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Distributed Data Transfer for Disaster Using Cloud Computing Infrastructure

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Abstract – **The main objective of this project is to enhance the data storage security and secured data transfer during disaster. To resolve this IaaS (Infrastructure as a Service) methodology will be implemented here. As per survey most of the banking server and data centres are placed in metropolitan cities, most of the metropolitan cities are in sea shore. We proposed the system to find out a solution for safe hand the data centres and banking servers. In this paper, we aimed to achieve the minimum cost benchmark, so we proposed a novel highly cost-effective and practical storage strategy that can automatically decide whether a generated data set should be stored or not at runtime in the cloud. The main focus of this strategy is the local-optimization for the trade off between computation and storage.**

INTRODUCTION

Earth observation technology plays a key role in the early warning, response, recovery and reconstruction of the disaster. Satellite remote sensing technology can extract disaster information rapidly and accurately for disaster monitoring on a regional and natural basis. The disaster management technology will generate huge volumes of remote sensing data. For massive remote information extraction, the web interoperable framework to integrate distributed data and model resources for disaster monitoring using cloud computing. Proposed system provides the solutions for massive remote sensing data analysis and rapid information extraction. It provides the solutions for distributed remote sensing data access and integration, automatic and fast remote sensing data processing through effective huge data management and distributed parallel computing. Basically massive computation power and storage capacity of cloud computing systems allow scientists to deploy computation and data intensive applications without infrastructure investment, where large application data sets can be stored in the cloud. However, they are either insufficiently cost-effective for the storage or impractical to be used at runtime. In this paper, toward achieving the minimum cost benchmark, we propose a novel highly cost-effective and practical storage strategy that can automatically decide whether a generated data set should be stored or not at runtime in the cloud. The main focus of this strategy is the local-optimization for the trade off between computation and storage, while secondarily also taking users' (optional) preferences on storage into consideration.

RELATED PAPERS:

1.DEPSKY: Dependable and Secure Storage in a Cloud-of-Clouds A.Bessani, M.Correia, B.Quaresma, F.Andre, and P .Sousa. DEPSKY: Dependable and Secure Storage in a Cloud-of-Clouds. In Proc.of ACM Euro Sys, 2011

The increasing popularity of cloud storage services has lead companies that handle critical data to think about using these services for their storage needs. Medical record databases, power system historical information and financial data are some examples of critical data that could be moved to the cloud. However, the reliability and security of data stored in the cloud still remain major concerns. In this paper we present DEPSKY, a system that improves the availability, integrity and confidentiality of information stored in the cloud through the encryption, encoding and replication of the data on diverse clouds that form a cloud-of-clouds.

2. MapReduce : Simplified Data Processing on Large Clusters :
J. Dean and S. Ghemawat, "Map Reduce: Simplified Data Processing on Large Clusters, "Proc. Sixth Symp. Operating System Design and Implementation (OSDI '04),pp. 137-150, Dec. 2009.

Map Reduce runs on a large cluster of commodity machines and is highly scalable: a typical Map Reduce computation processes many terabytes of data on thousands of machines. Programmers find the system easy to use: hundreds of Map Reduce programs have been implemented and upwards of one thousand Map Reduce jobs are executed on Google's clusters every day.

3. ***Load Balancing in Structured P2P Systems***
A. Rao, K. Lakshminarayanan, S. Surana, R. Karp, and I. Stoica, "Load Balancing in Structured P2P Systems, "Proc. Second Int'l Workshop Peer-to-Peer Systems (IPTPS '02),pp. 68-79, Feb. 2010.

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In this paper, we address the problem of load balancing in such P2P systems. We explore the space of designing load-balancing algorithms that uses the notion of "virtual servers". We present three schemes that differ primarily in the amount of information used to decide how to re-arrange load. Our simulation results show that even the simplest scheme is able to balance the load within 80% of the optimal value, while the most complex scheme is able to balance the load within 95% of the optimal value.

