Apache Flink Getting Started

Experiment 4: Simple Flink Table

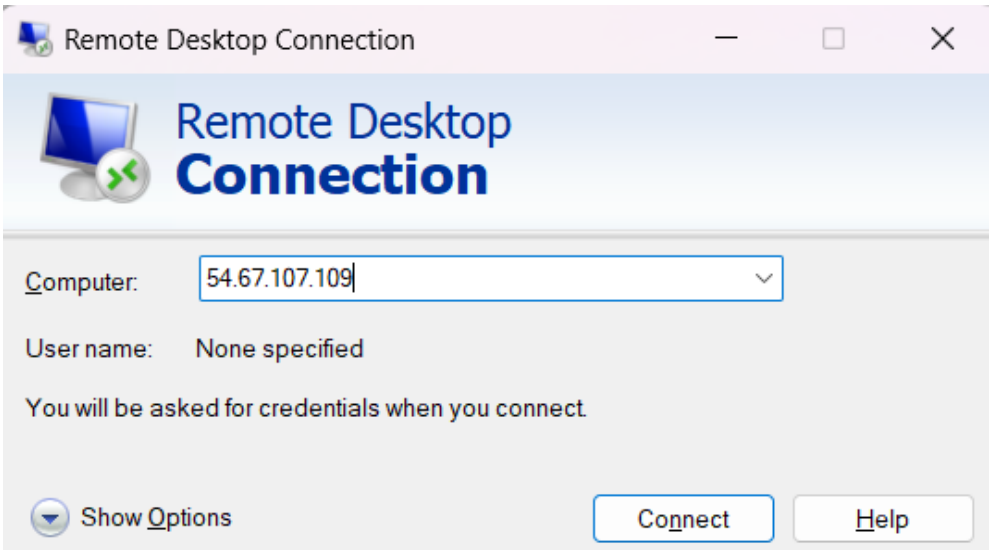
1.1 Steps to run next first Flink Program

1.1.1 Browse to the GitHub repo that you cloned. This should be cloned to your Windows Jump Box and the Flink Development Server
https://github.com/GeorgeNiece/flink-data-processing-2day

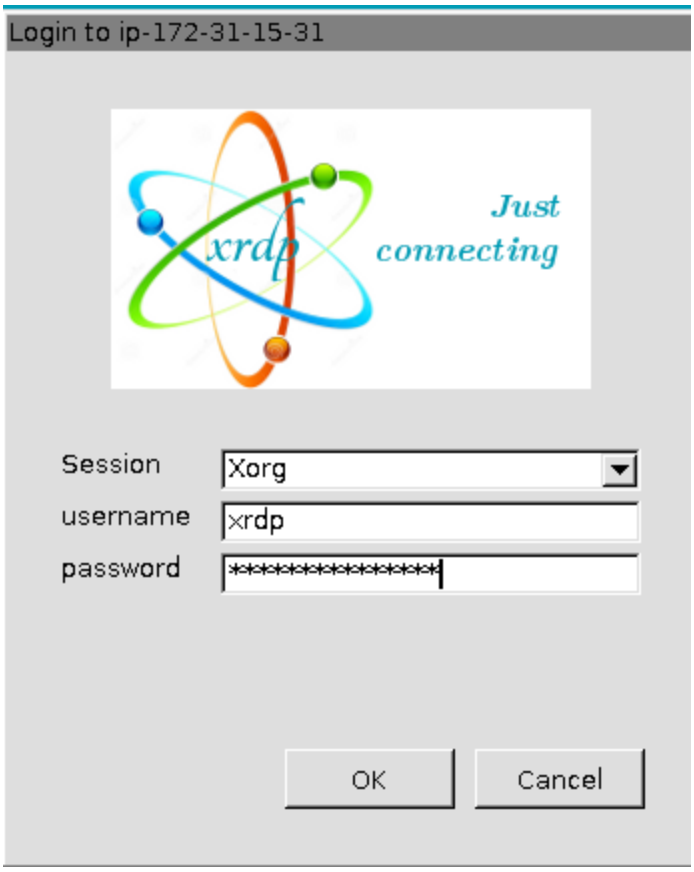
1.1.2 From a command prompt on your jumpbox machine SSH to the Unbuntu server
ssh -o ServerAliveInterval=180 -o ServerAliveCountMax=2 -i ansible.pem ubuntu@*ip_address_provided*

