Asigra Cloud Backup v14.1
Tools User Guide

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Contents

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1 About this guide

This guide describes how to install and use various tools to optimize the performance of the software.

1.1 Intended audience

This guide is intended for anyone who is responsible for using the tools.

1.2 Formatting conventions

The following formatting conventions are used in this guide:

Bold

Bold font identifies components, window and dialog box titles, and item names.

Italic

Italic font identifies references to related documentation.

Monospace Font

Monospace font identifies text that you should type or that the computer displays.

NOTE: Notes emphasize information that is useful but not essential, such as tips or alternative methods for performing a task.

IMPORTANT: Important notes emphasize information that is essential to the completion of a task and draw special attention to actions that could adversely affect the operation of the application or result in a loss of data.

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2 Using the Database Migration Tools

This chapter describes how to use various database migration tools.

2.1 Using the DS-System Database Migration Tool (Windows)

You can use the DS-System Database Migration Tool to migrate a DS-System database from Microsoft SQL Server instance to a PostgreSQL instance or vice-versa.

Once connectivity is established using the host name or IP address and credentials provided, the tool will attempt to retrieve a list of existing databases and set the source database and destination database names to **dssystem**.

NOTE: You can use the *DS-System Database Migration Tool* only on a Windows machine, but can read from and write to PostgreSQL databases installed on Linux machines.

2.1.1 Before you begin

Before you begin the database migration, ensure the following:

*   Install the PostgreSQL ODBC driver & Microsoft SQL ODBC Driver on the machine where the tool will run. For Microsoft SQL Server, the Microsoft SQL ODBC driver is installed along with it.

    –   You must install the PostgreSQL driver **psqlodbc_x64.msi** which is available on the installation DVD (Software\Tools\DBMigration). Double-click to install it.

NOTE: To access a database on a PostgreSQL server, you must first grant access to the server for the machine running the migration tool (Host Based Authentication). PostgreSQL will check the *pg_hba.conf* file if a pattern that matches your client address/username/database is present and enabled before any SQL GRANT access control lists are evaluated.

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*   Ensure you have the version of the source database (**dssystem**).

*   Stop the DS-System service on the source computer (the source database must not be in use).

*   Backup the source database (**dssystem**).

*   Ensure that the target destination database (**dssystem**) is at the same version level as the source:

- If the source database is at a specific release level (e.g. v12.0.0.0), you can run a fresh installation of that release version so that the source and destination databases are at the same version level.

- Otherwise, you can run the full DS-System database script (filename: **mssqldssystem.sql** or **postgresdssystem.sql**) from that release on the target destination database.

If the source database is at a higher version (of database patches) than the destination, you must run all missing patches on the destination to bring it up to the same version as the source before running the tool.

It is recommended to perform a backup of the existing database and restore to the new (alternate) location.

2.1.2 Software requirements

The following table lists the software requirements for installing the DS-System Database Migration Tool. For the latest information, see the *Support Matrix*.

The DS-System Database Migration Tool software can be installed only on the 64-bit version of the following supported operating systems:

- Windows Server 2016

2.1.3 Migrating a DS-System database

This section describes how to migrate a DS-System database from Microsoft SQL Server to PostgreSQL and vice-versa.

1. On the installation DVD double click **dssdbmigrate_x64.exe**.

2. On the **DS-System Database Migration** page, do the following:

    a) In the **Source Database** section, select the source database type, enter the server name and the credentials for that server.

    b) In the **Destination Database** section, select the destination database type, enter the server name and the credentials for that server.

    For a Microsoft SQL database, enter the complete server name/instance name. For a PostgreSQL database, enter the IP address of the machine with the database.

    > *NOTE:* The default port for PostgreSQL is 5432. To specify another port for the connection to the PostgreSQL database, type *<server IP address or host name>; port=<port number>*. For example, *localhost; port=5433*.

3. Click **OK** to display the **Data migration** dialog box.

- If you have established connectivity to both the source and destination databases servers, they will be displayed in a drop-down list in the **Parameters** section.

- If there are any errors, the database servers will be displayed in the **Progress** section.

4. Verify the Source Database and Destination Database, and then click **Start**.

NOTE: If diagrams were created in the source database, an error message *Invalid object name dtproperies* will appear. This does not affect the database migration.

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5. Once the database migration is complete, click **Change Extensible Storage Path(s)** to update the storage location paths on the destination database. The storage location paths will differ, if the operating systems are different.

6. On the **Extensible Storage Paths** page, select each path, and then update it.

7. Click **OK** when you are finished.

NOTE: Verify that you have entered the correct path(s). Any error will not allow the DS-System to start.

To complete the migration of a DS-System database:

- Change the **dssys.cfg** file to point to the new database server.

- Change the **dssys.cfg** file to point to the new storage location(s) if any storage location path(s) were adjusted.

- Change the **storage_label.txt** file to point to the new storage location(s), if any of storage location path(s) were adjusted.

- Delete the source database so that no DS-System will access it.

- Start the service / daemon on the target machine, if the DS-System is already installed.

- If you have only migrated the database, install DS-System on the target machine and configure it to use the migrated database.

