



Configuration Guide | PUBLIC
2024-05-10

Quick Configuration Guide for the ILM Store

Version for Apache Hadoop

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1 Introduction

Apache Hadoop is an open-source software project that enables distributed processing of large data sets across clusters of commodity servers. It is designed to scale up from a single server to thousands of machines, including a very high degree of fault tolerance. Rather than relying on high-end hardware, the resiliency of these clusters comes from the software's ability to detect and handle failures at the application layer.

Note

This is a quick set-up guide. For a comprehensive documentation, refer to [Installation & Config. Guide ILM Store \(from SPS 13\)](#).

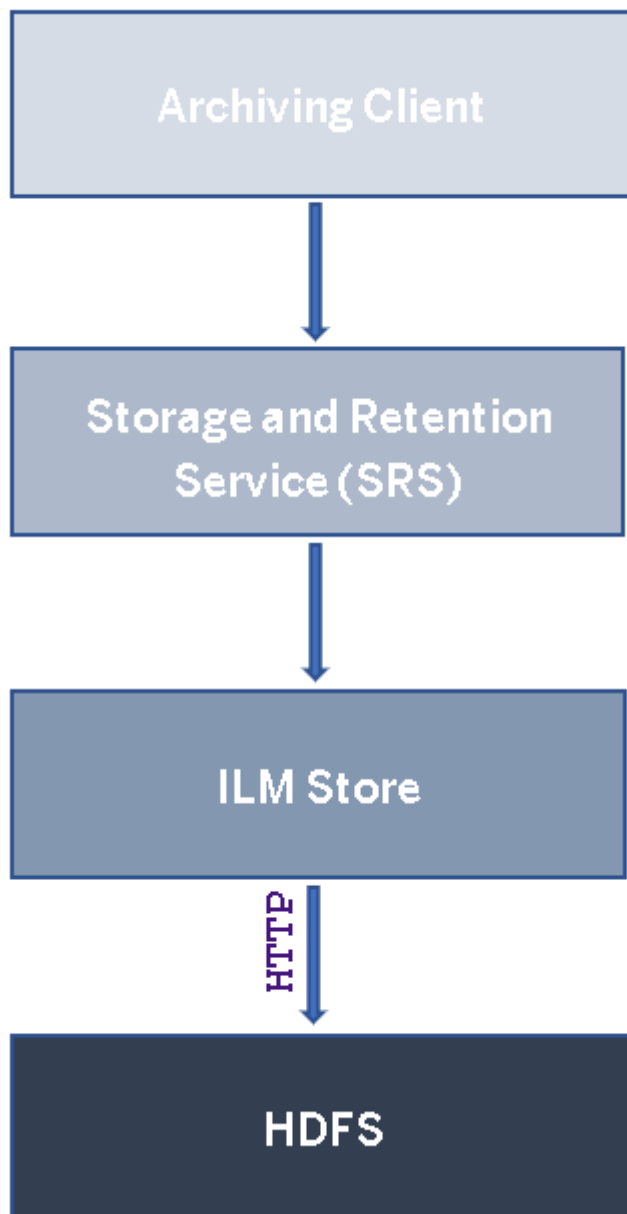


Figure 1: SAP ILM Store with Hadoop Architecture

Hadoop File System (HDFS) indicates the main difference between Hadoop and a database. While databases store data in the form of transparent tables, Hadoop operates with flat files in a directory structure. The HDFS stores files in specific directories. Therefore, the HDFS requires the file's name and directory path.

Table 1: Main URI / path components of the ILM Store and HDFS

ILM Store	Hadoop File System
Collection	Directory
Resource	File

Resources within the ILM Store are stored in specific collections that create resource URIs. These resource URIs are also used in the Hadoop File System.

Benefits:

1. Better traceability of files in a HDFS
2. Flexible selection of resources when moving or cleaning files

You can use this document to set up the ILM Store with Hadoop.

Caution

Once the ILM Store is set up and the operations have started, do not make any changes in the settings as this can lead to the loss of the information stored so far.

2 Prerequisites

To configure the ILM Store, ensure the following:

- You use an SAP NetWeaver system with the minimum requirements of software component *SAP_BASIS 740 Support Package 13* or *SAP_BASIS 750 Support Package 02*.
SAP recommends using the latest version of the *SAP_BASIS* software component.
- You have activated the business function *ILM_STOR*.
- You have a productive Hadoop cluster that can be accessed from the system landscape.


