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## FUNDAMENTAL: APACHE ZOOKEEPER

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By [www.HadoopExam.com](http://www.HadoopExam.com)

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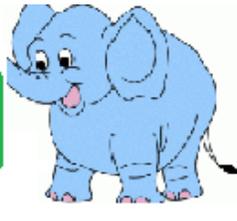
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## Introduction to Apache Zookeeper

Zookeeper service is helpful where, you have multiple nodes in your cluster or infrastructure.

Examples:

- Hadoop Cluster
- Kafka Messaging Engine
- Storm

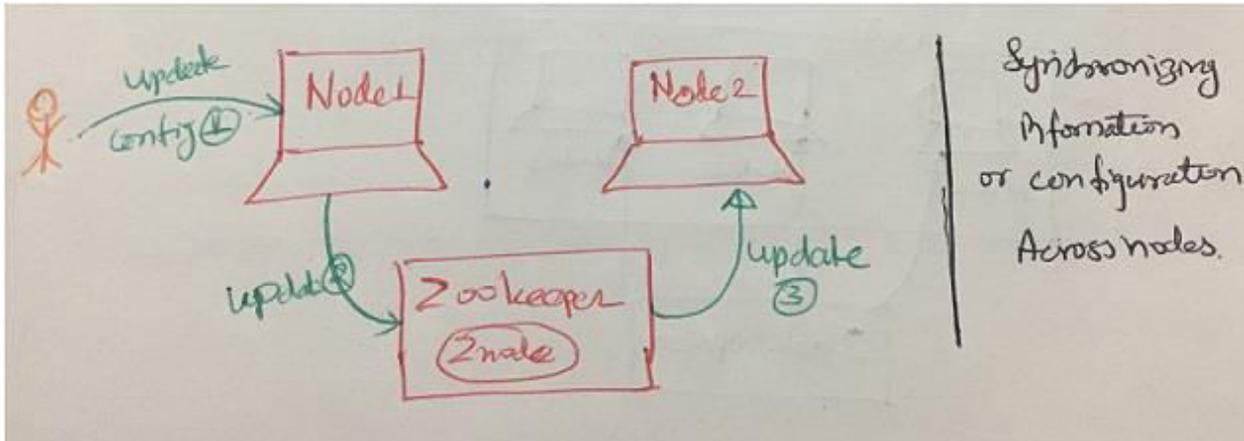
**Purpose:** Zookeeper helps in synchronizing information across nodes in cluster.

Zookeeper store information in

- Memory
- On Disk

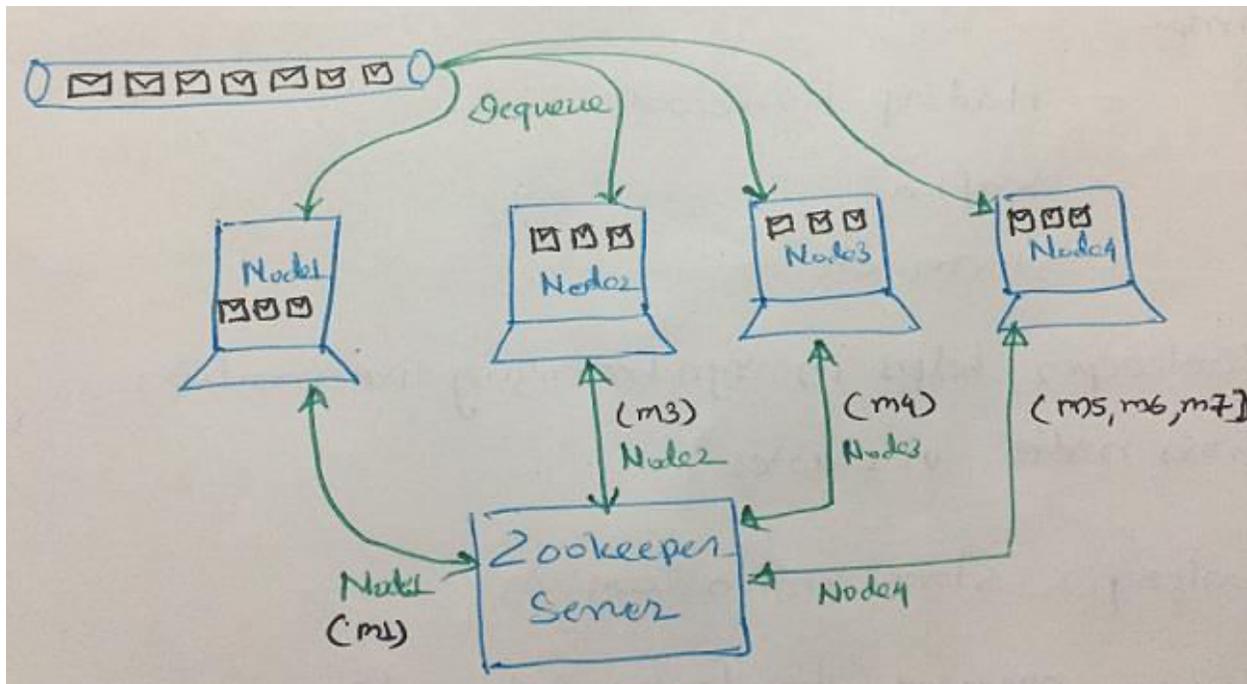
Znode: Znode stores the information which is required or needs to be shared among multiple nodes.

