Article
Anton Umnikov · Oct 17, 2019 5m read

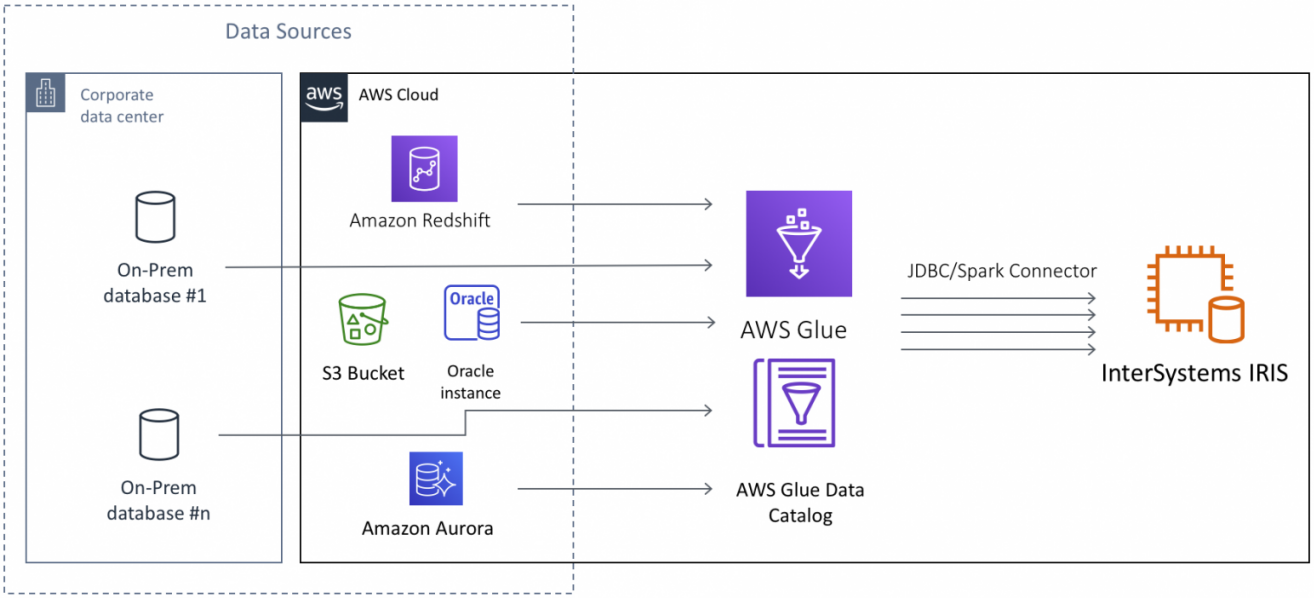
Using AWS Glue with InterSystems IRIS

October 17, 2019

Anton Umnikov
Sr. Cloud Solutions Architect at InterSystems
AWS CSAA, GCP CACE

AWS Glue is a fully managed ETL (extract, transform, and load) service that makes it simple and cost-effective to categorize your data, clean it, enrich it, and move it reliably between various data stores.

In the case of InterSystems IRIS, AWS Glue allows moving large amounts of data from both Cloud and on-Prem data sources into IRIS. Potential data sources include, but not limited to on-Pem databases, CSV, JSON, Parquet and Avro files residing in S3 buckets, Cloud-native databases such as AWS Redshift and Aurora and many others.



This article assumes that you have the basic familiarity with AWS Glue, at least at the level of completing AWS Glue Getting Started tutorials. We will concentrate on the technical aspects of configuring AWS Glue Jobs to use InterSystems IRIS as a Data Target, or in other terms - "data sink".

