REVA UNIVERSITY

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Approved by AICTE, COA and BCI, New Delhi

Lecture 11.1
BigData and Hadoop

School of Computing and Information Technology

2020-2021

Outline

Recap of previous Lecture

Topic for the Lecture

Objective and Outcome of Lecture

Lecture Discussion

History of Hadoop

Recap of previous Lecture

Recap of Previous Lecture

History of Hadoop

Over View of Hadoop

Topic of the Lecture

Topic of the Lecture

Components of Hadoop

Key aspects of Hadoop

Hadoop ecosystem

Hadoop Components

Objective and Outcome of Lecture

Objective and outcome of lecture

Lecture Objective

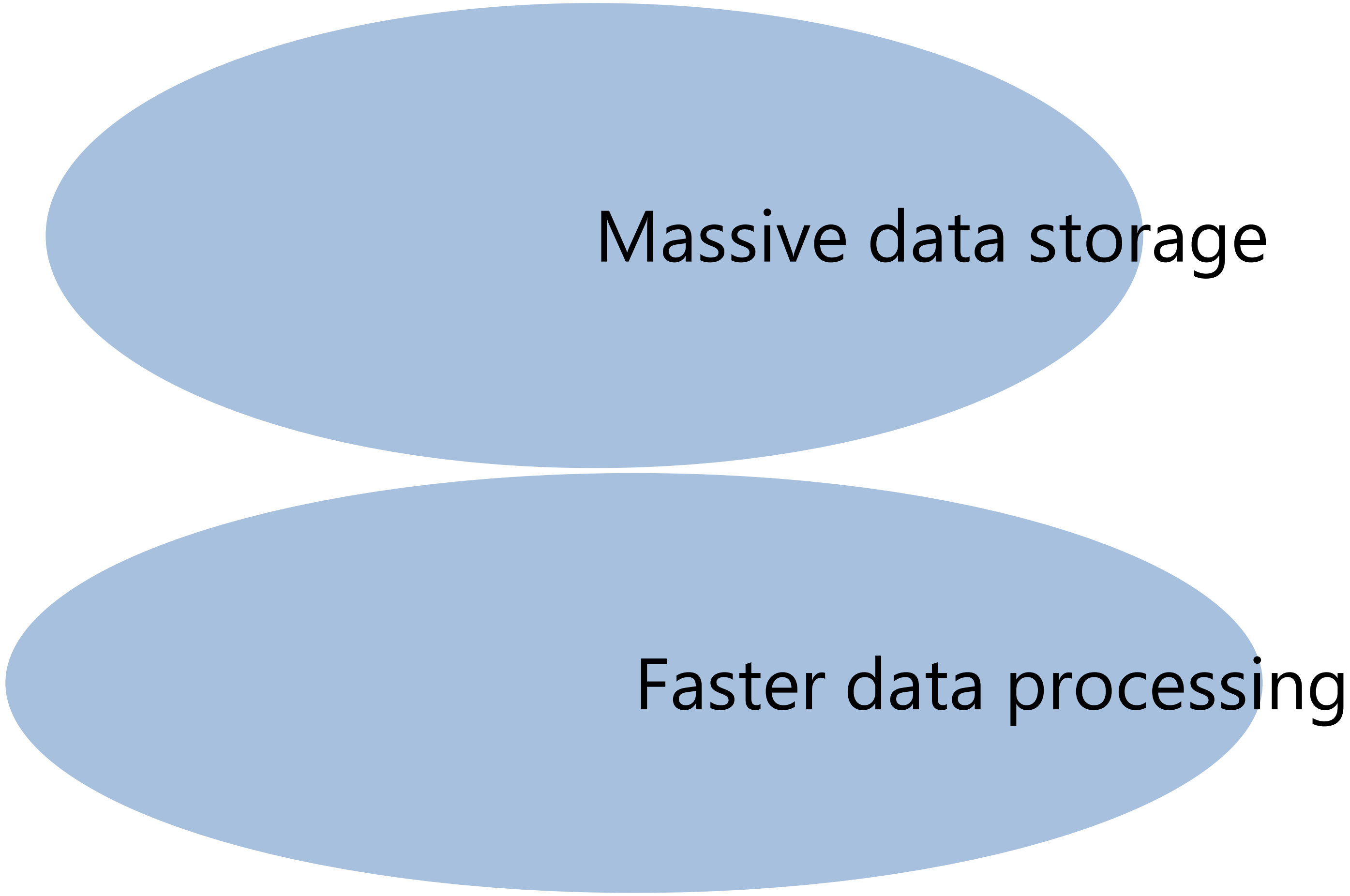
Explain why Hadoop components and Ecosystem.

