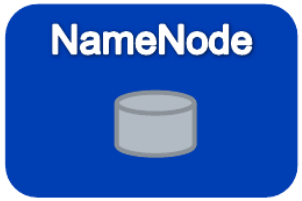
HDFS

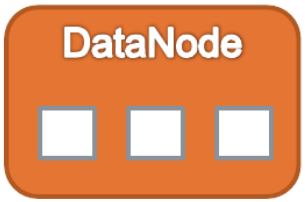
- Based on the Google File System (open-source version)
- Master-slave architecture:
  - Master
    - NameNode that manages the metadata
    - maps blocks (or chunks) of files to DataNodes
    - responsible for failure detection
  - Slaves
    - one or more slave DataNodes store the data
    - process the actual read and write operations

HDFS Components

File: Is split into **blocks** of 128 MB size (configureable)



NameNode: “Master”
Stores metadata about **location of data** and active DataNodes.



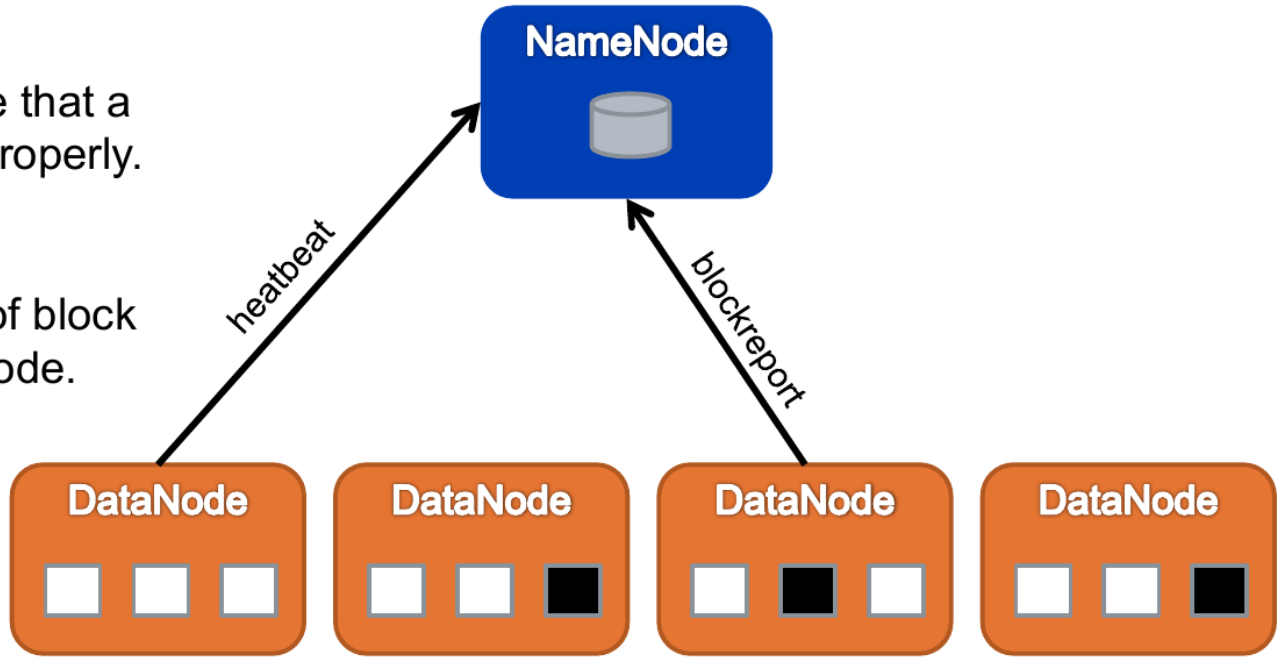
NameNode: “Worker”
Stores **data-blocks**.

- Relatively large blocks $\Rightarrow$ keeps metadata small
- Clients also cache metadata
- This keeps the load on master low