📘 Note

This documentation does not cover installation support for Hadoop clusters. Install and enable HttpFS or WebHDFS service on your Hadoop cluster.

HttpFS and WebHDFS are HTTP services covered by the Apache Hadoop project. They provide HTTP REST API that supports all HDFS file system operations. The ILM Store's [Hadoop Connector](#) supports connection to both of these services. For more details about the services, refer to the official documentation of the Apache Hadoop project: [Apache Hadoop](#) .

2.1 Important SAP Notes

Make sure that you have implemented the relevant notes of component *BC-ILM-STO*.

Title	SAP Note	Comment
ILM Store - Collection of notes	2563024 	This note gives a list of notes for component <i>BC-ILM-STO</i> . Refer to this note for detailed information.

3 Authorizations

Access to the ILM Store

1. Create a technical user with the authorization to access the ILM Store and to save files in the store.
2. Assign a role to the user. Use the following authorizations:

Authorization Object	Field	Value
SILMSTOR	ACTVT	16 (Execute)
S_DATASET	FILENAME	*
	PROGRAM	CL_ILM_STOR_DATASET=====CP, RILM_STOR_PUT_WORKER
	ACTVT	6 (Delete), 33 (Read), 34 (Write)
S_DEVELOP	OBJTYP	TABL
	ACTVT	07 , 40
S_CTS_ADMI	CTS_ADMFCT	TABL
S_CTS_SADM	CTS_ADMFCT	TABL

ILM Store Administration

To be able to install, configure, and test the store, you need a role with the authorization object SILMSTORAD with the following values of ACTVT:

1. [02](#) = Change
2. [07](#) = Activate, Generate
3. [39](#) = Check

4 Origin Customizing

The origin serves as the identifier of the data source. It is essential for the Store's configuration.

4.1 Administrative Customizing

1. Start transaction ILM_STOR_ADM_CUST, or go to *SAP NetWeaver Customizing*, and choose
► *Application Server* ► *Basis Services* ► *Information Lifecycle Management* ► *ILM Store* ► *Define Settings for Administrative Customizing* ►.
2. Click *Create*.
3. Enter the *Client* and the *Logical File Name*.
4. Specify a name and a description for the new *Administrative Origin*.

The screenshot displays the SAP NetWeaver Customizing transaction ILM_STOR_ADM_CUST. The interface is divided into several sections:

- Client: Details**
 - Client: ILM_STORE
 - Logical File Name: ILM_STOR_ADK_FILE
- Administrative Origin: Details**
 - Administrative Origin: archive
 - Description: Origin for archived data
 - ILM Store User: [Redacted]
- Administrative Origin: Table Distribution**

Table Name	DB Connection
TILM_STOR	DEFAULT
TILM_STOR_AUDIT	DEFAULT
TILM_STOR_COL	DEFAULT
TILM_STOR_POOL	DEFAULT
TILM_STOR_PROP	DEFAULT
TILM_STOR_RTI	DEFAULT
TILM_STOR_RTM	DEFAULT

Figure 2: Customizing in Transaction ILM_STOR_ADM_CUST

5. Click *Add Operational Origin*.
6. In the pop-up *Create Operational Origin*, enter the *Operational Origin* name and a *Description*.
7. In the *DB Connection* field for TILM_STOR_BLOB, enter **DEFAULT**.

Figure 3: Customizing of the Origin DB Connection in Transaction ILM_STOR_ADM_CUST

4.2 Operational Customizing

To maintain additional properties, start transaction `ILM_STOR_OPR_CUST`, or go to the *SAP NetWeaver Customizing*, choose **► Application Server ► Basis Services ► Information Lifecycle Management ► ILM Store ► Define Settings for Operational Customizing**.

To maintain additional properties, enter the client maintained in *Administrative Origin* and click *Execute*.

4.3 Configuring Storage Connections

Maintain the following entries in transaction `SM30` for table `TILM_STOR_CUS`.