2.2 Using the DS-Client Database Migration Tool (Windows)

You can use the DS-Client Database Migration Tool to migrate a DS-Client database from Microsoft SQL Server to PostgreSQL.

2.2.1 Software requirements

The DS-Client Database Migration Tool software can be installed only on the 64-bit version of the following supported operating systems:

- Windows Server 2016

For the latest information, see the *Support Matrix*.

2.2.2 Migrating a DS-Client database

This section describes how to migrate a DS-Client database from Microsoft SQL Server to PostgreSQL.

IMPORTANT: If the PostgreSQL database is installed on a remote machine, you must configure the **hosts** file (located in the *PostgreSQL_Installation_Path>/data folder* and in C:\Windows\system32\drivers\etc\) and **pg_hba.conf** on that machine to allow connections from the source computer (DS-Client machine).

The following steps describe the process for a scenario where the Windows DS-Client, the Microsoft SQL Server instance, and the PostgreSQL server instance are located on the same machine. For details on other scenarios, refer the Knowledge base article KB4888 on the Asigra tech-support portal.

To migrate a DS-Client database on the same machine:

1. Download and use the PostgreSQL interactive installer by EnterpriseDB.

2. Install the PostgreSQL Server on the DS-Client computer using the default options (make a note of the user name and password used for PostgreSQL).

3. Log on to the DS-Client machine with the DS-Client service account or the user must be a local or domain user with the *sysadmin* role for the Microsoft SQL Server instance.

4. Connect to the Windows DS-Client, and navigate to **Help** > **About DS-User** > **DS-Client info**. Make a note of the version number and the hotfix number if available.

5. Download the required Windows DS-Client hotfix package from the Asigra Support site and follow the instructions in the release notes.

NOTE: Some DS-Client hotfixes would require a DS-User hotfix. For details, refer the DS-Client hotfix release notes.

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6. Stop the DS-Client service, and then uninstall Windows DS-Client.

7. Reinstall Windows DS-Client and select PostgreSQL (installed earlier - step 2) as the DS-Client database. This ensures that the target migration database is created correctly.

8. Install the DS-Client and DS-User hotfixes as required.

9. Connect to the DS-Client using the PostgreSQL server and verify the version number and hotfix number as mentioned in step3.

10. Stop the DS-Client service and copy the Asigra DS-Client Database Migration Tool to the DS-Client machine.

11. Right-click the database migration tool executable and select **Run as administrator**.

12. In the **Asigra DS-Client Database Migration** dialog box, do the following and then click **OK**.

    a) In the **Source Database** box, type the server name/IP and the instance name of the Microsoft SQL Server. Enter the credentials for MS SQL Server Authentication. For Windows, leave the user name and password blank.

    NOTE: The user must be a local or domain user with the *sysadmin* role for the Microsoft SQL Server instance.

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    b) In the **Destination Database** box, type the server name and the credentials for the machine hosting the PostgreSQL database.

    NOTE: When multiple PostgreSQL instances are running on the same machine, they listen on different port numbers. The default port number is 5432. To specify a different port number for the connection to the PostgreSQL database instance, type <server IP address or host name:port number>. For example, localhost:5433.

    ---

13. In the **Data Migration dialog box,** the DS-Client source and destination databases are correctly displayed in their corresponding fields, if the migration tool has recognized/connected to these databases.

14. Click **Start** to initiate the database migration process.

15. When the migration is done, start the DS-Client service, connect to the DS-User. and run the **Weekly Admin** process.

2.2.3 Migrating a DS-Client database from a command line

This section describes how to migrate a DS-Client database from Microsoft SQL Server to PostgreSQL from a command line.

To migrate a DS-Client database on the same machine:

1. Uninstall DS-Client on the machine where you want to run the DS-Client Database Migration Tool.

2. Install DS-Client with PostgreSQL on the machine.

3. Stop the DS-Client service.

4. Open the command prompt and type the following command:

   `DSClientMigrate_x64.exe`

   The following command line options are available:

   `--sUseLocalDSClient`

   `--sDriver    [source ODBC driver name]`

   NOTE: If you are working with TLS 1.2, you must specify a compatible SQL Server ODBC driver. The default driver is SQL Server.

   `--sServer    [source server]`

   `--sUser      [source user name]`

   `--sPassword [source password]`

   NOTE: If you are using the Windows authentication mode, you must not use the parameters *sUser* and *sPassword*. You can use them with SQL Server authentication.

   `--sDatabase [source database]`

   `--dServer    [destination server]`

   `--dUser      [destination user name]`

   `--dPassword [destination password]`

   `--dDatabase [destination database]`

   `--buffer [folder path]`

   `--log [file path]`

   `--progressFile [file path]`

   `--useSameNodes`

   NOTE: You must type the source and destination databases in the format -[prefix]dsclient.

