# Hadoop

# Hadoop Distributions

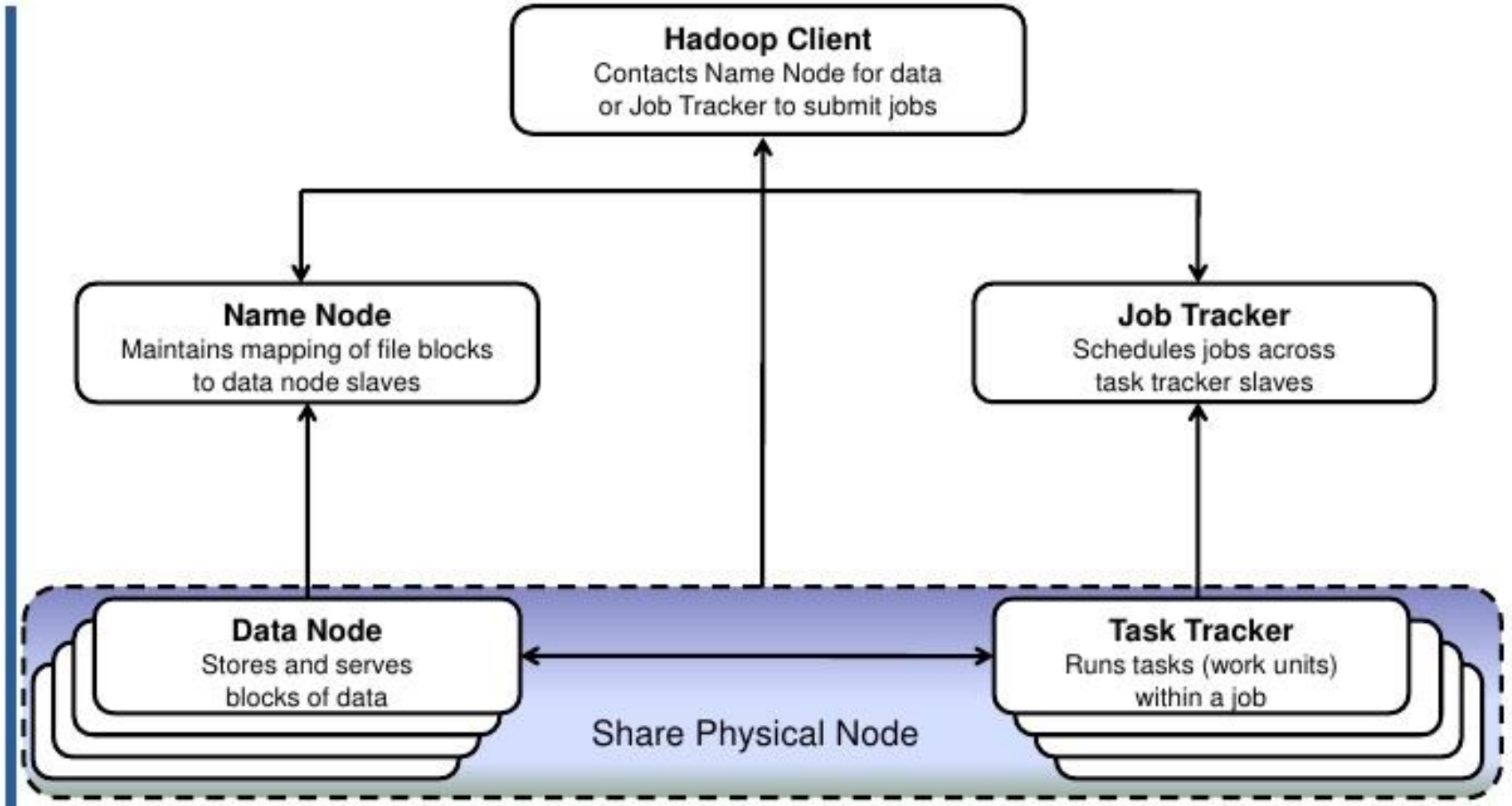
- Cloudera – CDH
- Hortonworks – HDP
- IBM – BigInsights
- Mapr – Mapr
- EMC – Greenplum
- Hp – Vertica, Haven
- Teradata – Aster
- Oracle – Exalytics
- Microsoft - HDInsights

