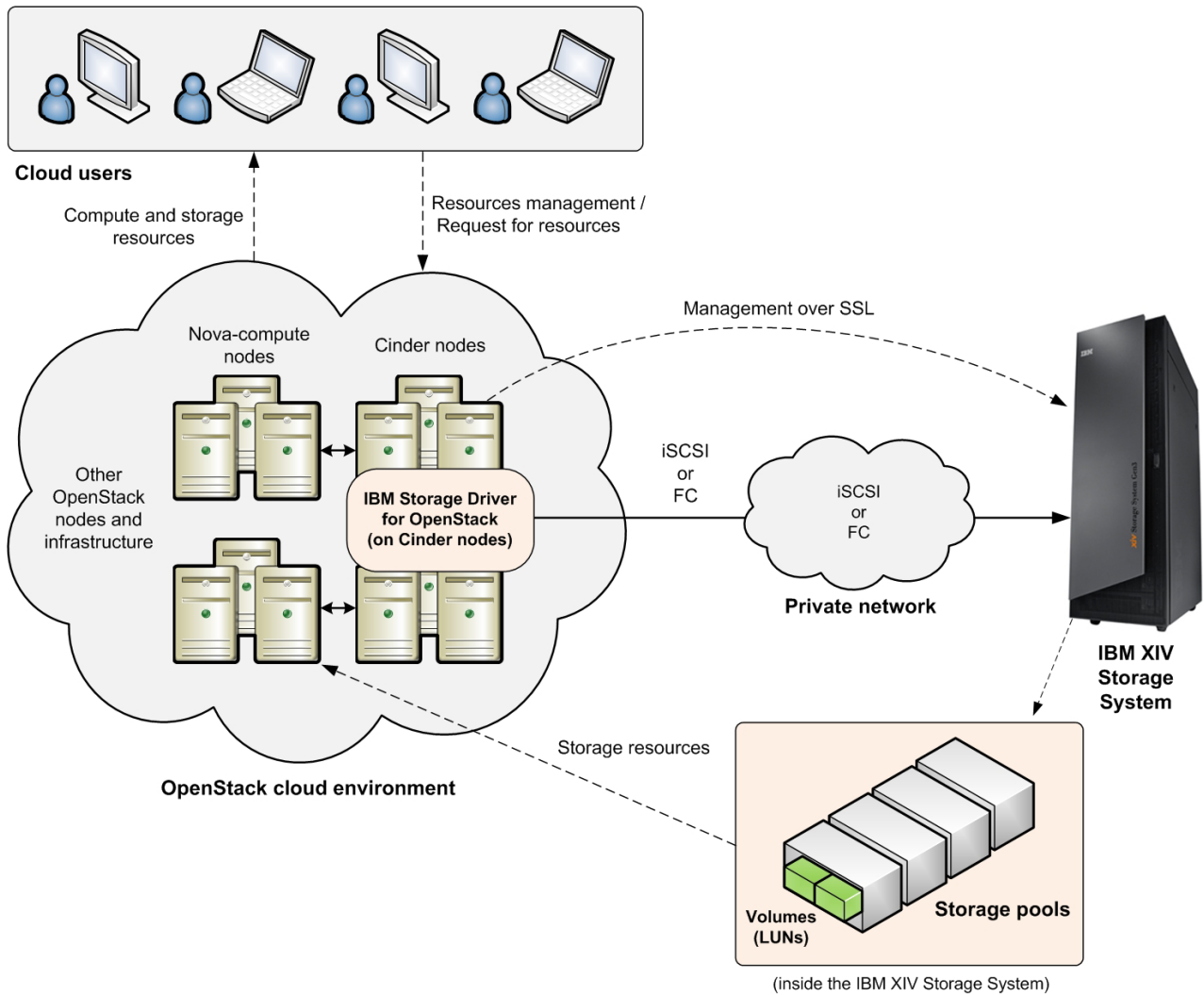


Figure 1. IBM XIV Storage System integrated with an OpenStack cloud

## Compatibility and requirements

For the complete and up-to-date information about the compatibility and requirements of the IBM Storage Driver for OpenStack, refer to the latest release notes.

You can find the latest release notes on the IBM Storage Host Software Solutions Information Center ([publib.boulder.ibm.com/infocenter/strhosts/ic](http://publib.boulder.ibm.com/infocenter/strhosts/ic)) or on the IBM Fix Central ([www.ibm.com/support/fixcentral](http://www.ibm.com/support/fixcentral)).

**Note:** Refer to the relevant OpenStack documentation for information about how to deploy the compatible release of the OpenStack platform on your cloud nodes.

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## Chapter 2. Installation

The IBM Storage Driver for OpenStack should be installed on each OpenStack Cinder node.

During the installation, you can connect the Cinder node to one or more XIV storage systems and storage pools, using different connection types and user credentials. Each individual connection is referred to as a different volume backend.

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### Running the installation wizard on the Cinder node

Run the installation wizard on each individual Cinder node as explained in the following procedure.