To migrate a DS-Client database from one machine to another machine:

If you have one DS-Client machine with Microsoft SQL Server and you want to migrate this database to a new machine with PostgreSQL, do the following:

1. Install DS-Client with PostgreSQL on the new machine.

2. Stop the DS-Client service on both machines.

3. Open the command prompt and type the following command:

    ```
    DSClientMigrate_x64.exe
    ```

    The following command line options are available:

    ```
     --sUseLocalDSClient
    ```

NOTE: If you are using the option *sUseLocalDSClient*, no other source parameter is required. You must run the DS-Client Database Migration Tool on the machine with the Microsoft SQL Server.

```
--sDriver    [source ODBC driver name]
--sServer    [source server]
--sUser      [source user name]
--sPassword [source password]
--sDatabase [source database]
--dServer    [destination server]
--dUser      [destination user name]
--dPassword [destination password]
--dDatabase [destination database]
--buffer [folder path]
--log [file path]
--progressFile [file path]
```

NOTE: You must type the source and destination databases in the format [prefix]dsclient.

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3 Using the I/O Load Test Tool

The I/O Load Test Tool is an application that can be installed on Windows or Linux platforms and allows storage vendors and prospective customers to test and compare how specific storage solutions will perform, prior to installing the DS-System or BLM Archiver.

Some features of the I/O Load Test Tool:

- Client-Server architecture: GUI can connect to different servers / daemons.

- Server / Daemon (I/O Test Server) is designed to simulate how the DS-System/ BLM handles concurrent I/O (read / write / delete) activities to a specified storage location (local disk, UNC path, NAS).

- I/O Load Test Tool server / daemon retains logs and history.

- I/O Load Test Tool GUI caches Load Monitor for the duration of the session (connection) with the server / daemon.

- All graphs and log tables can be printed / exported to file.

3.1 Preparing to install the IO Load Test Tool

This section describes the system requirements for installing the I/O Load Test Tool on various supported platforms.

3.1.1 Hardware requirements

Since the I/O Load Test Tool is designed to help you test and compare how specific storage solutions will perform, you must use similar or same hardware and software platform as you intend to use for your production environment.

Refer to the DS-System and BLM Archiver installation chapters in the *Server Software Installation Guide* for the corresponding hardware and software requirements.

3.1.2 Software requirements

This section describes the software requirements for installing the I/O Load Test Tool. For the latest information, see the *Support Matrix*.

The I/O Load Test Tool software can be installed only on the 64-bit version of the following supported operating systems:

- Windows Server 2016

- Red Hat Enterprise Linux 7.3, 7.4, or 7.5

- SUSE Linux Enterprise Server 11 SP4, 12 SP3, or 15

IMPORTANT: Before installing the software on Linux, it is recommended that you run the **setup_lin.sh** command on the DVD to install the required Linux libraries automatically. The individual RPM packages can be found in the /bin folder.

Red Hat Enterprise Linux 7.x

Download and install Java 1.8. You can run the I/O Load Test Tool GUI with the following command line:

/<path to java 1.8>/bin/java -jar "/opt/CloudBackup/IOTest/IOTestGUI.jar

3.1.3 Port requirements

The following table lists the ports that are required by the I/O Load Test Tool.

Port #	Description
4420	I/O Load Test Tool GUI to I/O Load Test Tool Server

3.2 Installing the I/O Load Test Tool

This section describes how to install the I/O Load Test Tool.

To install the I/O Load Test Tool:

1. Login to the target installation computer as a local administrator (Windows) or root super-user (Linux).

2. Copy the installation file for the required operating system from the DVD to the computer that you want to simulate as the DS-System or BLM Archiver

3. Double-click or enter the command line to start the installation.

4. In the Installation Type screen, choose a type of installation and click **Next**.

    – **Typical**: Installs both the I/O Load Test Tool Service and GUI.

    – **Custom**: Select the component to install.

5. Specify the database path and click **Next**.

NOTE: In the *IO Test Installation* folder the file *iotest.cfg* stores the database path during installation. If you need to change the database path manually, modify this file accordingly.

6. Click **Install** in the confirmation screen which displays the installation location and the items being installed.

7. In the installation summary screen that appears once the installation is finished, click **Finish** to complete the installation and automatically start the service (daemon).

NOTE: If you restart the machine, you have to restart the I/O Load Test Tool service (daemon).

3.3 Getting started

This section provides detailed instructions on how to use th I/O Load Test Tool.

3.3.1 Starting and stopping the I/O Load Test Tool service

Windows

You can stop or start the I/O Load Test Tool service from the Windows control panel.

- Open the *Windows Services* screen, select the service and click **Stop** or **Start**.

- You can also right-click on the service and in the *IO Test Properties* screen, click **Stop** or **Start**.

Linux

You can stop or start the I/O Load Test Tool daemon from the command line by entering the corresponding command:

`/etc/init.d/iotest stop`

/etc/init.d/iotest start

3.3.2 Connecting to an I/O Load Test Tool Server

To launch the I/O Load Test Tool:

Windows:

- Navigate to

  `Start > All Programs > Asigra IOTestGUI`

  OR

- In the command line type:

  `<installation directory>\IOTestGUI.exe`

Linux:

- Navigate to

```
Applications > Programming > Asigra IOTestGUI
```
OR

- In the command line type:

```
<installation directory>/IOTestGUI.bin
```

IMPORTANT: Initiate the I/O Load Test Tool Service or Daemon and ensure that the service/Daemon is running. You can then connect to it from the GUI.

Once you have launched the Storage I/O Performance Test GUI, connect to a computer running the I/O Test Server / Daemon.

