Cloudera Data Engineering 1.23.0

Spark Connect Sessions (Technical Preview)

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Contents

Spark Connect Sessions

You can learn what a Spark Connect Session is, certain known limitations, and the supported Runtime component versions.

What a Spark Connect Session is

A session is an interactive short-lived development environment for running Spark commands. A Spark Connect Session is a type of CDE Session that exposes the Spark Connect interface. A Spark Connect Session allows you to connect to Spark from any remote Python environment.

Spark Connect allows you to connect remotely to the Spark clusters. Spark Connect is an API that uses the DataFrame API and unresolved logical plans as the protocol. The separation between client and server allows Spark and its open ecosystem to be leveraged from everywhere. It can be embedded in modern data applications, in IDEs and Notebooks. For more information about Spark Connect, identify the Spark version in your Virtual Cluster, and navigate to the relevant *Spark Connect Overview* page linked to that Spark version in the Spark documentation.

Supported versions of Cloudera Runtime components

Ensure that you are using Spark 3.5.1 before you use Spark Connect Sessions.

Limitations

Spark Connect Sessions do not support the following:

- Profile support: Spark Connect does not support profiles in the configuration files even though the CDE clients support "Profiles" in the configuration files.

Configuring Spark Connect Sessions

Learn about how to configure a Spark Connect Session with CDE.

Before you begin

Before you create a Spark Connect Session, perform the following steps:

1. Enable a Cloudera Data Engineering service .
2. Create a CDE Virtual cluster. You must select All Purpose (Tier 2) in the Virtual Cluster option and Spark 3.5.1 as the Spark version.

Procedure

1. Perform the following steps on each user's machine:
   a) Create the ~/.cde/config.yaml configuration file and add the vcluster-endpoint and cdp-endpoint parameters. This allows the client machine to identify a virtual cluster. For more information, see vcluster-endpoint and cdp-endpoint.

      For example,

      ```
      cdp-endpoint: https://console-cdp.apps.example.com
      credentials-file: /Users/user1/.cde/credentials
      vcluster-endpoint: https://ffws6v27.cde-c9b822vr.apps.example.com/dex/
      api/v1
      ```

b) Create an access key and update the credentials-file parameter in the ~/.cde/config.yaml configuration file with the path where the credentials file is located. This allows the client machine to acquire the short-lived access tokens.

Note: Access keys configured with the default profile are supported.

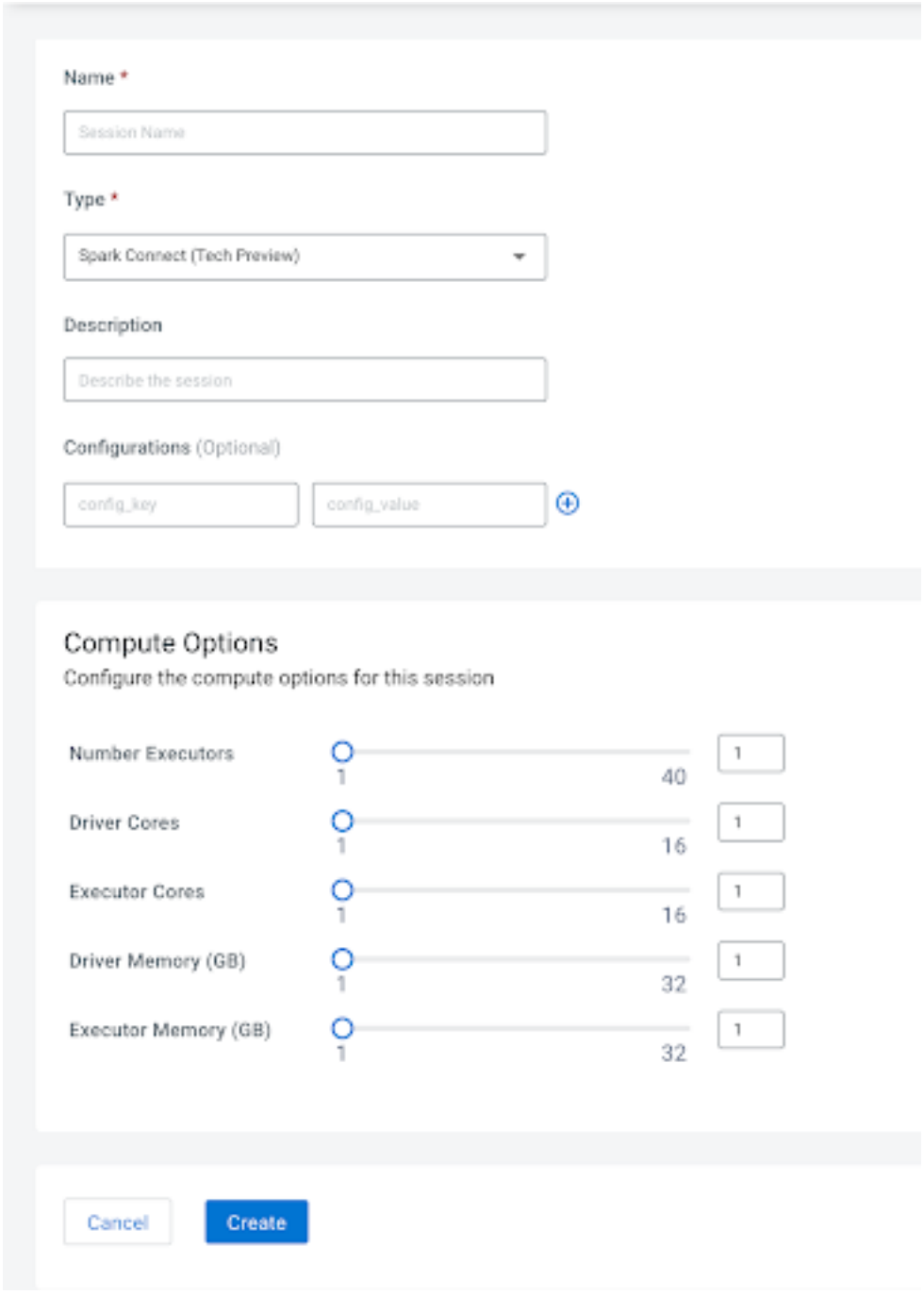
For example,

```
[default]
cdp_access_key_id=571ff....
cdp_private_key=dvbYd....
```

