Chapter 1: An Introduction to SMACK

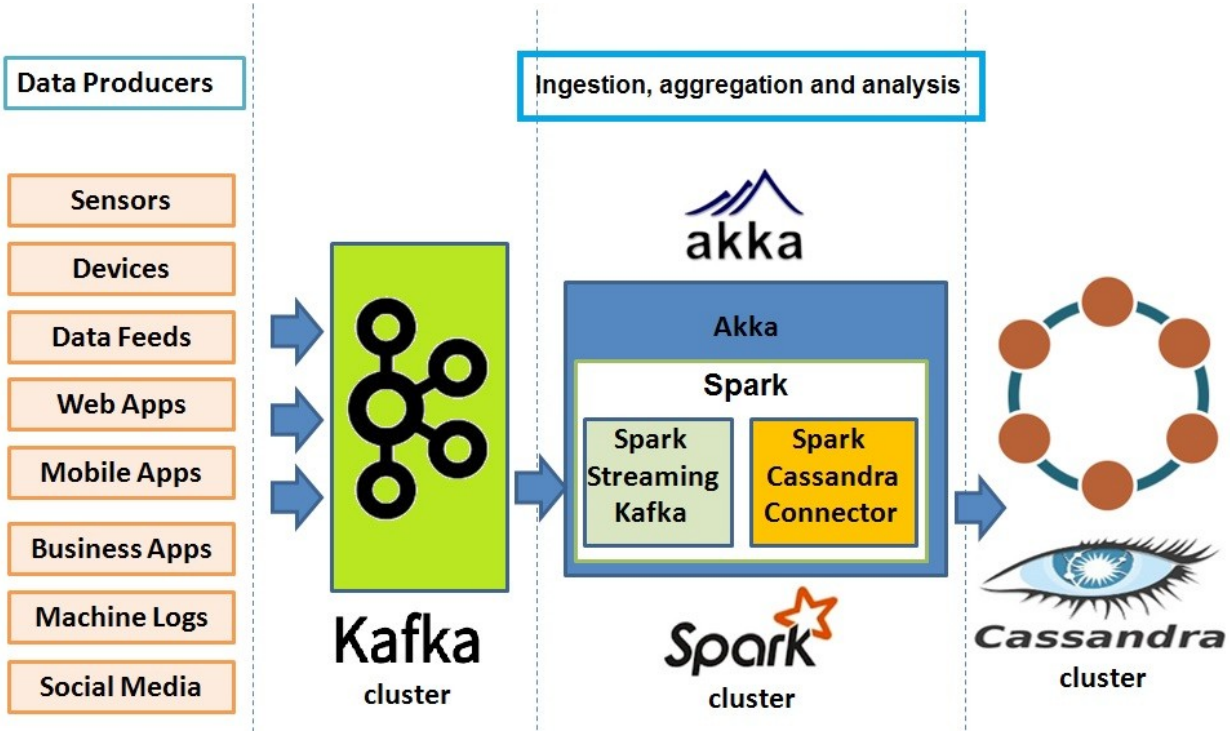

Figure 1.1 The SMACK pipeline architecture

Chapter 2: The Model - Scala and Akka

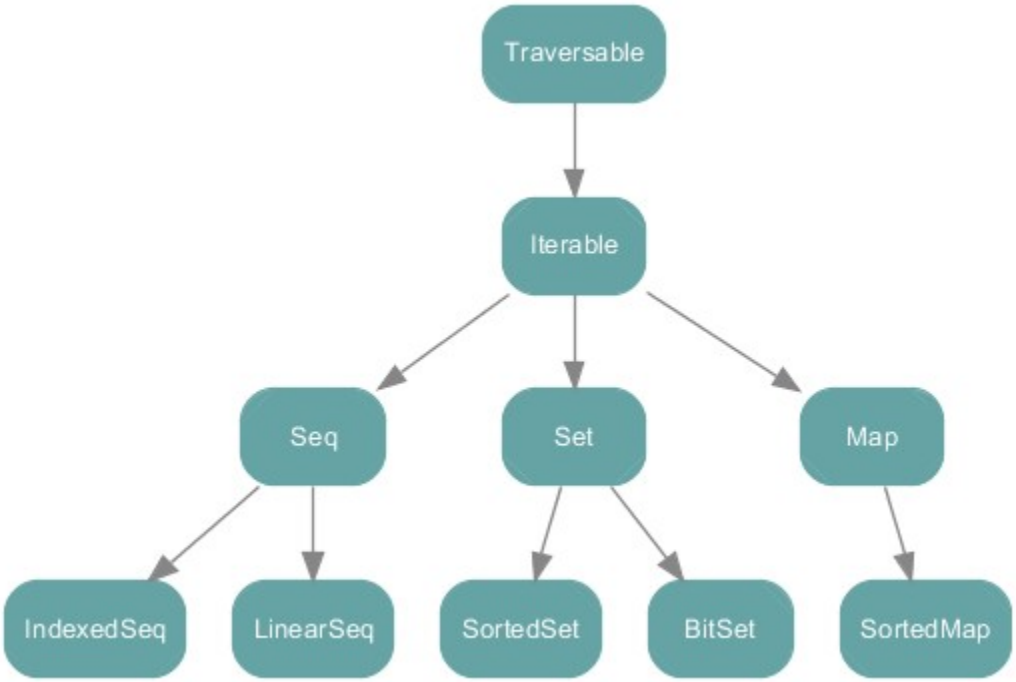

Figure 2-1. The Scala collections top hierarchy.

