DataStax Enterprise Analytics

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DSE Analytics

Data extraction, transformation and load (ETL)

Cross-table operations, JOIN, UNION

Ad-Hoc queries

Complex analytics e.g. machine learning

Streaming processing

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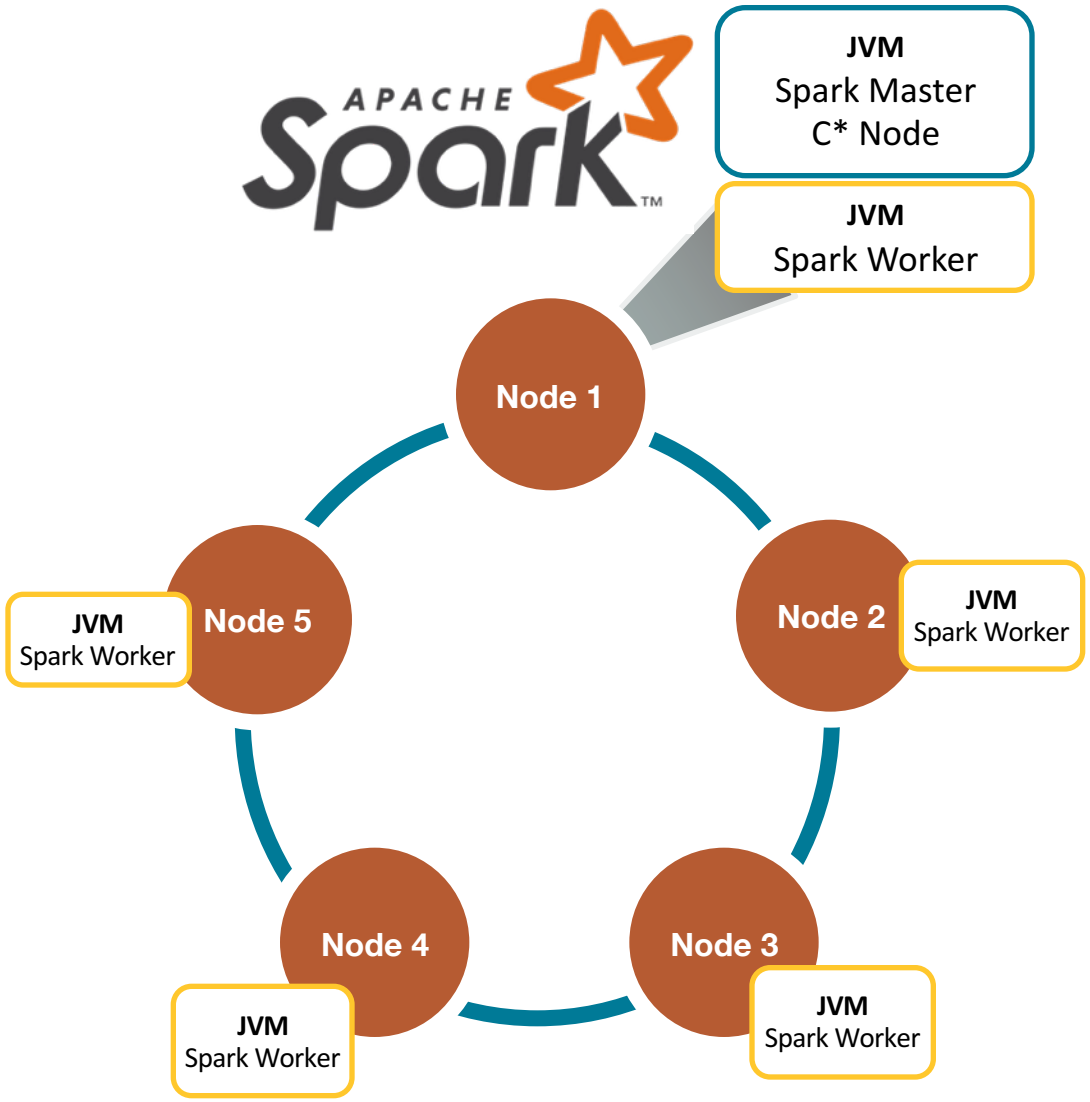
Architecture overview

- HA for Spark Master
- All nodes are worker nodes
- No extra software needed
  e.g. Zookeeper, Yarn