Example: Configuration Data



Zookeeper Server is used mainly for co-ordination among the nodes in a cluster where multiple nodes are involved.

**Zookeeper in Message Processing Engine:**

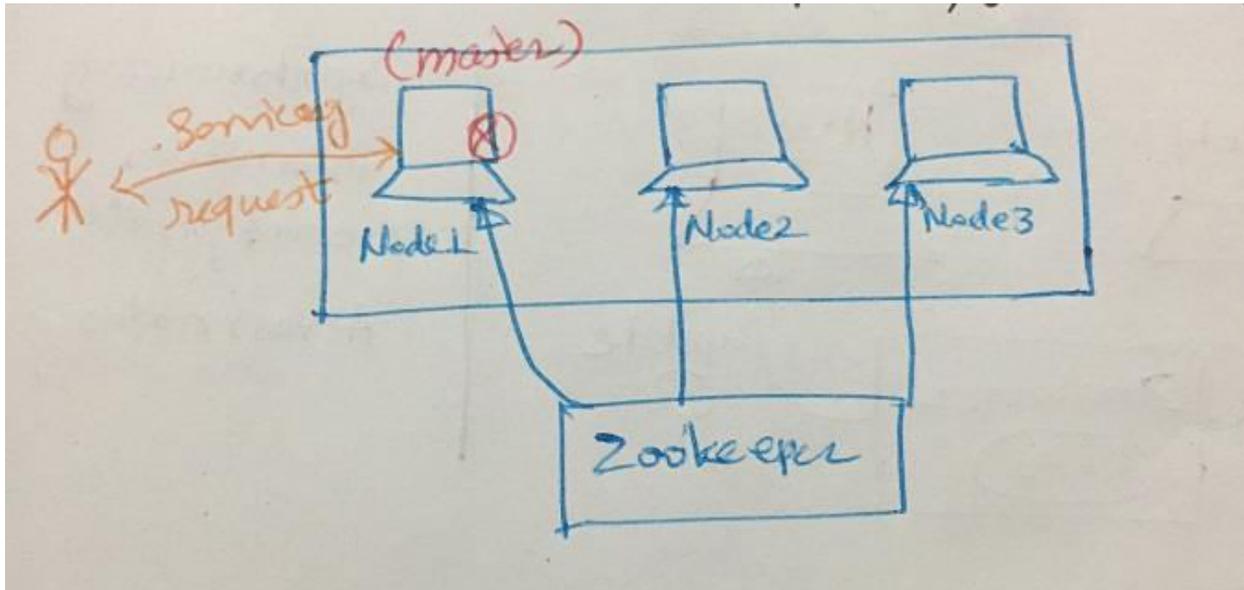


Which node is processing which message? This information is stored in Zookeeper's znode and each node get or watch this information. Hence, same message cannot be processed more than once.