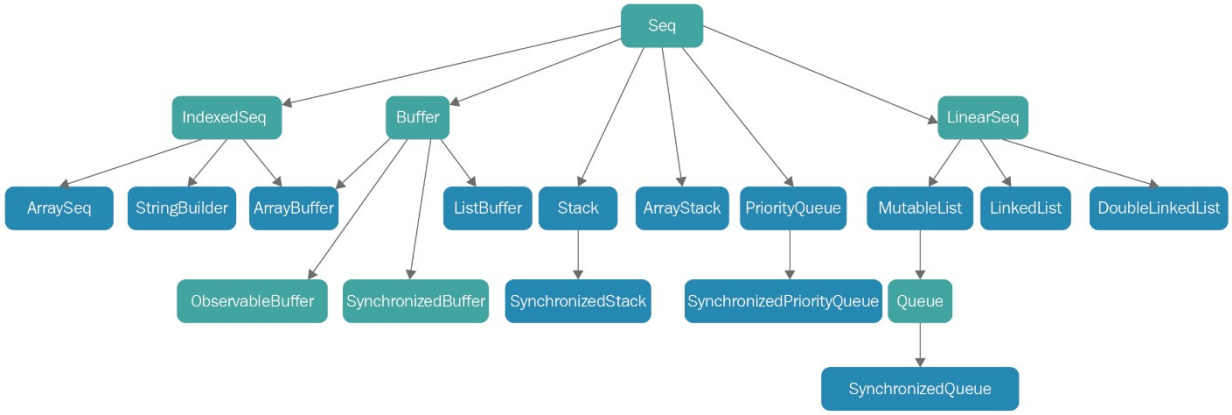

Figure 2-2- The Seq hierarchy

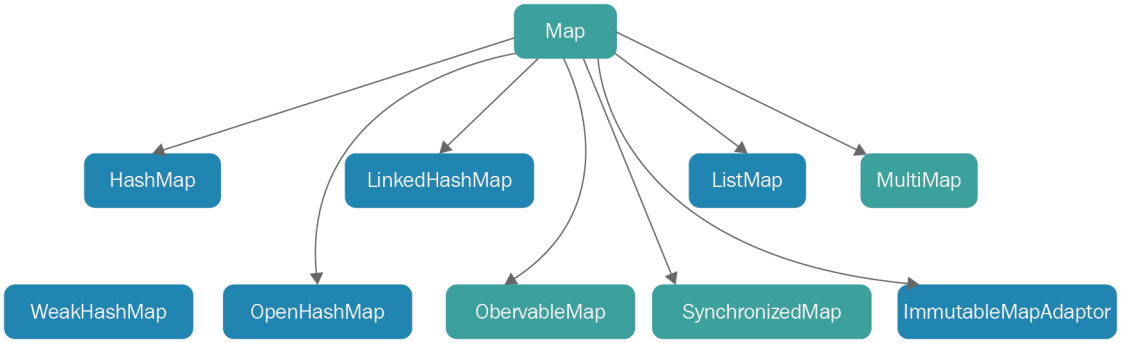

Figure 2-3- The Map hierarchy

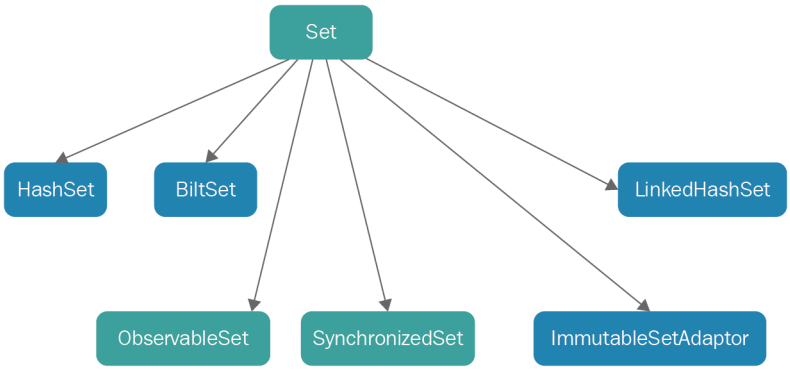

Figure 2-4- The Set hierarchy

Chapter 3: The Engine - Apache Spark

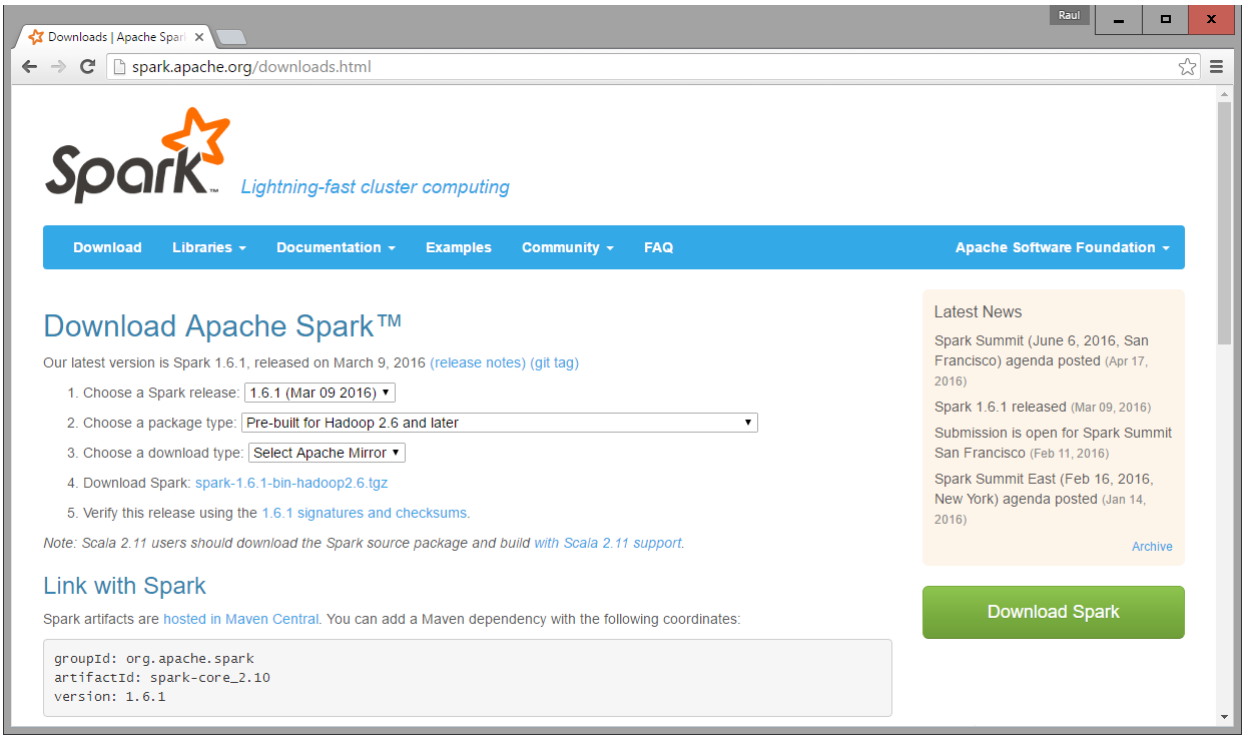

Figure 3-1 Apache Spark download page

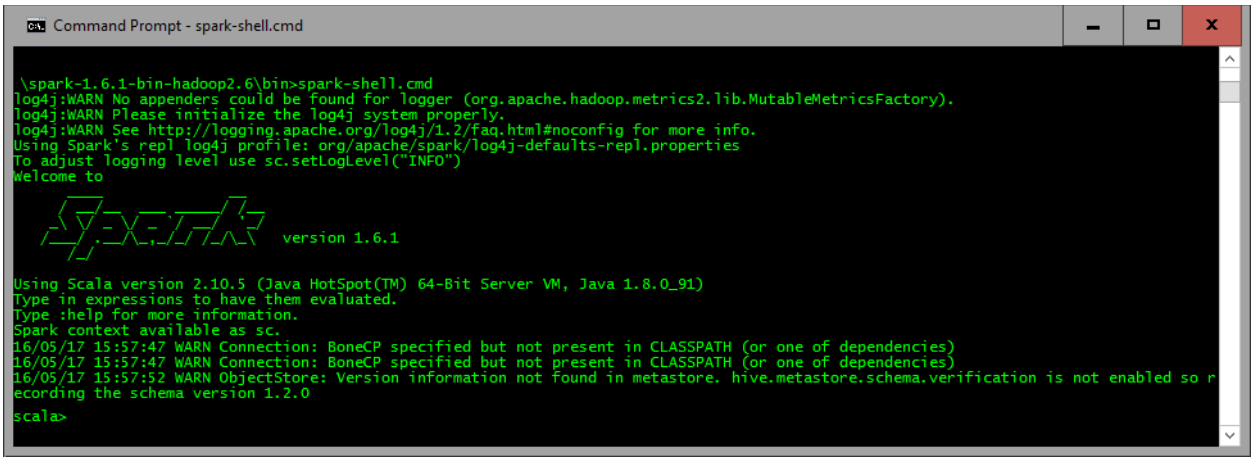

Figure 3-2 Terminal window with Spark running

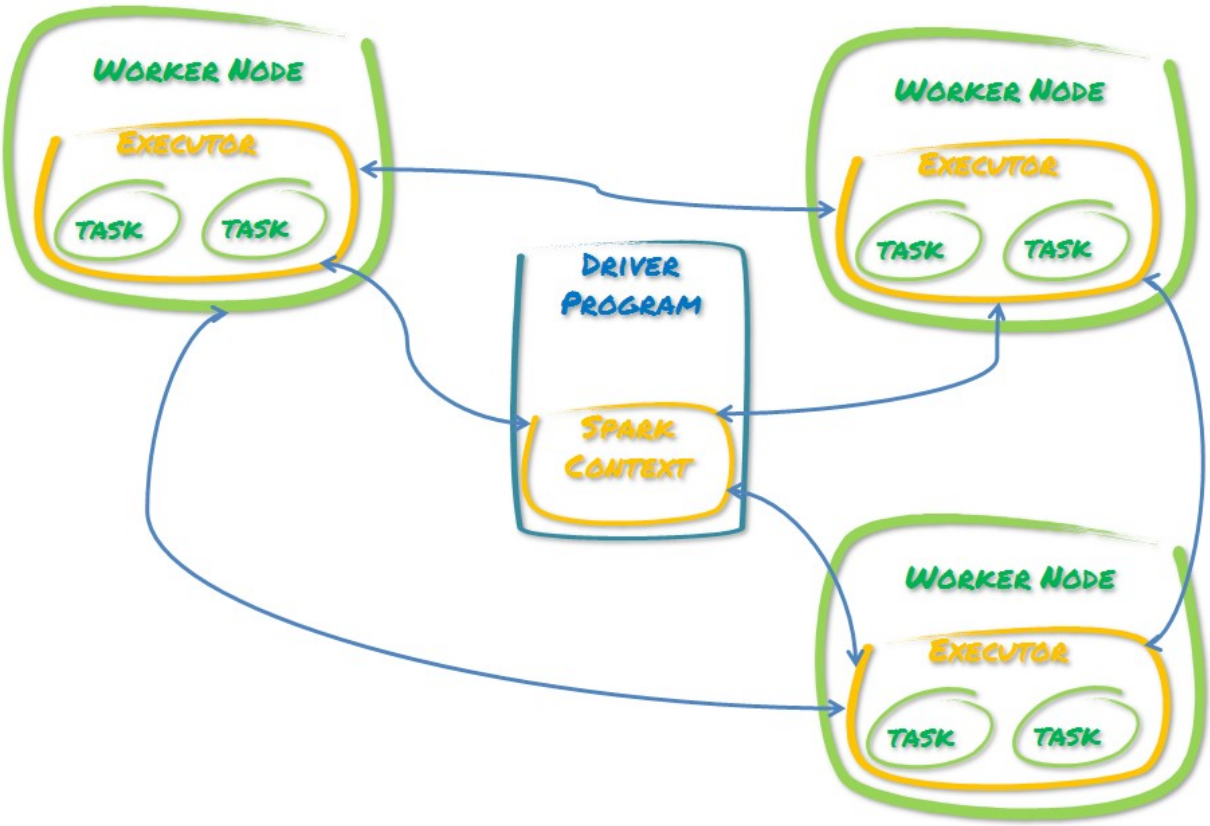

Figure 3-3 One driver program with three worker nodes

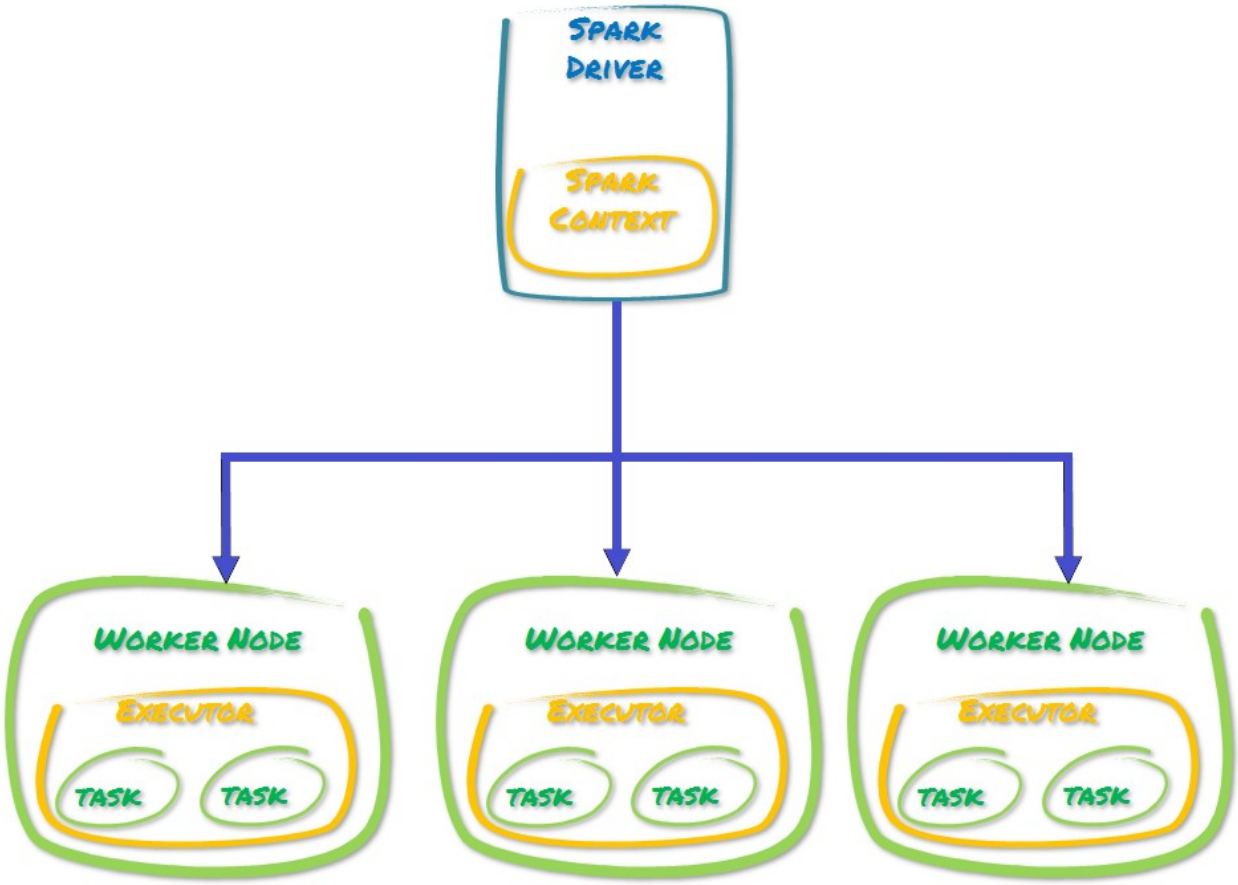