#### Before you begin

Prior to installing the IBM Storage Driver, a predefined storage pool must be ready for your use on the XIV storage system. Refer to the IBM XIV management GUI or XCLI documentation for information about how to define a storage pool, or contact your storage administrator.

If you are using Fibre Channel (FC) connectivity, ensure that proper zoning is configured between the relevant Nova-compute nodes and the XIV storage system. For more information about FC zoning, refer to the '*Overview of Fibre Channel zoning*' section in the IBM XIV Host Attachment Guide.

---

**Important:** You must have root user privileges on the Cinder node in order to run the installation.

---

#### About this task

You can run the installation script in two ways:

- Regular mode – in this mode you are prompted to provide connection parameters and other information in separate interactive steps.
- Unattended mode – in this mode you can avoid prompts in separate steps. For more information, see “Installing in unattended (silent) mode” on page 5.

#### Procedure

To run the installation in regular mode:

1. Extract the driver installation package on the Cinder node ([build] represents a build number):

```
# gunzip -c IBM_Storage_Driver_for_OpenStack_1.2.0-[build].tar.gz | tar xvf -
```
2. From the extracted folder, run the following script:

```
install.sh
```

The following prompt is displayed:

```
Welcome to the IBM Storage Driver for OpenStack (v1.2.0) installation.
Press [ENTER] to proceed.
```

3. Press Enter. The following message is displayed:

```
Enter the IBM XIV Storage System IP address or hostname:
```

4. Enter the IP address or hostname of the XIV storage system that you want to use. For example: 106.9.220.221
5. Enter the credentials for accessing the specified XIV storage system:

```
Enter the username and password for accessing the IBM XIV Storage System:
Username: john-1x2
Password: *****
```

---

**Important:** You must use storage admin credentials.

---

6. Choose the connectivity type that the node uses to connect to the XIV storage system: enter f for Fibre Channel or i for iSCSI.

```
Please choose the connectivity type:
f/fc/fibre for Fibre Channel or i/iscsi for iSCSI: [Default: [i]: i
```

7. Enter the name of the XIV storage pool that was predefined for your OpenStack environment:

```
Enter the XIV volume pool name: Nova_Pool_1
```

8. Choose whether you want to connect to another XIV storage system or storage pool (another volume backend):

```
Would you like to add another IBM XIV Storage System? [Default: [No]: n
```

If you enter y (yes), repeat steps 3–7 for the additional XIV storage system or storage pool (you can press CTRL+C to abort the addition after you entered y). Otherwise, enter n and then the following prompt is displayed:

```
Verifying installation...
Installation verified successfully.
Installing IBM Storage Driver for OpenStack Python eggs...
Stopping OpenStack volume service...
Configuring OpenStack with IBM XIV Storage System information...
Starting OpenStack volume service...
Installation of the IBM Storage Driver for OpenStack (v1.2.0) is complete.
Press [ENTER] to exit.
```

9. Press Enter. The IBM Storage Driver for OpenStack is now installed.

---

**Note:** If you encounter any error during the installation, see Chapter 3, “Troubleshooting,” on page 9.

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## Installing in unattended (silent) mode

Installation of the IBM Storage Driver in unattended mode (referred to as 'silent' in the CLI) allows you to avoid prompts in separate steps during the installation. In addition, you can use a configuration file that contains the required XIV connection parameters.

### Before you begin

Like in the regular installation, you must first extract the driver installation package on the Cinder node:

```
# gunzip -c IBM_Storage_Driver_for_OpenStack_1.2.0-[build].tar.gz | tar xvf -
```

### About this task

Unattended installation can be performed in two methods:

- By typing the unattended installation command along with required connection parameters on the command line. This method allows connection to one XIV storage system (volume backend). If at a later stage you will want to connect to additional volume backends, you will need to first uninstall the IBM Storage Driver and then use the regular interactive installation or the unattended installation using a configuration file.
- By using a configuration file that contains the required connection parameters, saving the need to type-in the parameters on the command line. This method allows connection to multiple XIV storage systems (volume backends) in one single command.

### Procedure

- To install in unattended mode by entering the connection parameters on the command line, type the installation command in the following format:

```
install.sh -s -a [IP or hostname] -u [XIV username] -p [XIV password]  
-o [storage pool name] -t [connection type (iscsi|fibre_channel)]
```

For example:

```
# install.sh -s -a 106.9.220.221 -u john-1x2 -p ***** -o Nova_Pool_1 -t iscsi  
Verifying installation...  
Installation verified successfully.  
Installing IBM Storage Driver for OpenStack Python eggs...  
Stopping OpenStack Volume service...  
Configuring OpenStack with IBM XIV Storage System information...  
Starting OpenStack Volume service...  
Installation of the IBM Storage Driver for OpenStack (v1.2.0) is complete.
```

- To install in unattended mode by using a configuration file, type the installation command in the following format, where [file name] represents the directory location and name of the file:

```
install.sh -s -i [file name]
```