- The Apache Hadoop software library is a framework that allows for the distributed processing of large data sets across clusters of computers using simple programming models.
- Hadoop runs on commodity hardware
- Completely written in java
- Robust, Self-healing and Resilient
- Hadoop core components : HDFS and Map Reduce

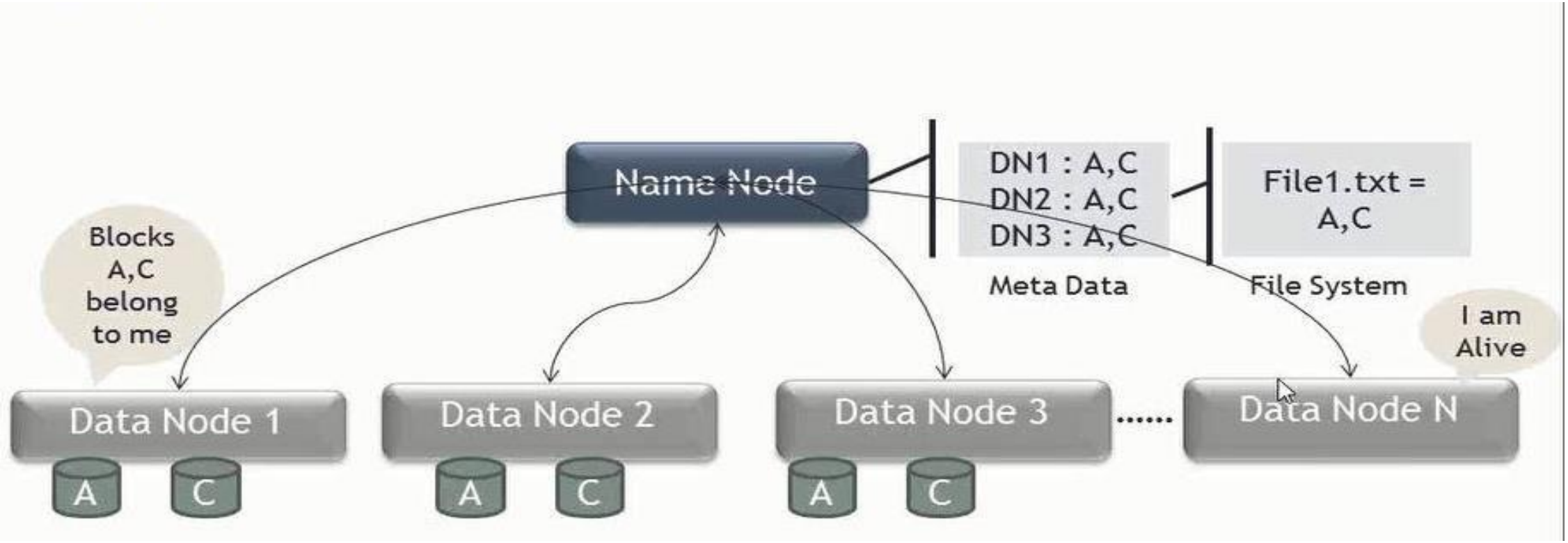
# About Hadoop

- Released in 2008 under Apache
- A well publicised feat, the New York times used Hadoop on EC2 to crunch 4 TB of scanned archives from paper, converting the to PDF for web. This processing took less than 24 hours on 100 machines
- In April 2008, Hadoop broke a world record to become fastest system to sort a terabyte of data. Running on a 910 node cluster, Hadoop sorted 1TB in 209 seconds beating previous years winner of 297 sec.
- Later in November of the same year, Google reported that itd Map-reduce implementation sorted 1TBin 68 seconds.
- In April 2009, a team at Yahoo! Used Hadoop to sort 1TB in 62 seconds