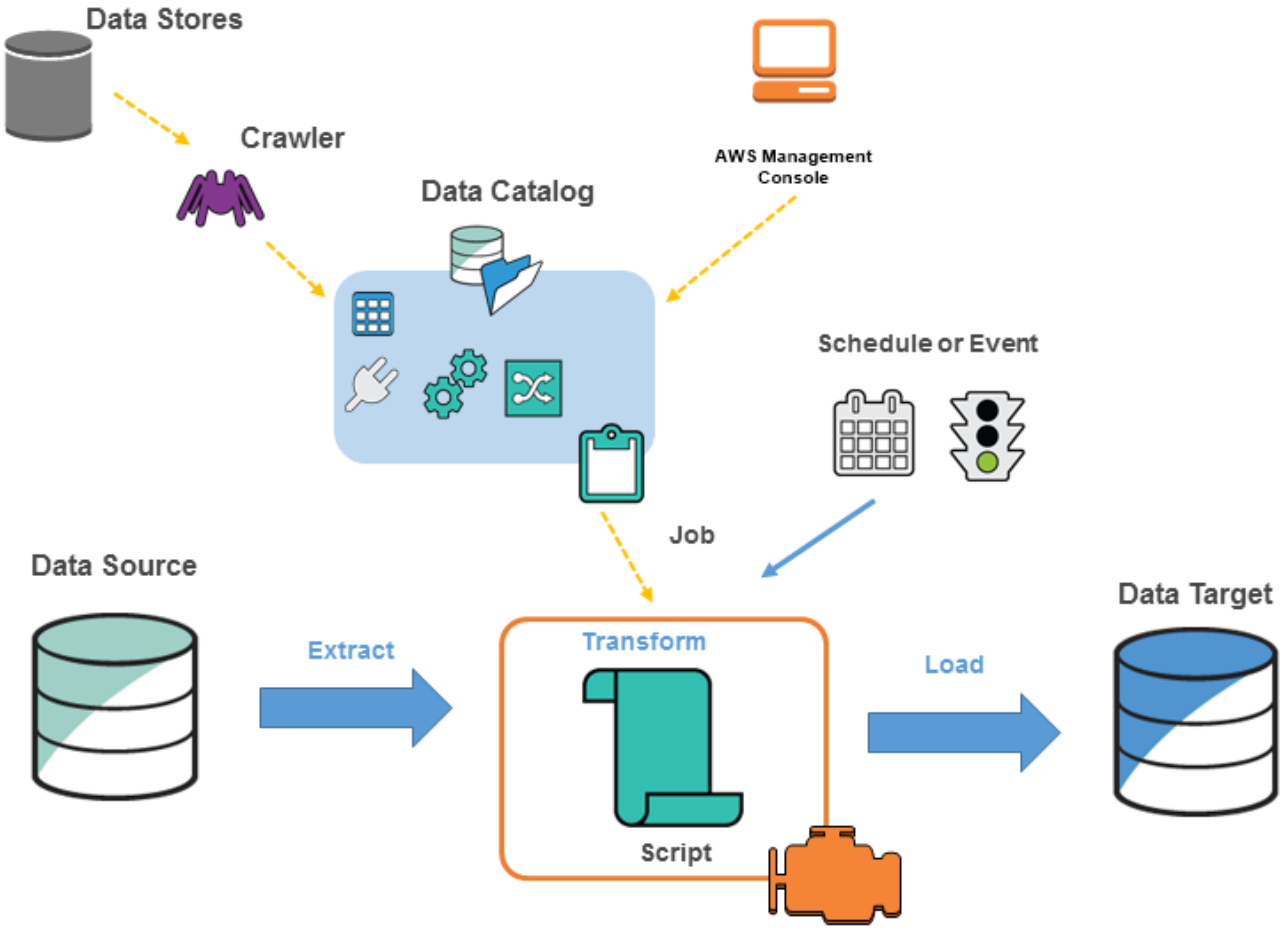


Image from https://docs.aws.amazon.com/glue/latest/dg/components-key-concepts.html

AWS Glue Jobs are run in a "Serverless" manner. All the resources, required for performing the job are dynamically provisioned by AWS only for the time the job is actually running and immediately destroyed the moment the job is completed, so instead of provisioning, managing and incurring ongoing costs for the required infrastructure you are being billed only for the time job is actually running and spend you efforts only on writing the Job code. At the "idle" time - no resources are consumed, other than S3 buckets, storing the job code and configuration.