Lecture Outcome

Outline the Hadoop components and Ecosystem.

Hadoop Overview

Basically Hadoop accomplishes 2 Tasks



Massive data storage

Faster data processing

Key Aspects of Hadoop

Key aspects of Hadoop

Open source software: It is free to download.

Framework: Everything is provided –programs ,tools etc.

Distributed : Divides and stores data across multiple computers.

Massive data storage: stores huge amount of data across nodes of low-cost commodity

Faster data processing: large amount of data is processed in parallel.

Use cases of Hadoop

clickStream Data:helps to understand the purchasing behaviour of customers. clickStream also helps to online marketers to optimize their product web pages,promotional contents etc.

Use cases of hadoop

clickStream analysis using Hadoop provides following 3 benefits.

1.Hadoop helps to join clickStream data with other data sources such as customer relationship data.this additional data often provides the much needed information to understand customer behaviour.

2.hadoop scalability property helps you to store years of data without ample increment cost.

3.business analysis can use Apache pig or Apache Hive for website analysis.with these tools we can organize clickStream data by user session ,refine it ,and feed it to visualization or analytics tools

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Lecture 11.2

BigData and Hadoop

School of Computing and Information Technology

2020-2021

Outline

Recap of previous Lecture

Lecture Discussion

Overview of The Hadoop

Summary

Overview of the Hadoop

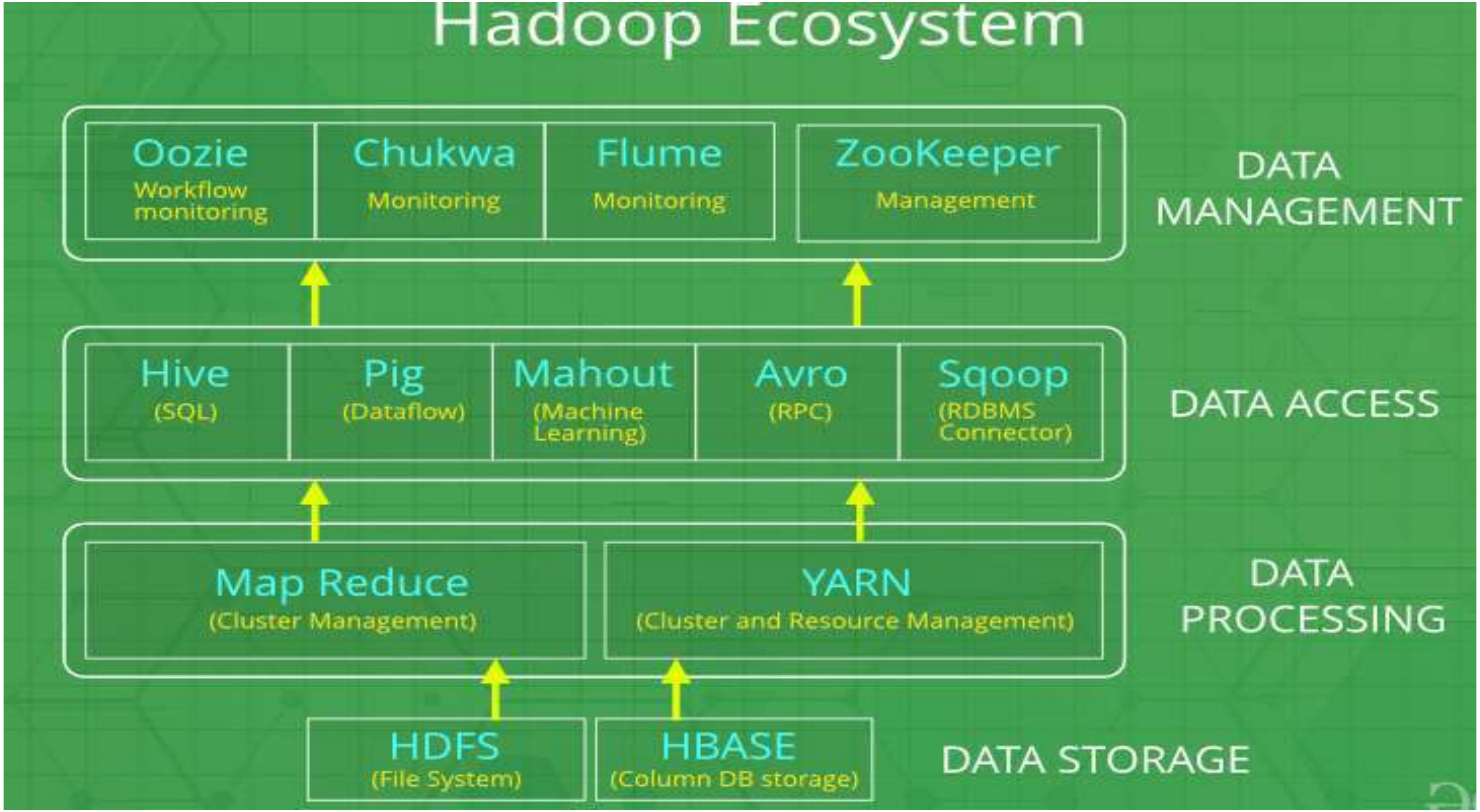
Recap of Previous Lecture

Components of Hadoop

Key aspects of Hadoop

Use Cases of Hadoop

Hadoop Ecosystem



Hadoop Ecosystem

Oozie
Workflow monitoring

Chukwa
Monitoring

Flume
Monitoring

ZooKeeper
Management

DATA MANAGEMENT

Hive
(SQL)

Pig
(Dataflow)

Mahout
(Machine Learning)

Avro
(RPC)

Sqoop
(RDBMS Connector)

DATA ACCESS

Map Reduce
(Cluster Management)

YARN
(Cluster and Resource Management)