1.1.4 Change to the flink folder, verify Flink isn't started, start the Flink dev cluster, and verify that it started

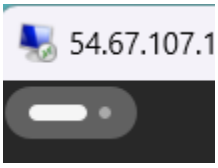
ps -ef | grep flink
cd ~/flink-2.0.0
./bin/start-cluster.sh
ps -ef | grep flink



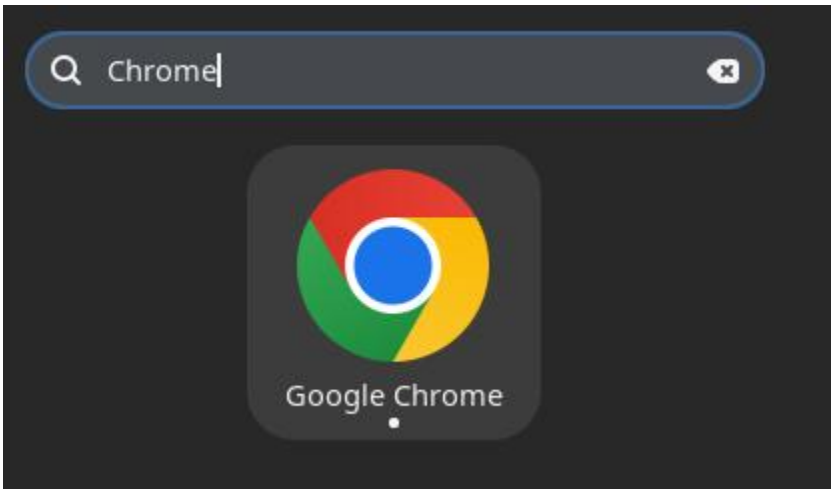
1.1.5 Login to the ubuntu dev sandbox using Windows RDP with the xrdp user and the password that you set in Step 1.14