Figure 3-4. Distributed Spark application

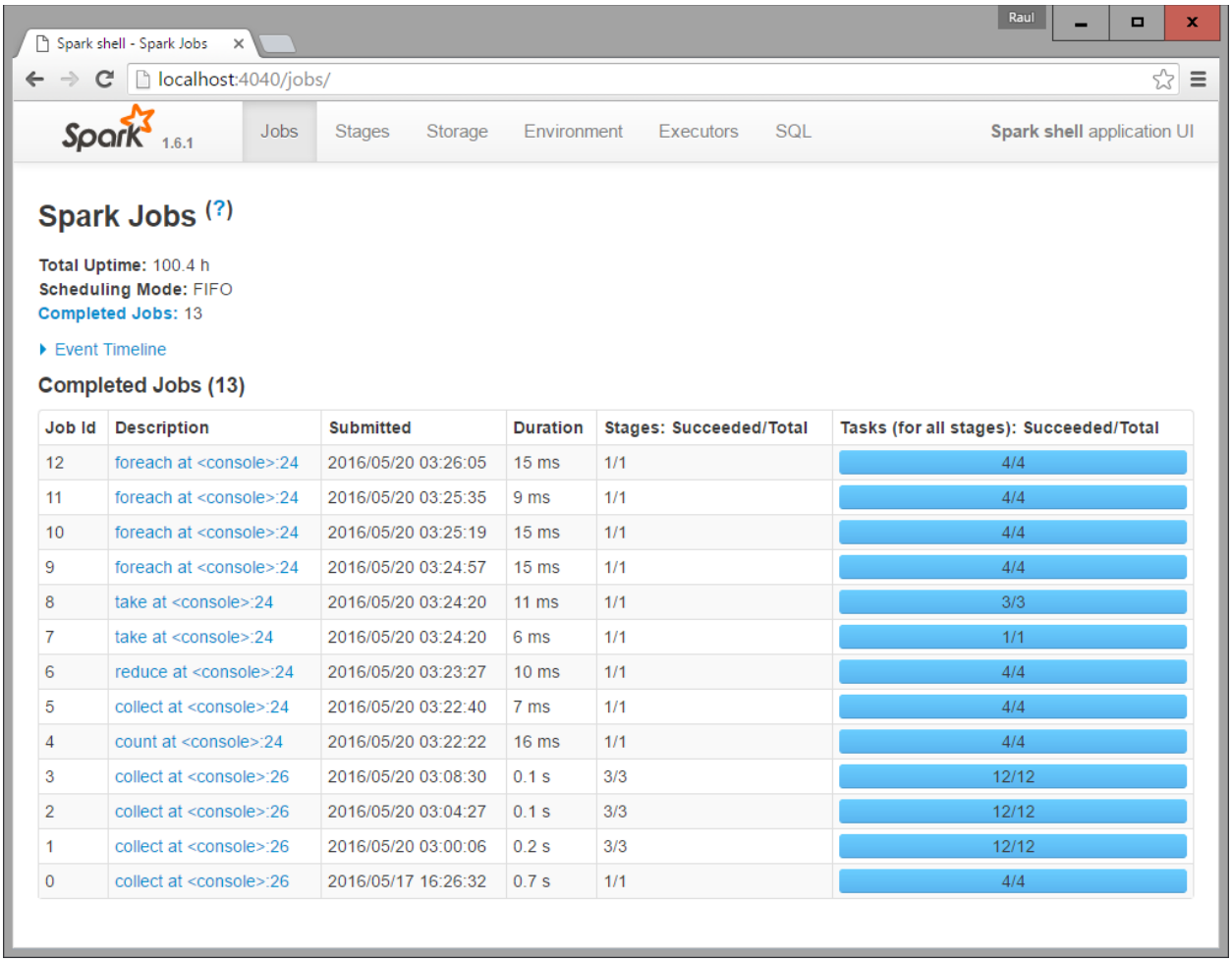

Figure 3-5. Spark shell application web UI

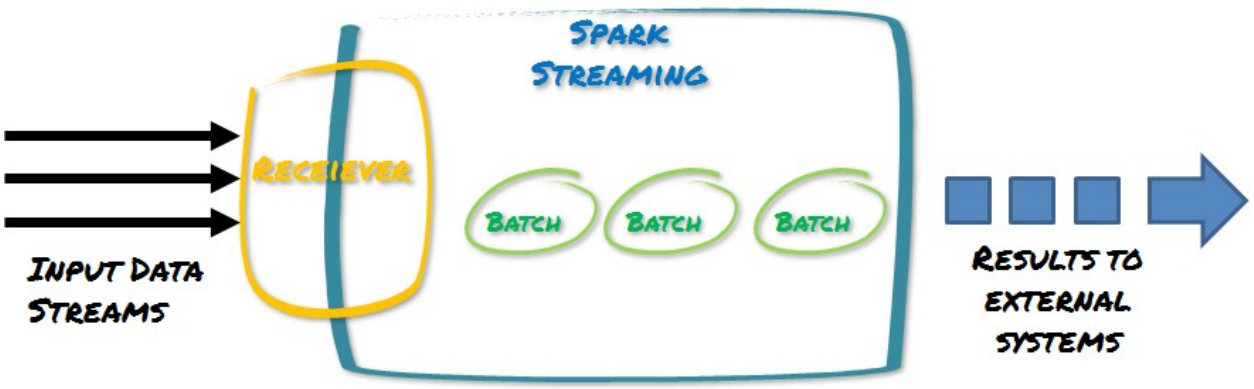

Figure 3-6. Spark Streaming Operation

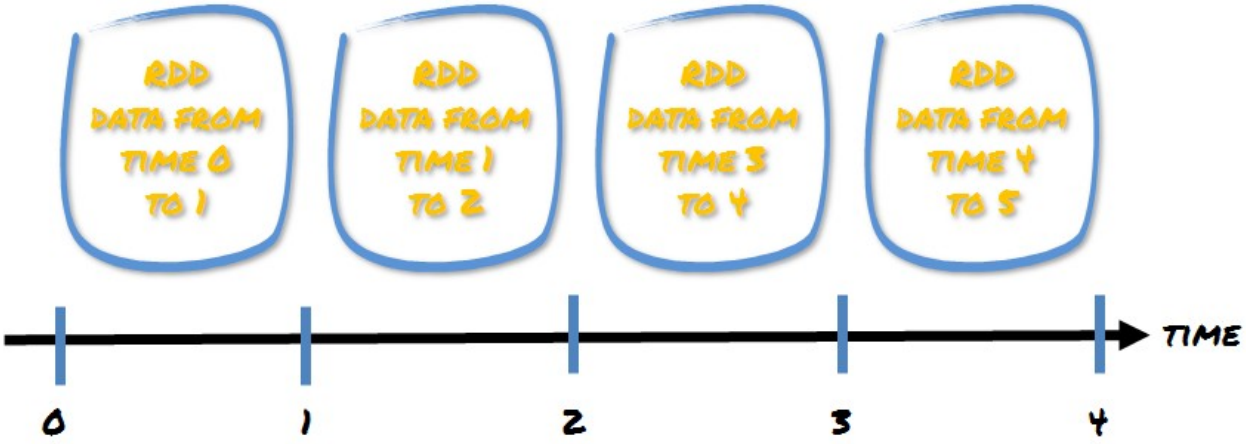

Figure 3-7. A DStream as an RDD series

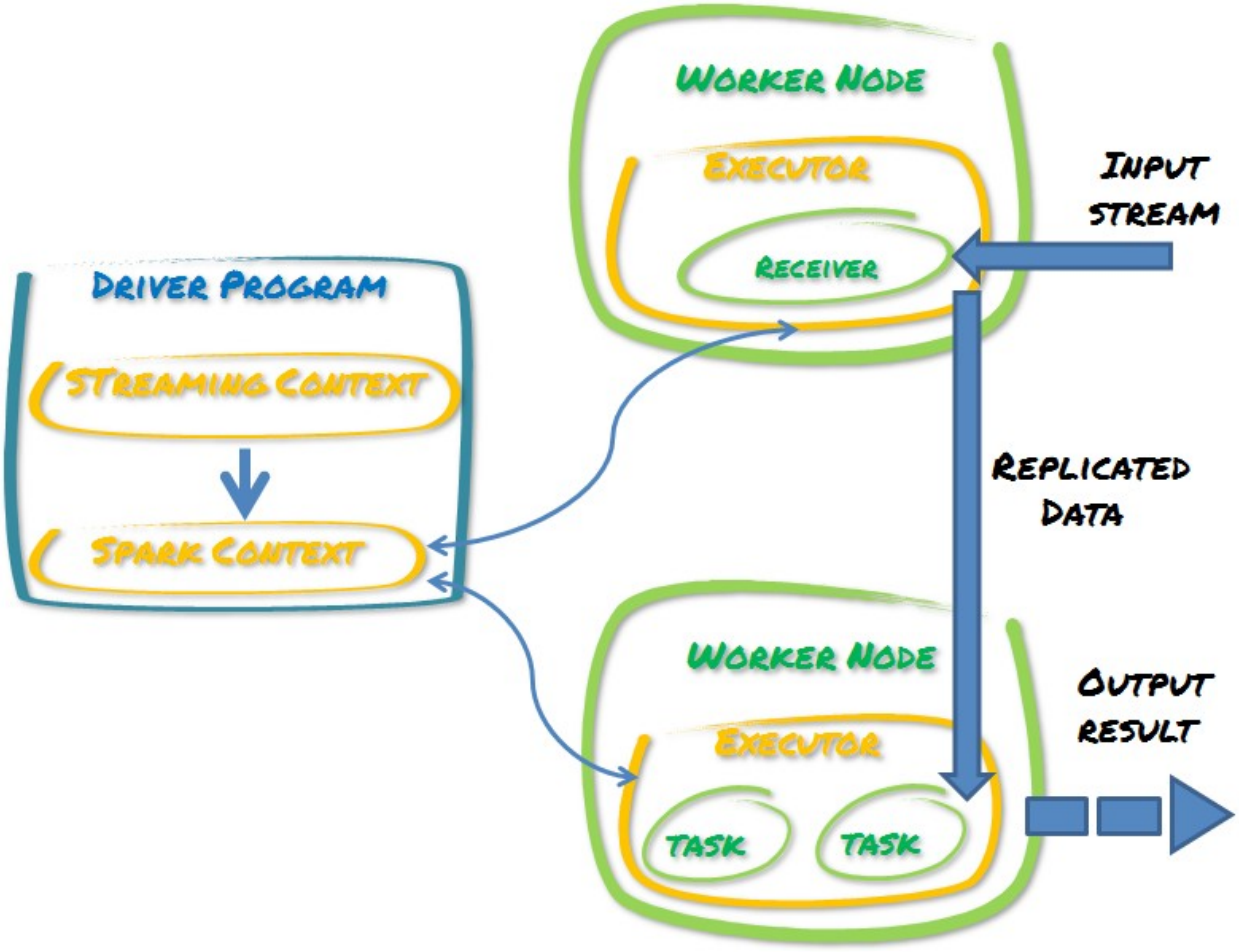

Figure 3-8. Spark Streaming execution with Spark components

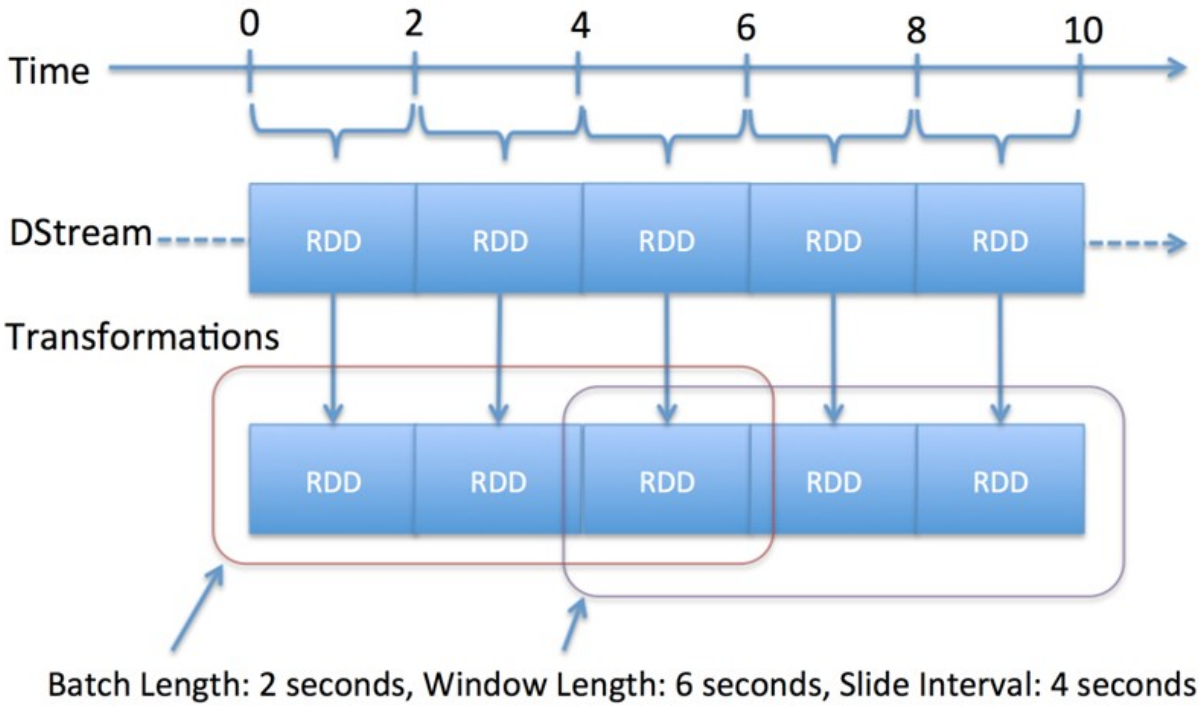

Figure 3-9. Windowed operations example

Chapter 4: The Storage - Apache Cassandra

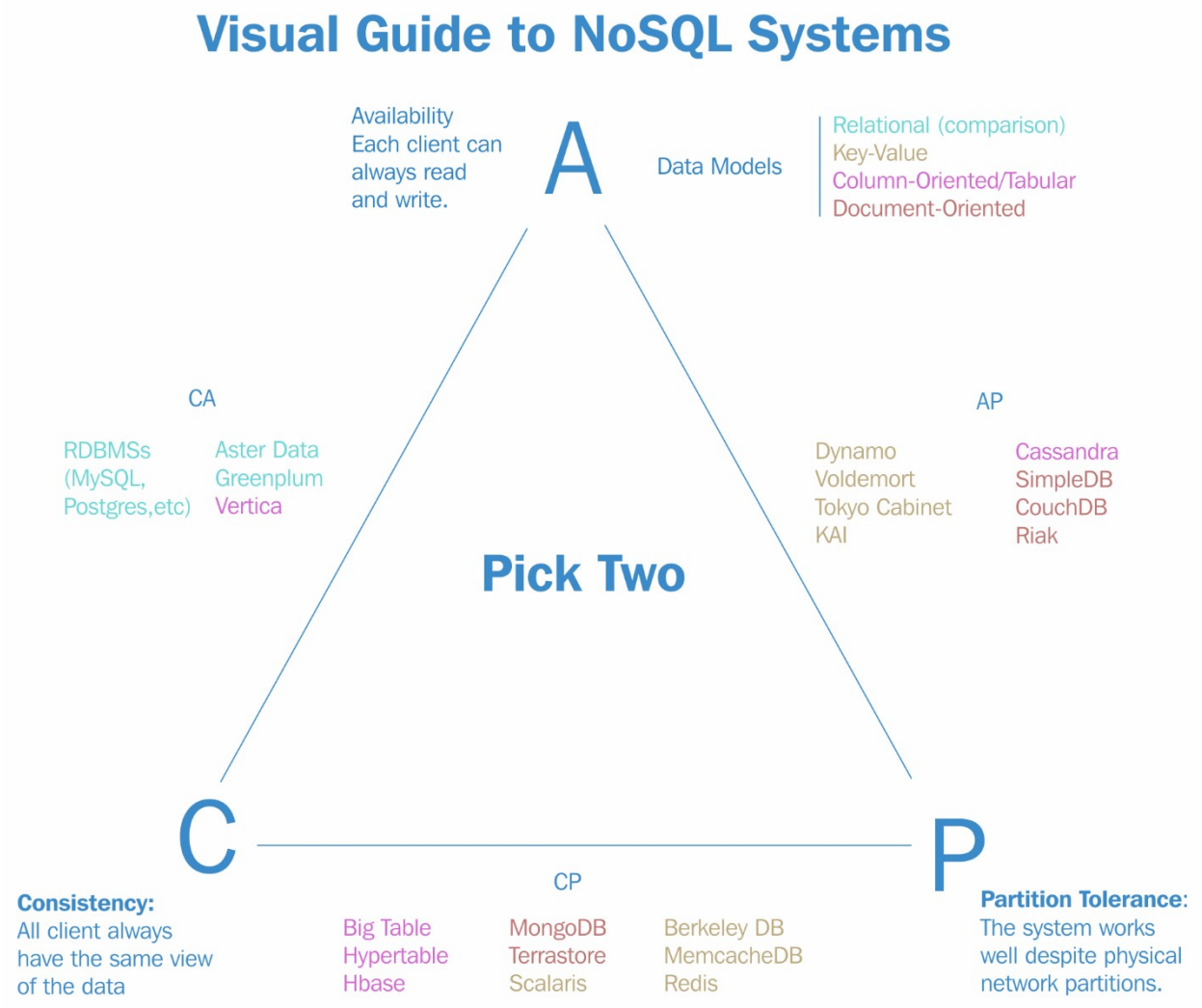

Figure 4-1 CAP Brewer's theorem