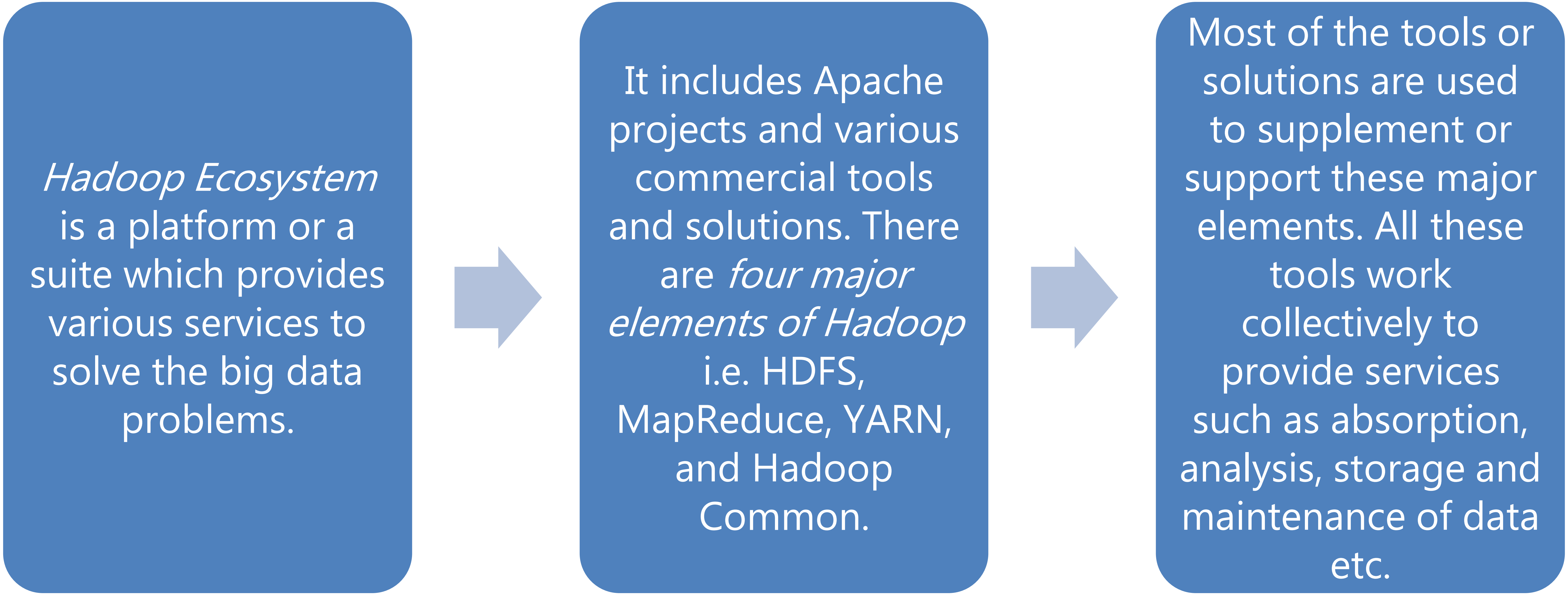
DATA PROCESSING

HDFS
(File System)

HBASE
(Column DB storage)

DATA STORAGE

Contd……….



Hadoop Ecosystem is a platform or a suite which provides various services to solve the big data problems.