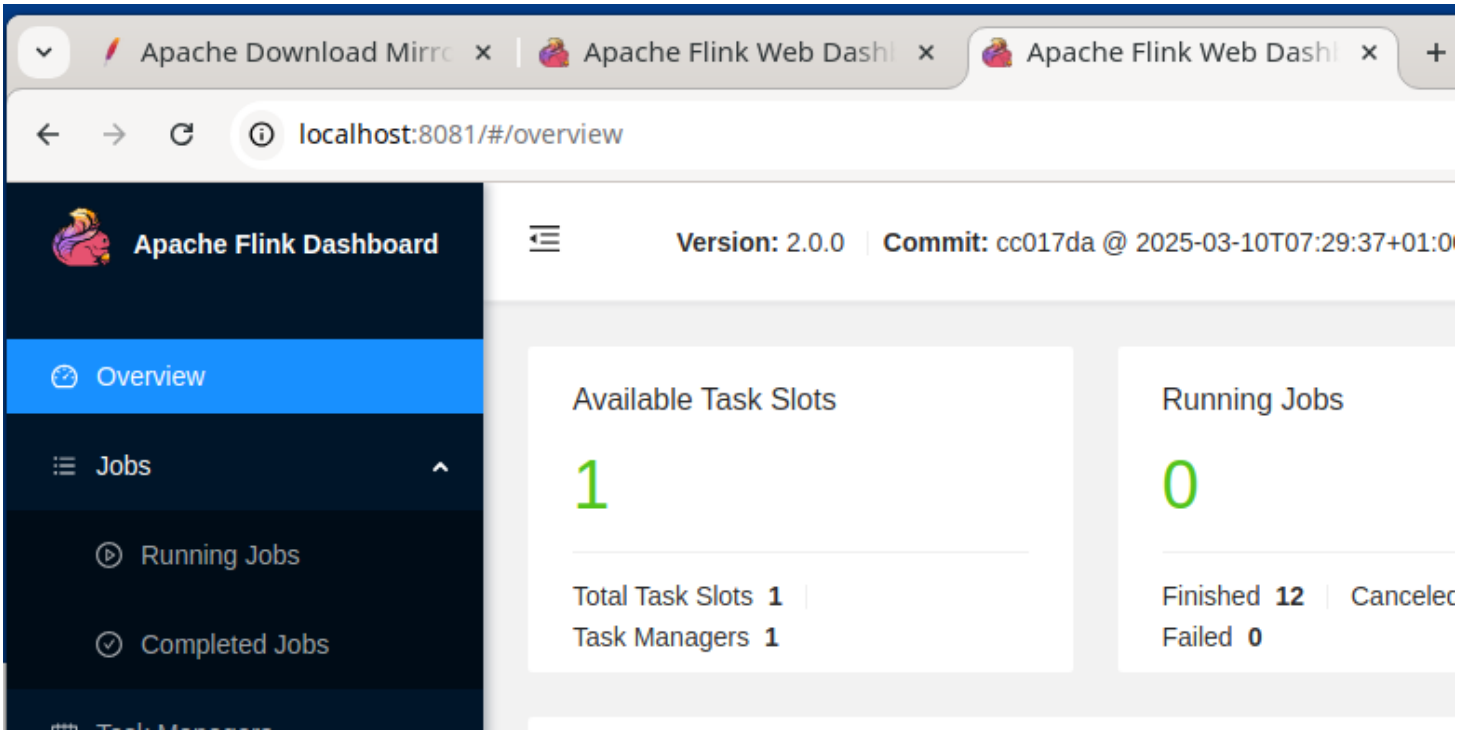
1.1.6 Click the Activities button in the top left corner of the Ubuntu Desktop



