

Abstract for Sodhganga

Increase in digital data generation demands a system for storing and managing such data. This gave rise to the paradigm of cloud storage system with data management features. To build up such a system, one needs to consider virtual machines as resources, storage model for deciding the storage architecture, load balancing technologies for supporting the multitenancy, security for protecting the data, monitoring unit to observe the health status of the system & supporting the pay as you go model. To store & access such voluminous data which also has other complex data characteristics (e.g., value, variety, velocity, veracity), enough resources are necessary. In this thesis, the focus is to develop a novel cloud storage system named as Object based Schema oriented Cloud Storage system (RSoS System) to handle big data variety property. A series of frameworks, algorithms, & models are presented to reach this objective. Machine learning technologies are incorporated within the system to make it more acceptable & applicable. The service quality parameters are also examined to judge the performance of the involved resources, the significance of resources in workload handling, & load balancing algorithms for handling the multitenancy. Three different data types & databases are used. A storage model is also presented for RSoS System to store & retrieve data to & from the corresponding storage device. Three query elements (reading, writing, & deleting) along with query execution time of data insertion, deletion, extraction, & aggregation are considered to assess the performance of the proposed RSoS system. A classification engine framework is designed to predict the storage space of the input dataset at the storage time & performance is judged using accuracy, precision, & recall. Two load balancing algorithms are proposed, namely DRSQ & DTPAHBF, where DRSQ is used to find out the efficient resource & select the appropriate resources whereas DTPAHBF assists to reduce energy consumption of virtual machines.