4. Simple Efficient Load Balancing Algorithms for Peer-to-Peer Systems.
D. Karger and M. Ruhl, "Simple Efficient Load Balancing Algorithms for Peer-to-Peer Systems,"Proc. 16th ACM Symp. Parallel Algorithms and Architectures (SPAA '04),pp. 36-43, June 2004.

Load balancing is a critical issue for the efficient operation of peer-to-peer networks. We give two new load balancing protocols whose provable performance guarantees are within a constant factor of optimal. Our protocols refine the consistent hashing data structure that underlies the Chord (and Koorde) P2P network. Both preserve Chord's logarithmic query time and near-optimal data migration cost.

5. Balanced Binary Trees for ID Management and Load Balance in Distributed Hash Tables
G.S. Manku, "Balanced Binary Trees for ID Management and Load Balance in Distributed Hash Tables,"Proc. 23rd ACM Symp. Principles Distributed Computing (PODC '04),pp. 197-205, July 2004.

We present a low-cost, decentralized algorithm for ID management in distributed hash tables (DHTs) managed by a dynamic set of hosts. Each host is assigned an ID in the unit interval [0;1). At any time, the set of IDs splits the interval into disjoint partitions. Hosts do not possess global knowledge of other IDs in the system.

6. Locality-Aware and Churn-Resilient Load Balancing Algorithms in Structured P2P Networks
H. Shen and C.-Z. Xu, "Locality-Aware and Churn-Resilient Load Balancing Algorithms in Structured P2P Networks,"IEEE Trans.Parallel and Distributed Systems,vol. 18, no. 6, pp. 849-862, June 2007

This paper presents a locality-aware randomized load-balancing algorithm to deal with both the proximity and network churn at the same time. We introduce a factor of randomness in the probing of lightly loaded nodes in a range of proximity. We further improve the efficiency by allowing the probing of multiple candidates (d-way) at a time. Simulation results show the superiority of the locality-aware two-way randomized algorithm in comparison with other random or locality-aware algorithms.

7. Pastry: Scalable, Distributed Object Location and Routing for Large-Scale Peer-to-Peer Systems
A. Rowstron and P. Druschel, "Pastry: Scalable, Distributed Object Location and Routing for Large-Scale Peer-to-Peer Systems,"Proc. IFIP/ACM Int'l Conf. Distributed Systems Platforms Heidelberg, pp. 161-172, Nov. 2001

This paper presents the design and evaluation of Pastry, a scalable, distributed object location and routing substrate for wide-area peer-to-peer applications. Pastry performs application-level routing and object location in a potentially very large overlay network of nodes connected via the Internet. It can be used to support a variety of peer-to-peer applications, including global data storage, data sharing, group communication and naming.

8. Online Balancing of Range-Partitioned Data with Applications to Peer-to-Peer Systems.
P. Ganesan, M. Bawa, and H. Garcia-Molina, "Online Balancing of Range-Partitioned Data with Applications to Peer-to-Peer Systems," Proc. 13th Int'l Conf. Very Large Data Bases (VLDB '04), pp. 444-455, Sept. 2004

We propose efficient, asymptotically optimal algorithms that ensure storage balance at all times, even against an adversarial in-section and deletion of tuples. We combine the above algorithms with distributed routing structures to architect a P2P system that supports efficient range queries, while simultaneously guaranteeing storage balance.

9. HAIL: A High-Availability and Integrity Layer for Cloud Storage
K.D.Bowers, A.Juels, and A.Oprea. HAIL: A High-Availability And Integrity Layer for Cloud Storage. In Proc. Of ACMCCS, 2009

We introduce HAIL (High-Availability and Integrity Layer), a distributed cryptographic system that permits a set of servers to prove to a client that a stored file is intact and retrievable. HAIL strengthens, formally unifies, and streamlines distinct approaches from the cryptographic and distributed-systems communities. Proofs in HAIL are efficiently computable by servers and highly compact