2. Create a Spark Connect Session using one of the following methods:

   Note: You can interact with a Spark Connect session that only you have created.

   - Using the UI: Create a new session as per Creating Sessions in Cloudera Data Engineering but when you select the session type, select Spark Connect (Tech Preview) from the Type drop-down list.



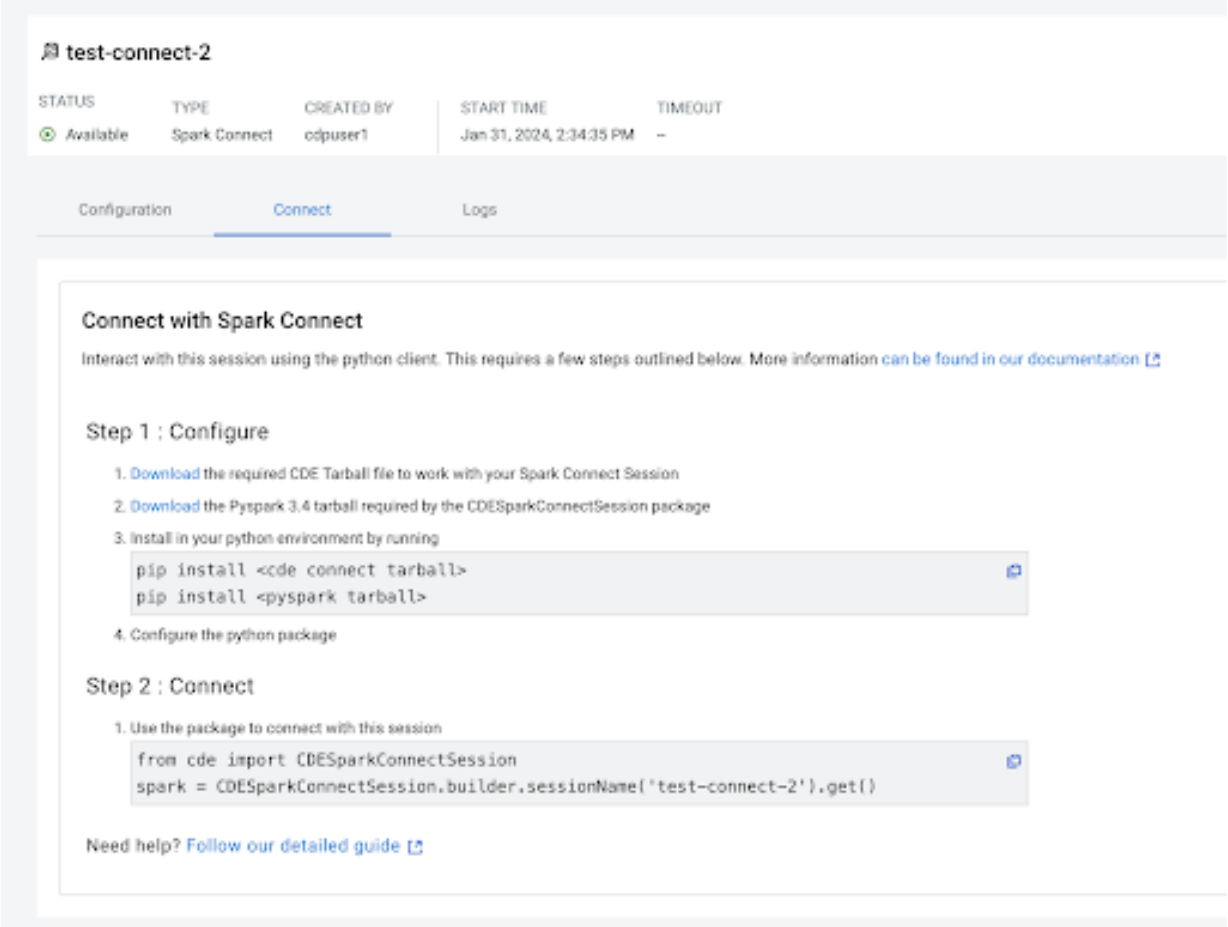
   - Using the CLI: Create a Spark Connect Session by running the following command:

```
cde session create --name [***SPARK-SESSION-NAME***] --type spark-connec
t
```

Note:

To get all the attributes of a cde session command, run the `cde session -h` command.

