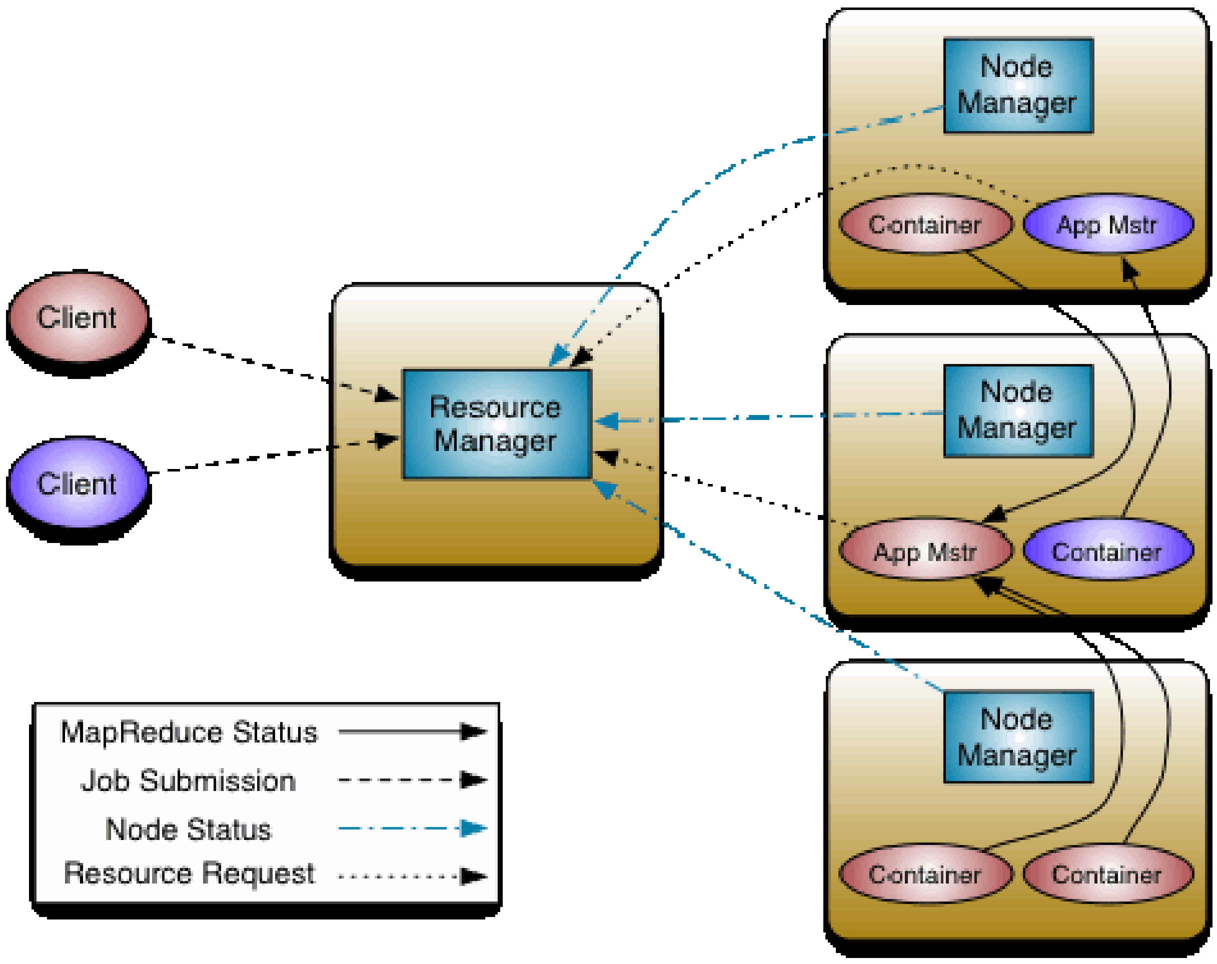