1. In the menu bar, click **Server** and select **Available Servers**, select the required server and then click **Connect**.

2. To add a new test server, click **Add**.

3. In the **Add I/O Test Server** dialog box, do the following:

   a) **Server -** Enter the IP Address or Computer Name of the target server.

   b) **Username -** Enter the corresponding username for the specified server.

   c) **Password -** Enter the corresponding password for the specified server.

   d) **Encrypted Communication -** Select this option to encrypt the communication between the systems.

   NOTE: This may have an effect on the GUI response performance (not the I/O of the Storage).

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4. Click **OK**. Repeat this step to add as many test servers as required.

   - To modify the credentials for an existing I/O test server, select the required I/O test server and click **Edit**.

3.3.3 Configuring the storage path

1. Select the required **I/O Test Server** and click **Connect** or double-click the required I/O Test Server to connect to a I/O Test server.

Once you have connected to an I/O Test Server, you must configure the storage path. This location must be accessible from the I/O Test Server.

- If the storage path has already been configured, you can skip to Section 3.4, "Running an I/O load test".

1. In the menu bar, click **Server** and select **Storage Path**.

2. In the **Storage** screen, define the following storage parameters.

    •   **Storage Path** - Enter the path to the storage location that you want to test. Only one storage location can be tested at a time. This path can be a Local Disk, UNC Path or a Mounted share.

    > *NOTE:* The Storage path must be accessible from the I/O Load Test Tool using the local administrator / root user account.

    •   **Volume Type** - Select or enter a description of the type of volume located in this storage path. This is just a flag for your own sorting purposes. No check or validation is performed.

    •   **Disk Type** - Select or enter a description of the disk type used. This is just a flag for your own sorting purposes. No check or validation is performed.

    •   **Disk Block Size (bytes)** - Enter the fixed sector size of the hard disk. This data can be extracted from the BIOS. In a Linux environment, this data is displayed by the operating system.

    •   **Description** - In this section, you can enter additional comments, if required.

3. Click **Update** to set this path for the I/O Tests. In the main GUI screen, you can configure and run the I/O Tests on this storage location. (refer Section 3.4, "Running an I/O load test".

3.3.4 Exporting the list of I/O Load Test servers

In the **I/O Load Test Tool** screen, do the following:

•   On the menu bar, click **Export**. The list of I/O test servers is saved as a text file. You can do this only when the *I/O Test Servers* screen is displayed.

3.3.5 Printing the list of I/O Load Test servers

On the **I/O Load Test Tool** screen, do the following:

- On the menu bar, click **Print** to print the list of I/O test servers. You can do this only when the *I/O Test Servers* screen is displayed.

3.3.6 Deleting an I/O Load Test Server

On the **I/O Load Test Tool** screen, do the following:

- Select the required I/O test server and click **Delete** to remove it from the list.

3.3.7 Disconnecting from an I/O Load Test Server

On the **I/O Load Test Tool** screen, do the following:

- On the menu bar, click **Server** and select **Disconnect**.

3.3.8 Exiting the I/O Load Test Tool

On the **I/O Load Test Tool** screen, do the following:

- On the menu bar, click **Server** and select **Exit**.

3.4 Running an I/O load test

The tests correspond to various activities a production DS-System or BLM Archiver will perform:

- **Create**: Similar to Backup (write to disk)

- **Read Header**: Similar to System Admin.

- **Read Full**: Similar to Restore

- **Delete**: File deletion process

- **Scripting/Automation**

You can start multiple tests of the same type (create, read, delete). To simulate a real-world environment, start multiple concurrent tests of each different type.

3.4.1 Testing the file backup process

First perform a test to create files. This is similar to performing backups to the DS-System.

1. In the menu bar click **Test** and select **Create**.

2. On the menu bar, click **Add**.

3. In the **File Creation Parameters** screen, do the following:

    *   **Type** - Select the type of backup to simulate. Depending on your selection, the default parameters will change.You can modify these parameters as required.

        –   File System

        –   Database

        –   E-Mail

    *   **Checksum** - Select the type of checksum to append to each file that is created.

        –   **None**: No checksum will be appended. This means the Read Full operation will be unable to detect data corruptions. Use this option only if you want to perform a pure file write test.

        –   **CRC32**: (Default) Appends a 4-byte checksum to each file. This is the standard method for error detection and can detect most corruptions (over 99%).

        –   **MD5**: Appends a 16-byte checksum to each file. This method can detect virtually all possible corruptions.

        –   **None + BLOCK**: Same as "None", plus a CRC32 block-level checksum. The number of blocks is determined by the file size divided by the buffer size. A block-level checksum can help detect where corruptions occur in a file.

        –   **CRC32 + BLOCK**: Same as "CRC32", plus a CRC32 block-level checksum.

        –   **MD5 + BLOCK**: Same as "MD5", plus a CRC32 block-level checksum.

    *   **Buffer Size (KB)** - Select the buffer size that will be allocated to each thread. This uses the I/O Server's computer memory - if you allocate too much or start too many threads, the computer will run out of memory. The default is 32KB (range 1KB - 10,240KB).