3. On the CDE Home page, click Sessions and then select the Spark Connect Session that you have created.
4. Go to the Connect tab and download the required CDE TAR file and PySpark TAR file as displayed on the screen.



Note:

- The Copy Link option can be used to retrieve a URL and download the client using cURL.
- The PySpark TAR file version must be same as the Virtual Cluster's Spark version.

5. Create a new Python virtual environment or use your existing one and install the TAR file after activating your Python virtual environment.

```
python3 -m venv cdeconnect
. cdeconnect/bin/activate

pip install [***CDECONNECT TARBALL***]
pip install [***PYSPARK TARBALL***]
```

Sample code to connect to Spark Connect Session

After configuring Spark Connect Sessions, learn how you can run the CLI commands from a remote Python host to connect to a session and execute Spark SQL commands through an example.

You can use the following sample code to connect to the Spark Connect session. Use the spark variable to interact with Spark as you connect to the CDE jobs or sessions.

```
> python
Python 3.9.13 (main, Jul 29 2022, 12:22:24)
[Clang 13.0.0 (clang-1300.0.27.3)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> from cde import CDESparkConnectSession
>>> spark = CDESparkConnectSession.builder.sessionName('connect-session').ge
t()
>>> spark.version
'3.4.1.1.20.7180.0-33'
>>> spark.sql("use retaildb").show()
++
||
++
++

>>> spark.sql("select * from products_external").show()
+----------+------------------+--------------------+------------------+
------------+--------------------+
|product_id|product_category_id|        product_name|product_description|pro
duct_price|       product_image|
+----------+------------------+--------------------+------------------+--
----------+--------------------+
|         1|                 2|Quest Q64 10 FT. ...|                  |
     59.98|http://images.acm...|
|         2|                 2|Under Armour Men'...|                  |
     129.99|http://images.acm...|
|         3|                 2|Under Armour Men'...|                  |
     89.99|http://images.acm...|
|         4|                 2|Under Armour Men'...|                  |
     89.99|http://images.acm...|
|         5|                 2|Riddell Youth Rev...|                  |
    199.99|http://images.acm...|
|         6|                 2|Jordan Men's VI R...|                  |
     134.99|http://images.acm...|
|         7|                 2|Schutt Youth Recr...|                  |
     99.99|http://images.acm...|
|         8|                 2|Nike Men's Vapor ...|                  |
    129.99|http://images.acm...|
|         9|                 2|Nike Adult Vapor ...|                  |
      50.0|http://images.acm...|
|        10|                 2|Under Armour Men'...|                  |
     129.99|http://images.acm...|
|        11|                 2|Fitness Gear 300 ...|                  |
    209.99|http://images.acm...|
|        12|                 2|Under Armour Men'...|                  |
    139.99|http://images.acm...|
|        13|                 2|Under Armour Men'...|                  |
     89.99|http://images.acm...|
|        14|                 2|Quik Shade Summit...|                  |
     199.99|http://images.acm...|
|        15|                 2|Under Armour Kids...|                  |
     59.99|http://images.acm...|
|        16|                 2|Riddell Youth 360...|                  |
    299.99|http://images.acm...|
|        17|                 2|Under Armour Men'...|                  |
    129.99|http://images.acm...|
|        18|                 2|Reebok Men's Full...|                  |
      29.97|http://images.acm...|
|        19|                 2|Nike Men's Finger...|                  |
    124.99|http://images.acm...|
```

```
|        20|                   2|Under Armour Men'...|                    |
    129.99|http://images.acm...|
+----------+--------------------+--------------------+--------------------+-
------------+--------------------+
only showing top 20 rows
```

Troubleshooting errors when working with Spark Connect Session

While working with the Spark Connect Sessions in Cloudera Data Engineering (CDE), you might encounter errors. Learn how you can troubleshoot those errors.

Condition

If the session is killed or the driver exits due to an error when the code is being executed, Spark Connect shows the following error.

```
pyspark.errors.exceptions.connect.SparkConnectGrpcException: <_MultiThreaded
Rendezvous of RPC that terminated with:
 status = StatusCode.UNKNOWN
 details = "Stream removed"
 debug_error_string = "UNKNOWN:Error received from peer  {grpc_message:"Str
eam removed", grpc_status:2, created_time:"2024-01-31T13:28:23.35214+05:30"}
"
>
```

Remedy

Procedure

Check the actual error from the session driver logs using UI or CDE CLI.