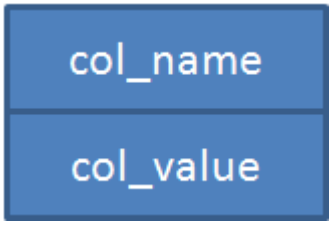

Figure4-2: Column

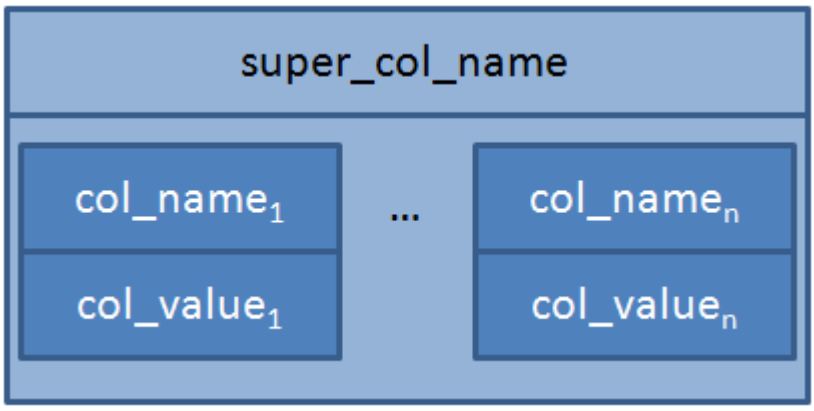

Figure 4-3: Super column

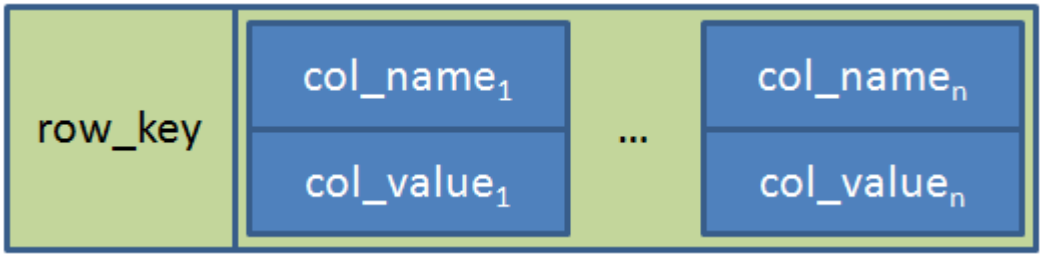

Figure 4-4: Column family

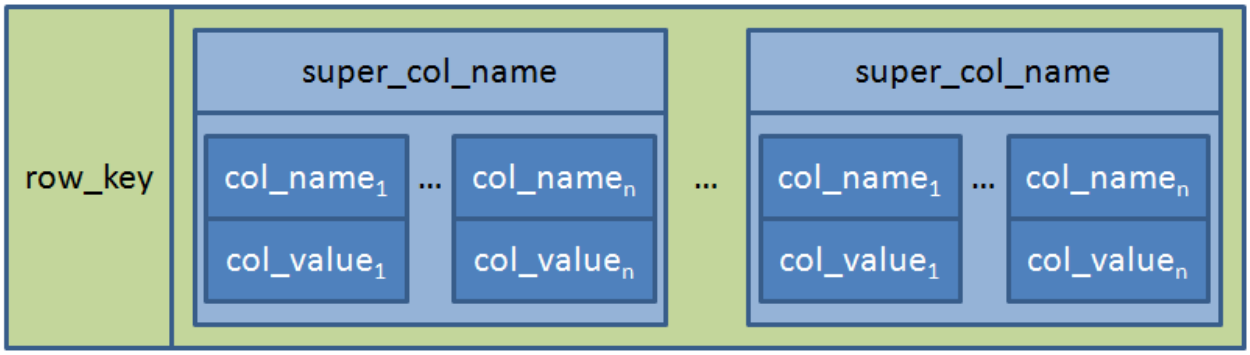

Figure 4-5: Super column family

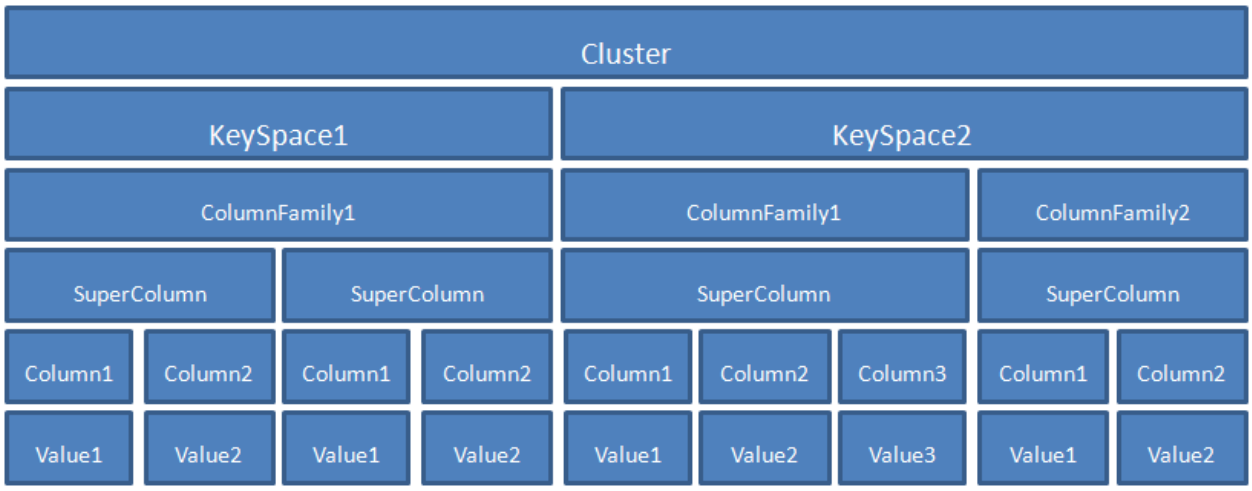

Figure 4-6: Cluster with key spaces

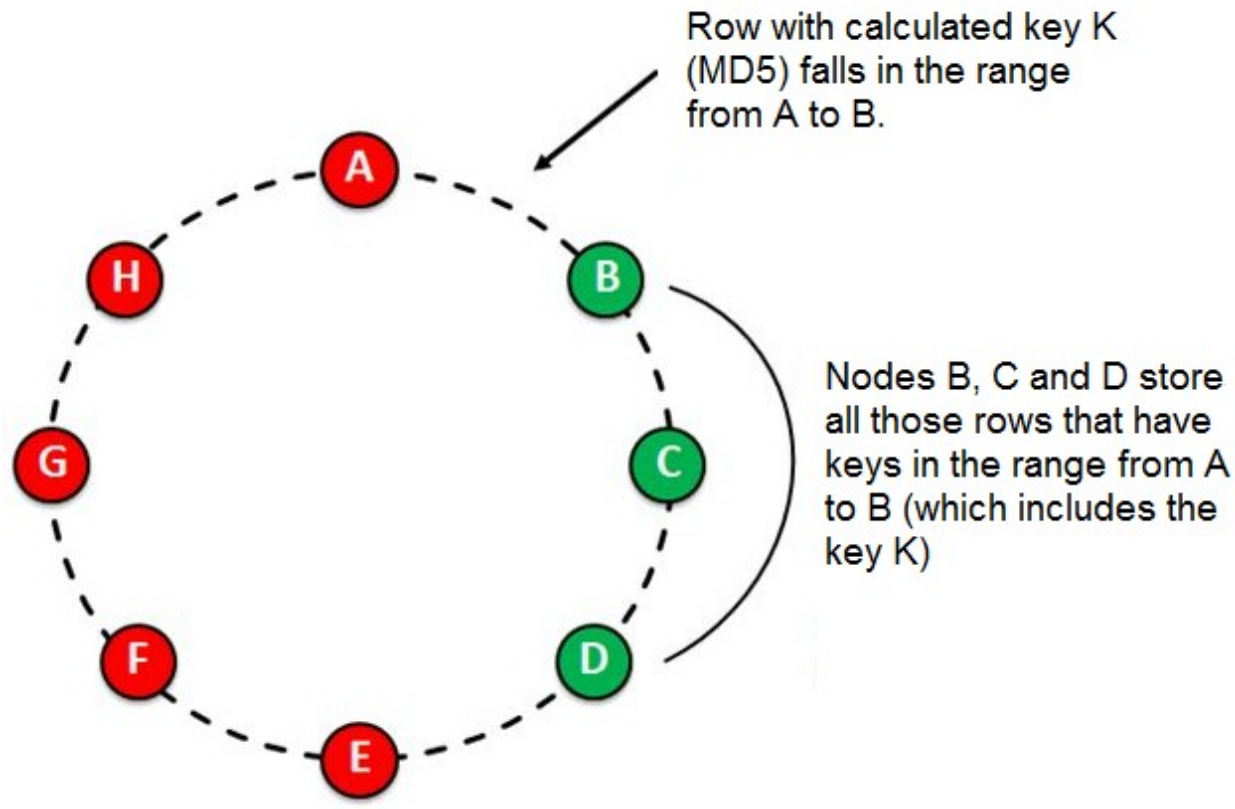

Figure 4-7: Nodes within a cluster

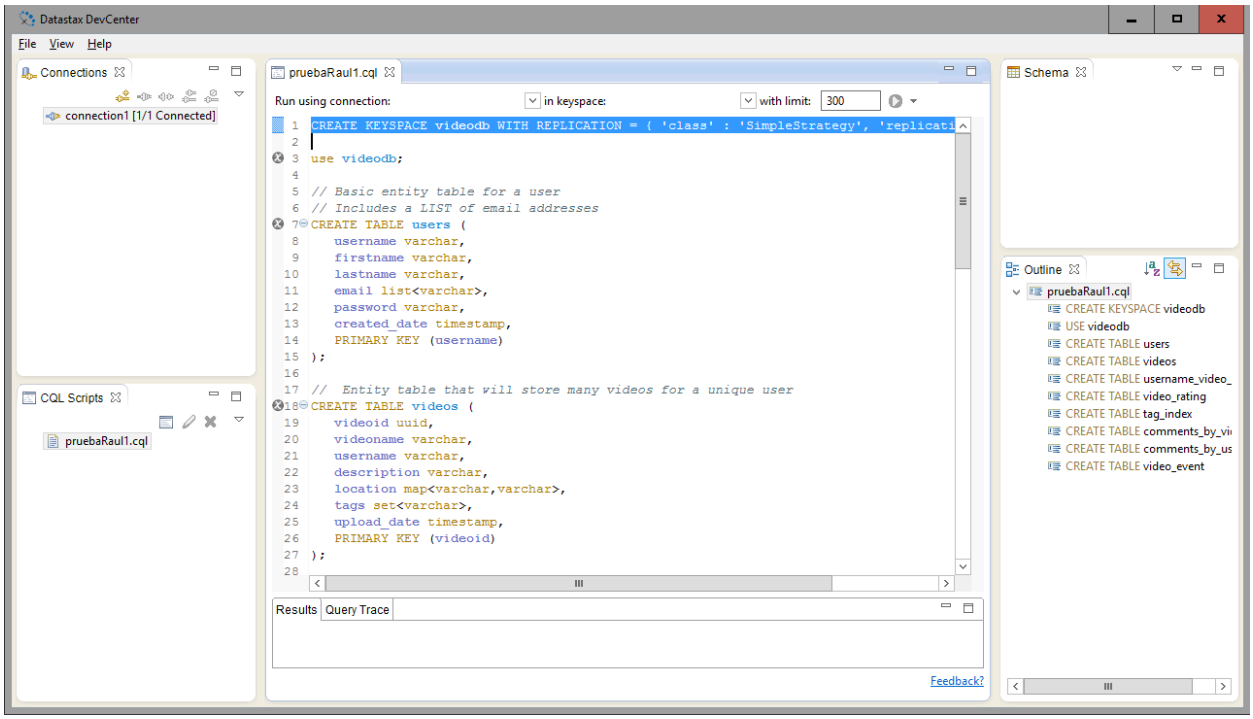

Figure 4-8: DataStax OpsCenter

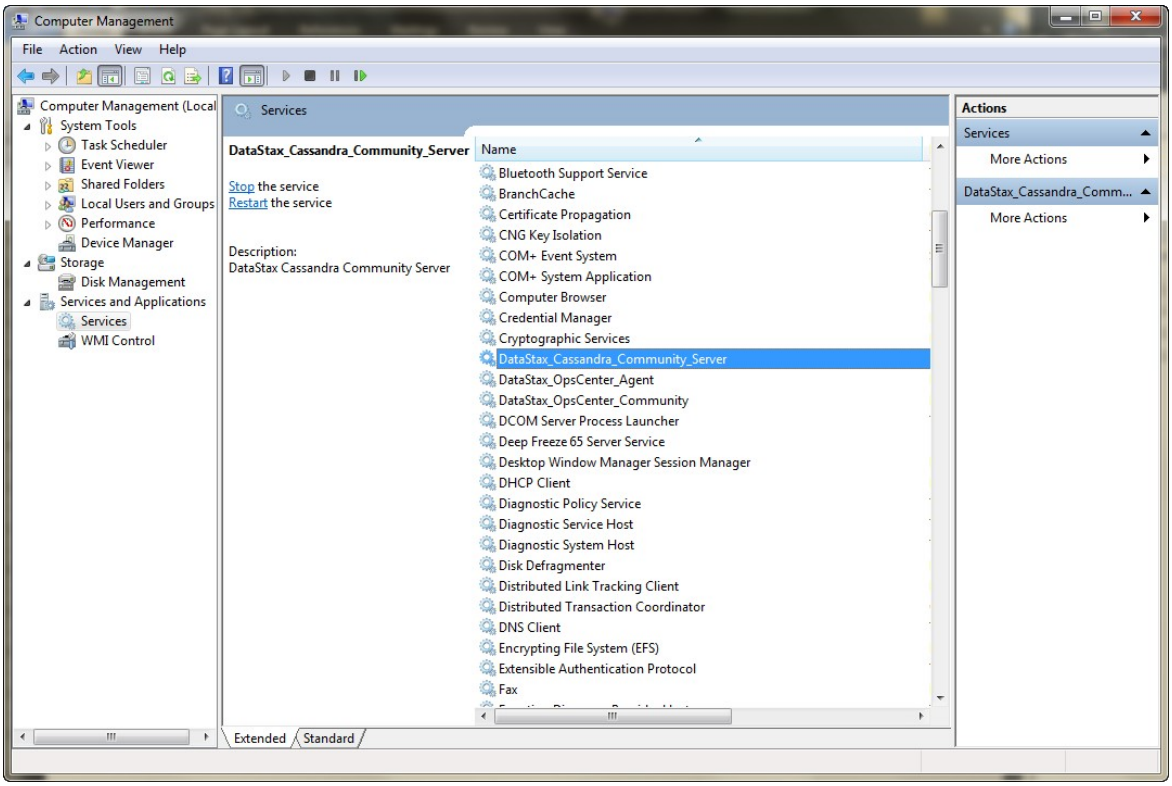

Figure 4-9: Microsoft Windows display services