    *   **Consolidate Size (KB)** - Files smaller than this value (in the same directory) will be consolidated to one large file. This simulates the DS-System's consolidated small regular files feature. The default is 0KB (range 0-512KB). 0 = no consolidation

- **Number of clients** - Select the number of clients you want to create. A folder is created for each client.

- **Number of backup sets** - Select the number of backup sets you want to create. A backup set folder is created for each client.

- **Number of directories** - Select the number of directories you want to create in each backup set.

- **Number of files** - Select the number of files you want to create in each directory.

- **File Size** - From [...] To [...]Select the range (x Bytes to xx TeraBytes).

  – For example: "1KB to 100KB" will create files of any size randomly chosen from between the minimum and maximum specified.

  – To select a fixed number, define the same values for minimum and maximum (e.g. 25KB to 25KB).

4. Click **OK**. In the **I/O Test File Creation** screen, you can add, modify or delete an activity.

5. Select a required activity and click **Start**. The main *I/O Load Test Tool* GUI appears with a list of activities that the Tool is working on.

NOTE: If you click **Close** and exit the screen, you will lose all the settings in the File Creation Activities list. Use the Export / Import functions if you want to save a specific File Creation Test Case to a file. You can then reproduce this I/O Test case on other locations.

3.4.2 Testing the system admin process

The *Read Header Test* is similar to a System Admin. activity on the DS-System. It will only read the header of the file(s).

Once you have created files (Section 3.4.1, "Testing the file backup process"), you can perform tests on those files to see how the storage performs.

1. In the menu bar, click **Test** and select **Read Header**.

   - Each line corresponds to a specific backup set. Use **Ctrl+Shift** to select multiple backup sets.

   - The *Read Header Test* is performed using the same buffer setting that was used when the backup set was created.

2. In the **I/O Test Read Header Activity** screen, select the **Client(s)** and **Backup Set(s)** you want to test (Read Header) and click **Start**.

   The *I/O Load Test Tool* screen displays the processes you have started.

3.4.3 Testing the file restore process

The *Read Full Test* is similar to a Restore activity on the DS-System. It will read the full contents of the file(s) selected.

Depending on the checksum selection (None, CRC32, MD5) of a backup set, the Read Full Test can detect if corruptions have occurred to the data. If no checksum was applied, no data corruption errors will be reported.

1. In the menu bar, click **Test menu** and select **Read full**.

    - Each line corresponds to a specific backup set. Use **Ctrl+Shift** to select multiple backup sets.

    - The *Read Full Test* is performed using the same buffer setting that was used when the backup set was created.

2. In the **I/O Test Read Full Activity** screen, select the **Client(s)** and **Backup Set(s)** you want to test (Read Full) and click **Start**.

    The *I/O Load Test Tool* screen displays the processes you have started.

3.4.4 Testing the file deletion process

The *Delete Test* feature will delete files from the selected client(s) \ backup set(s). This is a pure file system delete test.

1. In the menu bar, click **Test** and select **Delete**.

    - Each line corresponds to a specific backup set. Use **Ctrl+Shift** to select multiple backup sets.

    - The *Delete Test* is performed using the same buffer setting that was used when the backup set was created.

2. In the **I/O Test Delete Activity** screen, select the **Client(s)** and **Backup Set(s)** you want to test (Delete) and click **Start**.

    The *I/O Load Test Tool* screen displays the processes you have started.

3.4.5 Running an automated script

Before using any test template, read all the previous sections of this guide to familiarize yourself with the types of tests that are performed. The test templates are scripts that replace an end-user's manual clicking through the GUI to configure and execute tests.

A sub-folder called *\test* exists in the installation directory of the *I/O Load Test Tool.* The default location is:

```
\Program Files (x86)\CloudBackup\IOTest\test [Windows]
/opt/CloudBackup/IOTest/test [Linux]
```

This folder contains 6 pre-defined scripts:

Script	Details
basic_test.groovy	This script performs a BASIC Test of 20 test cases for a storage size of 10TB. • Each line corresponds to a different test case, from 1-20. • This script will CREATE the 20 test cases, then READ HEADER for the 20 test cases, then READ FULL for the 20 test cases, then DELETE the 20 test cases. • This script only reads and deletes the files created by this test script. All other data on the storage is left alone.
load_test.groovy	This script performs a LOAD test of 3 test cases for a storage size of almost 1TB. The load comes from 50 threads and a total of 70,000,000 files. This script only reads and deletes the files created by this test script. All other data on the storage is left alone.
create_test.groovy	This script performs a CREATE test of 20 test cases for a storage size of 10TB. • Each line corresponds to a different test case, from 1-20.
read_full_test.groovy	This script performs a READ FULL test which reads everything on the storage location
Script	**Details**
read_header_test.groovy	This script performs a READ HEADER test which reads everything on the storage location.
delete_test.groovy	This script performs a DELETE test which deletes everything on the storage location.

Table 1   *List of automated scripts*

You must run the BASIC and LOAD tests. You can use other scripts to run individual tests on the entire storage location.

NOTE: Automated scripts run from the GUI, not from the server. You must keep the GUI open until the test finishes, otherwise the test will stop once the GUI closes.

3.4.5.1 Scripting/Automation

Scripting/Automation uses the GROOVY scripting language which is similar to Java.

