❌ Hardcoding = Manually entering credentials in ADF (not secure).

✅ Best Practice = Store credentials in Key Vault & let ADF fetch them securely.

WHAT AM I DOING:

Data Ingestion from On-Premises SQL Server to Azure Data Lake using Azure Data Factory( USING HARDCODED AUTHENTICATION WITHOUT ANY KEY VALUT):

So to ingest data from onpremise SQL server to Azure Data Lake , first we create an azure data factory in azure resource and the data is loaded into azure data lake g2( which is in cloud now ===IMPORTANT)

STEP1:

Setting Up the SQL Server Connection in ADF

Objective:To create a secure connection between the "on-premises" SQL Server and Azure Data Factory.

AZURE DATA FACTORY======> INSTANCE(BY CLICKING LAUNCH STUDIO)=====>

CONNECTIONS(LINKED SERVICES)========>+

now we can select the linked service we need, here we select AZURE SQL DATABASE

we give name for exmaple i gave Name: hardcoded\_sql\_LS ;

::::::::::::::::::::::::::::::::::::::::IMPORTANT:::::::::::::::::::::::::::::::::::

So here while selecting Connect via integration runtime: we have two options like:

1)AutoResolveIntegrationRuntime : FOR CONNECTING ANY CLOUD BASED SERVICE

2)Integration Runtime : FOR CONNECTING ANY ONPREMISE SERVICE

( To deal with integration run time we have to first allow ADF to communicate with your laptop’s SQL Server:

to do this :

Go to Azure Portal → Open Azure Data Factory.

ADF Cannot Directly Access On-Premises SQL Server

ADF is a cloud service, and your local SQL Server is not directly accessible from the cloud. You need to use an Integration Runtime (IR) to create a bridge between Azure and your local database.

after we have to select ;since i am connecting to on premise service i am now connecting to Integration Runtime

2️⃣ Go to "Manage" (Gear Icon) → Click Integration Runtimes.

3️⃣ Click + New → Select "Self-Hosted" Integration Runtime(if ypu want a new integration rum time).

4️⃣ Click "Download and Install" → Install it on your laptop (where SQL Server is running).

5️⃣ During setup, it will ask for an Authentication Key → Copy it from ADF and paste the key it into the installer.

6️⃣ Once installed, it should show "Running" in Azure.

[[[[[[[ my practice:

Name\*: Hardcoded\_SQL\_LS

Description: Here, we are hardcoding the username and password, which is not secure but is done for learning purposes.

Connect via integration runtime\*: integrationRuntime1

Account selection method:From Azure subscription/Enter manually( select enter manually)

Fully qualified domain name\*: HELLO/SQLEXPRESS

Database name\*:AdventureWorksLT2022

Authentication type\*: SQL authentication

User name\*:lahari

Password\*:..........

chexk the trusted certificate

test connection

So intially when i tested connection here i got an ERROR:

Cannot connect to SQL Database. Please contact SQL server team for further support. Server: 'HELLO/SQLEXPRESS', Database: 'AdventureWorksLT2022', User: 'lahari'. Check the linked service configuration is correct, and make sure the SQL Database firewall allows the integration runtime to access.

A connection was successfully established with the server, but then an error occurred during the login process. (provider: Shared Memory Provider, error: 0 - No process is on the other end of the pipe.)

:::::::::::::::::::::::::ERROR:::::::::::::::::::::::::::::::

No process is on the other end of the pipe

Why Are You Getting This Error?

The error "No process is on the other end of the pipe" usually happens because SQL Server is not allowing the login from Azure Data Factory. Here’s what’s likely causing the issue and how to fix it.

✅ Step-by-Step Fix

1️⃣ Make Sure SQL Server Authentication is Enabled

By default, SQL Server only allows Windows Authentication. Since you are using a SQL login (lahari), you need to enable SQL Server Authentication.

🛠 How to Enable SQL Authentication:

Open SQL Server Management Studio (SSMS) and connect to HELLO\SQLEXPRESS.

Right-click on the server name (HELLO\SQLEXPRESS) → Select "Properties".

Go to the "Security" tab.

Under "Server authentication", select "SQL Server and Windows Authentication mode".

Click OK and restart SQL Server:

Open Services.msc

Find SQL Server (SQLEXPRESS)

Right-click and Restart

🔄 Test again in ADF after this step.

2️⃣ Check If Your User (lahari) Has Proper Permissions

Even if SQL Authentication is enabled, the user lahari might not have permission to log in.

🛠 How to Grant Access to lahari:

In SSMS, go to Security → Logins.

Right-click on lahari → Select "Properties".

Go to "Server Roles" → Check sysadmin (for full access, or public + db\_owner for limited access).

Go to "User Mapping" → Make sure lahari has access to AdventureWorksLT2022.

Click OK and try again.