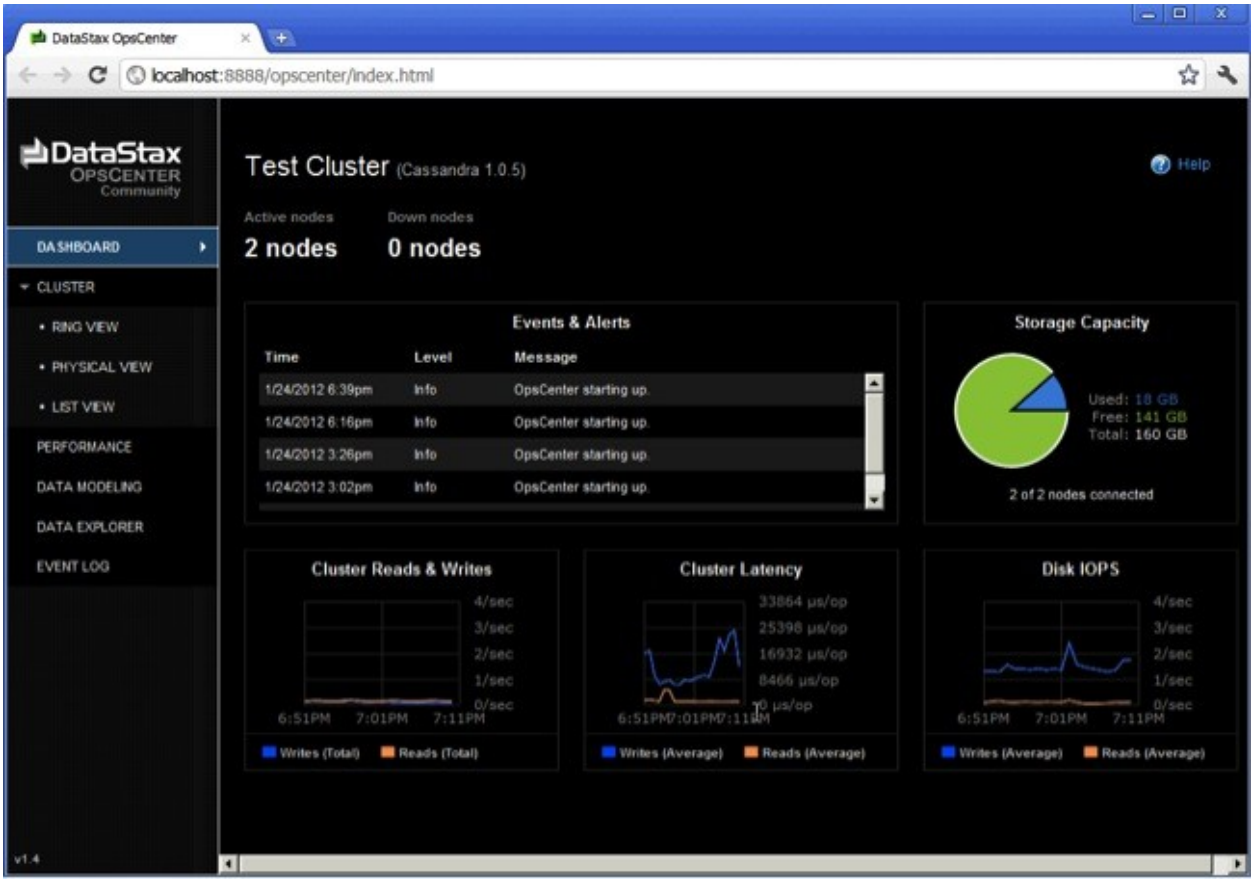

Figure 4-10: Display cluster in OpsCenter

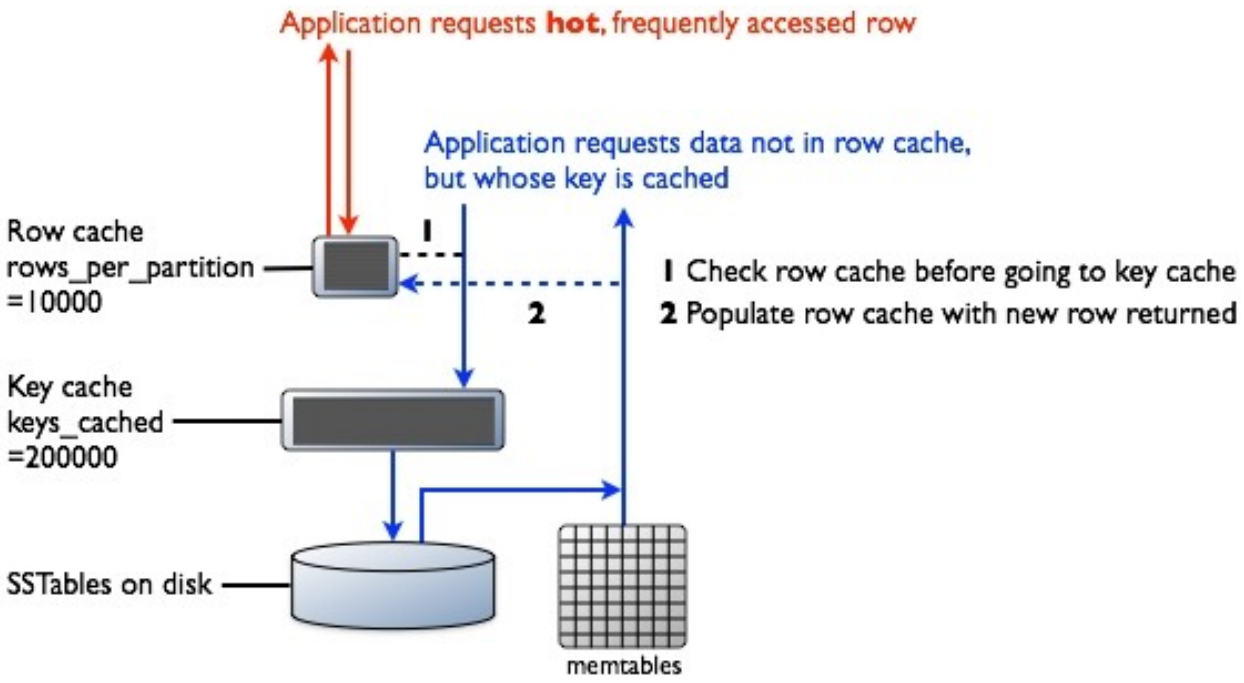

Figure 4-11: Apache Cassandra cache

Chapter 5: The Broker - Apache Kafka

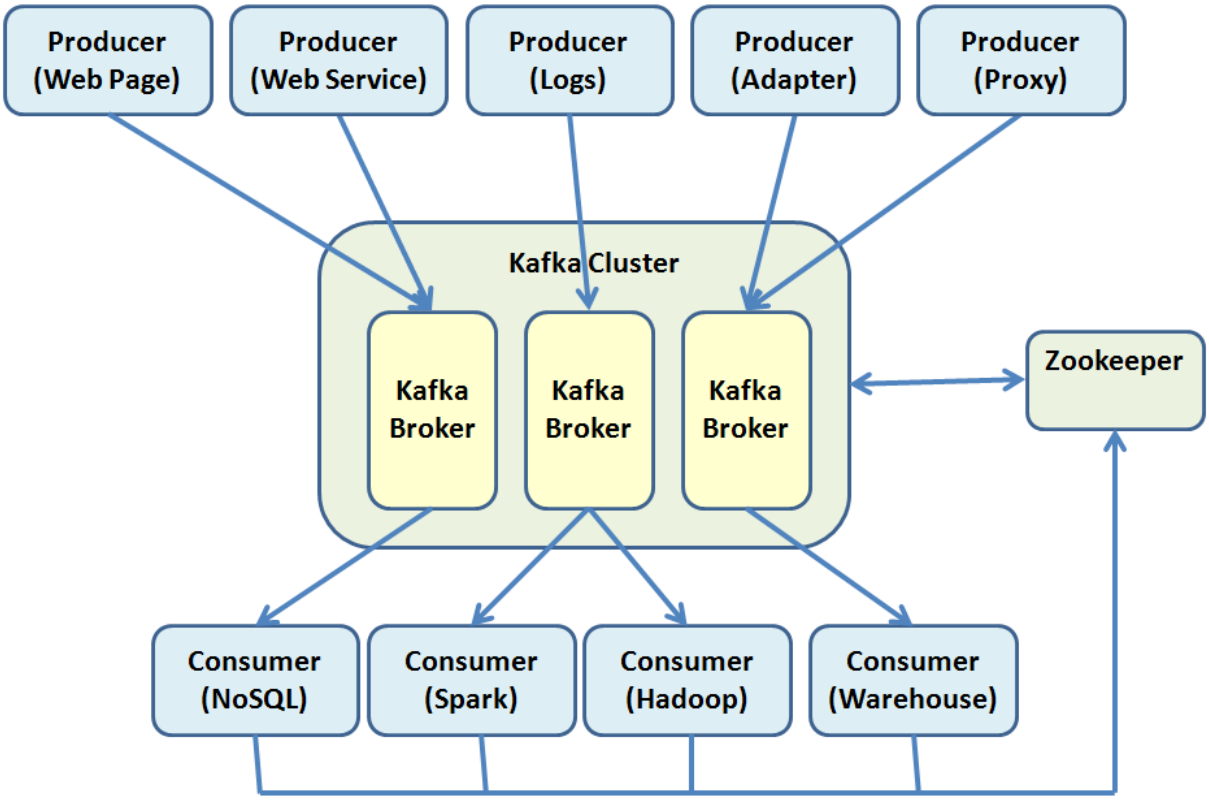

Figure 5-1. Apache Kafka typical scenario

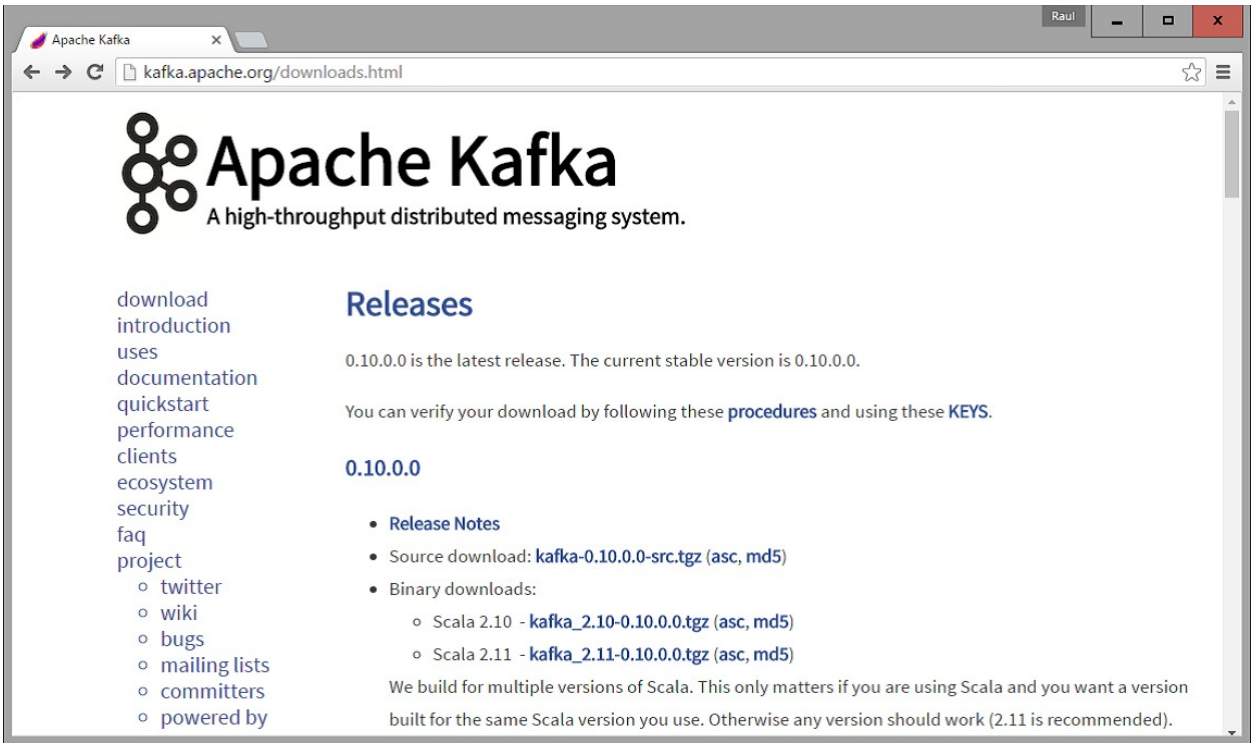

Figure 5-2. Apache Kafka download page

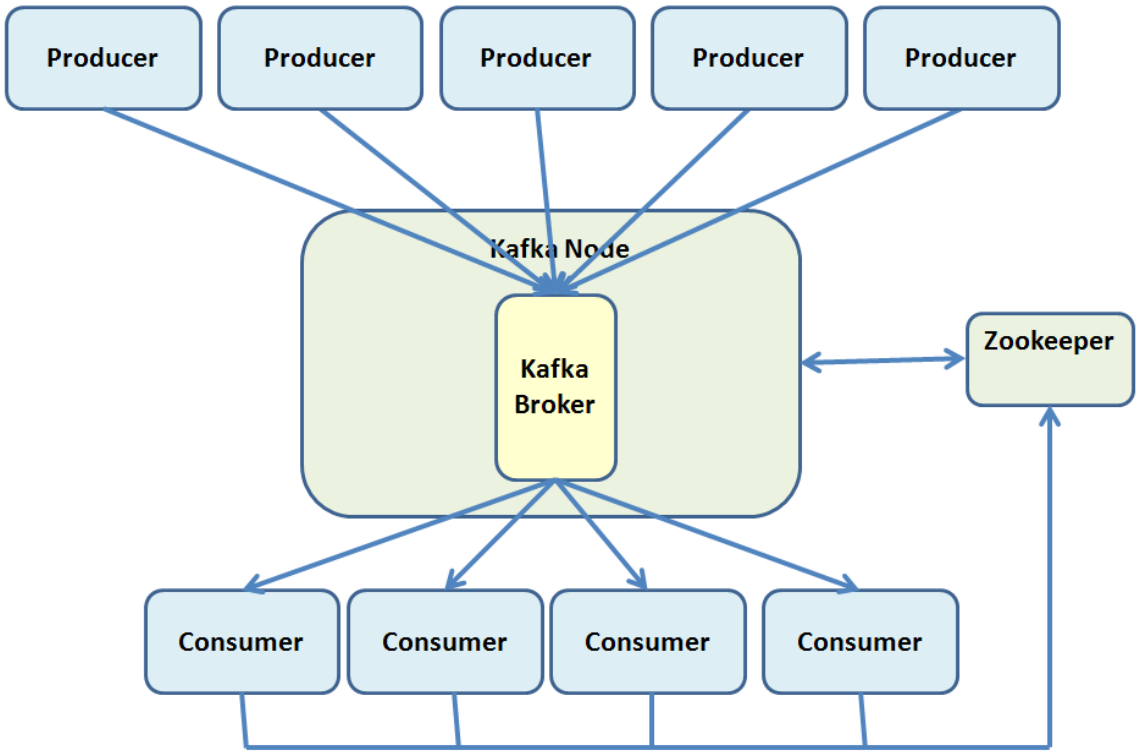

Figure 5-3. Single node - single broker Kafka cluster example

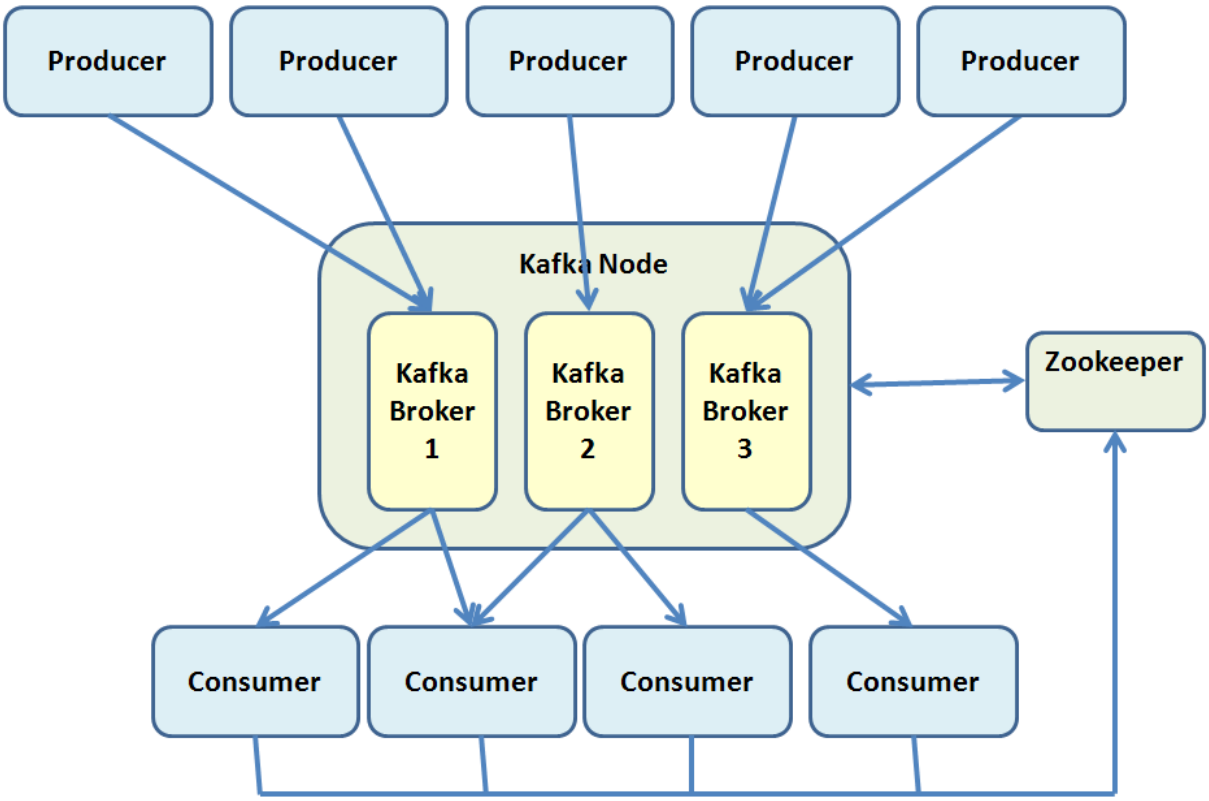

Figure 5-4. Single node - multiple broker Kafka cluster example.