# Hadoop High-Level Architecture



# HDFS Architecture

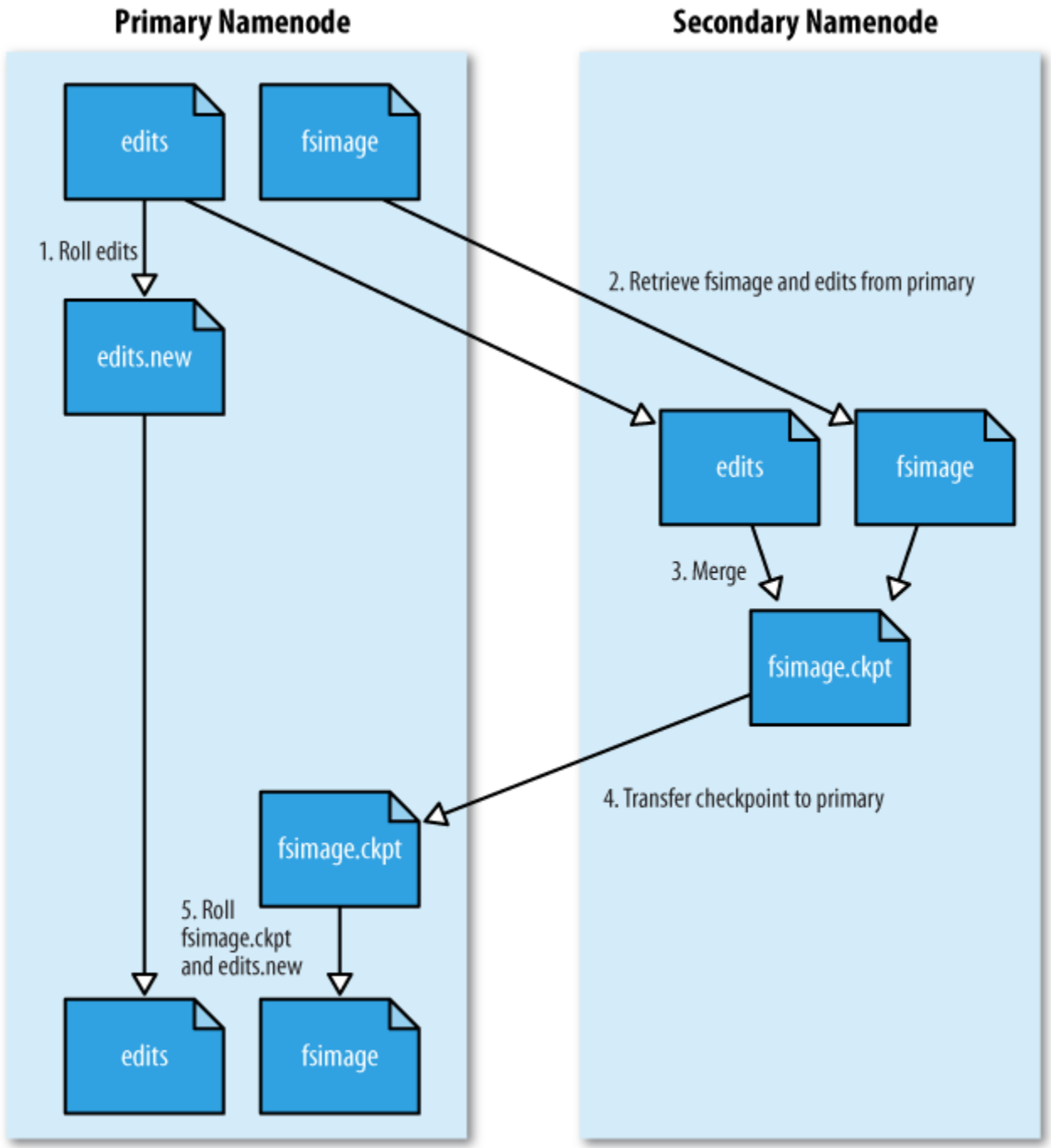


# Namenode

- The master node
- Manages the filesystem namespace
- Maintains filesystem tree and metadata for all the files and dir in the tree
- *fsimage and edits*
- *fsimage* is the complete persistent checkpoint of the filesystem metadata
- The namenode also knows the datanodes on which all the blocks for a given file are located; however, it does not store block locations persistently, because this information is reconstructed from datanodes when the system starts.
- $ hdfs fsck / -files –blocks  :- command to see block for each file

# Checkpointing using SNN





# Checkpointing through SNN

- The schedule for checkpointing is controlled by two configuration parameters.

- The secondary namenode checkpoints every hour (dfs.namenode.checkpoint.period in seconds), or sooner if the edit log has reached one million transactions since the last checkpoint (dfs.namenode.checkpoint.txns), which it checks every minute (dfs.namenode.checkpoint.check.period in seconds).

# Datanode