1. In the menu bar, click **Test**, select **Scripting/Automation**, point to **File,** and then click **Open**.

2. Browse and select the GROOVY script you want to use, and then click **Open**.

   The script is loaded into the GUI.

3. In the menu bar, click **Script,** and then select **Run** to execute the script.

Once the test is completed, check the *Test History* to view the performance.

4. Click **Interrupt** to stop the script.

To change any test parameters, refer Section 3.4.5.2, "Customizing scripts".

3.4.5.2 Customizing scripts

You can modify a default script, or create your own script based on your test requirements. To learn the GROOVY scripting language, visit (http://groovy.codehaus.org).

To change the amount of data that is written, you can use the BASIC script (script name: basic_test.groovy) as a template. This script has a total of 20 test cases (each test case is a separate line in the script). In the script, you can edit the test cases by modifying lines from the section starting with:

```
// Begin Test Cases
test_cases = [
...
```

Each line in the script (test case) is equivalent to one set of *File Creation Parameters.*

3.4.6 Stopping a test

To stop a test process, do the following:

1. In the menu bar click **Test** and select **Stop Activity**.

2. In the *Stop Activity* screen, select the activity from the *Activity Type* drop-down list and click **Stop**. The options are:

    *   All

    *   Create

    *   Read Header

    *   Read Full

    *   Delete

3.5 Viewing I/O load test results

Once you have run some tests on the storage location, you can review the results using the features under the Report menu.

3.5.1 Viewing server information

To view details of the current I/O Test Server, do the following:

*   On the menu bar, click **Report** and select **Server Info**. The *I/O Test Server Info* screen displays details of the current I/O Test Server.

3.5.2 Viewing test history information

To view the test history for a selected period, do the following:

1. On the menu bar, click **Report** and select **Test History**.

2. In the **I/O Test History** screen, select the date and time in the fields **From** and **To.**

3. Select an individual activity and click one of the following to view a detailed report of an I/O Test Process:

   • Activity Log

   • System Load

   • I/O Performance

   • File count

   • Activities

   • I/O Statistics

   • Storage

NOTE: In general, any errors reported by an activity indicate there will likely be problems with the storage. This is a warning about this storage location.

3.5.3 Viewing storage history information

To view the test history of storage locations, do the following:

• On the menu bar click **Report** and select **Storage History**.

This is a sequential list in which only one storage location can be tested at a time. The information is generated from the storage path settings.

3.5.4 Viewing system load information

To view the system load information for a selected period, do the following:

1. In the menu bar click **Report** and select **System Load**.

2. In the **System Load** screen, select the date and time in the fields **From** and **To.**

The *System Load* screen will display system load information that is cached in the GUI.

3.5.5 Viewing I/O performance information

To view the I/O performance information for a selected period, do the following:

1. In the menu bar, click **Report** and select **I/O Performance**.

2. In the **I/O Performance** screen, select the date and time in the fields **From** and **To.**

The *I/O Performance* screen will display information that is cached in the GUI.

3.5.6 Viewing file count information

To view the file count information for a selected period, do the following:

1. In the menu bar, click **Report** and select **File Count**.

2. In the **File Count** screen, select the date and time in the fields **From** and **To.**

The **File Count** screen will display information that is cached in the GUI.

3.5.7 Viewing activity information

*   To view the activities information for a selected period, do the following:

1. In the menu bar, click **Report** and select **Activities**.

2. In the **Activities** screen, select the date and time in the fields **From** and **To.**

The *Activities* screen will display information that is cached in the GUI.

3.6 Monitoring the I/O test Server

Once you are connected to an I/O Test Server, to monitor the server in real-time, do the following:

*   To monitor current activities, in the menu bar click **Monitor** and select **Current activities**.

*   To monitor current system load, in the menu bar click **Monitor** and select **Current System Load**.

*   To monitor current file count, in the menu bar click **Monitor** and select **Current File Count**.

*   To monitor current I/O performance, in the menu bar, click **Monitor** and select **Current I/O performance**.

4 Using the System Information Collector Tool

The purpose of this tool is to gather information from a machine to help with the initial investigation of cases. It does not perform any fixes at this time. The tool just collects the logs to verify if the packages that are being installed are not corrupted, and it is also gathering some logs about the environment in order to help technical support with answers that are normally asked in first stages of case investigations. The usage of the tool does not guarantee that it will provide all the details necessary to resolve an issue and further investigation will probably be required.

Once the logs are collected, the zipped log file can be attached to a Technical Support case or sent to technical support for further investigation. Currently, the System Information Collector gathers logs for the following:

- Local System

- DS-Client

- DS-System

- BLM Archiver

- DS-Billing

4.1 Preparing to install the System Information Collector Tool

The System Information Collector Tool has been developed using Java 1.6 and is designed to collect information on local or remote machines and can work on Windows, Linux, and Mac.

4.1.1 Hardware requirements

This section describes the system requirements for installing the System Information Collector Tool. Refer the DS-System installation chapter in the *Server Software Installation Guide* for the hardware requirements.

4.1.2 Software requirements

This section describes the software requirements for installing the system Information Collector Tool on various supported platforms. For the latest information, see the *Support Matrix*.