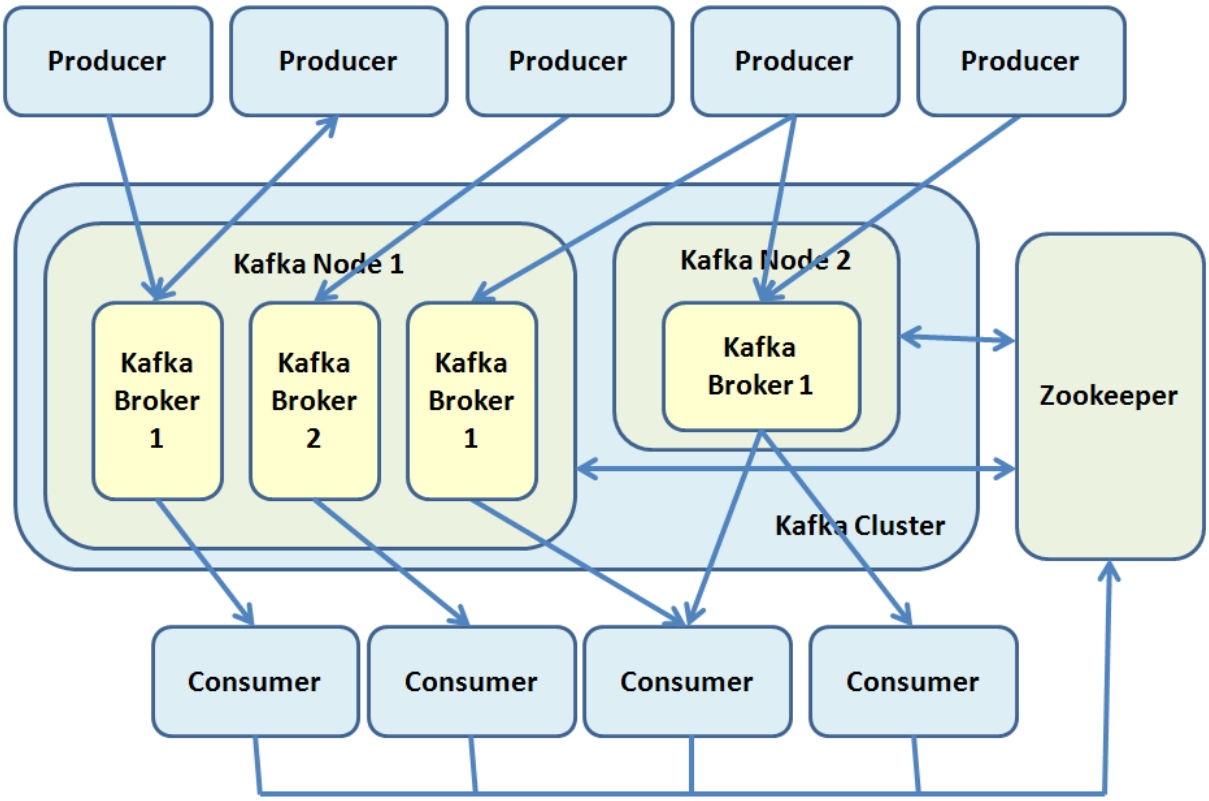

Figure 5-5. Multiple node - multiple broker Kafka cluster

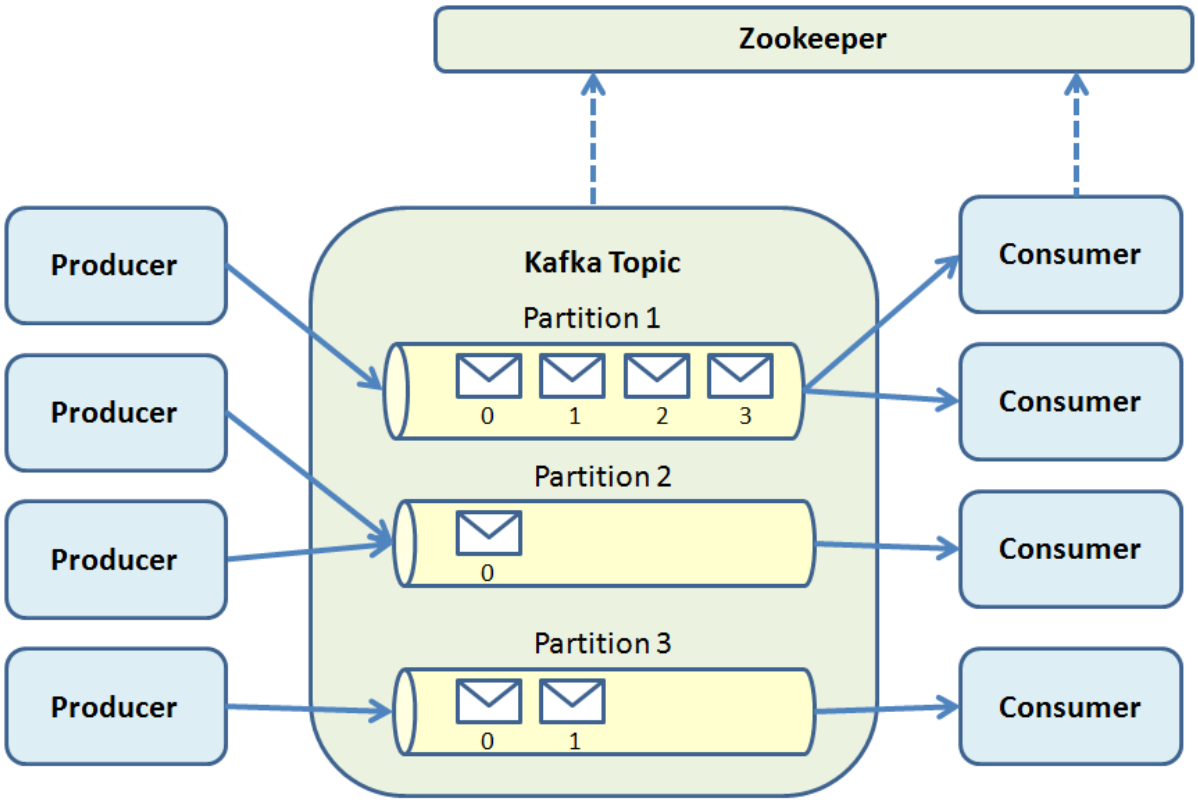

Figure 5-6. A topic with 3 partitions

Chapter 7: Study Case 1 - Spark and Cassandra

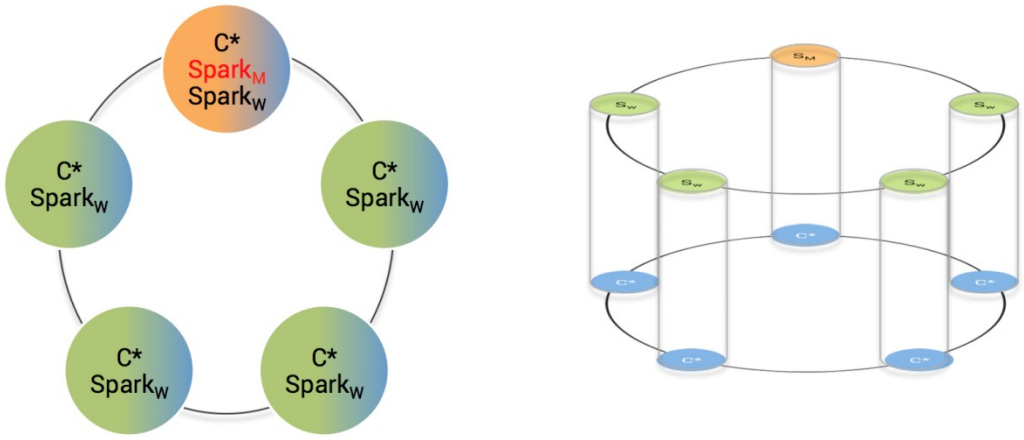

Figure 7-1. Canonical Spark Cassandra cluster

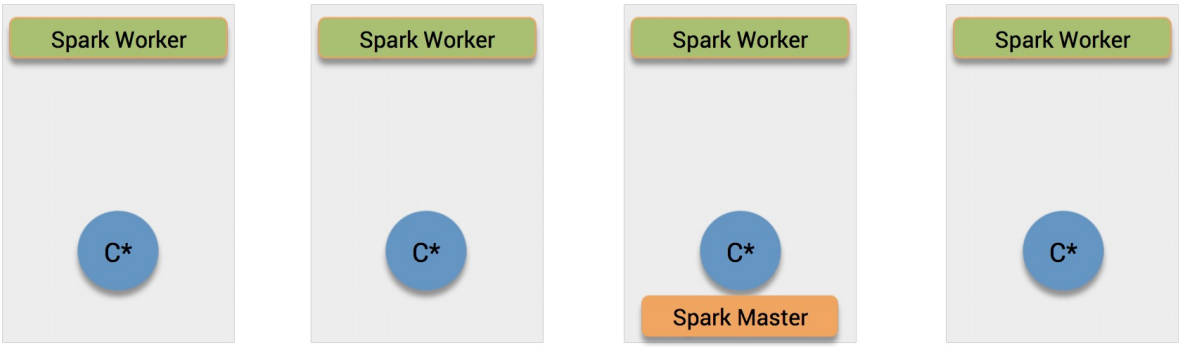

Figure 7-2. Cassandra process and Spark worker one to one relationship

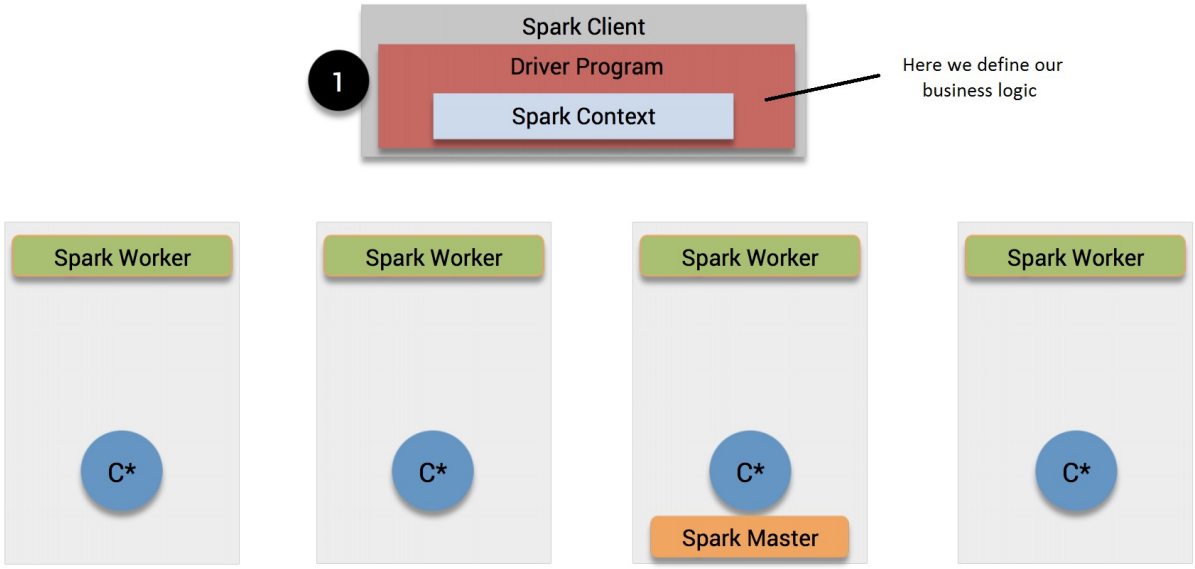

Figure 7-3. Step 1 - Define the business logic

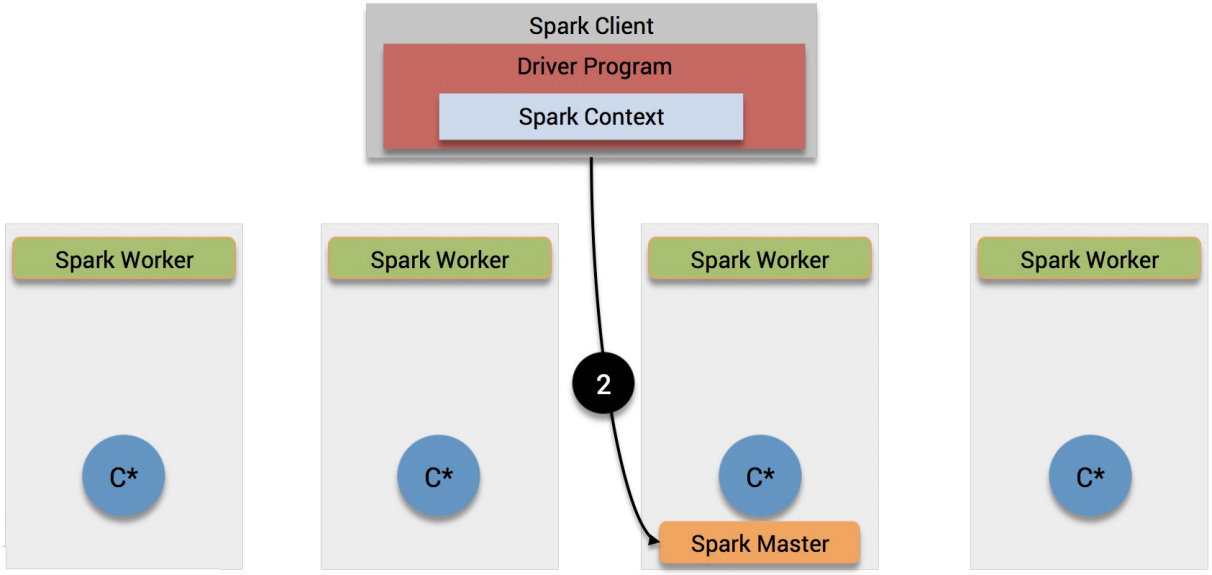

Figure 7-4. Step 2 - Driver send the tasks to the Spark Master

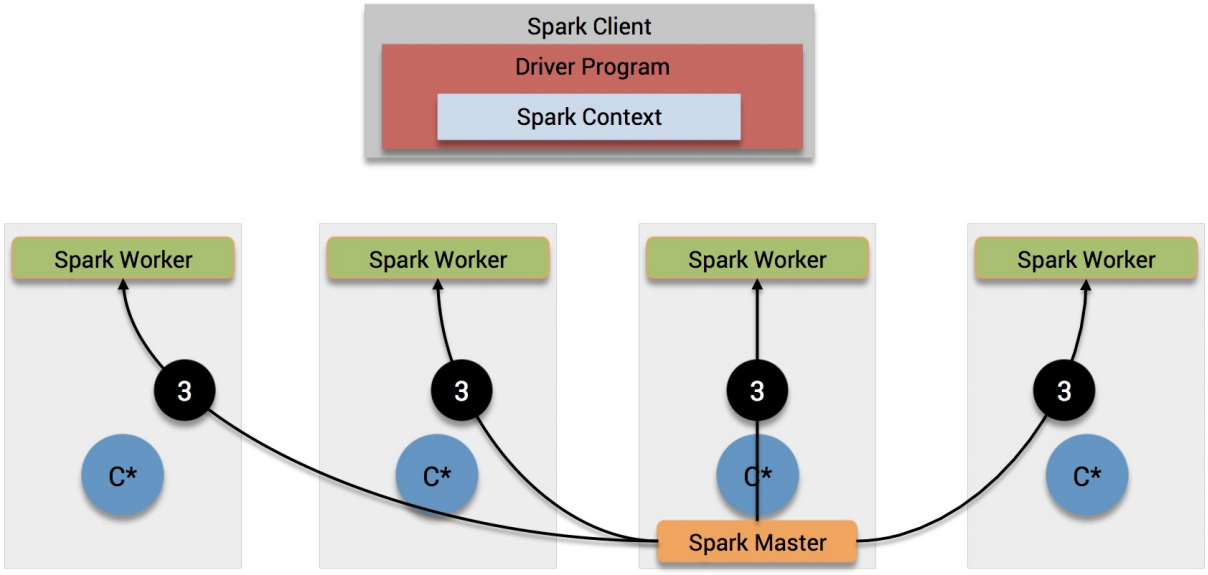