Origin	Namespace	Property	Value
adk	DB	DBCON.TILM_STOR_BLOB	HADOOP_CONNECTION_ID
adk	DB	CONSYS.HADOOP_CONNECTI ON_ID	HADOOP

4.4 Routing Table Configuration

1. In transaction `SM30`, enter the table name `TILM_STOR_O_ROUT`.
2. Create the following entry:
SAP System ID: <System ID>
Client: <Client>
Data Source: <Your operational origin>

Display View "Operational Origin Routing ILM Object": Overview				
Operational Origin Routing ILM Object				
SAP System ID	Res. Cat.	Client	ILM Object	Data Source
				adk

Figure 4: Routing Table Entries

4.5 Class Factory Customizing

1. In transaction SM30, enter the table name TILMSTOR_CF.
2. Create an entry with the following values.

New Entries: Details of Added Entries	
Interface	IF_ILM_STOR_DB_OPERATOR
API Version	Default Version
Parameters	HADOOP
ILM DB Store: Class Factory	
Implement. Class	CL_ILM_STOR_DB_OPERATOR_HDP
Singleton	false

Figure 5: Class Factory Table Entries

5 Publishing the ILM Store

5.1 Create the ICF Node for the ILM Store

1. Start transaction SICF and create a new service under node ILM. Enter the service name in the [Service Name](#) field.

The screenshot shows the 'Create/Change a Service' SAP transaction. The 'Service Name' field is highlighted with a red box and contains the value 'zilm_stor'. The 'Path' is '/default_host/sap/bc/ilm/'. The 'Lang.' is set to 'English'. The 'Description' section has 'Description 1' as 'ILM Store Service'. The 'Logon Data' tab is selected, showing 'Procedure' as 'Standard', 'Client' as '...', 'User' as '...', 'Language' as '...', and 'Password Status' as 'Set'. The 'Security Requirement' section has 'Standard' selected. The 'Authentication' section has 'Standard SAP User' selected. The 'Reauthentication' section is empty.

Figure 6: SICF Node Creation for the ILM Store

2. In the [Logon Data](#) tab, enter a user with the authorization to access the ILM Store. For more information, see [Authorizations \[page 8\]](#).
3. On the [Handler List](#) tab, enter CL_ILM_STOR_WD_REQUEST_HANDLER as [Handler](#).
4. Activate the service.

5.2 Create the RFC Destination

Create two RFC connections as listed below.

5.2.1 Connection to HDFS

1. Start transaction SM59.
2. Create a new HTTP connection to the external server (type **G**).
3. Maintain the target host and service number (port) where the Hadoop HTTP Service is initialized and running.
4. Give the path prefix referring to the home directory that refers to the user to be invoked for the connection. It has the following syntax:
`/webhdfs/v1/<hdp_usr_home_path>`
 - `/webhdfs/v1` – This is the mandatory path prefix defined by the HttpFS and WebHDFS APIs.
 - `<hdp_usr_home_path>` – This is the home directory path of the target Hadoop user. Each Hadoop user has their own home directory. In UNIX type systems, for example, this is typically `/user/`. The user is the owner of the directory and has higher access privileges.

The screenshot shows the 'RFC Destination' configuration window in Transaction SM59. The title bar reads 'RFC Destination ILM_STOR_HADOOP_TEST'. Below the title bar, there is a 'Connection Test' button. The 'RFC Destination' field is set to 'ILM_STOR_HADOOP_TEST'. The 'Connection Type' is set to 'G' (HTTP Connection to External Server). The 'Description' section contains three fields: 'Description 1' (ILM Store: HTTP connection to a Hadoop cluster for testing), 'Description 2', and 'Description 3'. Below the description section, there are four tabs: 'Administration', 'Technical Settings', 'Logon & Security', and 'Special Options'. The 'Technical Settings' tab is selected. Under 'Target System Settings', the 'Host' field is redacted, the 'Port' field is redacted, and the 'Path Prefix' is set to '/webhdfs/v1/user/guest'. Under 'HTTP Proxy Options', the 'Global Configuration' button is highlighted. The 'Proxy Host', 'Proxy Service', and 'Proxy User' fields are empty, and the 'Proxy PW Status' is set to 'is initial'.

Figure 7: RFC Connection to HDFS in Transaction SM59

5.2.2 Connection to the ILM Store

1. Start transaction SM59.
2. Create a new HTTP connection to the external server (type **G**).

3. In the *Technical Settings* tab, maintain the below values:
 - Target host
 - Service number (port) corresponding to your system.
 - Path prefix: insert the service path you have defined using transaction SICF in [Create the ICF Node for the ILM Store \[page 12\]](#). Example path: `/sap/bc/ilm/zilm_stor`.
4. Save your changes and perform a connection test.