The System Information Collector software can be installed only on the 64-bit version of the following supported operating systems:

- Windows Server 2016

- Windows 10

- CentOS 7.3, 7.4, or 7.5

- Red Hat Enterprise Linux 7.3, 7.4, or 7.5

- SUSE Linux Enterprise Server 11 SP4, 12 SP3, or 15

- Mac OS X 10.12 (Sierra) or 10.13 (High Sierra)

4.1.3 Before you begin

- If the remote machine is a Windows machine, the remote machine must have file and print sharing enabled and the default ADMIN$ share (a hidden share that maps to the Windows directory) is defined on the remote machine. The firewall must allow connection from the local machine to the remote machine on ports 139 and 445.

- If the SQL Server is on a different machine than the service machine, then the firewall must allow the connection to the SQL Server host machine on port 1433. This port is used by the Java JDBC driver to connect to the SQL Server database.

- If the remote machine is a Linux machine, then it must have the SSH service running. The firewall must allow connection from the local machine to the remote machine on port 22.

- If the Postgre database server is on a remote machine, the firewall must allow the connection to the Postgres database server on port 5432. This port is used by the Java JDBC driver to connect to the Postgres database server.

NOTE: Since these ports are not normally exposed to the Internet, it is better to run System Information Collector on the service machine itself or from its local network.

4.1.4 Microsoft SQL Server authentication requirements

The System Information Collector can use Windows authentication or SQL authentication for the Microsoft SQL Server database.

Database is on local machine

If Microsoft SQL Server is on the local machine where you run the System Information Collector; the 'sqlcmd' and 'osql' command will be used to collect the logs. A "trusted" connection will be used; therefore the user you are logged in as must be able to connect to the Microsoft SQL Server and access the database.

Database and Service are on same machines

If Microsoft SQL Server is on the same remote machine where the service (such as DS-Client) is running, the 'sqlcmd' and 'osql' command will be used to collect the logs. A "trusted" connection will be used; therefore the user you entered for the service must be able to connect to the Microsoft SQL Server and access the database.

Database and Service are on different machines

If Microsoft SQL Server is on a remote machine and it is also different from the service machine, JDBC driver will be used to collect the logs. You can use either Windows authentication or SQL authentication.

1. Windows Authentication

If you are using Windows authentication, you must input the full Windows user name (including windows computer name or domain name) and password in the 'DB User' and 'DB Password' column. For example, the user name might be 'Computer1\user1' or 'domain1\user1'.

The SQL Server must have TCP/IP or named pipe protocol enabled when using Windows Authentication and SQL Server Browser service must be started on the SQL Server machine.

2. SQL Server Authentication

If you are using SQL Server authentication, input the username and password to the fields 'DB User' and 'DB Password'.

IMPORTANT: The SQL Server must have TCP/IP enabled when using SQL Server Authentication and SQL Server Browser service must be started on the SQL Server machine.

NOTE: If you leave the 'DB User' column empty, Windows Authentication will be used. The user and password you entered in the 'Username' and 'Password' columns will be used. If the 'Username' column is empty, then the credentials you logged in as and are using to run the System Information Collector will be used.

4.2 Working with the System Information Collector Tool

This section describes how to use the Storage and Bandwidth Calculation Tool to gather information from a machine on which the software is running.

4.2.1 Starting the System Information Collector Tool

To start the System Information Collector tool:

*   Copy the System_Information_Collector folder to your local DS-System machine.

*   Run the program from the following folder on the installation DVD:

    ```
    \Software\Tools\System_Information_Collector\SystemInfoCollect
    or.exe
    ```

4.2.2 Generating logs

For BLM logs in a Windows environment, and for all the logs in a Linux environment, use the password for *user postgres* to connect to PostgreSQL.

The "Password" field will be available for edit / update once you select the check-box for that line. The password is retained as long as the System Information Collector is in use. The password has to be re-entered every time you launch the application.

1. **Select Service**

Select the service you want in the first column of the table. Some information will be filled automatically for the services on the local machine.

2. **Enter Service Information**

If the service is on the local machine then you do not need to input the user name and password. If not, you must provide a user name and password for the connection to the machine. The user must have administrator privileges to gather information from the remote machine.

3. **Enter Database Connection Information**

Microsoft SQL Server

If the database is a Microsoft SQL Server, you must enter the database host machine and instance in the DB Instance column. If there is no instance then enter only the machine name. Here 'Machine' can be an IP address or the machine name. Only use the machine name if you can ping the machine name correctly.

If you want to use Integrated Windows authentication, leave the DB User and DB password fields empty. The System Information Collector will use the credentials you used for the local machine to connect to the database. If you want to use database authentication, then enter the database username and password in the table.

PostgreSQL Server

If the database is PostgreSQL, you must enter the database host machine name or IP address in the DB Instance column, and enter the database user name and password. Only use the machine name if when you can ping the machine name correctly.

NOTE: The PostgreSQL database server must be configured to allow connection from the machine where the System Information Collector is running.

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4. Select the log type and time

Click on the logs column, a dropdown list allows you to select which logs you want to collect. In the last two columns, you can enter the log start date and end date.

By default, the start time is two days before the current date and the end time is the current date. DS-Client Service default is 7 days before current date.