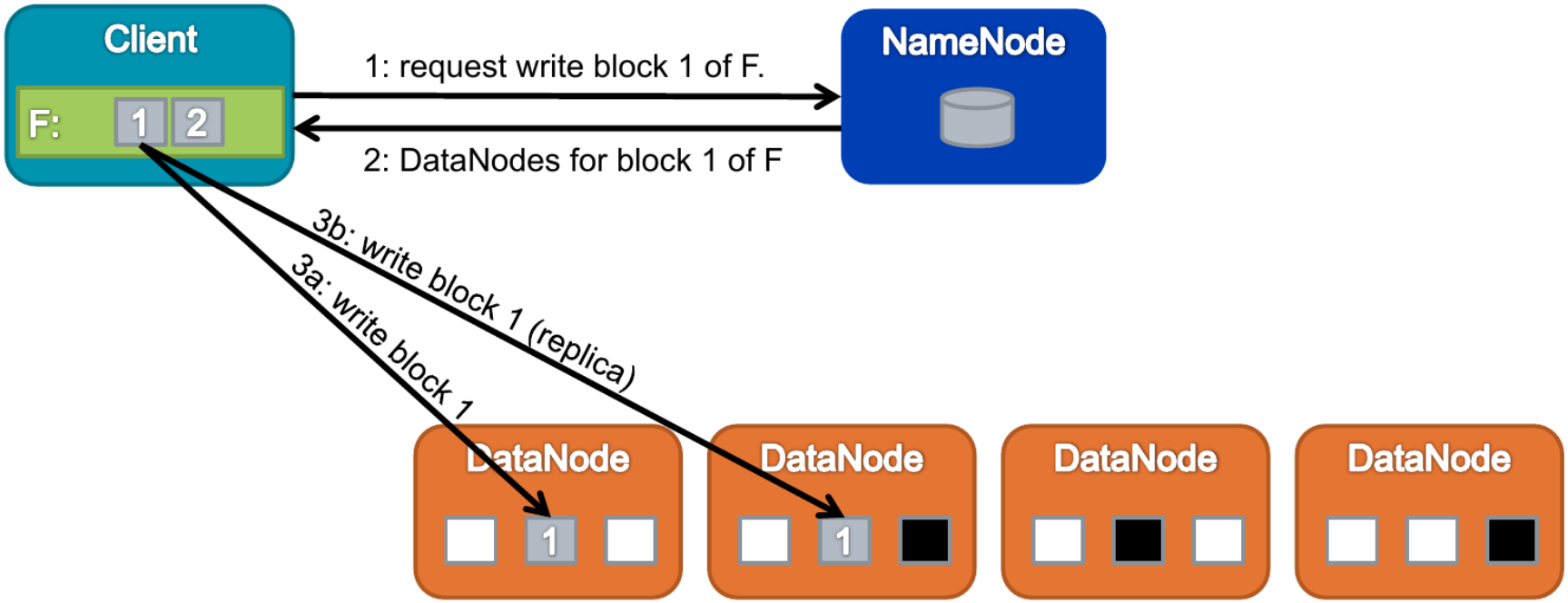
HDFS Metadata

Heatbeat:
informs the NameNode that a DataNode is working properly.

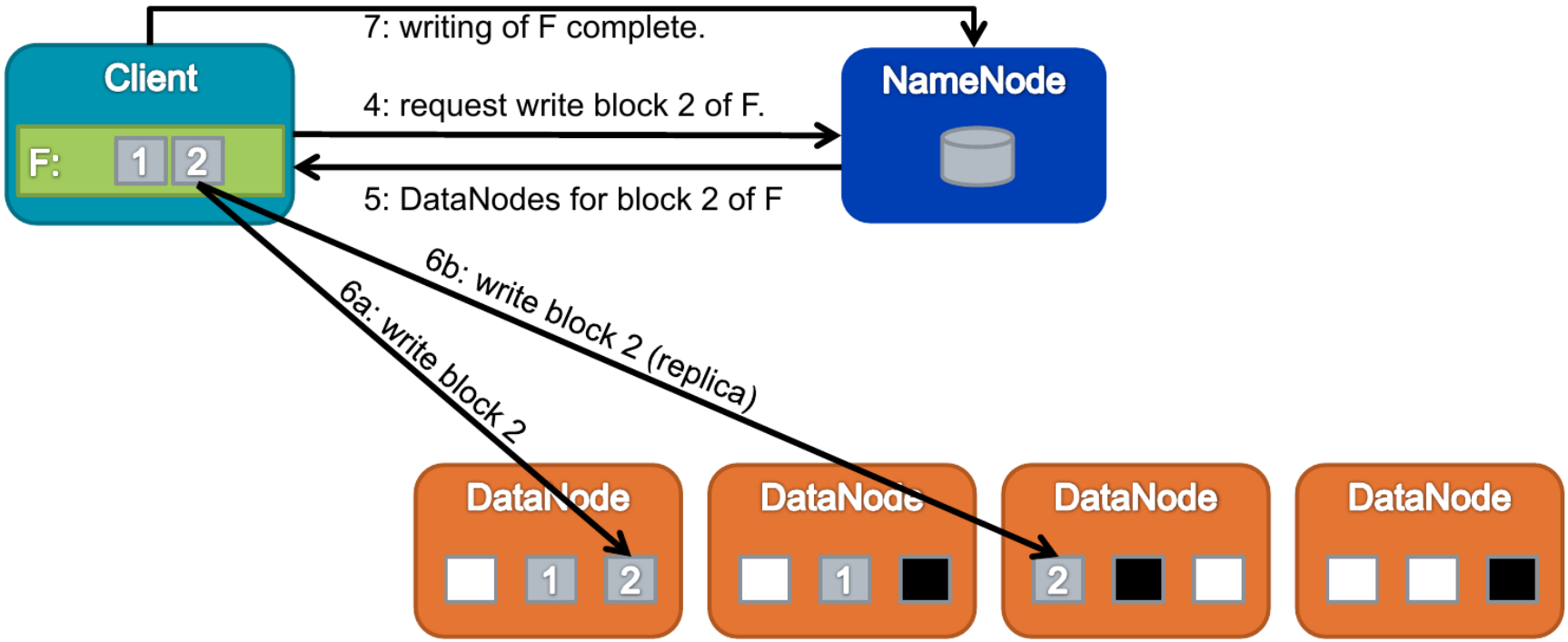
Blockreport:
informs a NameNode of block IDs stored on a DataNode.



HDFS Write File



HDFS Write File (2)



HDFS Sequential Read File