Real-Time Big Data Analytical Architecture for Remote Sensing Application

ABSTRACT:

The assets of remote senses digital world daily generate massive volume of real-time data (mainly referred to the term “Big Data”), where insight information has a potential significance if collected and aggregated effectively. In today’s era, there is a great deal added to real-time remote sensing Big Data than it seems at first, and extracting the useful information in an efficient manner leads a system toward a major computational challenges, such as to analyze, aggregate, and store, where data are remotely collected. Keeping in view the above mentioned factors, there is a need for designing a system architecture that welcomes both realtime, as well as offline data processing. Therefore, in this paper, we propose real-time Big Data analytical architecture for remote sensing satellite application. The proposed architecture comprises three main units, such as 1) remote sensing Big Data acquisition unit (RSDU); 2) data processing unit (DPU); and 3) data analysis decision unit (DADU). First, RSDU acquires data from the satellite and sends this data to the Base Station, where initial processing takes place. Second, DPU plays a vital role in architecture for efficient processing of real-time Big Data by providing filtration, load balancing, and parallel processing. Third, DADU is the upper layer unit of the proposed architecture, which is responsible for compilation, storage of the results, and generation of decision based on the results received from DPU. The proposed architecture has the capability of dividing, load balancing, and parallel processing of only useful data. Thus, it results in efficiently analyzing real-time remote sensing Big Data using earth observatory system. Furthermore, the proposed architecture has the capability of storing incoming raw data to perform offline analysis on largely stored dumps, when required. Finally, a detailed analysis of remotely sensed earth observatory Big Data for land and sea area are provided using Hadoop. In addition, various algorithms are proposed for each level of RSDU, DPU, and DADU to detect land as well as sea area to elaborate the working of an architecture.

INTRODUCTION

RECENTLY, a great deal of interest in the field of Big Data and its analysis has risen, mainly driven from extensive number of research challenges strappingly related to bonafide applications, such as modeling, processing, querying, mining, and distributing
large-scale repositories. The term “Big Data” classifies specific kinds of data sets comprising formless data, which dwell in data layer of technical computing applications and the Web. The data stored in the underlying layer of all these technical computing application scenarios have some precise individualities in common, such as 1) large-scale data, which refers to the size and the data warehouse; 2) scalability issues, which refer to the application’s likely to be running on large scale (e.g., Big Data); 3) sustain extraction transformation loading (ETL) method from low, raw data to well thought-out data up to certain extent; and 4) development of uncomplicated interpretable analytical over Big Data warehouses with a view to deliver an intelligent and momentous knowledge for them. Big Data are usually generated by online transaction, video/audio, email, number of clicks, logs, posts, social network data, scientific data, remote access sensory data, mobile phones, and their applications. These data are accumulated in databases that grow extraordinarily and become complicated to confine, form, store, manage, share, process, analyze, and visualize via typical database software tools.

EXISTING SYSTEM

In Existing System the data collected from remote areas are not in a format ready for analysis. Therefore, the second step refers us to data extraction, which drags out the useful information from the underlying sources and delivers it in a structured formation suitable for analysis. For instance, the data set is reduced to single-class label to facilitate analysis, even though the first thing that we used to think about Big Data as always describing the fact.

DisADVANTAGE OF Existing SYSTEM

- Sometimes we have to deal with erroneous data too, or some of the data might be imprecise.

PROPOSED SYSTEM

In Proposed System the architecture for real-time Big Data analysis for remote sensing application. The proposed architecture efficiently processed and analyzed real-time and offline remote sensing Big Data for decision-making. The proposed architecture is composed of three major units, such as 1) RSDU; 2) DPU; and 3) DADU. These units
implement algorithms for each level of the architecture depending on the required analysis. The architecture of real-time Big is generic (application independent) that is used for any type of remote sensing Big Data analysis.

ADVANTAGE OF PROPOSED SYSTEM

✓ Capabilities of filtering, dividing, and parallel processing of only useful information are performed by discarding all other extra data.
✓ These processes make a better choice for real-time remote sensing Big Data analysis.
✓ The algorithms proposed in this paper for each unit and subunits are used to analyze remote sensing data sets, which helps in better understanding of land and sea area.

ARCHITECTURE:
HRDWARE REQUIREMENTS:

- System : Pentium IV 2.4 GHz.
- Hard Disk : 40 GB.
- Floppy Drive : 44 Mb.
- Monitor : 15 VGA Colour.

SOFTWARE REQUIREMENTS:

- Coding Language : Java 1.7, Hadoop 0.8.1
- Database : MySql 5
- IDE : Eclipse