

Using spark-submit drop-in migration tool for migrating Spark workloads to CDE

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Using spark-submit drop-in migration tool for migrating Spark workloads to CDE

Cloudera Data Engineering (CDE) provides a command line tool `cde-env` to help migrate your CDP Spark workloads running on CDP Private Cloud Base (spark-on-YARN) and Data Hub to CDE without having to completely rewrite your existing `spark-submit` command-lines.

Supported platforms

You can use the migration tool in the following platforms:

- Linux
- MacOS
- Windows (Docker only)

You can use the migration tool either by installing it on a gateway host or running it as a docker container.

Using the `cde-env` tool

You can run the `spark-submit` command after installing the `cde-env` tool. You can use the `cde-env` tool even without administrator privileges.

You can activate the specific profile you want to use by running the following command:

```
$ cde-env.sh activate -p <profile-name>
```

For example, to alternatively run the the same `spark-submit` command either against YARN or one of the CDE virtual cluster, you can activate the relevant profile:

1. Run spark jobs on YARN by activating the `yarn` profile. `yarn` is a reserved profile name here.

```
$ cde-env.sh activate -p yarn
```

2. Run spark jobs on a CDE virtual cluster configured by CDE CLI profile named `vc-1`:

```
$ cde-env.sh activate -p vc-1
```

Switching profiles back and forth this way lets you run the same `spark-submit` command either against YARN or one of the CDE virtual clusters.

Run sample `spark-submit` command

After you activate the profile using the `cdp-env` tool, you can run your `spark-submit` commands on CDE without completely rewriting your existing `spark-on-yarn` command lines.

- Sample `spark-submit` commands you can run on the CDE workloads.

```
$ spark-submit \  
--name pt_rpt_streams \  
--master=yarn --deploy-mode=cluster \  
--driver-memory 4G \  
--executor-memory 4G --executor-cores 3 \  
--num-executors 4 \  
--files "$HOME/spark-sql.py" \  
--conf "spark.executor.extraJavaOptions=-  
Djava.security.auth.login.config=/home/hdpsparkprd/spark-
```

```
hdpsparkprdkeytab-jaas.conf -Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--conf "spark.driver.extraJavaOptions=-Djava.security.auth.login.config=/
home/hdpsparkprd/spark-hdpsparkprdkeytab-jaas.conf
-Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--co
nf "spark.io.compression.codec=org.apache.spark.io.LZ4CompressionCodec" \
$HOME/spark-sql.py
```

```
$ spark3-submit \
--name pt_rpt_streams \
--master=yarn --deploy-mode=cluster \
--driver-memory 4G \
--executor-memory 4G --executor-cores 3 \
--num-executors 4 \
--files "$HOME/spark-sql.py" \
--conf "spark.executor.extraJavaOptions=-
Djava.security.auth.login.config=/home/hdpsparkprd/spark-
hdpsparkprdkeytab-jaas.conf -Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--conf "spark.driver.extraJavaOptions=-Djava.security.auth.login.config=/
home/hdpsparkprd/spark-hdpsparkprdkeytab-jaas.conf
-Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--c
onf "spark.io.compression.codec=org.apache.spark.io.LZ4CompressionCodec" \
$HOME/spark-sql.py
```

- Sample spark-submit commands with an inline profile configuration you can run on the CDE workloads.

```
$ CDE_CONFIG_PROFILE=yarn \
spark-submit \
--name pt_rpt_streams --master=yarn \
--deploy-mode=cluster --driver-memory 4G \
--executor-memory 4G --executorcores 3 \
--num-executors 4 --files "$HOME/spark-sql.py" \
--conf "spark.executor.extraJavaOptions=-
Djava.security.auth.login.config=/home/hdpsparkprd/spark-
hdpsparkprdkeytab-jaas.conf -Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--conf "spark.driver.extraJavaOptions=-Djava.security.auth.login.config=/
home/hdpsparkprd/spark-hdpsparkprdkeytab-jaas.conf
-Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--c
onf "spark.io.compression.codec=org.apache.spark.io.LZ4CompressionCodec" \
$HOME/spark-sql.py
```

```
$ CDE_CONFIG_PROFILE=vc-1 \
spark3-submit \
--name pt_rpt_streams \
--master=yarn --deploy-mode=cluster \
--driver-memory 4G --executor-memory 4G \
--executor-cores 3 --num-executors 4 \
--files "$HOME/spark-sql.py" \
--conf "spark.executor.extraJavaOptions=-
Djava.security.auth.login.config=/home/hdpsparkprd/spark-
hdpsparkprdkeytab-jaas.conf -Djava.security.krb5.conf=/etc/krb5.conf -
Djavax.security.auth.useSubjectCredsOnly=true" \
--conf
```

```
"spark.driver.extraJavaOptions=-Djava.security.auth.login.config=/home/
hdpsparkprd/spark-hdpsparkprdkeytab-jaas.conf -Djava.security.krb5.conf=/
etc/krb5.conf -Djavax.security.auth.useSubjectCredsOnly=true" \
--c
onf "spark.io.compression.codec=org.apache.spark.io.LZ4CompressionCodec" \
$HOME/spark-sql.py
```