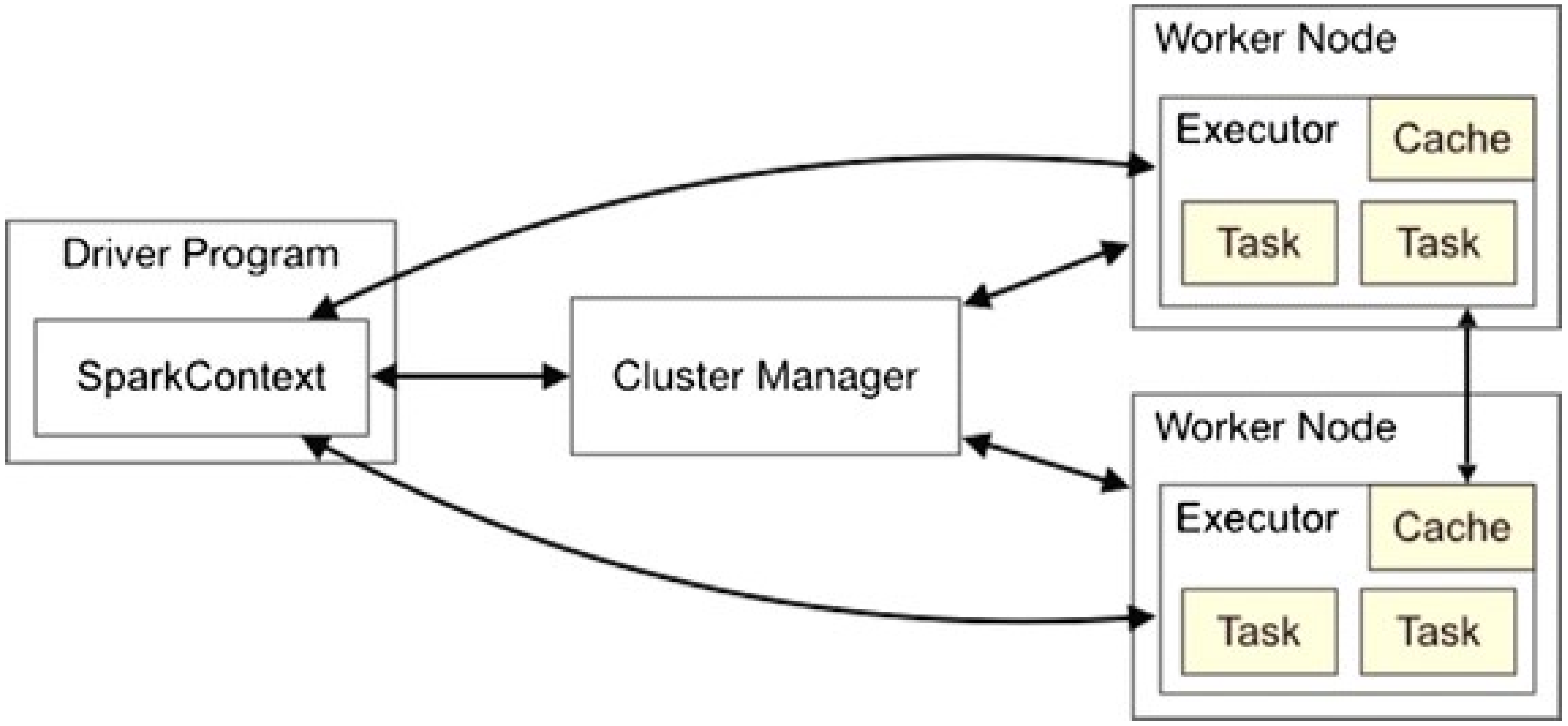
An Introduction to Apache Spark