While multiple options are available, typically Glue Jobs are executed on dynamically provisioned Apache Spark and written in PySpark code. Glue Job contains the *"Extract"* portion, where data is being extracted from data sources, series of *"Transformations",* build using Glue API and finally the *"Load"* or *"sink"* part, where after final transformation data is being written to the target system.

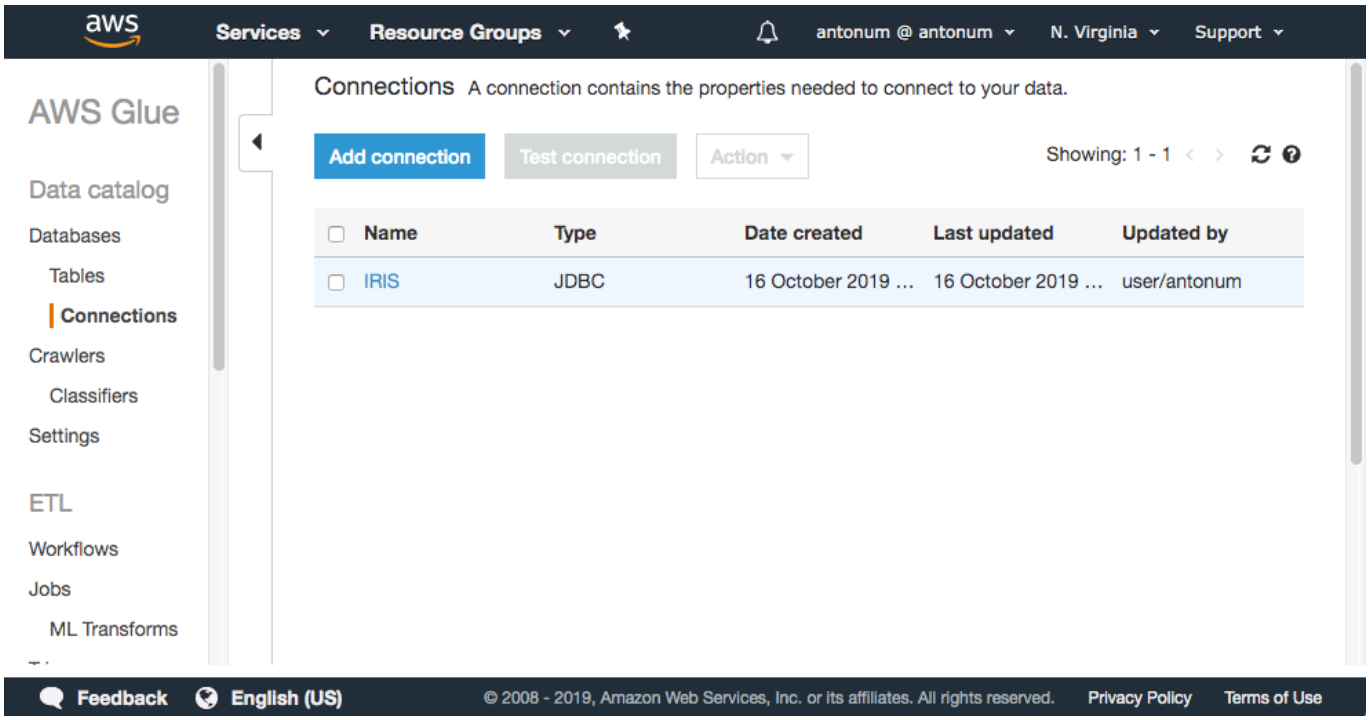
In order to enable AWS Glue to interact with IRIS we need to ensure the following:

- Glue has network access to the IRIS instances involved
- IRIS JDBC driver JAR file is accessible to the Glue Job
- Glue Job is using API, compatible with InterSystems IRIS JDBC

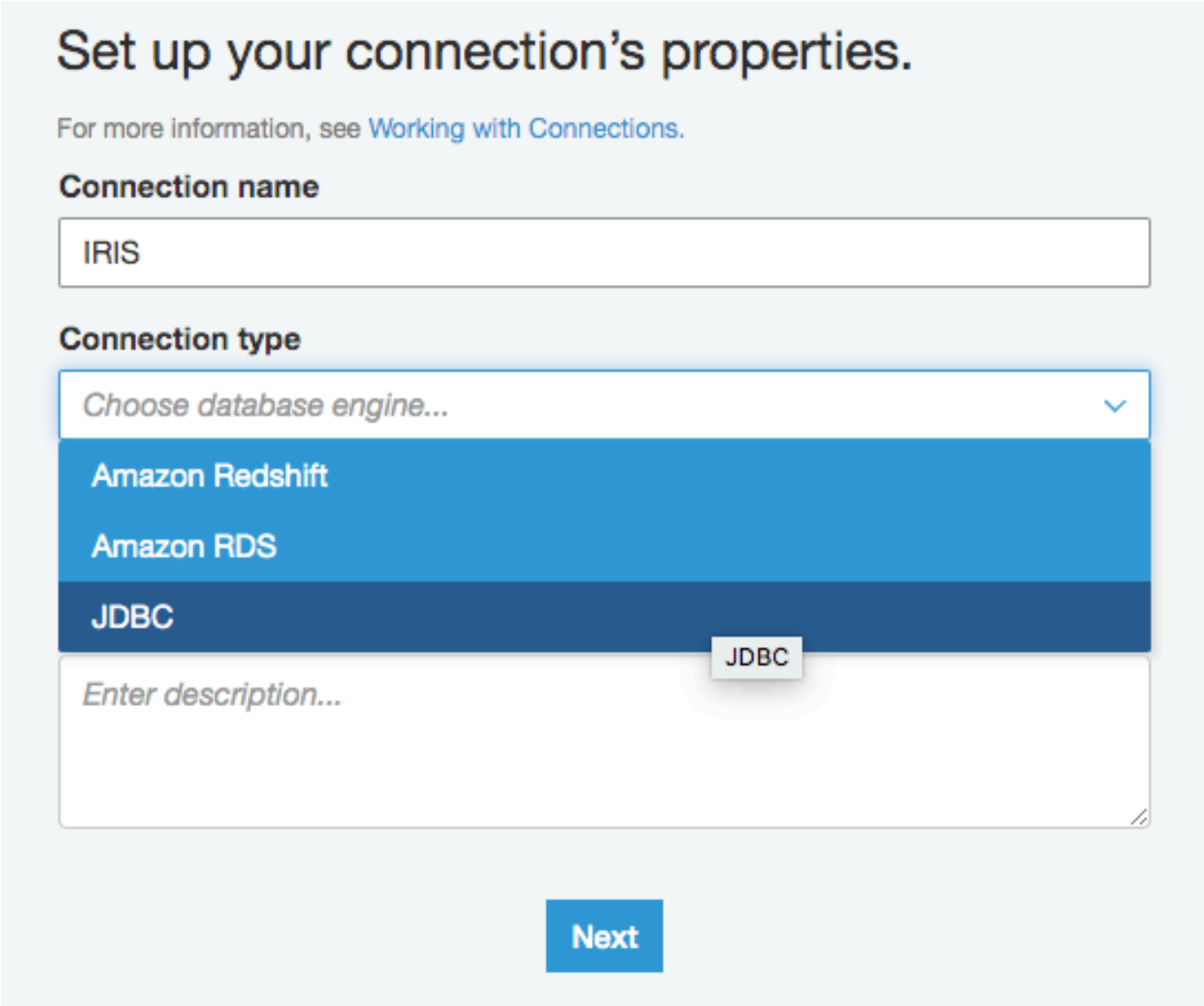
Let's examine each of the required steps.