RFC Destination ILM_STORE

Connection Test

RFC Destination: ILM_STORE

Connection Type: G HTTP Connection to External Serv

Description:

Description 1: ILM Store connection

Description 2:

Description 3:

Administrati... Technical Settings Logon & Security Special Options

Target System Settings

Target Host: [Redacted] Service No.: [Redacted]

Path Prefix: /sap/bc/ilm/zilm_stor

HTTP Proxy Options

Global Configuration

Proxy Host:

Proxy Service:

Proxy User: N

Proxy PW Status: is initial

Figure 8: RFC Connection to ILM Store in Transaction SM59

Note

In case you are running the SRS and the ILM Store on two different systems, set up the RFC destination in the SRS system using the same procedure. The RFC destination in the ILM Store system is for testing purposes.

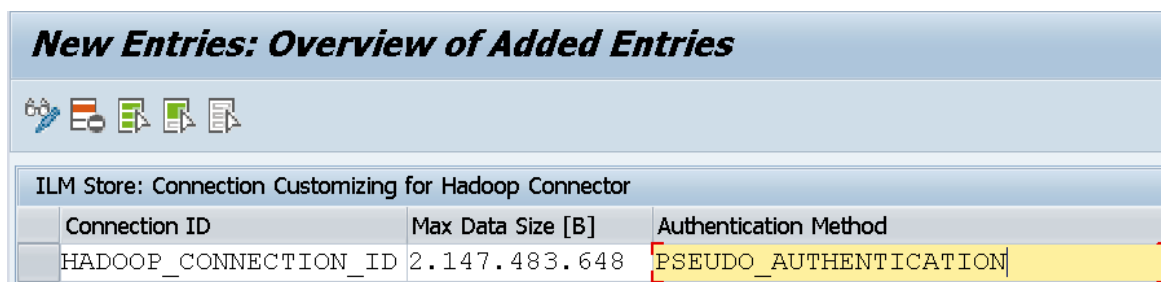
6 Maintenance of Hadoop Preferences in ILM Store

To ensure successful operation and data transfer between the ILM Store and Hadoop, maintain the connection parameters, the authentication, and the access methods.

6.1 Hadoop Connection Customizing

To configure the Hadoop connection, do the following:

1. Start transaction SM30, and enter the table name `TILM_STOR_HDP_C`.
2. Maintain the *Connection ID* in alignment with the name in `TILM_STOR_CUS` in [Configuring Storage Connections \[page 10\]](#).
3. Create an entry with the following values.



ILM Store: Connection Customizing for Hadoop Connector		
Connection ID	Max Data Size [B]	Authentication Method
HADOOP_CONNECTION_ID	2.147.483.648	PSEUDO_AUTHENTICATION

Figure 9: Hadoop Connection Table Entries

The Customizing table contains the following properties:

- *Max Data Size*: Maximum amount of data (in bytes) transferrable by an HTTP request. The value depends on the HTTP service setup in Hadoop.
- *Authentication Method*: Authentication method used for user access to Hadoop. The value depends on the HTTP service setup in Hadoop. You can choose between *Pseudo Authentication* and *No Authentication*.

6.2 Access Customizing

The *No Authentication* method requires no further maintenance. The *Pseudo Authentication* method requires the following additional configuration steps.

1. Start transaction SM30, and enter the table name `TILM_STOR_HDP_PU`.
2. Create an entry with the following values.

New Entries: Overview of Added Entries		
ILM Store: Origin to User Mapping for Pseudo Authentication		
Connection ID	Data Source	User Name
HADOOP_CONNECTION_ID	adk	guest

Figure 10: Origin to User Mapping Table Entries

This entry maps the origin (data source)-to-Hadoop user that is supposed to perform the connection and data transfer. The Hadoop user must exist in the Hadoop system.

6.3 Hadoop Origin-Dependent Connection Customizing

To configure the Hadoop origin-dependent connection, do the following:

1. Start transaction SM30, and enter the table name TIILM_STOR_HDP_CO.
2. Maintain the [Connection ID](#) in alignment with the database connection name maintained in TIILM_STOR_CUS.
3. In the [RFC Destination](#) field, maintain the RFC [Connection to HDFS](#) [page 13].