Spark Architecture

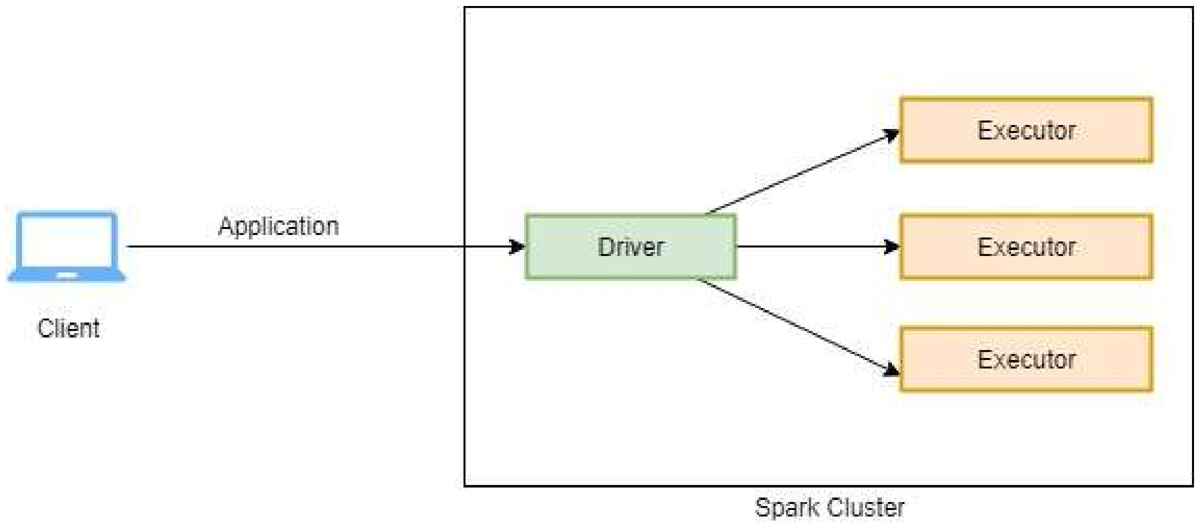


Spark Architecture

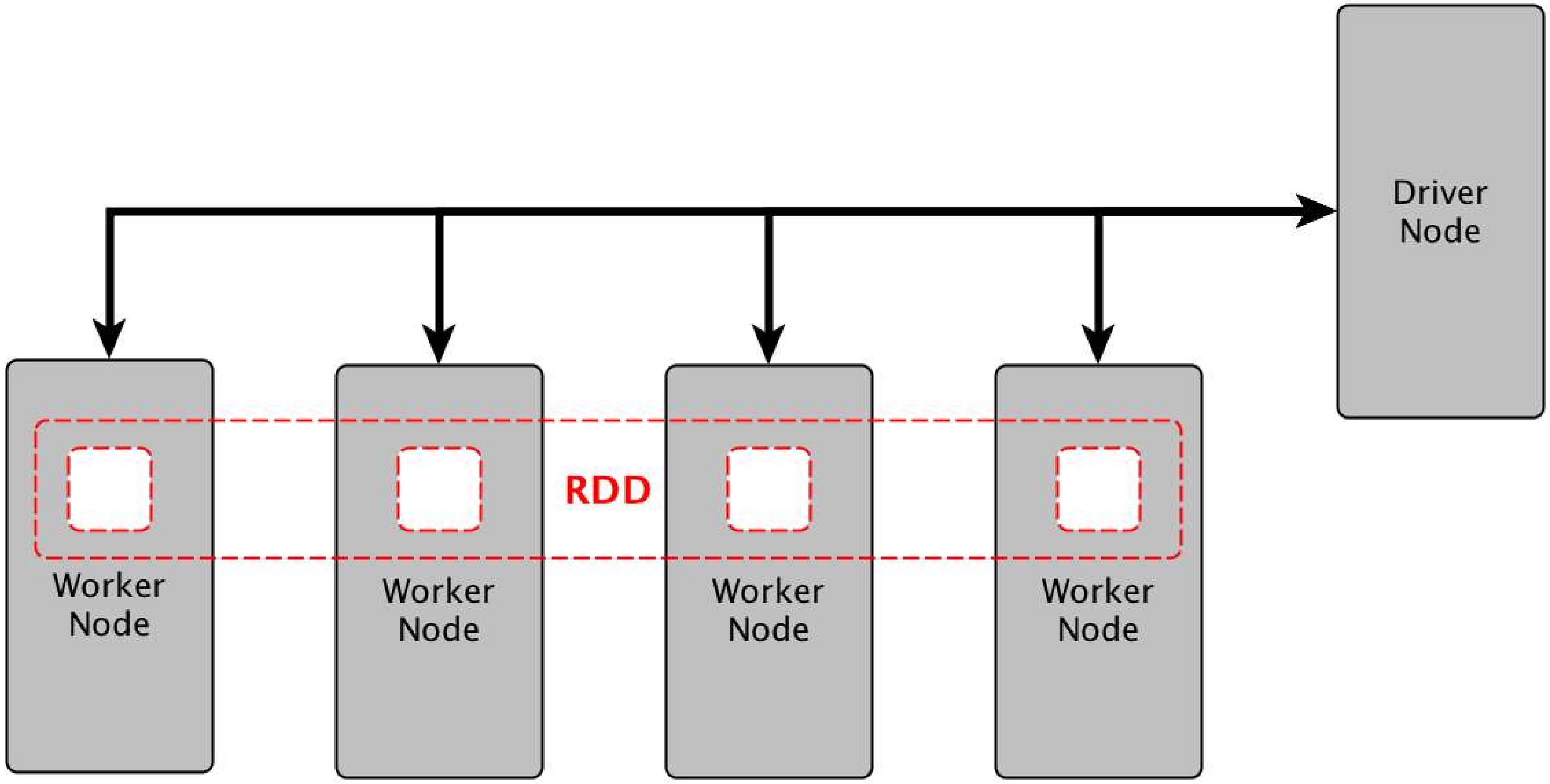


Apache Spark Execution

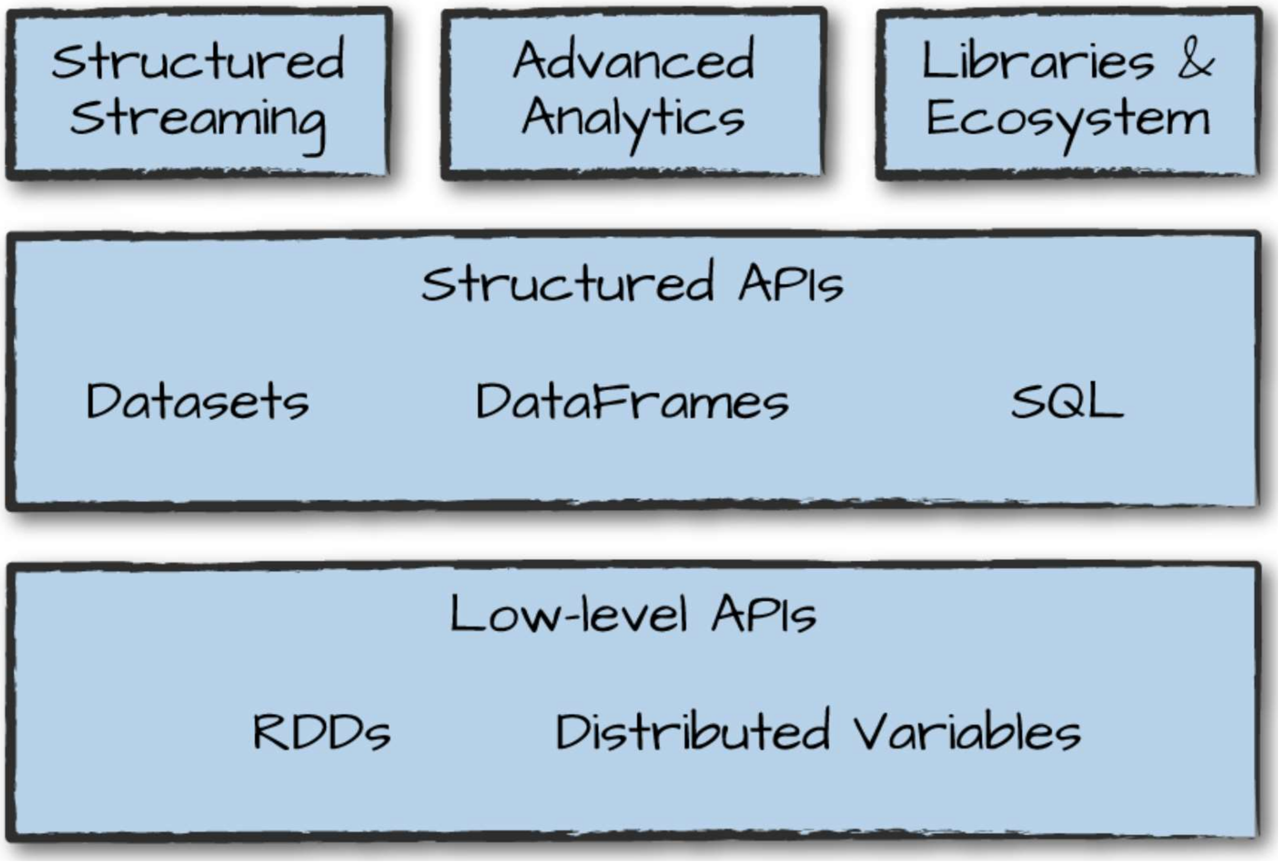
- For every application submitted on spark cluster, spark creates a dedicated Driver process and bunch of Executor processes.
- Driver process is responsible for analyzing, distributing, scheduling and monitoring of executor processes.
- Whereas the executor process is only responsible for running the task they were assigned by drivers and reporting the status back to the driver.