Figure 7-5. Step 3 - The Spark Master distributes the task among the workers

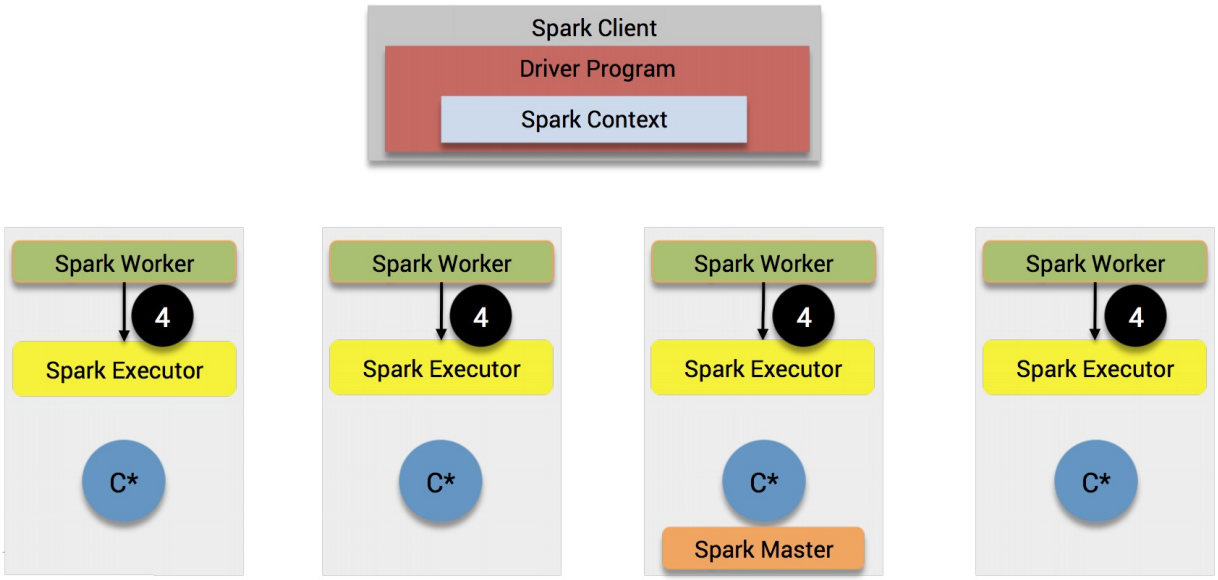

Figure 7-6. Step 4 - The Spark worker executes the task with the Spark executor

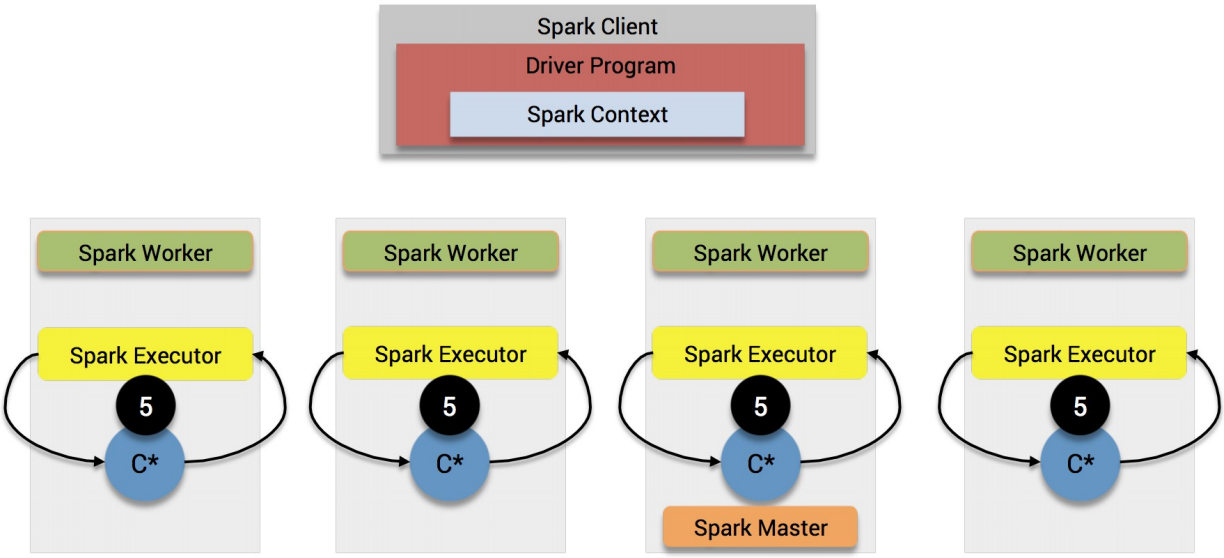

Figure 7-7. Step 5 - The Spark Executor executes the task with the Cassandra Process

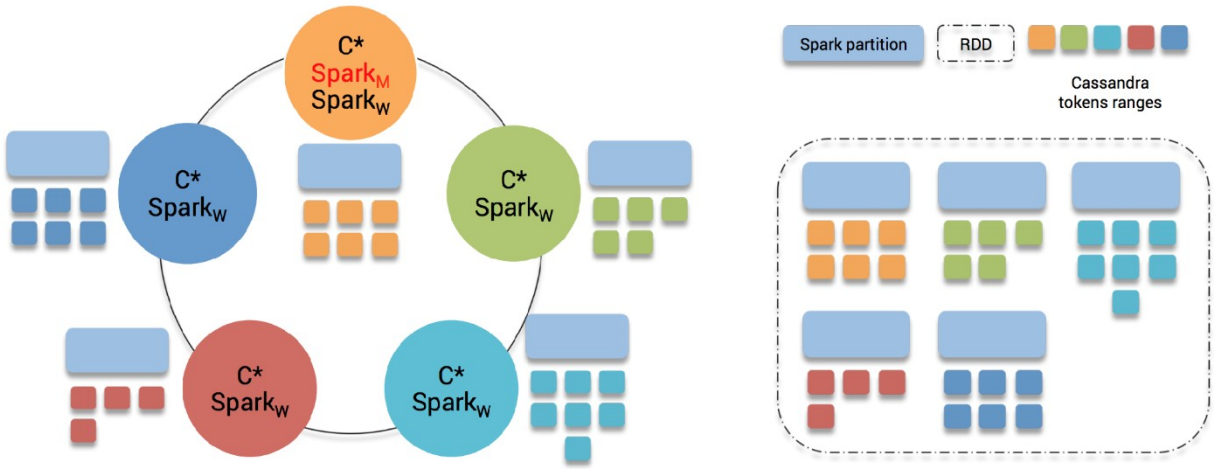

Figure 7-8. Data Locality

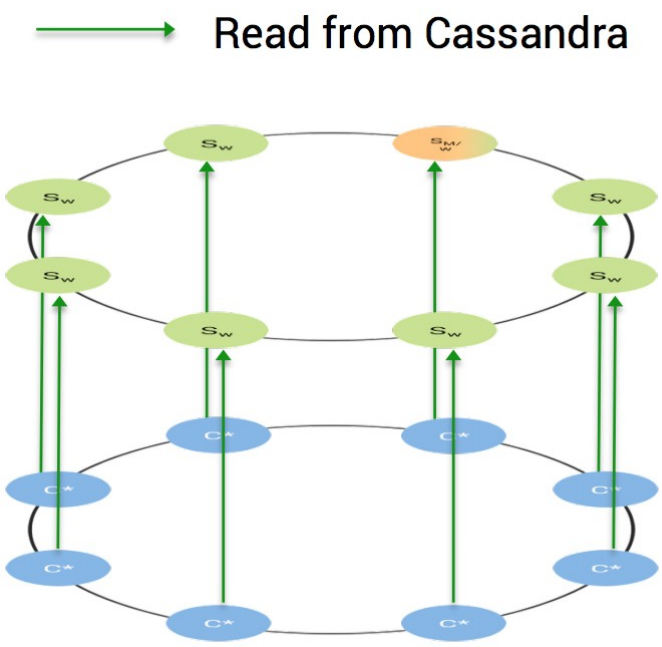

Figure 7-9. Read data from Cassandra

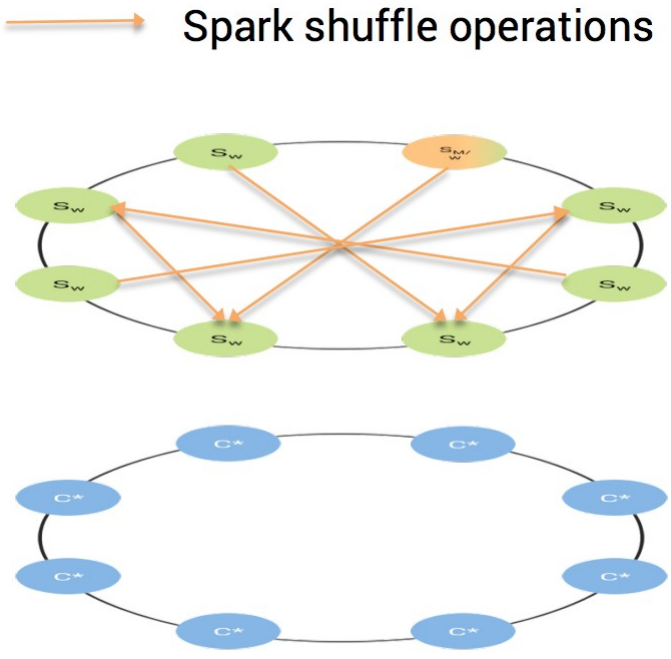

Figure 7-10. Spark shuffle operations

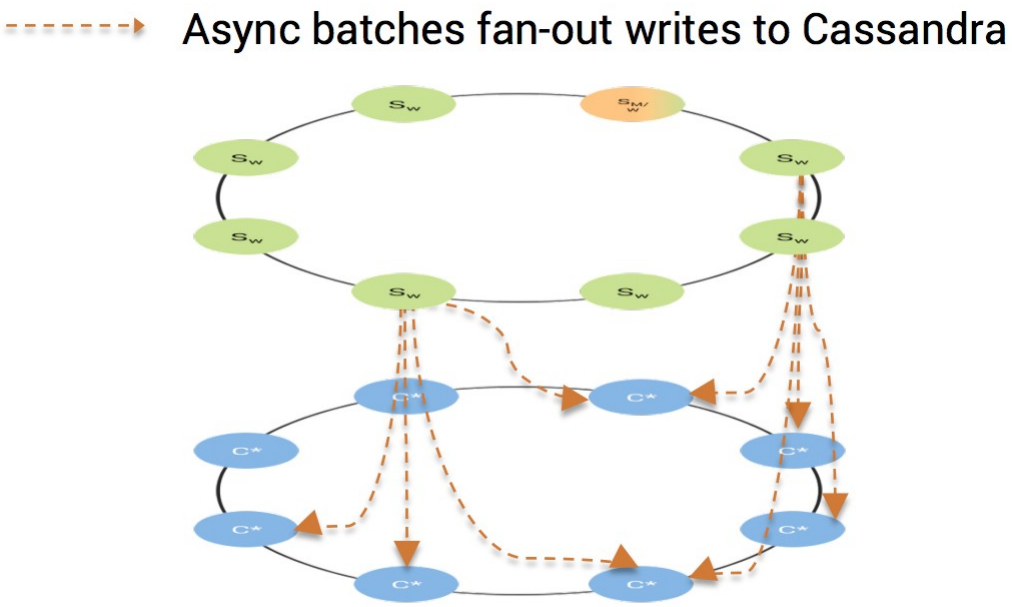

Figure 7-11. Async writes to Cassandra (without data locality)