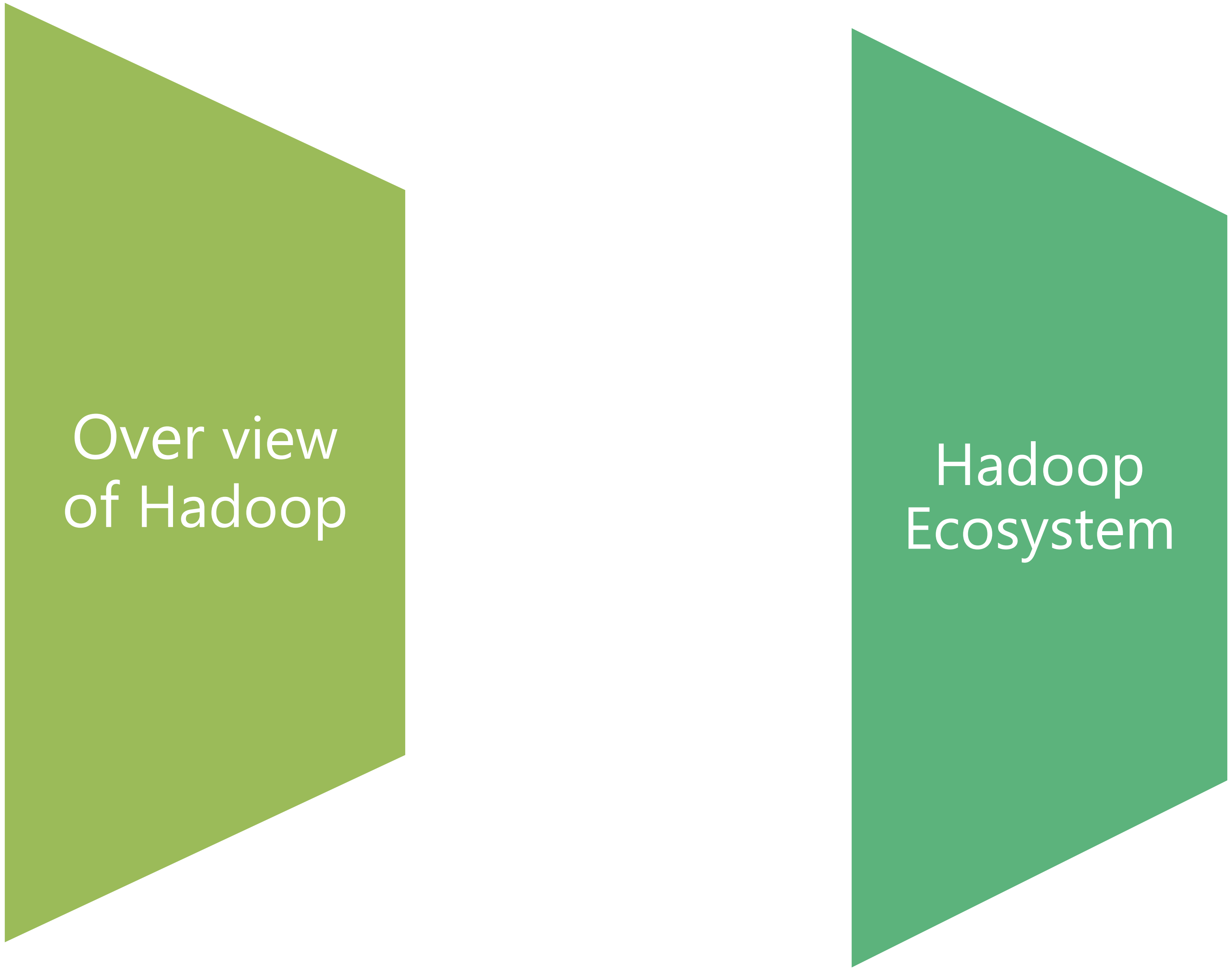
It includes Apache projects and various commercial tools and solutions. There are *four major elements of Hadoop* i.e. HDFS, MapReduce, YARN, and Hadoop Common.

