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The Data Recovery File System for Hadoop Cluster -Review Paper

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***Abstract*— in today's world, require Data Recovery system is most challenging aspects in the internet or World Wide Web applications. Now a day evens a tera bytes (TB) and peta bytes (PB) of data is not enough for storing large chunks of database (DB). Hence IT industries use concept is known as Hadoop in their applications. This approach has been adopted in Cloud computing environment for unstructured data. Hadoop is an open source distributed computing framework based on java and supports large set of distributed data processing. HDFS (Hadoop Distributed File System) is popular for huge data sets and streams of operation on it. Avaliable Hadoop in cloud is one of the important factors. But in Hadoop Distributed File System, Master Namenode Failure affects the performance of the Hadoop Cluster. In this paper, we examine the behaviour of Namenode and what are the issues of Namenode failure. This paper presents a Scenario to overcome this failure our scheme replicates the Namenode on the other Datanode so that the availability of the metadata is increases and also Decreases the loss and delay of data.**

***Keywords*— Hadoop, Fault tolerance, HDFS, Name node, Data node, Cloud computing**.

I. INTRODUCTION

Due to new cloud computing challenges high performance computing has become increasingly important in data analysis [1]. When system hardware ,system software and the configuration; tuning or optimization failure then decreases the quality of performance in the cloud environment because of that recent years, using Hadoop become as cloud workhorse[2].Many IT industries is dependent on Hadoop for large Datasets also every IT companies is creating large amount of data which is in Terabytes (TB) and Petabyte(PB).As a platform of computational and data storage , Hadoop can handle Many different types of data including file format such as audio; video; text; e-mail records; images etc. [3].

Hadoop [10] has major two important technology one part is Mapreduce open-source framework; that organize huge amount of data on many machines. Mapreduce is provided map/reduce execution engine task in Hadoop [7,8,9].and other term is HDFS [11] (Hadoop Distributed File System), sometimes also known as Enge-node. It acts as Centre communication point between Namenode & Datanode also using very large bandwidth. HDFS is provided High fault-tolerance & designed to be deployed lowest cost H/W or S/W as comparative other techniques.

The Procedure of Mapreduce is firstly provide Input Data is partitioned with Divide appropriate Size then Mapreduce process will start & Produces related results, after that ready to be passed to the Reduce stage by certain partition function, Later Shuffling/Sorting Data in suitable format, also reduce procedure performs aggregation task on specific keys. The Master node of Hadoop Mapreduce is known as Jobtracker which is managing & Scheduling several tasks & The Slavenode of Hadoop Mapreduce is known as Tasktracker which is following the sequence & updating files of the Jobtracker [1].

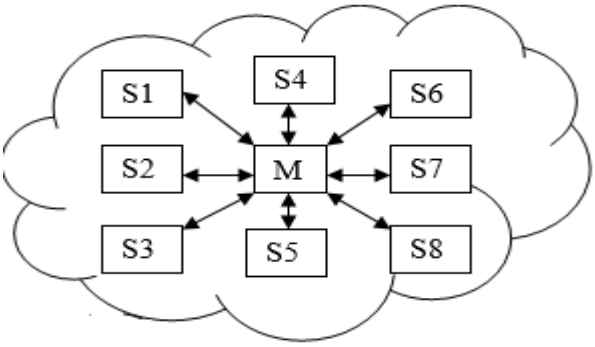

Fig. 1 Multi-node Cluster in Hadoop.

Figure 1 shows Hadoop Multi-node cluster with active State, here M are denoted as Master Namenode and S1, S2, S3…Sn are denoted as Slave Datanode.

In this paper organized remaining sections as follows. Section 2 provided some related work is discussed two terms HDFS and Mapreduce as well as related subpoints such as Primary/Secondary Namenode, Datanode, Job/Task tracker & Failure Situation of Namenode. Then section 3 is discussed our Proposed work. Finally, the paper is concluded in section 4.

II. RELATED WORK

Hadoop is an open source java framework implementation of Mapreduce for analysis huge datasets. Hadoop is manage large storage resources across the group of cluster, usually Hadoop provided Distributed user level file system is called as HDFS. The Arch. of Hadoop system shows in fig.2 the architecture of Hadoop system normally depends on the master & slave structure. Next contents of Hadoop architecture is Mapreduce & HDFS.

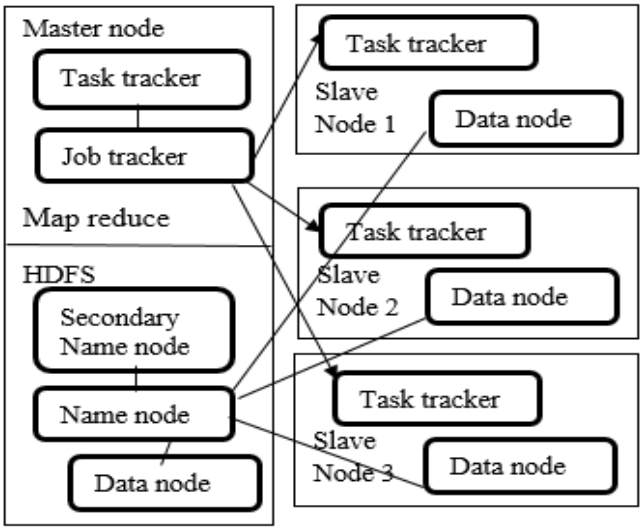

Fig. 2 Multiple node Architecture for Hadoop Systems.