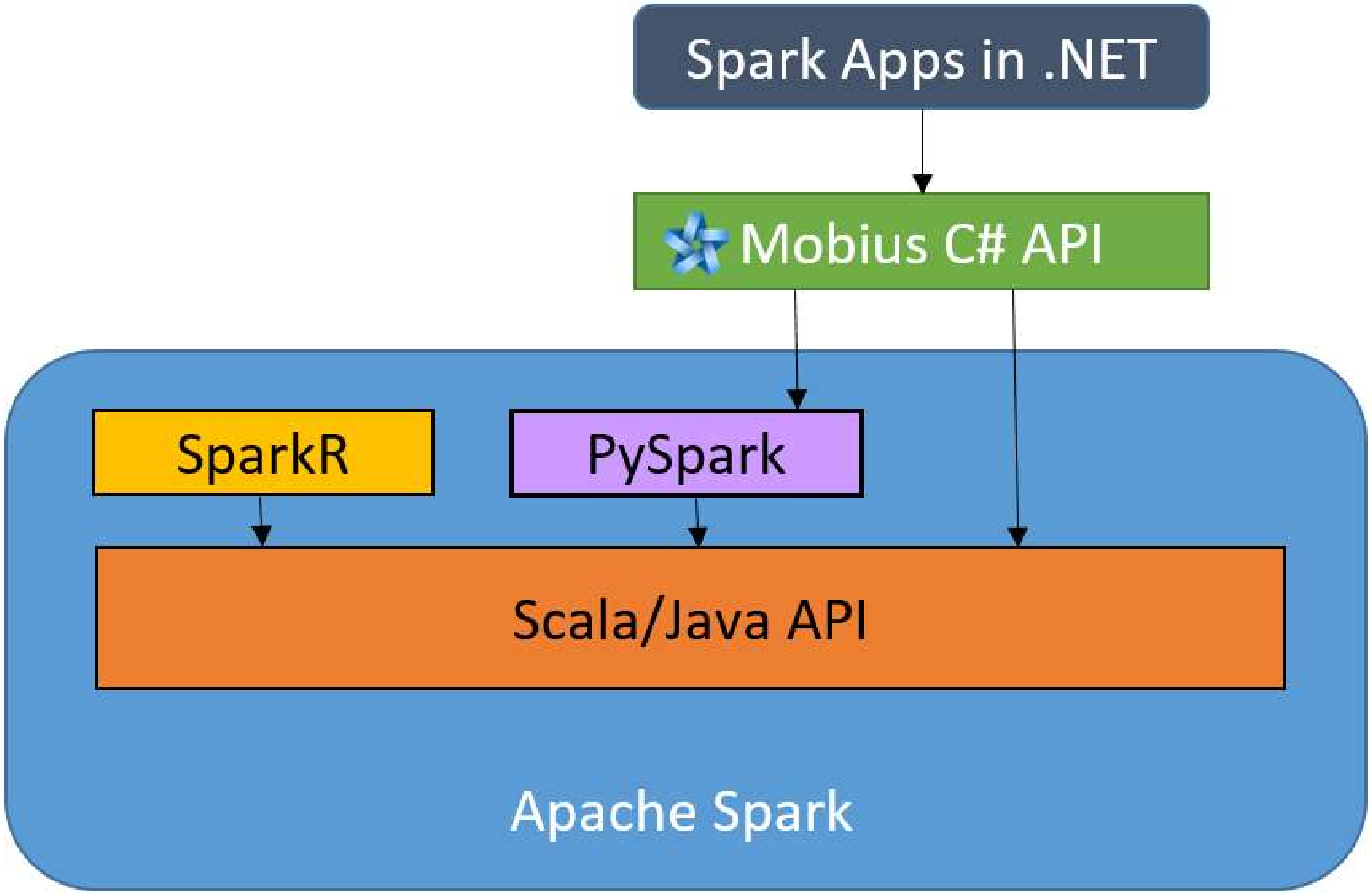
Apache Spark Execution



Spark’s Language APIs



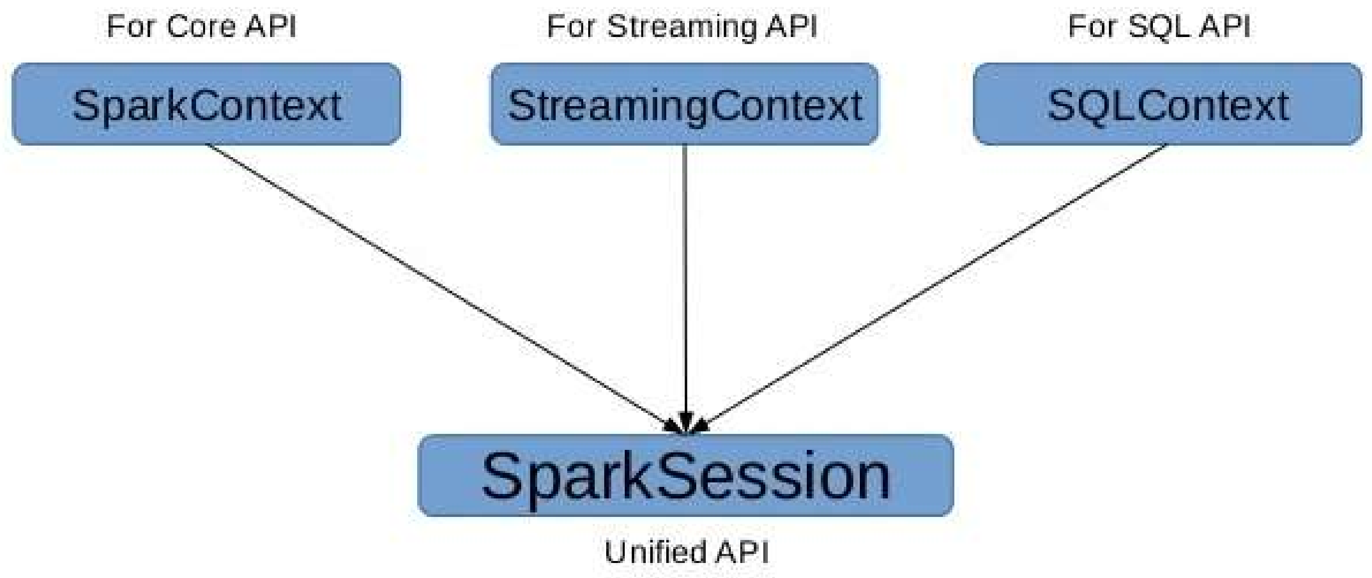
Spark’s Language APIs



SparkSession

- Before understanding spark-session let’s understand the entry-point
- An entry-point is where control is transferred from the operating system to the provided program.
- Before 2.0 entry-point to spark-core was the sparkContext.
- Apache Spark is a powerful cluster computing engine, therefore it is designed for fast computation of big data.
- In previous versions, spark context is the entry point for spark
- For streaming we needed streamingContext.
- For SQL sqlContext and for hive hiveContext.
- So in spark 2.0, we have a new unified entry point.