Most of the tools or solutions are used to supplement or support these major elements. All these tools work collectively to provide services such as absorption, analysis, storage and maintenance of data etc.

Components that Collectively form a Hadoop Ecosystem

- **HDFS:** Hadoop Distributed File System
- **YARN:** Yet Another Resource Negotiator
- **MapReduce:** Programming based Data Processing
- **Spark:** In-Memory data processing
- **PIG, HIVE:** Query based processing of data services
- **HBase:** NoSQL Database
- **Mahout, Spark MLLib:** Machine Learning algorithm libraries

Summary of the Lecture



Over view of Hadoop

Hadoop Ecosystem

Overview of Hadoop

Resources and Tasks to be completed

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Hadoop Ecosystem

Recap of previous Lecture

Recap of previous lecture

Hadoop Ecosystem

High Level Architecture of Hadoop

Topic of the Lecture

Topic of the Lecture

- Hadoop Architecture/Master slave Architecture
- Introduction to Hadoop Distributed File System
- Name node and Data node, MapReduce

Hadoop Architecture

Objective and Outcome of Lecture

Objective and Outcome of Lecture

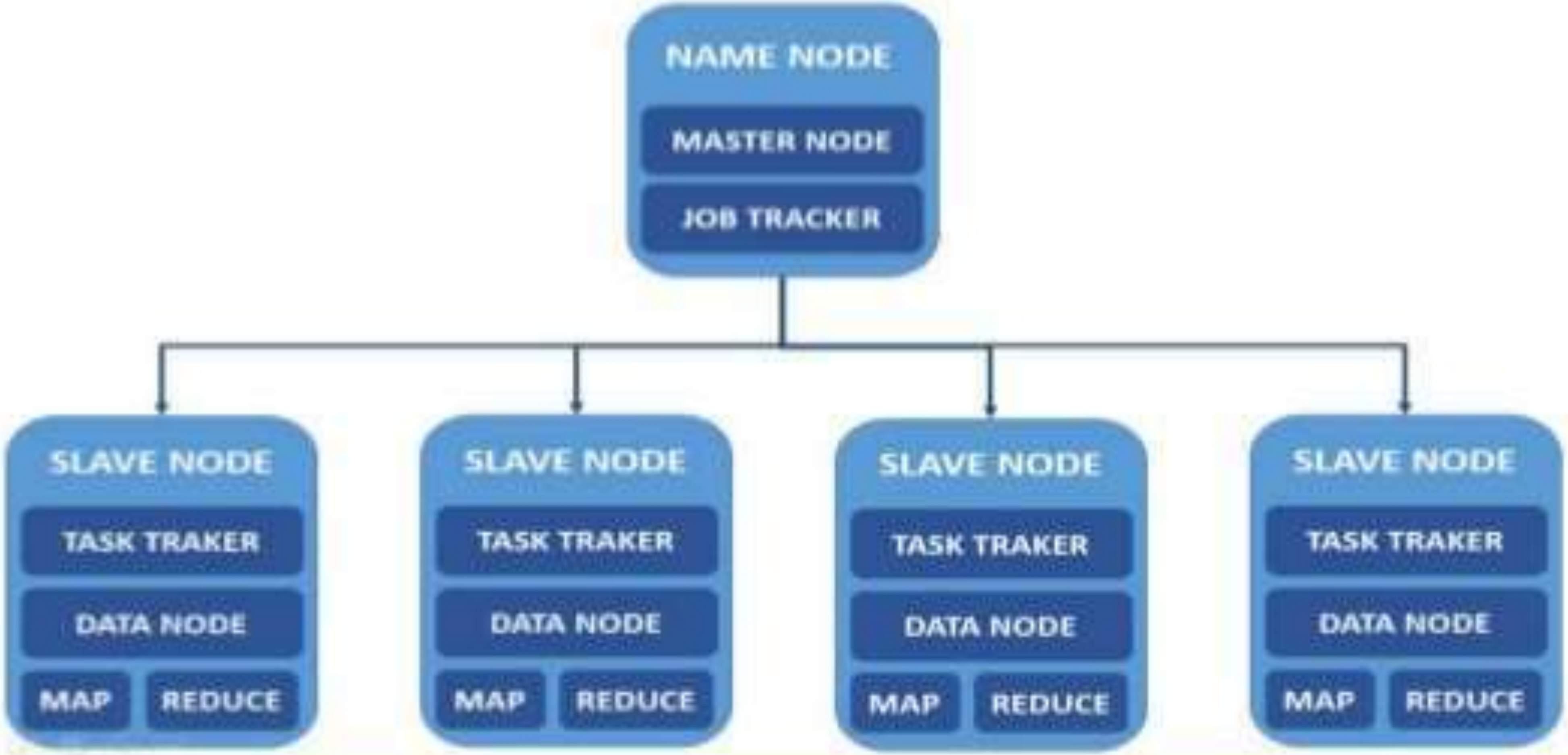
Lecture Objective

Explain the Hadoop High Level Architecture

Lecture Outcome

Outline the Hadoop High Level Architecture.