Mapreduce there are two key elements such as task & job tracker. While HDFS also available two key elements Name & Datanode, following are discuss with brief:

1.1 Primary Name node

The very important task of Namenode is that it stores records of the file system metadata and attributes in the file maps specific block locations and data blocks are stored in the Datanodes [4].the Namenode maintains two memory tables, 1st tables maps the block to Datanodes which one block maps to 3 Datanodes while 2nd table mapping a Datanode to block numbers. Whenever Datanode sending failure report of particular block number then first table gets a disk updated and if a Datanode is send node dead reports (i.e. node failure, network failure) then both the tables are gets updated.

1.2 Secondary Namenode

secondary Namenode is every time connects to the primary Namenode and keep records of the all file system metadata into local or remote storage.When Namenode is not work long period of time then Secondary Namenode is not act as Primary Namenode because it is not substituted of Primary Namenode. it is Image of Primary Namenode.

1.3 Datanode

The data node in 2nd node of the HDFS arch. Works as slave node. Datanode performs two main task sending a heartbeat message to the Namenode and keep the high level replication whenever communication with each other. When Datanode storing a block in HDFS, at a time of talk with each other maintain a Checksum. (i.e. Periodically update block of information and before updating verify the checksums) while reporting the checksum is incorrect means assumes doesn't receive information to Namenode. Accordingly generates the replica and takes steps of Datanode [3][5].

1.4 Job tracker and Task tracker

The job tracker primary function is managing the tasktracker.(Resource management, Tracking its progress, Fault tolerance so on.) and Task tracker basic function is following the sequence of job tracker and updating status file system related to the job tracker as well as send reporting periodically[2][6].

1.5 Failure Situation of Namenode

HDFS before stored metadata [15] as well as application data is Divide into separate parts. HDFS is establish a basis for data processing pattern is write only one time but read many times pattern. HDFS is totally depends on the Namenode and Datanode. In between the Data processing procedure. If HDFS client is require the metadata then sending request to the Namenode and retrieve data from the Namenode. But the Namenode is occur Dead condition (i.e. Namenode failure) then it will affects reliability of metadata. To avoid this types of problems HDFS arch [12]. Choose a Backup Namenode When primary Namenode don't work.

III. PROPOSED WORK

To avoid HDFS Arch. Chosen secondary Namenode When Primary Namenode is not working. To solve this problem, we proposed Backup Namenode System. i.e. If Namenode is not working then other Datanode chosen as master node is known as Backup Namenode System [13].Namenode suddenly terminated affects the Reliability as well as Performance of Hadoop Cluster. Backup Namenode will be update the information of Namenode Step by Step. After terminated, Backup Namenode acts as a Master Namenode [14].

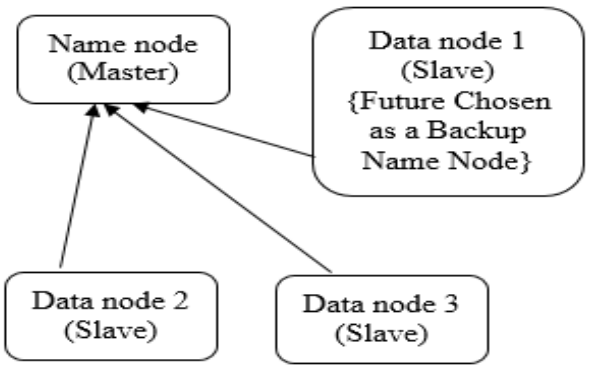

Fig. 3 before failure of namenode in HDFS Arch

Backup Namenode keep track records of corresponding Namenode. After a regular time interval, Backup Namenode is updated. At the beginning all the Datanode sends changes in form of the Heartbeats to Corresponding Namenode, when Namenode [16] gets down Backup Namenode itself broadcasts information in form of the messages to all Datanodes about New Namenode. Figure 3 shows before terminating of Namenode there are available

Namenode act as Masternode While service providing to many different Datanode such as Datanode1, Datanode2..... Datanode n.

In HDFS Arch. is mainly divided into two categories Namenode acts as Masternode and Datanode acts as Slavenode. If Datanode is Failure then Namenode will Shifted related work of Datanode to other suitable Datanode.

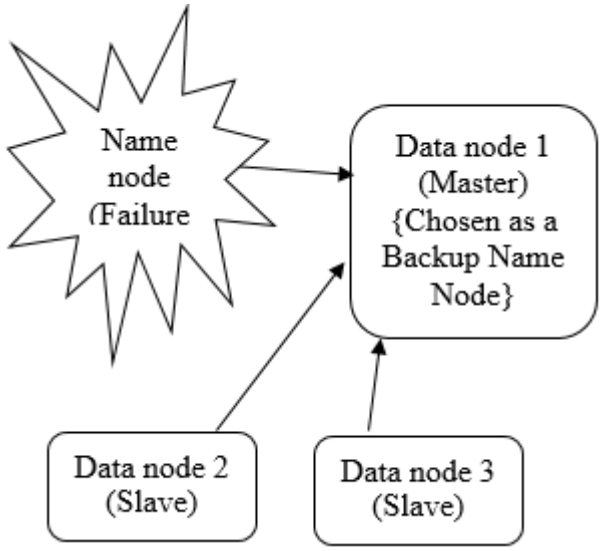

Fig. 4 after failure of Namenode in HDFS Arch.

Fig. 4. Shows after terminated of Namenode When Namenode suddenly terminate while Datanode is acts as Master Namenode. it is reduce the performance overhead of cluster Backup system should be introduce. Otherwise it required to restart the whole Hadoop cluster. Our Proposed system is increase performance, efficiency, reliability of Data processing in Hadoop cluster.

IV. CONCLUSIONS

In this paper, we studied and analyzed Hadoop cluster is suddenly unavailable when Namenode is terminated. Given that HDFS Arch. Proper solution to increases the performance and decreases the time of delay. we have proposed HDFS Arch.is solved automated failover problem as well as increases reliability of Hadoop. we also focused on selection of Backup Namenode after failure of primary Namenode

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