The SparkSession



DataFrames

- In Apache Spark, a DataFrame is a distributed collection of rows
- It has below characteristics:
  - Immutable in nature
    - We can create DataFrame RDD once but can’t change it.
  - Lazy Evaluations
    - Which means that a task is not executed until an action is performed.
  - Distributed

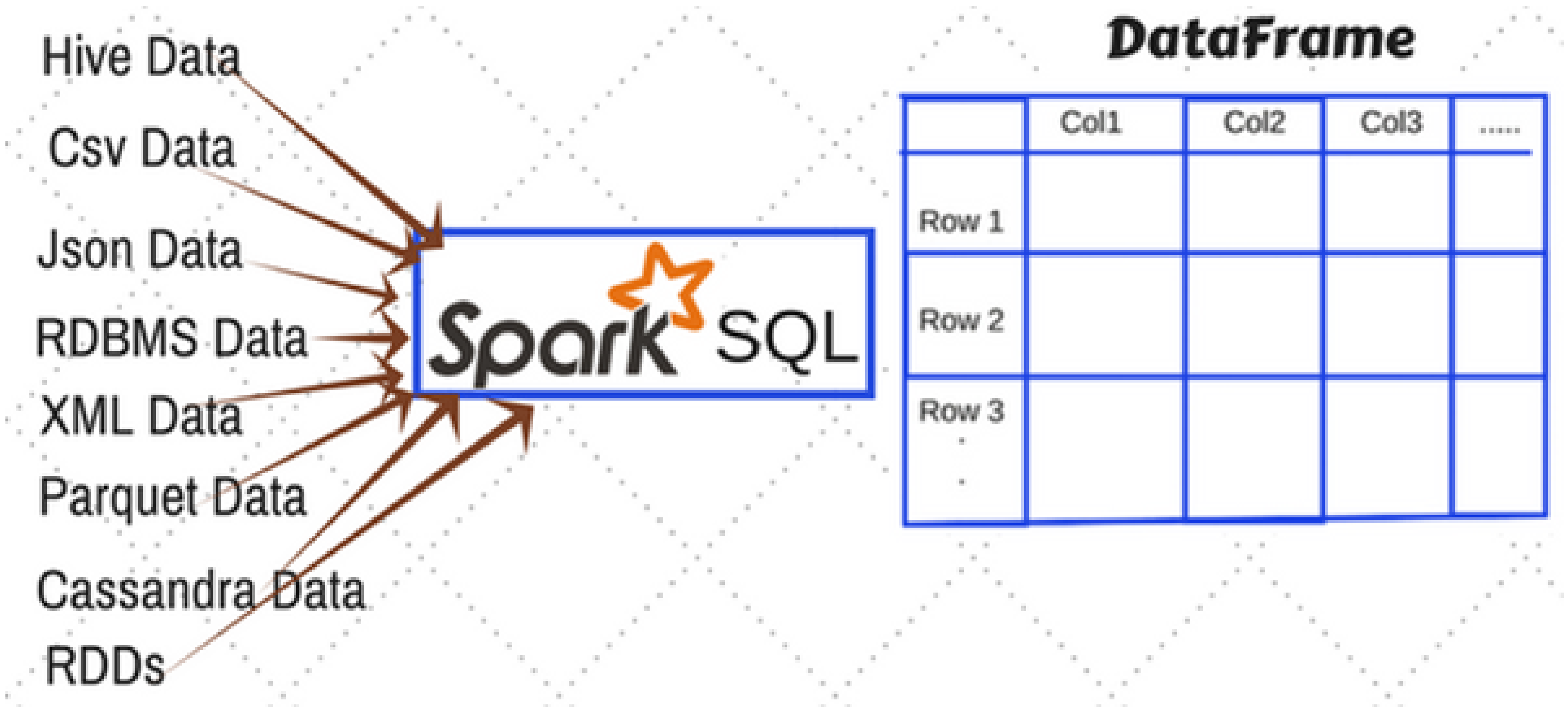
Why DataFrames are Useful?

- Designed for processing large collection of data.
- Has the ability to handle petabytes of data.
- Has API support for different languages like
  - Python,
  - R,
  - Scala,
  - Java.

Create a DataFrame

- Can be created using different data formats:
  - JSON
  - CSV
  - XML
  - Excel
- By loading data from Existing RDD
- By Programmatically specifying schema

Ways to create DataFrame in Spark



Creating DataFrame from RDD

- from pyspark.sql import Row
- l = [('Ankit',25),('Jalfaizy',22),('saurabh',20),('Bala',26)]
- rdd = sc.parallelize(l)
- people = rdd.map(lambda x: Row(name=x[0], age=int(x[1])))
- schemaPeople = sqlContext.createDataFrame(people)

- type(schemaPeople)
- #Output:
- #pyspark.sql.dataframe.DataFrame

Thanks