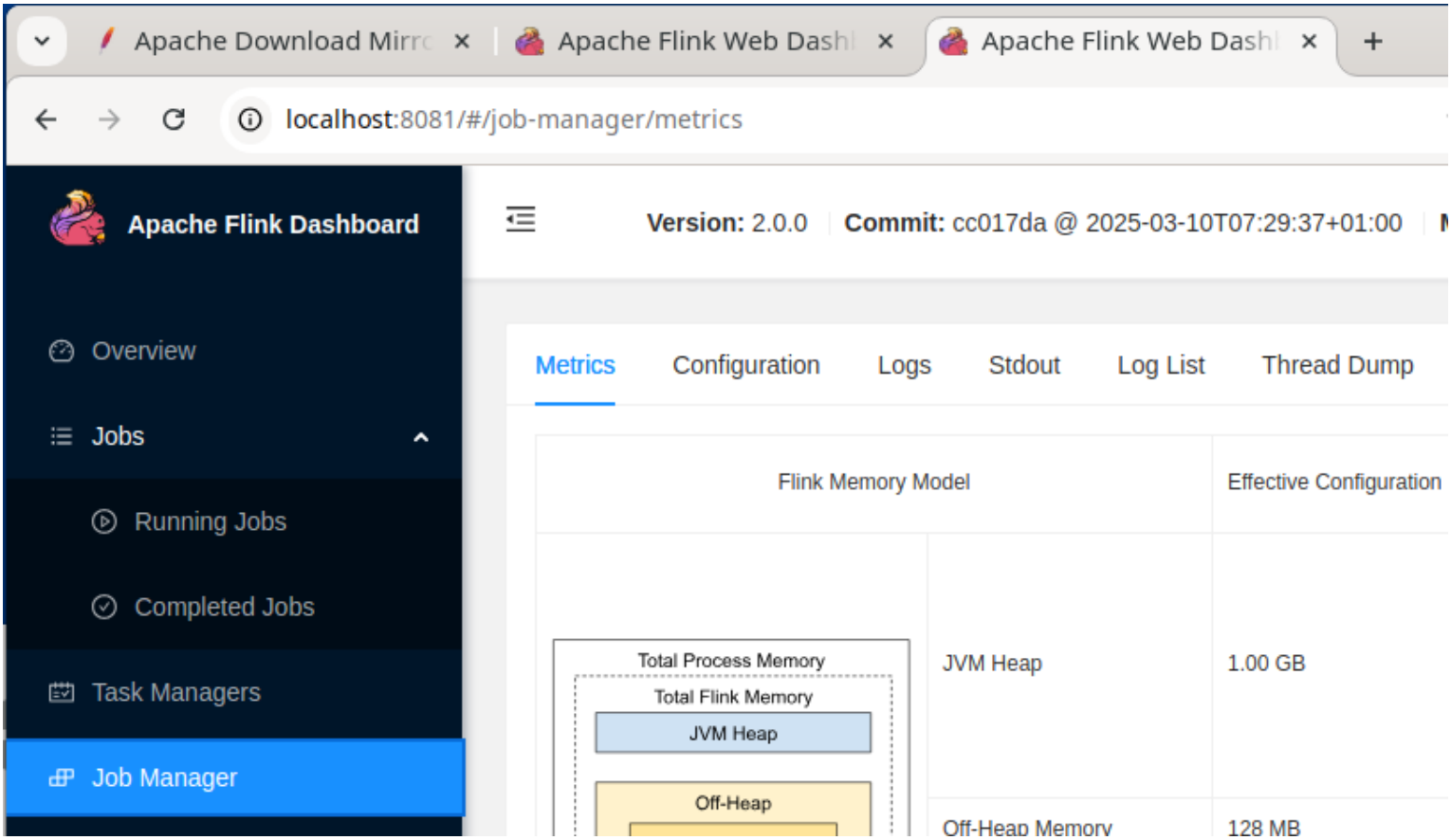
1.1.7 Wait for the Search Box at the top of the Ubuntu Desktop, and enter Chrome, click on the Launch Logo