3️⃣ Ensure TCP/IP is Enabled in SQL Server Configuration

Since ADF runs on your self-hosted integration runtime, it needs to communicate over TCP/IP, not Named Pipes.

🛠 How to Enable TCP/IP:

Open SQL Server Configuration Manager.

Expand SQL Server Network Configuration → Click Protocols for SQLEXPRESS.

Right-click "TCP/IP" → Click "Enable".

Restart SQL Server Service (again from Services.msc).

🔄 Try the connection again in ADF.

4️⃣ Check Windows Firewall and Allow Port 1433

Even if everything is configured, your Windows firewall might be blocking ADF’s access.

🛠 How to Open Port 1433 for SQL Server:

Open Windows Defender Firewall → Click Advanced Settings.

Go to Inbound Rules → Click New Rule.

Select Port → Click Next.

Choose TCP → Type 1433 in "Specific local ports" → Click Next.

Select Allow the connection → Click Next.

Apply to Domain, Private, and Public → Click Next.

Name it SQL Server 1433 → Click Finish.

🔄 Test again in ADF.

🛠 Final Troubleshooting Steps

If the error still persists, try these:

✅ In ADF, change HELLO\SQLEXPRESS to 127.0.0.1,1433 (forcing TCP/IP).

✅ Ensure SQL Browser Service is running in Services.msc.

✅ Manually create the login again in SQL:

sql

Copy

Edit

USE master;

GO

CREATE LOGIN lahari WITH PASSWORD = '9492466919';

GO

USE AdventureWorksLT2022;

GO

CREATE USER lahari FOR LOGIN lahari;

GO

ALTER ROLE db\_owner ADD MEMBER lahari;

GO

🔄 Try reconnecting in ADF after these steps.

🚀 Summary

✅ Enable SQL Server Authentication.

✅ Grant lahari login permissions in SQL Server.

✅ Enable TCP/IP in SQL Server Configuration Manager.

✅ Allow Port 1433 in the Firewall.

✅ Try connecting with 127.0.0.1,1433 instead of HELLO\SQLEXPRESS.

After i tried this step 1 i got error again when i am testing the connection: now i am going to verify step 2

AFTER STEP 2 : Updated user permissions in SQL Server Management Studio (SSMS):

Security → Logins → lahari → Server Roles → sysadmin.

Security → Logins → lahari → User Mapping → Assigned access to AdventureWorksLT2022.

=================================> AFTER I DID STEP 2 I GOT SUCCEEDED<================================

TEST CONNECTION IS SUCCESSFUL.

PART 2:::::::::::::::::::::Creating THE AZURE STORAGE GEN 2 AS A LINKED SERVICEE::::::::::::::::::

here we use the autoresolve integration runtime because the stirage account here we create as a linked \

service in azure data factory doesnot belong to the on premises so we use AutoResolveRunTime

Account Selection Method

From Azure Subscription ✅ (Recommended)

ADF will automatically detect the storage accounts you have access to.

Easier because you don’t need to manually type storage details.

Enter Manually (Only if required)

You would use this if the storage account is in a different subscription.

Requires you to manually enter the

NOTE: [[[[[ THE SECOND TIME I VISITED AFTER CREATION I OBSERVED THERE IS A STORAGEKEY AND URL WITHOUT

ENTERING THEM FIRST TIME]]]]]]]]

PART 3: CREATING Copy Data Pipeline in ADF

here we have options like: author , monitor, manage, learning center

AUTHOR

To copy data from SQL Server into Azure Data Lake Storage Gen2.

Steps:

Created a new dataset for the source SQL table.

Navigated to Author → Datasets → + New.

Selected Azure SQL Database.

Linked Service: Hardcoded\_SQL\_LS

Selected SalesLT.Customer table.

Created a new Linked Service for Azure Data Lake Storage.

Navigated to Connections → Linked Services → + New.

Selected Azure Data Lake Storage Gen2.

Name: Azure\_DATALAKE\_LS

Authentication Type: Account Key.

Storage Account Name: Selected manually.

Successfully tested the connection.

Configured Sink Dataset:

Navigated to Author → Datasets → + New.

Selected Azure Data Lake Storage Gen2.

Chose DelimitedText format (.txt file).

Configured file path: /AdventureWorks/SalesLT.Customer.txt.

Encountered Error:

"The specified container name 'Adventureworks' contains invalid characters."

Resolution:

Renamed the container to adventureworks (all lowercase).

Updated file path accordingly.

Successfully re-tested connection.

Created and Ran the Copy Data Pipeline:

Navigated to Author → Pipelines → + New.

Added a Copy Data Activity.

Configured Source as SQL\_Source\_Dataset.

Configured Sink as DelimitedText1 (pointing to ADLS Gen2).

Selected integrationRuntime1 for execution.

Pipeline Name: Copy\_SQL\_To\_DataLake

Execution Time: 32 seconds

Status: ✅ Succeeded