For example:

```
# install.sh -s -i path/filename.conf
```

The configuration file must be a text file that contains the following parameters per single backend:

```
[backend1 name]
xiv_address = host1.domain.com or IP address
xiv_user = storage_admin_user
xiv_password = password
xiv_vol_pool = poolname
xiv_connection_type = iscsi
```

The file can contain additional sections with connection parameters to additional XIV storage systems (additional volume backends). The details of each additional system should be specified in a separate section using a different name. For example, [backend2] is the section name for the additional system:

```
[backend2 name]
xiv_address = host1.domain.com or IP address
xiv_user = storage_admin_user
xiv_password = password
xiv_vol_pool = poolname
xiv_connection_type = fibre_channel
```

---

**Attention:** If you are using a configuration file, retain the file in a secure folder and do not distribute the file over non-secure media. Use any required precaution to avoid unauthorized remote access to your IBM XIV storage systems.

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## Uninstalling the IBM Storage Driver

You can uninstall the IBM Storage Driver from each individual Cinder node at any time, as described in the following procedure.

### Before you begin

Ensure that the IBM XIV storage resources are not currently in use.

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**Important:** You must have root user privileges on the Cinder node in order to uninstall the IBM Storage Driver.

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**Attention:** Removal of the IBM Storage Driver affects the availability of IBM XIV storage volumes that may currently be in use in the OpenStack cloud environment.

---

### About this task

You can uninstall in two ways:

- Regular mode – in this mode you are prompted to confirm the uninstallation.
- Unattended mode – in this mode you are not required to confirm the uninstallation.

### Procedure

To uninstall in **regular mode**:

1. Run the following script:

```
uninstall.sh
```

The following prompt is displayed:

```
IBM Storage Driver for OpenStack (v1.2.0) - Uninstallation
```

```
Are you sure you want to uninstall the IBM Storage Driver for OpenStack (v1.2.0)?  
[default: No]
```

2. Enter **y** to confirm the removal of the IBM Storage Driver. The following prompt is displayed:

```
Stopping OpenStack volume service...  
Press [ENTER] to proceed.
```

3. Press Enter. The following prompt is displayed:

```
Removing XIV information from OpenStack...  
Removing IBM Storage Driver for OpenStack Python eggs...  
Starting OpenStack volume service...  
The IBM Storage Driver for OpenStack (v1.2.0) has been removed successfully.  
Press [ENTER] to exit.
```

4. Press Enter. The IBM Storage Driver is now uninstalled.

---

**Note:** If you encounter any error during the uninstallation, see Chapter 3, “Troubleshooting,” on page 9.

---

Alternatively, to uninstall the IBM Storage Driver in **unattended mode**, type the **uninstall** command with the **-s** argument:

```
uninstall.sh -s
```

For example:

```
#!/uninstall.sh -s  
Stopping OpenStack Volume service...  
Removing XIV information from OpenStack...  
Removing IBM Storage Driver for OpenStack Python eggs...  
Starting OpenStack Volume service...  
The IBM Storage Driver for OpenStack (v1.2.0) has been removed successfully.
```





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## Chapter 3. Troubleshooting

Refer to this information to troubleshoot technical problems that you might encounter when using the IBM Storage Driver for OpenStack.

- “Checking the OpenStack node log files”
- “Displaying on-screen help”

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**Note:** For up-to-date information about known issues and possible workarounds, refer to the latest release notes.

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### Checking the OpenStack node log files

The Nova-compute and Cinder log files record operation information that might be useful for troubleshooting.

#### Before you begin

To achieve optimal and clear logging of events, activate the verbose logging level in the **cinder.conf** file, located in the `/etc/cinder` folder. Add the following line in the file, save the file, and then restart the cinder-volume service:

```
verbose = True
```

To turn off the verbose logging level, change `True` to `False`, save the file, and then restart the cinder-volume service.

#### About this task

You can check the log files on a periodic basis to ensure that the IBM Storage Driver is functioning properly. If you encounter issues with the driver functionality, you can send the contents of the files to IBM Support if needed.

#### Procedure

- To check the log file on a Cinder node:
  - Go to the `/var/log/cinder` folder and then open the log file named **cinder-volume.log**. The IBM Storage Driver writes to this log file using the `[IBM XIV STORAGE]` prefix for each event that it records in the file.
- To check the log file on a Nova-compute node:
  - Go to the `/var/log/nova` folder and then open the log file named **nova-compute.log** (might be `compute.log` in some cases).

---

### Displaying on-screen help

When needed, you can display on-screen help information that summarizes usage format, syntax, and other options that are available for the installation and uninstallation commands.

#### About this task

You can type the `--help` or `-h` argument after each of following commands:

- **install.sh** (regular installation; see “Running the installation wizard on the Cinder node” on page 3)
- **install.sh -s** (unattended installation; see “Running the installation wizard on the Cinder node” on page 3)
- **uninstall.sh** (uninstallation; see “Uninstalling the IBM Storage Driver” on page 6)

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