Create IRIS Connection

In AWS Console select AWS Glue->Connections->Add Connection



Enter the name of your connection and select "JDBC" for Connection Type.



In JDBC URL enter JDBC connection string for your IRIS instance, username and password information.

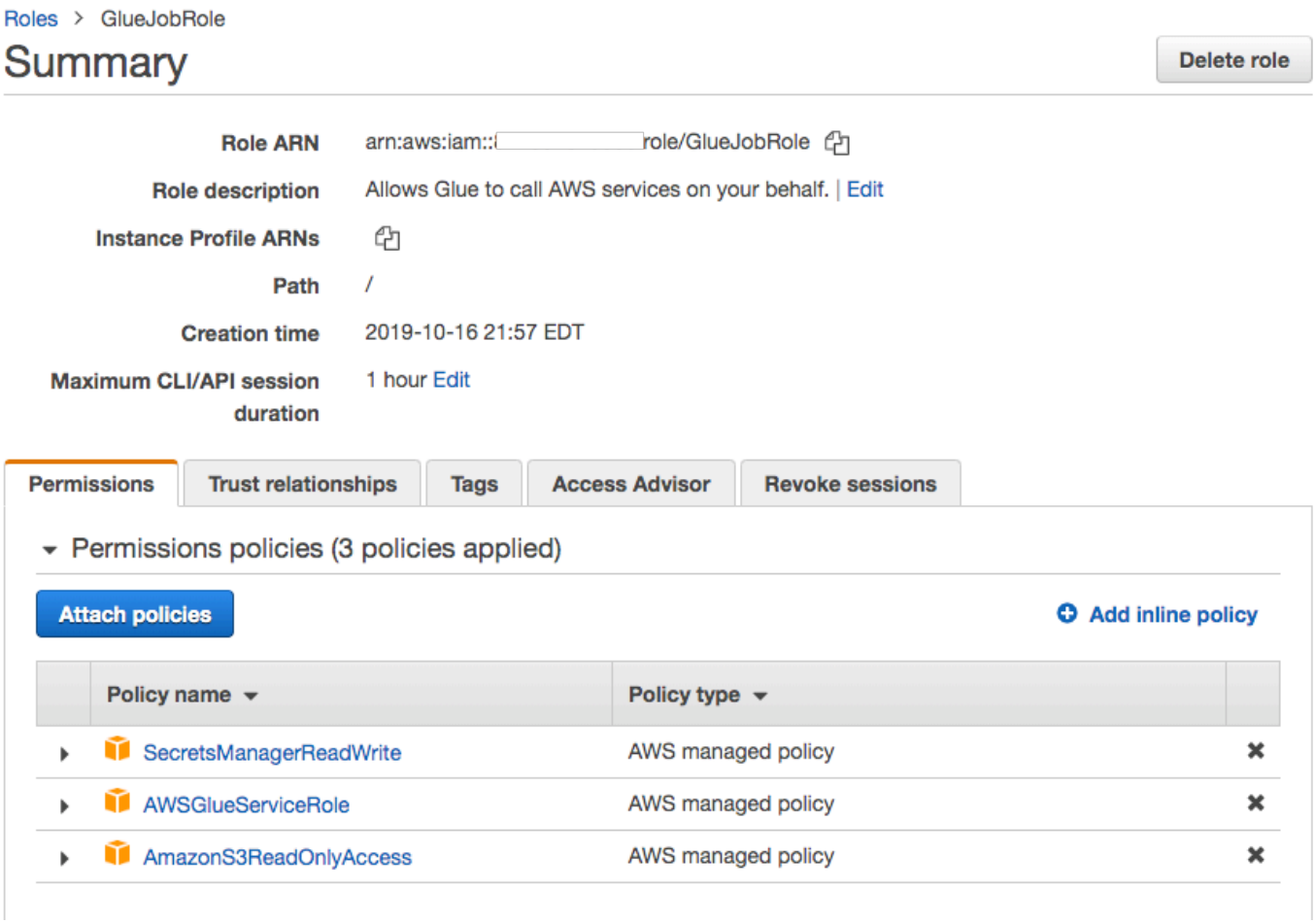
The next step is crucial - ***you need to make sure that Glue places its endpoints into the same VPC as your IRIS instance.*** Select VPC and Subnet of your IRIS instance. Any security group with a self-referencing inbound rule for all TCP ports would do here. For instance - your IRIS Instance security group.