New Entries: Overview of Added Entries		
ILM Store: Origin Dependent Connection Customizing for HDP		
Connection ID	Data Source	RFC Destination
HADOOP_CONNECTION_ID	adk	ILM_STOR_HADOOP_TEST

Figure 11: Hadoop Origin-Dependent Connection Table Entries

7 Storage and Retention Service

The *Storage and Retention Service* (SRS) is needed for the storing of ILM-enabled archive files in the ILM Store. To use SRS for managing ILM stores in, you need to activate it in the application system.

7.1 Activation of SRS

To activate SRS, you can choose between the following options:

- Activate the SRS that runs locally on the application system.
- Activate the SRS that runs on a separate (remote) system. To facilitate this, establish an HTTP connection between the relevant systems.

For more information, refer to the *SAP Help Portal* under ► [SAP Information Lifecycle Management](#) ► [Making SAP ILM Available](#) ► [Providing Stores for SAP ILM](#) ► [Configuring the Service for the Control of ILM Stores](#) ► [Configuring Storage and Retention Service for ILM Stores](#) ►.

7.2 Creation of the ILM Store in the SRS Administration

To enter stores that are available for the SRS in transaction ILMSTOREADM, create a new entry with the following values:

1. *ILM Store*: <identifying name for the store>
2. *Description*: <descriptive text>
3. *HTTP Connection*: <previously created RFC destination>



ILM Stores				
Save Cancel Edit New Test				
ILM Store	Description	HTTP Connection	Last Changed by	Change
ILMSTORE_QI3	ILM DB Store	ILM_STORE	[redacted]	30.11.2

Figure 12: Creation of Store in ILMSTOREADM

This store can further be used in the ILM rule maintenance in transaction IRMPOL. For more information, refer to the *SAP Help Portal* under ► [SAP Information Lifecycle Management](#) ► [Using ILM Retention Management in the Application System](#) ► [Editing ILM Policies](#) ► [Editing Retention Rules](#) ►.

8 Security

There are three main security tasks in the ILM Store:

1. Ensure that data is only accessible to its owners.
2. Ensure the confidentiality of data during HTTP communication.
3. Ensure the integrity of data.

8.1 Authentication

The Hadoop Connector offers two authentication methods:

1. `NO_AUTHENTICATION`
2. `PSEUDO_AUTHENTICATION`

Since Hadoop is an open-source software, you can implement other authentication protocols. To enable this for the SAP application as well, you can implement your own authentication methods. These methods must be registered in the table `TILM_STOR_HDP_A`, and a corresponding implementation of the authentication BAdI must be created in the enhancement spot `ILM_STOR_HDP_CONNECTIVITY`. The ILM Store's Hadoop Connector also supports the standard HTTP Basic authentication. User credentials are maintained within the corresponding RFC destination.

8.2 Apache KNOX

The Apache Knox Gateway is a `REST` API Gateway for interacting with Hadoop clusters. The Knox Gateway provides a single access point for all `REST` interactions with Hadoop clusters. It supports HTTP Basic authentication. You can maintain the HTTP Basic authentication within the RFC destination. Use the authentication method `NO_AUTHENTICATION` for this purpose.

8.3 HttpFS over HTTPS

HTTPS can be enabled on the level of RFC destination. To determine whether an SSL certificate shall be used, you can use transaction `SM59`. Before you do so, make sure you have a correct setup of the security certificate in transaction `STRUST`.

9 Testing the ILM Store

After completing the setup, test the ILM Store according to the following guidelines.

9.1 Origin for Test Purposes

To test the ILM Store configurations, you can use a test origin archeb.

1. Start transaction SM30, and enter table `TIILM_STOR_CUS`.
2. Create new entries for the origin archeb by copying all the entries of your origin (for example *adk* and *archive*).

It is mandatory to use the test reports to check the ILM Store functionality.

9.2 Test Reports

To test the ILM Store functionality, you can use the report `RILM_STOR_TEST_PF_SINGLE`. In the report selection, provide the RFC destination (created in [Configuring Storage Connections \[page 10\]](#)), and execute.