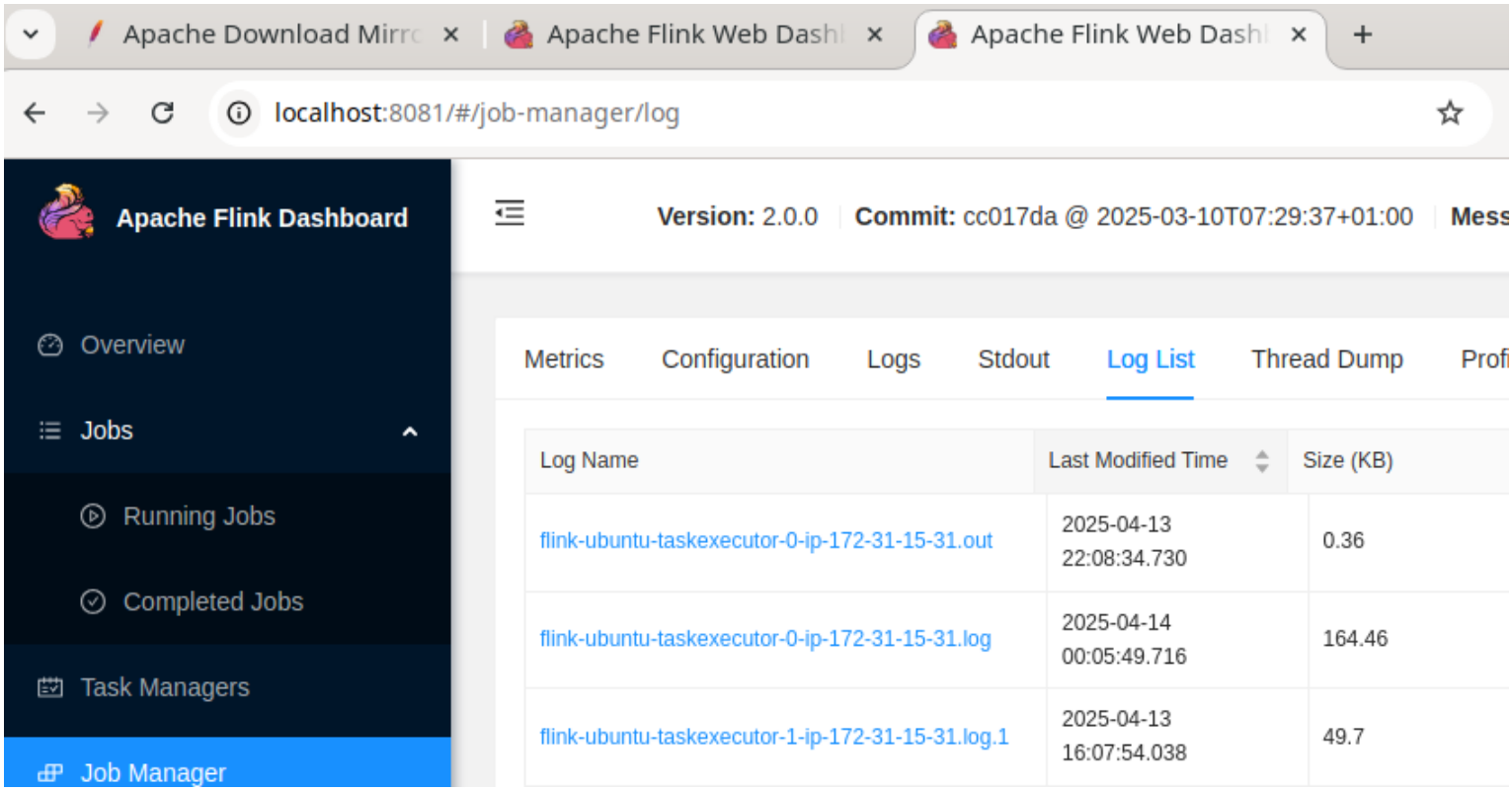
1.1.8 Load the Flink Web UI at localhost:8081



1.1.9 Click the Job Manager in the left hand navigation



1.1.10 Select Log List in the page navigation. These are the logs we'll monitor while we're running some of our experiments



1.1.11 The first flink-ubuntu-taskexecutor*.out file will be the one we spend the most time looking at. Select that so that we can view there. We could open two browser tabs and watch the Jobs -> Running Jobs page while we run our first experiment.

1.1.12 Navigate back to the SSH terminal to the flink distribution folder

cd ~/flink-2.0.0
./bin/flink run ~/flink-data-processing-2day/experiments/built/SimpleFlinkTable.jar

This should show us with the Job submission, Program execution finished, JobID and the Job Runtime, and output back to the invocation, rather than the log file stdout. We see the customer count and the average birth year that's been calculated.

```
ubuntu@ip-172-31-78-140:~/flink-2.0.0$ ./bin/flink run ~/flink-data-
Job has been submitted with JobID e288078e3ec826297418c2358867d98f
+----------------------+----------------------+
|  number of customers |   average birth year |
+----------------------+----------------------+
|                    6 |                 1979 |
+----------------------+----------------------+
1 row in set
Job has been submitted with JobID 27447b0f8e7d834d0f96a134538547da
SUCCESS!
```

We can view the logs to see the last written with the unix command **`ls -alrt`**

1.2 Steps to build your next Flink Program

1.2.1 We have the source for the Flink program in both the flink-project structure and the executable jar. **SimpleFlinkTable** uses the Table API to create a source from a collection then truncate the data to remove the last three columns. Then we calculate the count of the customers and the average birth year. We compare our output similar to what we'd do with a unit test or a deep health check and see that it was successful, since we see SUCCESS! In the output.