IAM Role with access to JDBC driver

If you haven't done it already - upload IRIS JDBC driver JAR file intersystems-jdbc-3.0.0.jar into S3 bucket. In this example, I'm using s3://irisdistr bucket. It would be different for your account.

You need to ***create IAM Role for your Glue Job, that can access that file,*** along with other S3 buckets that Glue would use to store scripts, logs etc.

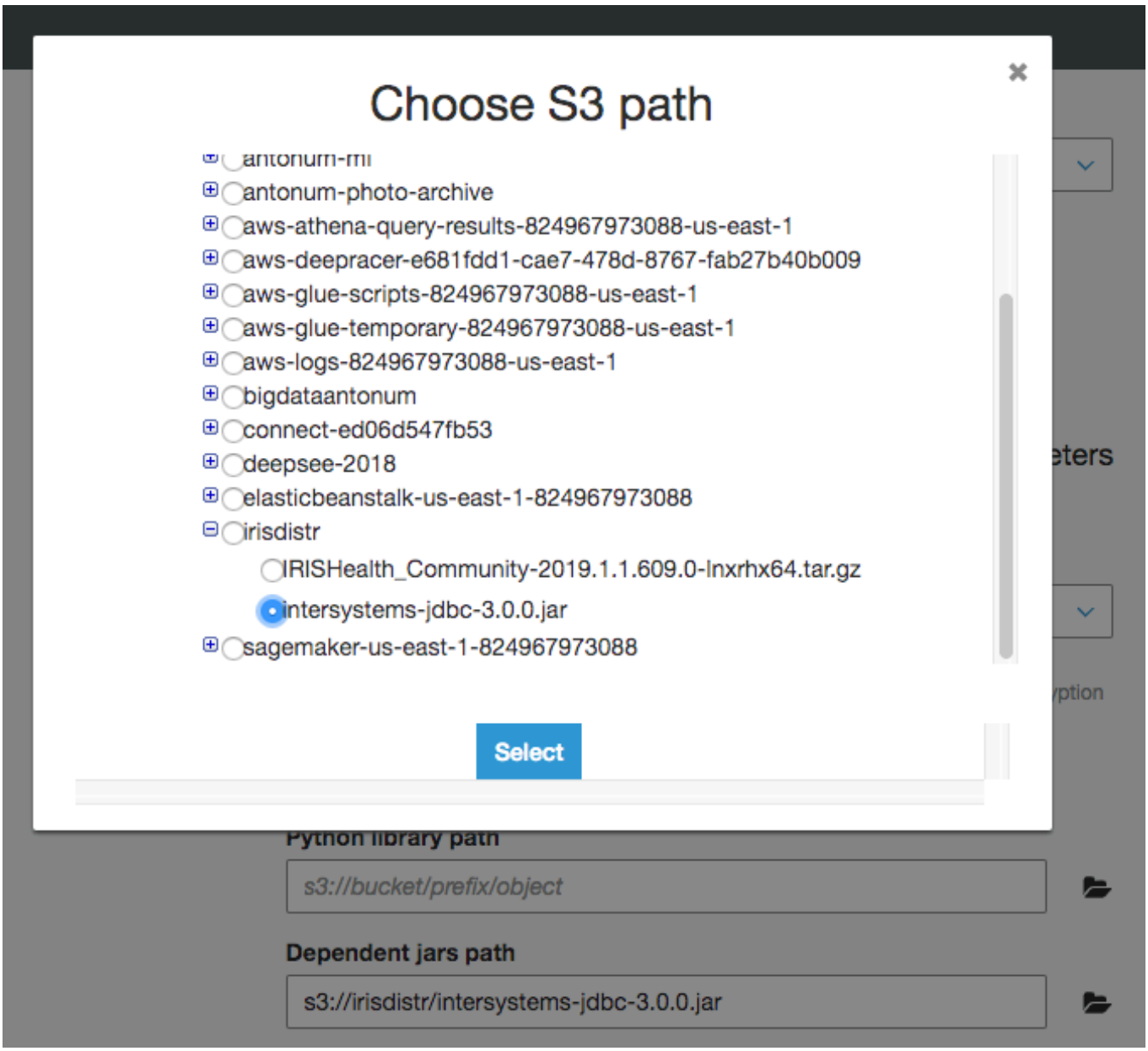
Make sure it has the read access to the bucket of your JDBC driver. In this case, we granting this role (GlueJobRole) ReadOnly access to all buckets, along with predefined AWSGlueServiceRole. You might choose to further limit this role permissions.