Using the migration tool in a docker container

You can run the docker image in an interactive mode after you mount the config.yaml and credentials files into the docker container.

Run the migration tool in a docker container

Mount the config.yaml and credentials files into the docker container and run the docker image in the interactive mode. You have to activate the tool after running the tool before you run `spark-submit` commands.

Procedure

1. Run the docker tool.

```
$ docker run -it \
-v <path-to-yaml-file>/config.yaml:/home/cdpuser1/.cde/config.yaml:ro \
-v <path-to-credential-file>/credentials:/home/cdpuser1/.cde/credentials:
ro \
<customers-docker-registry-for-cdp-private-cloud>/cloudera/dex/dex-migr
ation-tool:<tag>
```

Example:

```
$ docker run -it \
-v /Users/cdp-compute-cluster/cdpuser1/config.yaml:/home/cdpuser1/.cde/co
nfig.yaml:ro \
-v /Users/cdpuser1/credentials:/home/cdpuser1/.cde/credentials:ro \
docker-registry.example.com/cloudera/dex/dex-migration-tool:1.19.1-b185
```

2. Activate the profile.

```
$ cde-env.sh activate -p vc-1
```

Run sample spark-submit command inside the docker container

After you activate the docker image, you can run your `spark-submit` commands on CDE without completely rewriting your existing `spark-on-yarn` command lines inside the docker container.

- Sample `spark-submit` commands you can run on the CDE workloads.

```
$ spark-submit --name pt_rpt_streams5 --master=yarn --deploy-mode=cluste
r --driver-memory 4G --executor-memory 4G --executor-cores 3 --num-execu
tors 4 --conf spark.yarn.queue=hr --conf "spark.executor.extraJavaOption
s=-Djava.security.auth.login.config=/home/hdpsparkprd/spark-hdpsparkprd-
keytab-jaas.conf -Djava.security.krb5.conf=/etc/krb5.conf -Djavax.securi
ty.auth.useSubjectCredsOnly=true" --conf "spark.driver.extraJavaOptions=
-Djava.security.auth.login.config=/home/hdpsparkprd/spark-hdpsparkprd-ke
ytab-jaas.conf -Djava.security.krb5.conf=/etc/krb5.conf -Djavax.security
.auth.useSubjectCredsOnly=true" --conf "spark.io.compression.codec=org.a
```

```
apache.spark.io.LZ4CompressionCodec" --class org.apache.spark.examples.Sp  
arkPi http://qe-repo.s3.amazonaws.com/dex/app-jar/spark-examples_2.11-2.  
4.4.jar 22
```

Known Issues and Limitations

This page lists the current known issues and limitations that you might run into while using the cde-env tool.

- Limited to spark-submit commands and does not include spark-shell, pyspark, and sparksql.
- When activating a profile using the cde-env.sh script, there is no validation yet on whether such profile exists. However, if a profile does not exist, it will display an error when running the spark-submit command.
- The following spark-submit flags are not yet supported in CDE:
 - --archives
 - --exclude-packages
 - --driver-class-path
 - --driver-library-path
 - --driver-java-options

You are instead suggested to create CDE jobs to handle the above mentioned scenarios.

- Using the profile yarn is not supported in the container version of the migration tool.