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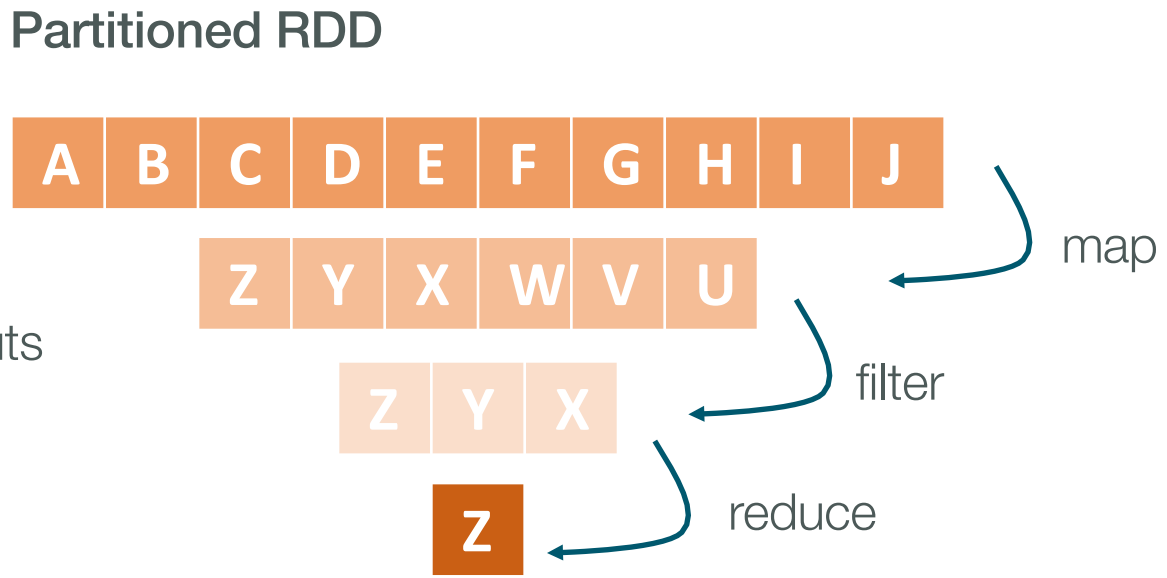
Spark data model RDD

RDD = Resilient Distributed Dataset

A collection with following qualities:

- immutable
- iterable
- serializable
- distributed
- parallel
- lazy

Immutable In and Outputs



Transformations are state less

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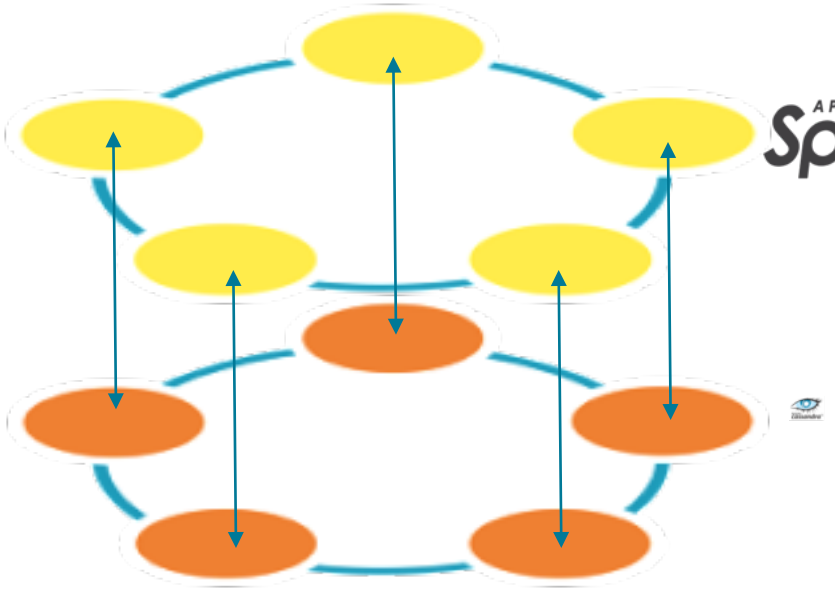
Token Ranges Aware

- Simple provisioning and deployment
- Data locality: less network hops
- Pushdown Predicates
- Caching