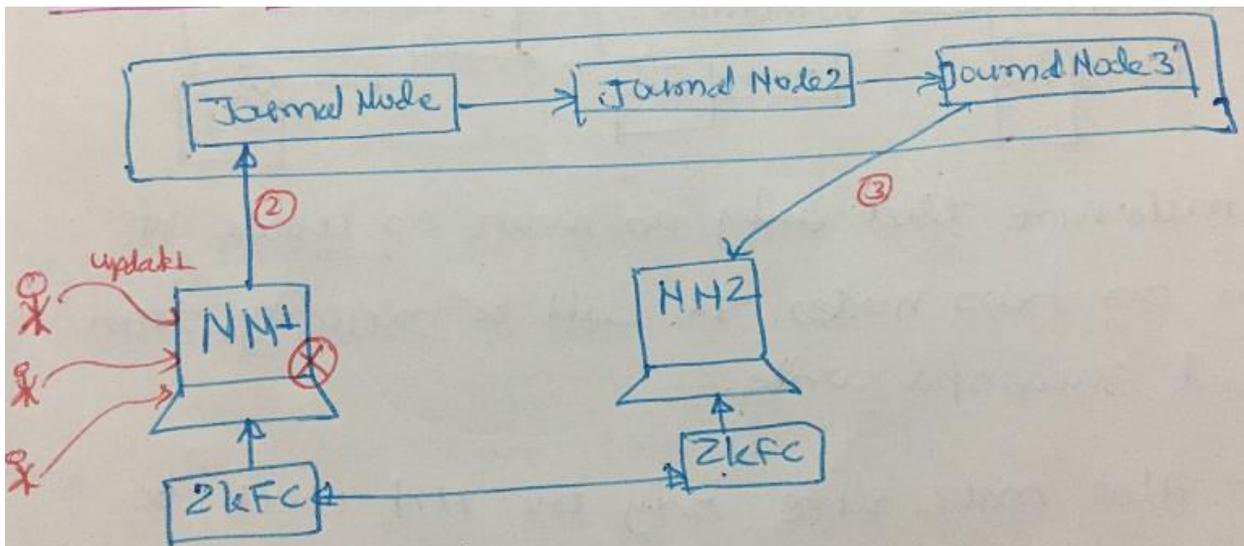
**Leader Selection:**

If you want to select, once of the node in your cluster as a master. How would you achieve this? This can be easily achieved using Zookeeper server. In three node cluster Node1 is a master node, which will sever all the requests. However, this node can fail. Hence, when Node1 fails than immediately in less than a second Zookeeper can mark Node1 as a failure and another node remaining between Node2 and

Node will become master node. ([Get Hadoop HandsOn Training Access to learn in depth and practice on Hadoop](#))



**Hadoop NameNode: Active and StandBy namenode co-ordination**



As we know that in Hadoop cluster to avoid single point of failure of NameNode. We must have at least two NameNode should be configured. One node as an active NameNode and another will be in StandBy mode. Zookeeper leader selection mechanism will help, which node will be master node and which node will remain in standby mode. As soon as active name node goes down. Zookeeper failover controller will be notified and within less than a second stand by NameNode will become active NameNode and as an administrator you can handle failed NameNode to bring it up.

**Znode**

Znode is just a file that contain information which needs to be shared across the nodes in a group (e.g group of NameNodes, group of message processing nodes). Any node from the group can watch this znode to monitor the change in information stored in it.

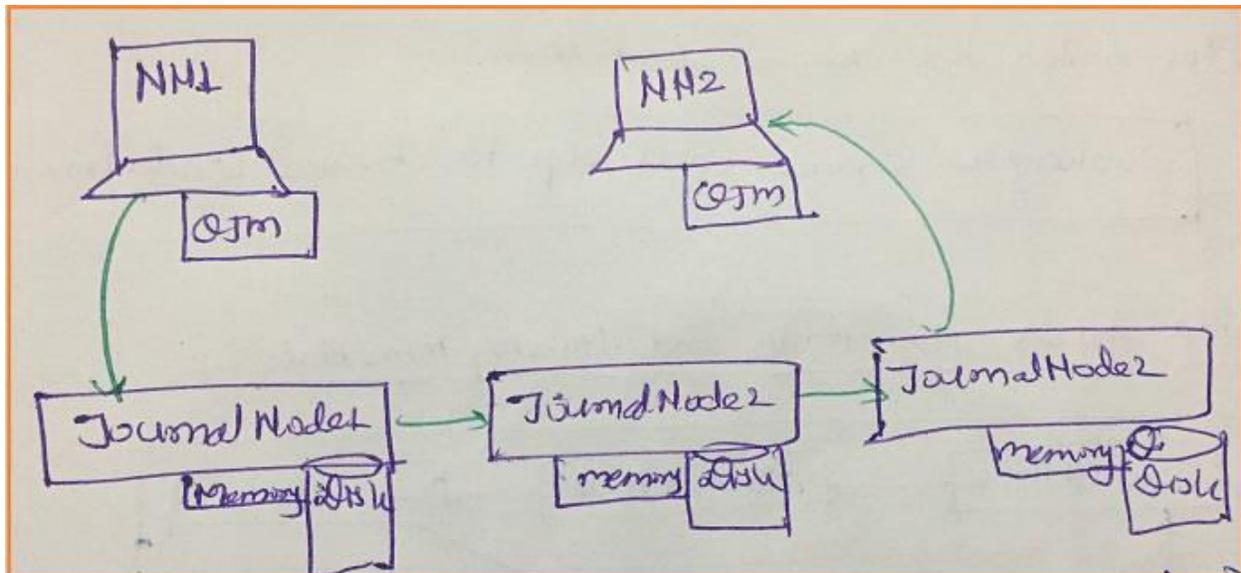
### Quorum

Quorum means, there is certainly majority required.

### Hadoop NameNode Quorum Journal Manager

#### Journal Node:

It is a separate daemon process (this is very lightweight process, hence can be setup on master nodes like NameNode, ResourceManager etc).



Quorum Journal Manager make sure that any changes needs to be written on majority or the Journal Nodes e.g. (2 out of 3) before information success commit. It will also make sure that only once of the NameNode will serve request to avoid any split-brain scenario.

Summary: By reading this article, you would have understood

- What is Zookeeper?
- What is the purpose of Zookeeper?
- What is Znode?
- What is JournalNode?
- What is Quorum Journal Manager?
- Leader selection in group of nodes?

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