5. Set log folder

The logs are saved in a default location (on Windows environment it is 'C:\temp\log-System-Information-Collector', and in Linux environment it is '/tmp/log-System-Information-Collector'). The default location can be changed using the 'Change log folder' button.

6. **Generate logs**

Once you have defined all the parameters, click **Generate**. The information is collected from the machine and the database which is then displayed in the progress logs field.

4.2.3 Viewing logs

To view the generated logs, click the *Open log* folder.

Information regarding the machine is saved in the file *computer-info.txt* under the production directory. Database logs are saved in separate files corresponding to the system (DS-System, DS-Client, etc.) under the production directory.The database logs are saved in text format. Each row in the table is represented by a line in the file and the fields are separated by a tab.

4.2.4 Changing the log folder

To change the location of the log folder, click **Change log folder** in the GUI.

4.2.5 Exiting the System Information Collector Tool

In the GUI, click **Exit** to close the System Information Collector tool.

5 Using the Storage and Bandwidth Calculation Tool

The Storage and Bandwidth Calculation Tool, reduces the time required to analyze the storage and bandwidth requirements for end users based only on values provided.

Factors that could affect the results are: network speed between the DS-Client and DS-System, LAN speed as well as Disc IO on the target machines that you are backing up, and DS-Client resources such as processing power. Compression is a critical component that impacts the transmitted amount.

By default the compression method is LZOP but you can change the compression algorithm to ZLIB which may give better compression on certain types of data sets.

NOTE: Certain data that is already compressed, like video, zip files, audio files, cad files, may not be compressed properly. By default the compression of compressed files will be skipped. Nevertheless we recommend that you don't skip compression on compressed files so that you can take advantage of the daily delta processing otherwise the backup will be a full backup daily.

5.1 Preparing to install the Storage and Bandwidth Calculation Tool

This section describes the system requirements for installing the Storage and Bandwidth Calculation Tool.

To estimate the customer's storage requirements you will need to provide the following information:

- number of servers or computers that need protecting
- amount and type of raw data to be protected on each server
- number and type of files that need to be processed
- daily change rate
- compression algorithm and ratio to be used
- number of generations

To estimate the bandwidth usage and estimated time to complete backup of a specific customer you will need to provide the following information:

- Amount of data to be transmitted daily
- Backup window available
- Total available bandwidth
- Percentage of bandwidth that can be allocated to DS-Client for backup
- Number of DS-Clients
- Number of processors on the DS-Client
- CPU architecture 32 bit or 64 bit

5.1.1 Hardware requirements

This section describes the system requirements for installing the Storage and Bandwidth Calculation Tool.

Refer to the DS-System installation chapter in the *Server Software Installation Guide* for the hardware requirements.

5.1.2 Software requirements

The Storage and Bandwidth Calculation tool is deigned to run only on a Windows machine. For the latest information, see the *Support Matrix*.

The Storage and Bandwidth Calculation Tool software can be installed only on the 64-bit version of the following supported operating systems:

- Windows Server 2016

- Windows 10

5.2 Installing the Storage and Bandwidth Calculation Tool

This section describes how to install the Storage and Bandwidth Calculation Tool.

Run the Setup program from the following folder on the DVD:

\Software\Tools\Storage_and_Bandwidth_Calculation_Tool

Double click the setup file (*setup.exe*) to start the installation and follow the instructions in the installation wizard to install the tool. Once the installation is complete, a shortcut icon is created on the desktop.

5.3 Working with the Storage and Bandwidth Calculation Tool

This section describes how to use the Storage and Bandwidth Calculation Tool to reduce the time required to analyze the storage and bandwidth requirements.

The information generated is based on the values provided in the Storage and Bandwidth Calculation Tool. The resulting variables are information regarding:

- Standard compression and daily changes compression

- Various capacities amounts:

  - Initial backup protected and stored

  - Daily delta changes protected and stored

  - Total protected and stored

- Total customer source data, required space for the initial backup, data amount to protect, delta amount to transmit daily over the Internet, protected and stored capacities, and various compression factors.

5.3.1 Starting the Storage and Bandwidth Calculation Tool

1. Click the **Storage and Bandwidth Calculation Tool** shortcut icon on the desktop to start the tool.

2. On the *Legal Disclaimer* page, click **I Agree** to proceed.

5.3.2 Calculating the storage and bandwidth

To calculate the storage requirement, do the following:

1. Under **Input data type specific**, enter all the required information and click **Calculate**.

   - If any field is left empty, the program will not proceed.

2. To view the results as a graph, click **Bar Chart**.

   - Provider View – Displays the compressed sizes and the x factors that are estimated from the data provided.

   - Customer View – Displays the uncompressed sizes of the data.

3. To edit the data or enter new data, click **Back** or **Restart**.

4. To calculate the bandwidth, do the following:

   - Under **Calculation of Bandwidth,** enter the WAN speed and enter a value (max. 95%) for the estimated percentage of line that will be used for daily backup.

   - Select **Include Processing Time** to include the processing time in the calculations.

5. To save the calculation results, click **Save to File**. The results are saved as a text file.

6. To exit the program, on the menu bar, click **File** and select **Exit** or click **Quit**.