DSE Analytics Cluster

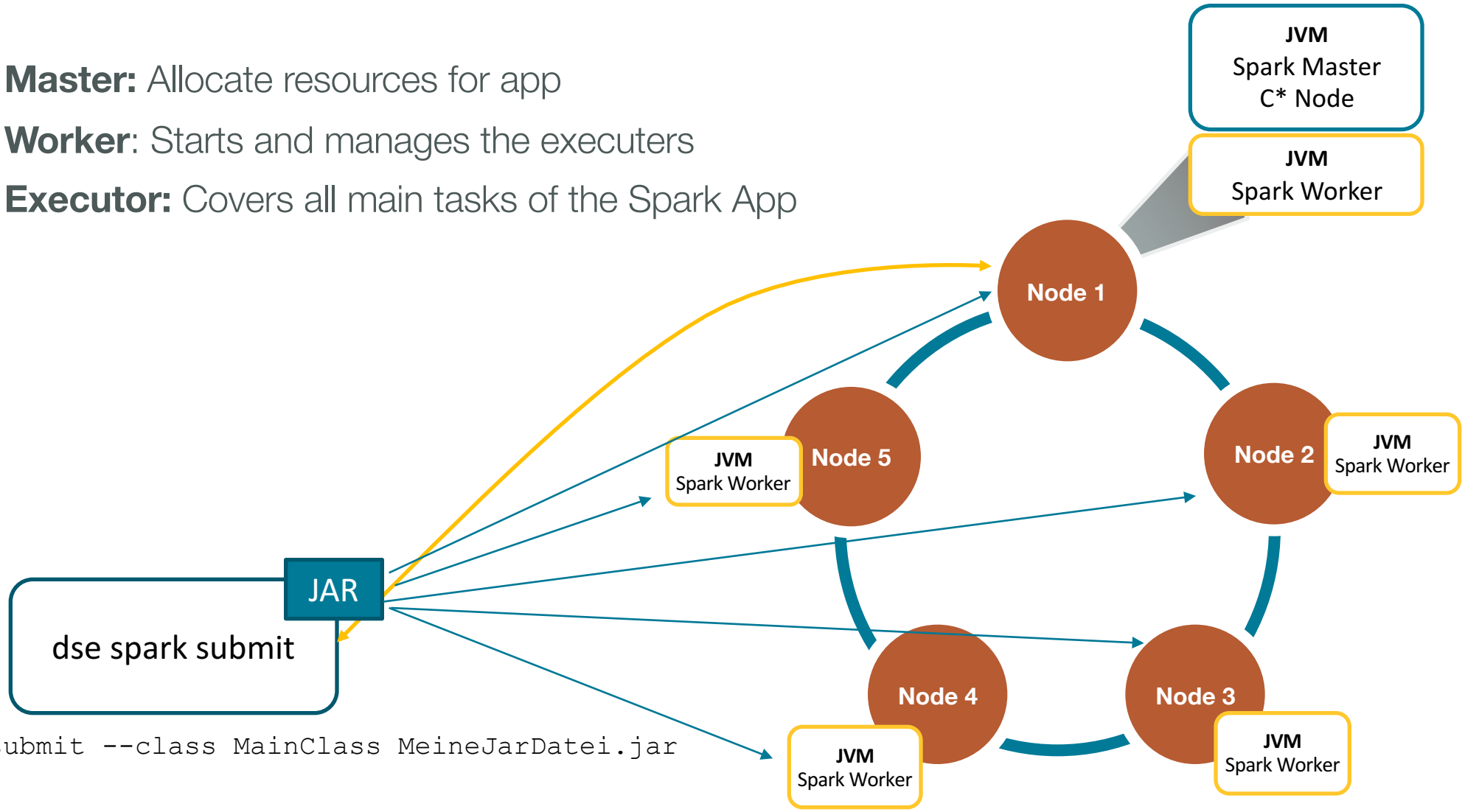
DSE Cluster

Submit Spark Jobs to DSE Analytics

Spark Master: Allocate resources for app

Spark Worker: Starts and manages the executers

Spark Executor: Covers all main tasks of the Spark App




```
dse spark-submit --class MainClass MeineJarDatei.jar
```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Features of DSE Analytics

- DSE Cassandra tables exposed as
  - Apache Spark™ RDDs
  - Apache Spark™ DataFrames
- Load data from DSE C* to DSE Analytics
- Write data from DSE Analytics to DSE C*
- Object mapper : Mapping of C* tables and rows to Scala / Java objects
- All DSE C* types supported and converted to Scala / Java types
- Server side data selection
- Virtual Nodes support
- Data Locality awareness
- Scala, Python and Java APIs

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DSE Analytics - REPL

```
$ dse spark
```

```
scala> val table = sc.cassandraTable[CassandraRow](
retailer‘,'sales‘).select("name",“item").where(“name= ?", “gregg")
```

```
table: com.datastax.spark.connector.rdd.CassandraTableScanRDD [com.datastax.spark.connector.CassandraRow] =
CassandraTableScanRDD[5] at RDD at CassandraRDD.scala:15
```

```
// With collect the data gets read from Cassandra
scala> table.collect()
```

```
res1: Array[com.datastax.spark.connector.CassandraRow] = Array(CassandraRow{name: gregg, item: PlayStation 4},
CassandraRow{name: gregg, item: iMac}, CassandraRow{name: gregg, item: Microsoft Xbox})
```

```
scala> table.collect().foreach(println);
```

```
CassandraRow{name: gregg, item: PlayStation 4}
CassandraRow{name: gregg, item: iMac}
CassandraRow{name: gregg, item: Microsoft Xbox}
```


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DSE Analytics - Spark SQL

Save to DSE

```
sc.parallelize(Seq(A,B,C)).saveToCassandra(“demo”, “collections")
```

Spark RDD JOIN with NOSQL!

```
churnRateRdd.join(custJourney).saveToCassandra(“customerESxty",“churns")
```

Use Spark SQL to select the database

```
val track_count_by_year = sqlContext.sql("select 'dummy' as dummy, album_year as year, count(*) as
track_count from tmp_tracks_by_album group by album_year")
```


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DSE Max – DSE Analytics Special Features

- Easy setup and config
  - No need to setup a separate Apache Spark™ cluster
  - No need to tweak classpaths or config files
- High availability of Apache Spark™ Master
- Enterprise security
  - Password / Kerberos / LDAP authentication
  - SSL for all DSE Analytics to DES C* connections
- Included support of Apache Spark™ in DSE Max subscription

Lab 6 : Hands-on DSE Analytics

Thank You!