Create and configure Glue Job

Create a new Glue Job. Select IAM Role, we created in the previous step. Leave everything else default.

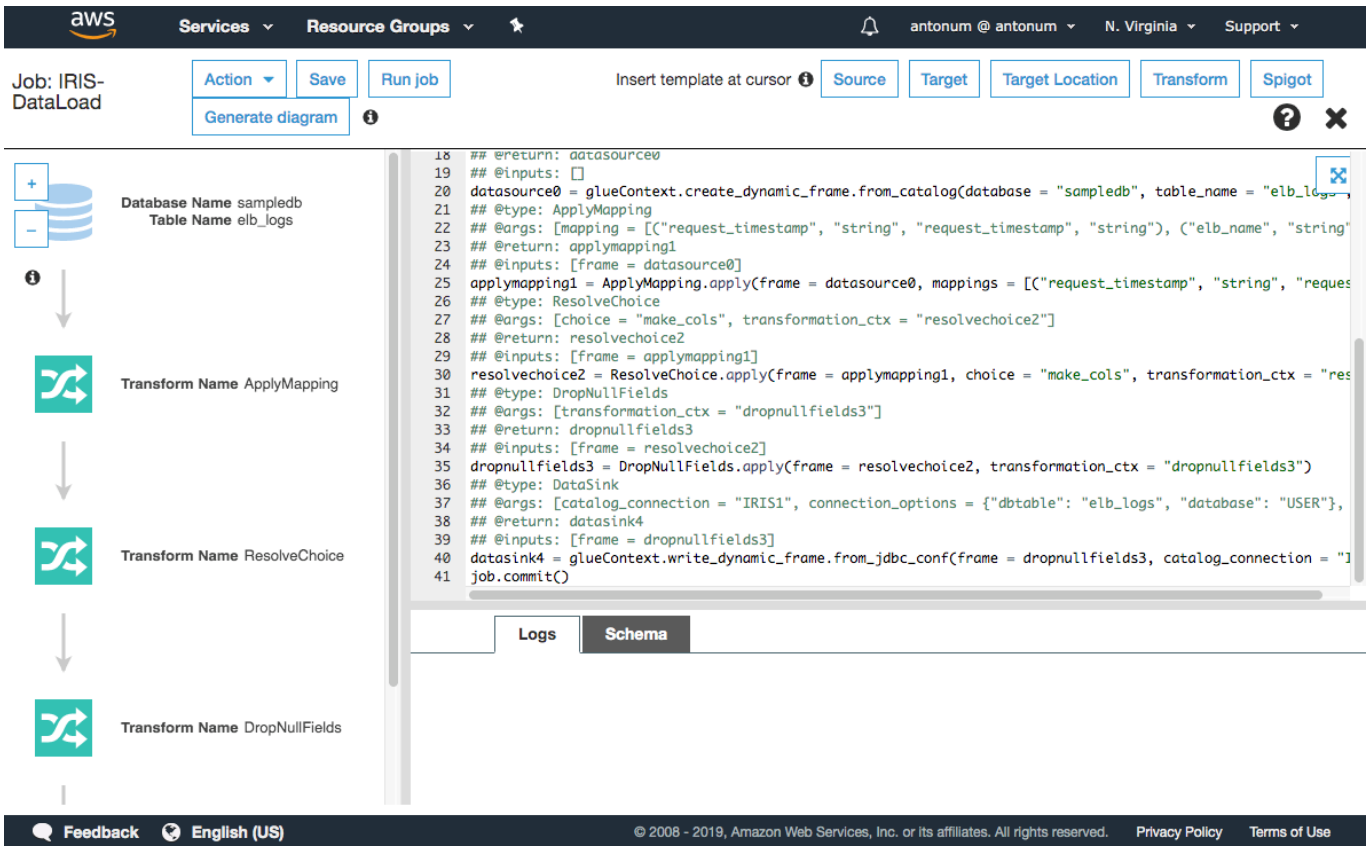
Under "Security configuration, script libraries, and job parameters (optional)" set "Dependent jars path" to the location of the intersystems-jdbc-3.0.0.jar in the S3 bucket.