HADOOP MASTER/SLAVE ARCHITECTURE



NAME NODE

MASTER NODE

JOB TRACKER

SLAVE NODE

TASK TRAKER

DATA NODE

MAP

REDUCE

SLAVE NODE

TASK TRAKER

DATA NODE

MAP

REDUCE

SLAVE NODE

TASK TRAKER

DATA NODE

MAP

REDUCE

SLAVE NODE

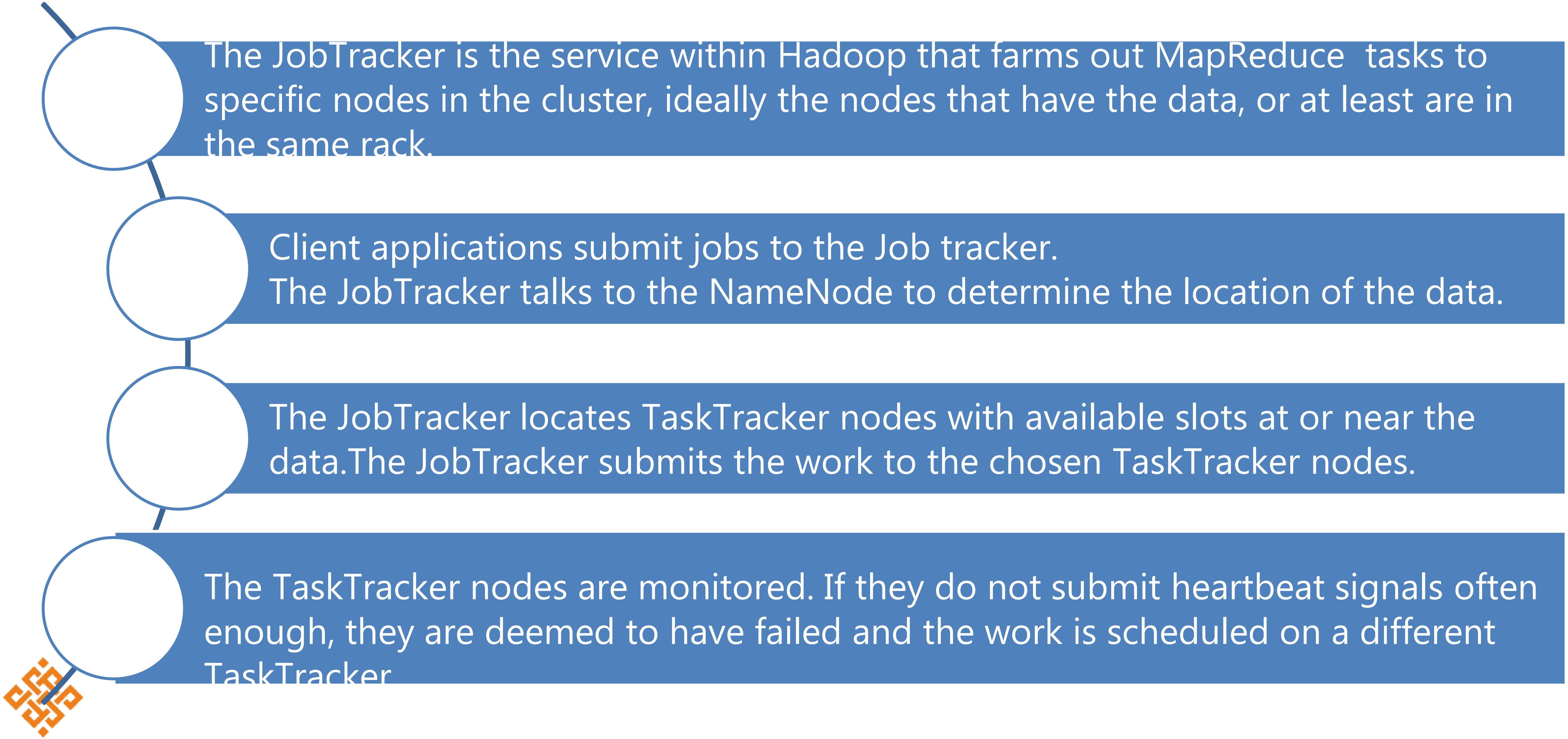
TASK TRAKER

DATA NODE

MAP

REDUCE

Job Tracker and Task Trackers



The JobTracker is the service within Hadoop that farms out MapReduce tasks to specific nodes in the cluster, ideally the nodes that have the data, or at least are in the same rack.

Client applications submit jobs to the Job tracker.
The JobTracker talks to the NameNode to determine the location of the data.

The JobTracker locates TaskTracker nodes with available slots at or near the data.The JobTracker submits the work to the chosen TaskTracker nodes.