1.2.2 To compile from command line with Java you would need to reference the flink distribution jar files in your classpath, either directly as noted here or in a build tool like Maven or Gradle. A sample POM file is included in our course GitHub repo in the flink-project

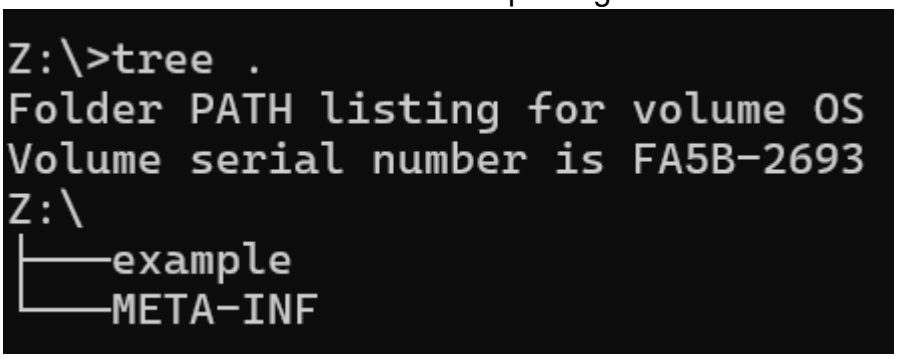
1.2.3 To compile from command line with Java you would need to reference the flink distribution jar files in your classpath, either directly as noted here or in a build tool like Maven or Gradle. A sample POM file is included in our course GitHub repo in the flink-project

```
javac -classpath C:\lib-2.0\flink-cep-2.0.0.jar;C:\lib-2.0\flink-
connector-files-2.0.0.jar;C:\lib-2.0\flink-csv-2.0.0.jar;C:\lib-
2.0\flink-dist-2.0.0.jar;C:\lib-2.0\flink-json-2.0.0.jar;C:\lib-
2.0\flink-scala_2.12-2.0.0.jar;C:\lib-2.0\flink-table-api-java-
uber-2.0.0.jar;C:\lib-2.0\flink-table-planner-loader-
2.0.0.jar;C:\lib-2.0\flink-table-runtime-2.0.0.jar;C:\lib-
2.0\log4j-1.2-api-2.24.1.jar;C:\lib-2.0\log4j-api-
2.24.1.jar;C:\lib-2.0\log4j-core-2.24.1.jar;C:\lib-2.0\log4j-
slf4j-impl-2.24.1.jar;C:\lib-2.0\flink-streaming-java-
1.20.1.jar;C:\lib-2.0\flink-runtime-2.0.0.jar;
example/SimpleFlinkTable.java
```

1.2.4 To package the executable jar for the Flink program we create a MANIFEST.MF that we'll use in the packaging, notice that the

```
Manifest-Version: 1.0
Implementation-Title: Flink : Examples : Simple Table
Implementation-Version: 2.0.0
Archiver-Version: Plexus Archiver
Built-By: geoniece
Specification-Vendor: Innovation in Software
Specification-Title: Flink : Examples : Simple Table
Implementation-Vendor-Id: com.innovationinsoftware
program-class: example.SimpleFlinkTable
Implementation-Vendor: Innovation in Software
Created-By: Apache Maven 3.8.6
Build-Jdk: 1.11.0_312
Specification-Version: 2.0.0
```

1.2.5 We have a folder structure with our package



1.2.6 To package the executable jar for our Flink program we do the following

Ubuntu-@ip-172.15.50.23:~$ **jar --manifest=META-INF/MANIFEST.MF --create --file c:\users\Geo\SimpleFlinkTable.jar example/***

1.2.7 **Congratulations, time to celebrate** you ran another Flink program in our session