ILM DB Store - Performance Test (Simple)	
ILM DB Store - Performance Test (Simple)	
SAP ILM Storage - Simple Performance Test:100 MB , Started At Destination ILM_STORE	2019-06-11T09:41:54Z
HEAD 200 OK OPTIONS 200 OK OPTIONS -> DAV =1,2 OPTIONS -> ILM CONFORMANCE =2 OPTIONS -> ILM AL CONFORMANCE =2 001). MKCOL 201 Created /sap 002). MKCOL 201 Created /sap/tst 003). MKCOL 201 Created /sap/tst/pf 004). MKCOL 201 Created /sap/tst/pf/single 005). PUT 201 Created /sap/tst/pf/single/res_01.bin 104857400 Byte 006). GET 200 OK /sap/tst/pf/single/res_01.bin 007). DELETE 200 OK /sap 008). PROPFIND 404 Not Found	
SAP ILM Storage - Simple Performance Test:100 MB Completed At	2019-06-11T09:42:18Z

Figure 13: Expected Output of the Report RILM_STOR_TEST_PF_SINGLE

To check various data constellations and operations as defined in the specification BC-ILM 3.1., you can use the report RILM_STOR_TEST_AT. In the report selection, provide the RFC destination (created in [Connection to the ILM Store \[page 13\]](#)), and execute.

Display logs							
Date/Time/User	Nu...	External ID	Object text	Subobject Text	Transactio...	Program	Log number
11.06.2019 12:45:02	119	42F2E9AFC3DF1E...	ILM Storage: Inte...	Additional Inform...	SE38	RILM_STOR...	Dialog Proce...
- Problem class Additional information 119							
Type Message Text							
SAP ILM DB Store - Validation for BC-ILM 3.0: Started At 2019-06-11T10:45:02Z Destination ILM_STORE 001)HEAD 200 OK 002)OPTIONS 200 OK 002)OPTIONS DAV = 1,2 002)OPTIONS SAP_ILM_CONFORMANCE = 2 2 002)OPTIONS SAP_ILM_AL_CONFORMANCE 2 2 003)MKCOL /sap 201 Created 004)MKCOL /sap/tst 201 Created 005)MKCOL /sap/tst/at 201 Created 006)MKCOL abcdefghijklmnopqrstuvwxyz.... 201 Created 007)PUT abcdefghijklmnopqrstuvwxyz_~!.... 201 Created 008)PUT res_0.xml 201 Created 009)PUT res_1.xml 201 Created 010)PUT res_2.xml 201 Created 011)PUT res_3.xml 201 Created 012)PUT res_4.xml 201 Created 013)PUT res_5.xml 201 Created 014)PUT res_6.xml 201 Created 015)PUT res_7.xml 201 Created 016)PUT res_8.xml 201 Created 017)PUT res_9.xml 201 Created							

Figure 14: Expected Output of the Report RILM_STOR_TEST_AT

To clear all table entries, you can use the report RILM_STOR_TEST_CLEAR.

To test the Hadoop communication, you can use the report RILM_STOR_TEST_HADOOP. In the report selection, provide the *DB Connection Name* and *Custom Connection Type* (created in [Connection to the ILM Store \[page 13\]](#)), and execute.



ILM Store: Test for Hadoop Communication	
DB Connection Name	HADOOP_CONNECTION_ID
Custom Connection Type	HADOOP

Figure 15: Selection Screen for the Report RILM_STOR_TEST_HADOOP



```

ILM Store: Test for Hadoop Communication

Transfer data
... Okay

Insert data (move to final storage place)
... Okay
... Checking Root
...»»» CONSYS : HADOOP_CONNECTION_ID@HADOOP
...»»» DATA_SIZE : 20
...»»» FILENAME : /user/[REDACTED]/mmmb.adktmp
... Okay
... Checking Hadoop
...»»» Read Data : Test Data for Hadoop
... Okay

Read data
... Checking Data Content
...»»» Written Data : Test Data for Hadoop
...»»» Read Data : Test Data for Hadoop
... Okay

Read chunk
... Checking Data Content
...»»» Written Data : Test Data for Hadoop
...»»» Offset : 3
...»»» Length : 4

...»»» Read Data : fred
... Okay


Delete data
...»»» DELETE : Item has been deleted
... Okay
  
```

Figure 16: Expected Output of the Report RILM_STOR_TEST_HADOOP

9.3 Application Logs

The application log object for the ILM Store is `ILM_STOR`. To access the logs of all operations performed in the store, start transaction `SLG1` and enter the object as `ILM_STOR`.

9.4 Troubleshooting

If you run into issues, access the troubleshooting [blog](#)  to find a list of common issues.

For further support, raise an incident for the application component `BC-ILM-STO`.

10 References



References	Link
ILM Store on the SAP Help Portal	Link
ILM Store Guide	Installation and Configuration Guide for the ILM Store
Hadoop Configuration Guide	Hadoop Connector Configuration Guide

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