**AWS GLUE**

**1. Introduction to AWS Glue**

AWS Glue is a serverless data integration service that allows you to discover, prepare, move, and integrate data from multiple sources for analytics, machine learning, and application development.

**2. Key Steps Performed in AWS Glue**

**🔹 Step 1: Set Up IAM Role**

* Create an IAM role with policies for:
  + S3 access(AWSS3FULLACCESS)
  + CloudWatch Logs
  + AWS Glue permissions (e.g., AWSGlueServiceRole)
* Trust relationship should include the Glue service:  
  "Service": "glue.amazonaws.com",

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**🔹 Step 2: Create or Use an Existing S3 Bucket**

* Upload your data sources (CSV, JSON, Parquet, etc.).
* This will be used for both input and output data in ETL jobs.

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**🔹 Step 3: Set Up Glue Data Catalog**

* **Crawlers**: Automatically scan your data and create tables.
  + Configure:
    - Data store location (S3, JDBC, etc.)
    - IAM role
    - Schedule (optional)
    - Output database

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**🔹 Step 4: Create a Glue Job**

* Choose the source and target tables.
* Select the job type: Spark (for ETL) or Python shell (for lightweight scripting).
* Configure:
  + Script file name
  + Glue version
  + Worker type and number of workers (e.g., G.1X or G.2X)
  + Job bookmark (to handle incremental loads)

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**🔹 Step 5: Edit and Customize the ETL Script**

* AWS Glue auto-generates PySpark code.
* You can customize:
  + Transformations (e.g., DropFields, RenameField, ResolveChoice)
  + Business logic using DynamicFrame and DataFrame APIs

**🔹 Step 6: Test and Run the Job**

* Validate script syntax.
* Monitor the job via:
  + AWS Console
  + CloudWatch logs
  + Glue job metrics

**🔹 Step 7: Monitor and Debug**

* Use Glue Console → Jobs → Logs to inspect execution logs.
* Use metrics dashboard to monitor:
  + Success/failure rate
  + Execution time
  + Data read/write volumes

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**🔹 Step 8: Schedule Jobs with Triggers**

* Create triggers to:
  + Run jobs on a schedule
  + Chain jobs based on completion
  + React to AWS events (event-based triggers)

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**RUN AWS GLUE ON LOCAL MACHIN USING DOCKER**

[**https://docs.aws.amazon.com/glue/latest/dg/aws-glue-programming-etl-libraries.html**](https://docs.aws.amazon.com/glue/latest/dg/aws-glue-programming-etl-libraries.html)

**To test scripts locally:**

**🔸 Step 1: Install Docker**

**🔸 Step 2: Pull the Glue ETL Docker Image**

**bash**

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**docker pull amazon/aws-glue-libs:glue\_libs\_4.0.0\_image\_01**

**🔸 Step 3: Run Docker Container**

**bash**

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**docker run -it amazon/aws-glue-libs:glue\_libs\_4.0.0\_image\_01 /bin/bash**

**🔸 Step 4: Set Up Local Python Environment**

* **Glue libraries are pre-installed.**
* **Use Jupyter or VSCode to run .py scripts with DynamicFrame and DataFrame.**

**🔸 Step 5: Test Your Glue Scripts**

* **Run your ETL scripts locally before deploying to AWS Glue.**
* **Connect to local or mock S3 and JDBC endpoints if required.**

**For more:** [**AWS Glue Local Development**](https://docs.aws.amazon.com/glue/latest/dg/aws-glue-programming-etl-libraries.html)