For Source - use one of your pre-existing data sources. If you followed tutorials, referenced above you'll have at least one already.

Use "Create tables in your data target" option and select IRIS connection you've created in the previos step. Leave everything else default.

If you followed us up until now you should arrive at the screen similar to this:



Almost there!!! We just need to make one simple change to the script in order to load data into IRIS.

Adjusting the script

The script that Glue generated for us uses AWS Glue Dynamic Frame - AWS proprietary extension to Spark. While it provides some benefits for ETL jobs it also ensures that you can't write data to any database that AWS don't have managed service offering for.

Good news - at the point of writing the data to the database all the benefits of Dynamic Dataframe such as no schema enforcement for "dirty" data are not required anymore (at the point of writing data is presumed to be "clean") and we can easily convert Dynamic Dataframe to Spark native Dataframe that is not limited to AWS managed targets and can work with IRIS.

So the line we need to change is line #40 on the picture above. One before last.

Here is the change we need to make:

```
#datasink4 = glueContext.write_dynamic_frame.from_jdbc_conf(frame = dropnullfields3,
catalog_connection = "IRIS1", connection_options = {"dbtable": "elb_logs", "database"
: "USER"}, transformation_ctx = "datasink4")
dropnullfields3.toDF().write \
    .format("jdbc") \
    .option("url", "jdbc:IRIS://172.30.0.196:51773/USER/") \
    .option("dbtable", "orders") \
    .option("user", irisUsername) \
    .option("password", irisPassword) \
    .option("isolationlevel","NONE") \
    .save()
```

Where irisUsername and irisPassword are the username and passwords for your IRIS JDBC connection.

Note: *storing passwords in the source code is a big No No! We'll encourage you to use tools like* AWS Secrets Manager *for that, but going into this level of the security details is beyond the scope of this article. Here is the good* article *on using AWS Secrets Manager with AWS Glue.*

Now hit "Run Job" button, sit back and relax while AWS Glue is doing ETL for you.

Well... more than likely you'll hit some errors at first... We all know how it works. A typo here, a wrong port in security group there... AWS Glue uses CloudWhatch to store all the execution and error logs.
Browse */aws-glue/jobs/error* and */aws-glue/jobs/output* log groups to identify what went wrong.

Happy ETLing in the cloud!

-Anton

#AWS #Best Practices #Big Data #Cloud #Databases #Python #SQL #InterSystems IRIS