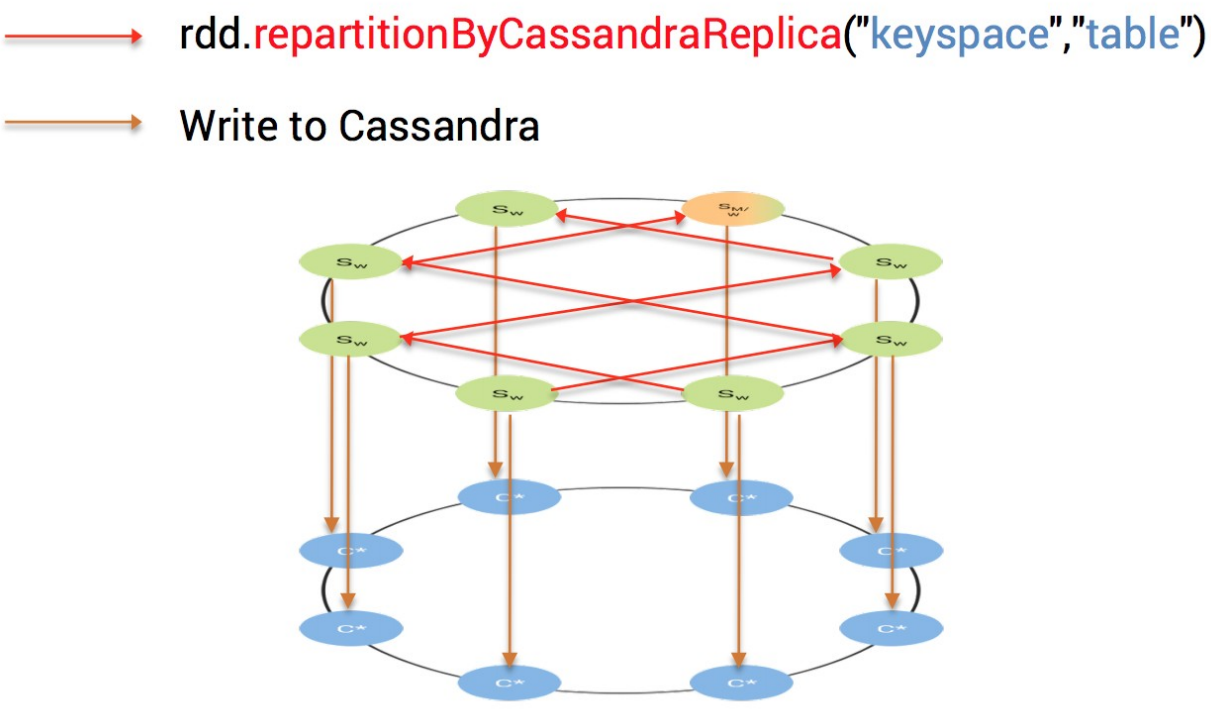

Figure 7-12. Write to Cassandra with Data Locality

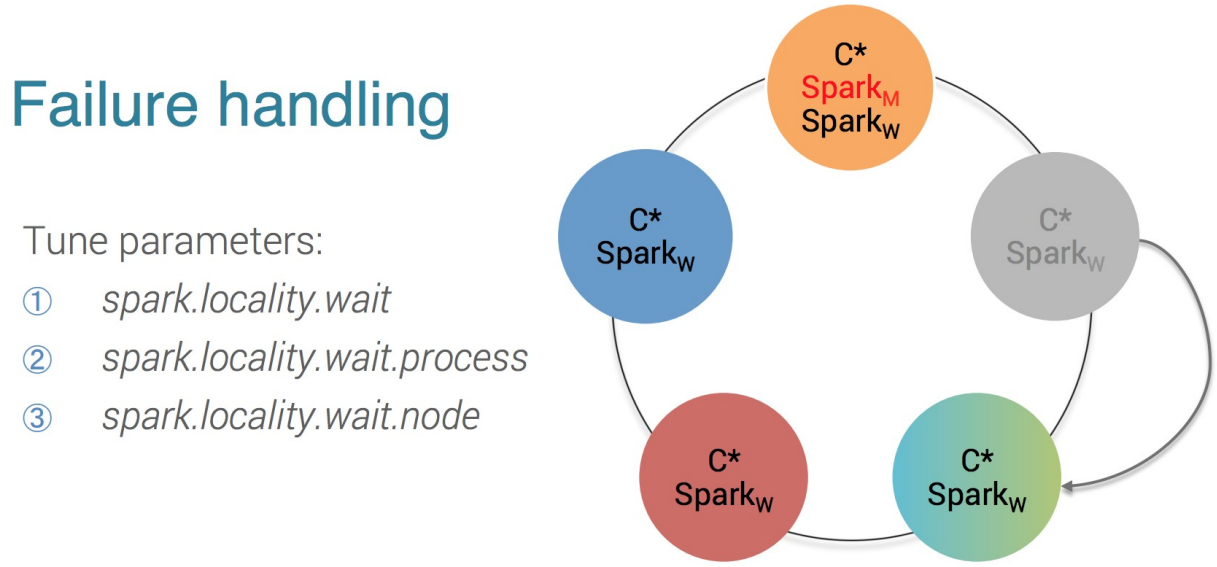

Figure 7-13. Failure handling

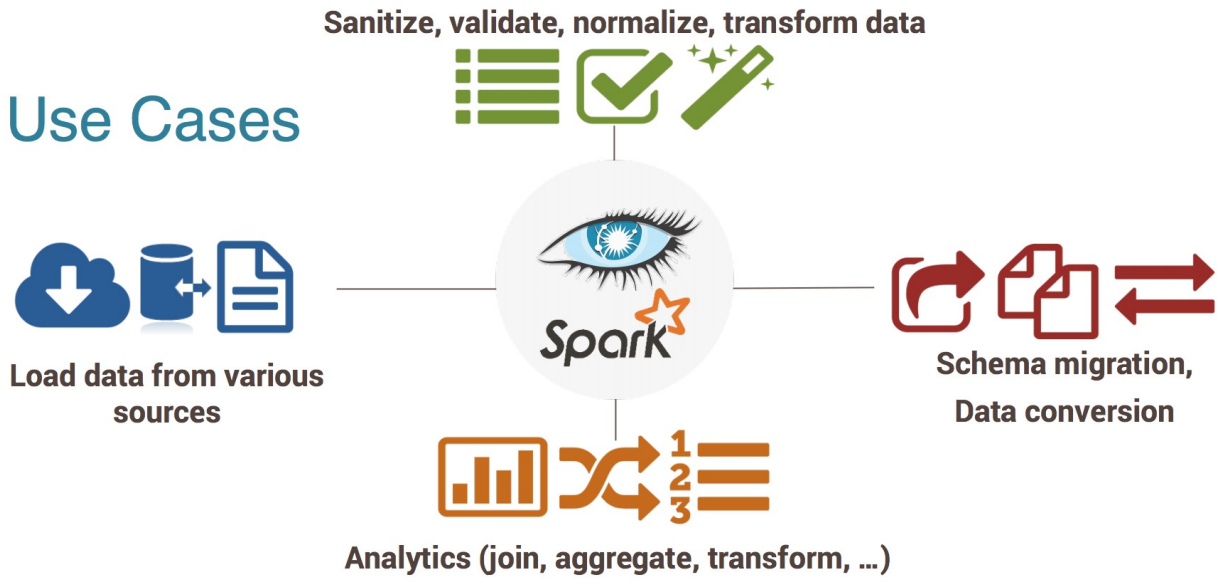

Figure 7-14. Spark Cassandra use cases

Chapter 8: Study Case 2 – Connectors

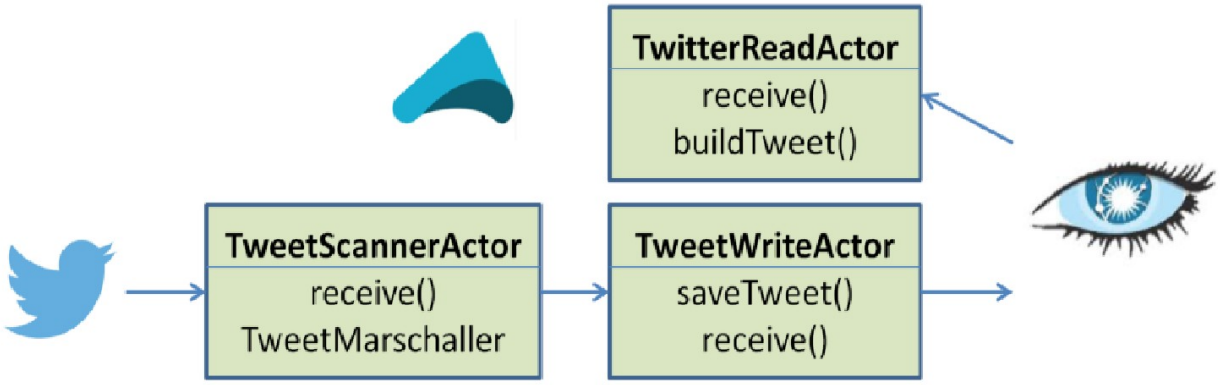

Figure 8-1. Twitter downloader actors

Chapter 9: Study Case 3 - Mesos and Docker

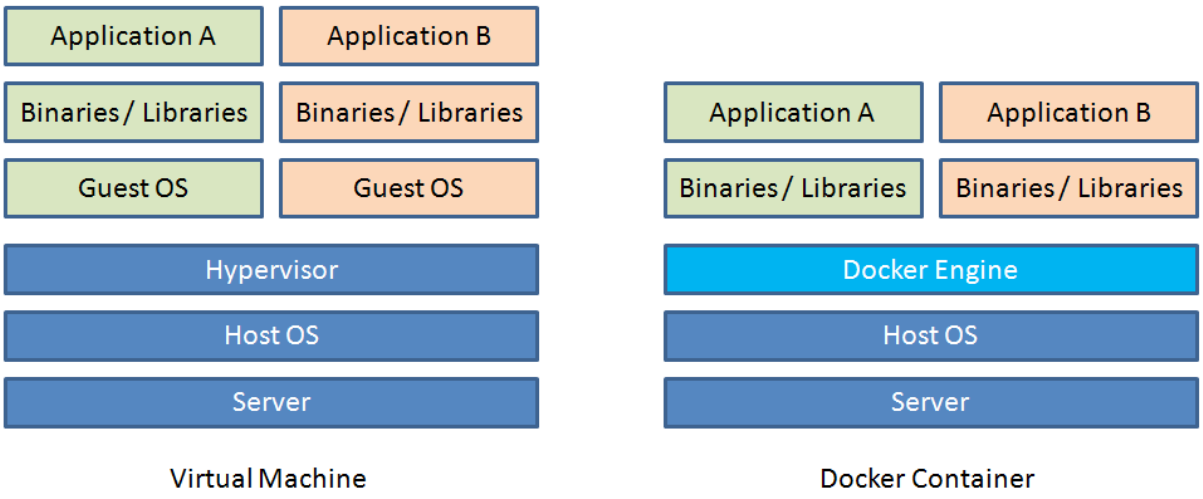

Figure 9.1. Comparison between a virtual machine and a Docker container

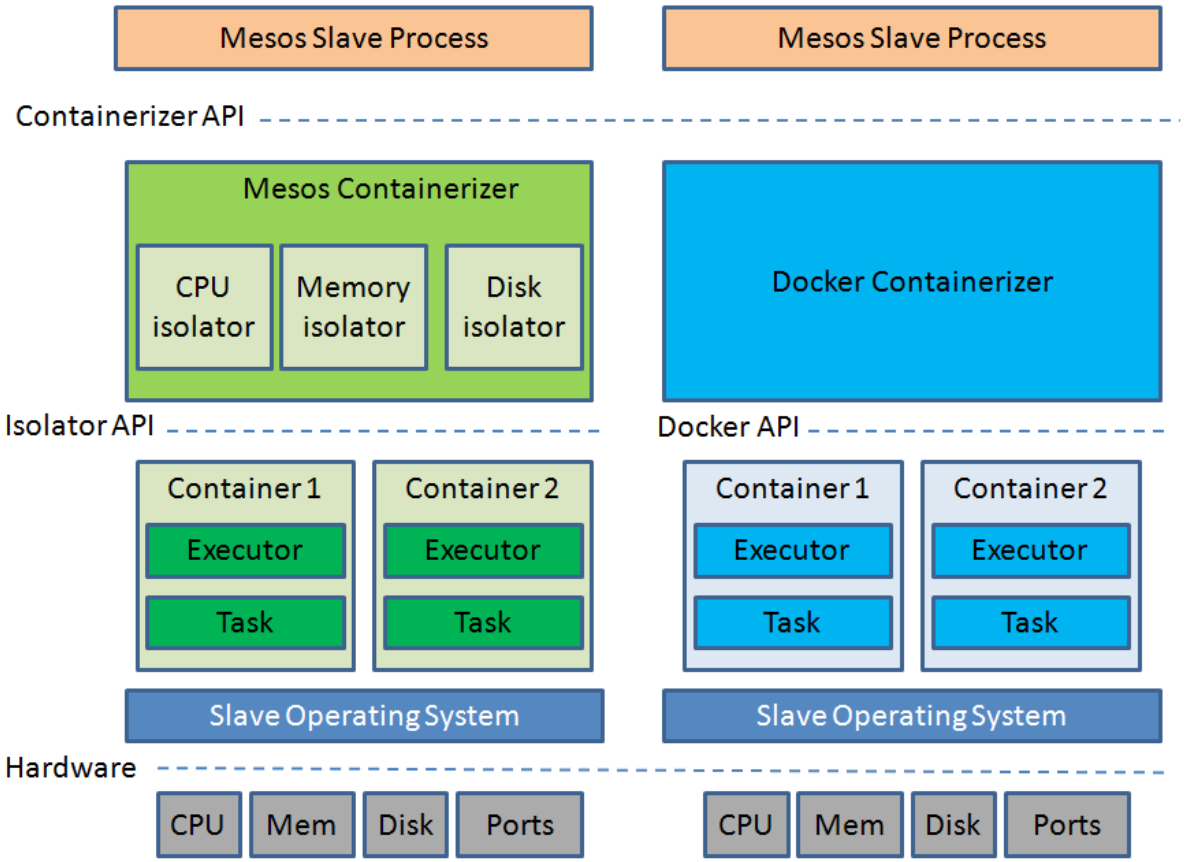

Figure 9.2. Containerization in Mesos