The TaskTracker nodes are monitored. If they do not submit heartbeat signals often enough, they are deemed to have failed and the work is scheduled on a different TaskTracker

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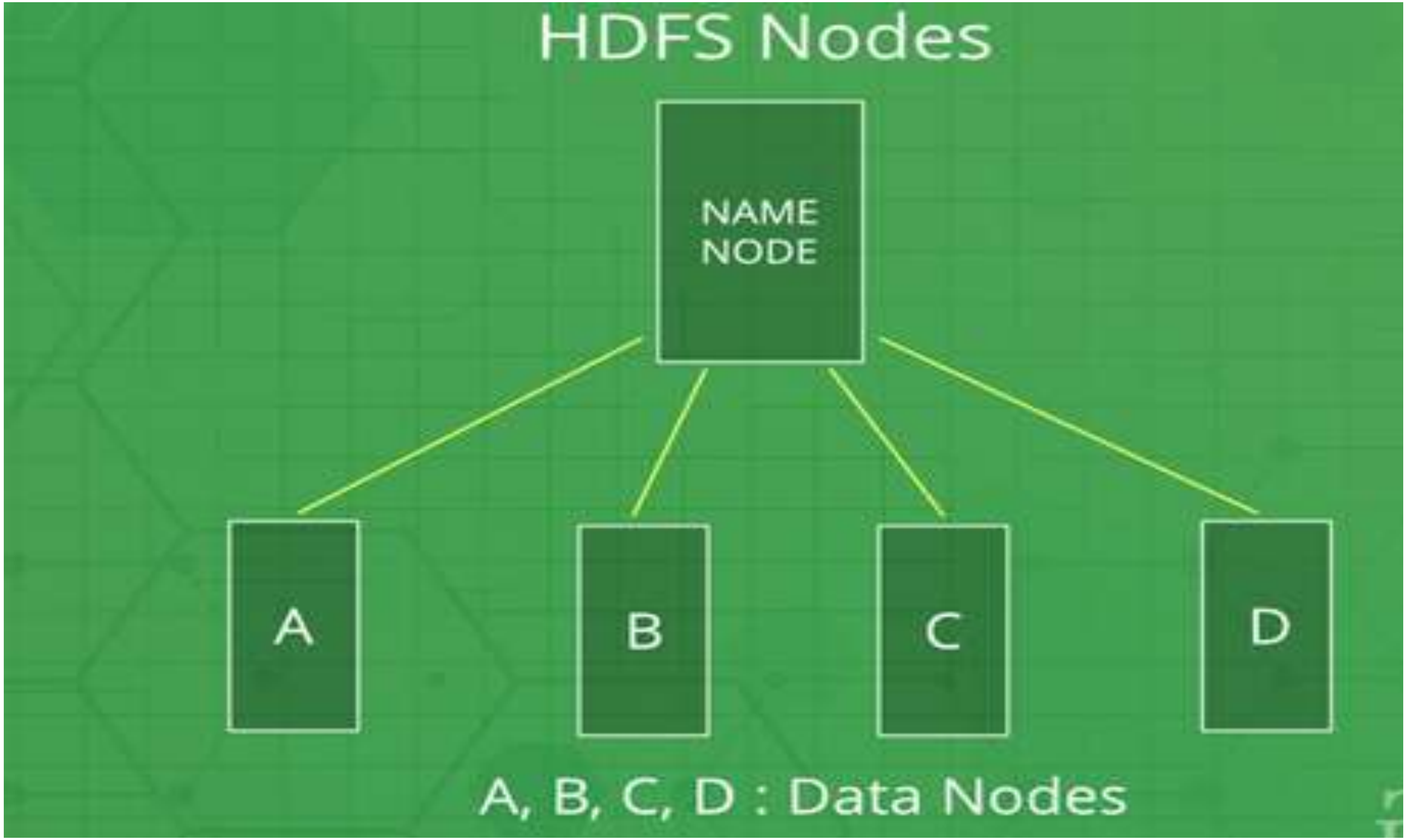

HDFS Nodes

A, B, C, D : Data Nodes

Thank You