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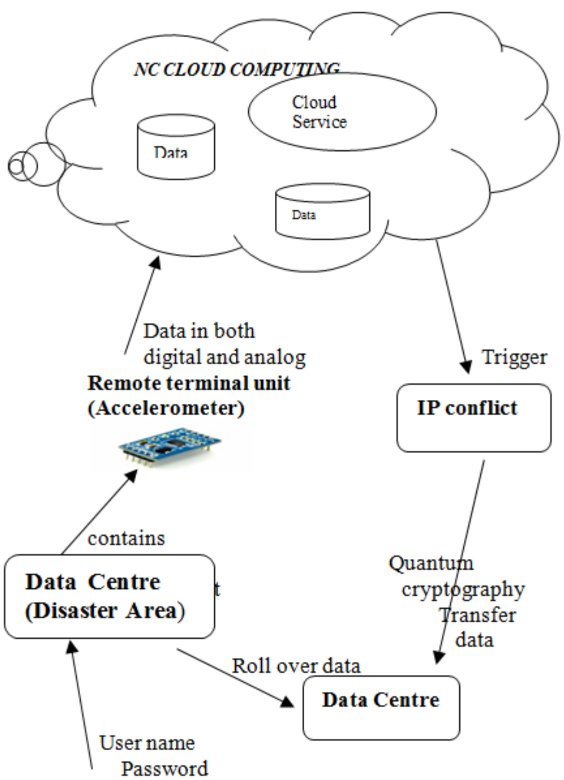
typically tens or hundreds of bytes, irrespective of file size. HAIL cryptographically verifies and reactively reallocates file shares. It is robust against an active, mobile adversary, i.e., one that may progressively corrupt the full set of servers.

10. Enabling Data Integrity Protection in Regenerating-Coding-Based Cloud Storage: Theory and Implementation
H.C.H.ChenandP .P .C.Lee. Enabling Data Integrity Protection in Regenerating Coding Based Cloud Storage. In Proc. of IEEE SRDS, 2012.

We design and implement a practical data integrity protection (DIP) scheme for a specific regenerating code, while preserving its intrinsic properties of fault tolerance and repair traffic saving. Our DIP scheme is designed under a mobile Byzantine adversarial model, and enables a client to feasibly verify the integrity of random subsets of outsourced data against general or malicious corruptions.

PROPOSED SYSTEM:



Admin

Cloud Formation with NC Cloud.

The public cloud environment is the IaaS/PaaS Infrastructure or Platform as a Service that we rent from Linux (IaaS) or Microsoft (PaaS). Both are enabled for web hosting. Then, your SaaS stack will run under your Internet environment most likely in a virtualized one on your own equipment which would make it private. In this project we specialize in private cloud technology. Here we execute in a cloud environment. If strict security requirements go public or hybrid and if not, try the public or community cloud environment. So that here we are implementing a web services for the output purpose as well as the environment will be shown in actual while hosting the application. So finally SaaS can be fully utilized in cloud environment as IaaS/PaaS. Thus we formed cloud environment.

Disaster Analysis

Due to global warming our earth may face many types of disasters like earthquake, tsunami, storm, flood and etc. This disaster can be analysed through cloud remote monitoring. This module has main function to capture data from sensor both in digital or analog input. Package of specific sensors with Remote Terminal Unit will be placed in some places or objects prone to disasters. Cloud computing could be proposed as central of data processing to run service like service listener. It has function to capture and store information sent from the remote client. Otherwise, it could be used for the central data storage and application server to display the processed results to the user.

Data preservation using cloud service provider

This module deals with the software architecture of the cloud service provider, which is inter related with the remote disaster tool, so that when ever disaster will occur the cloud service provider will trigger out the malware process. This process may execute through Intranet, Internet and also through GPS. So that global communication will be possible here. This architecture should be assigned during the server configuration.

Executing IP conflict for TPA

The Cloud service provider will the triggering function with the TPA(Third Party Auditing). This module will take cares the database migration process. So that when ever disaster will occur the CSP will trigger through the IP conflict and the data base will be restored in the concern location assigned by the admin. Admin can customize the database by providing priority to the table sets. So that the transfer will work according to the assigned priority. This saves the database from data loss.

Roll over data

This module will execute after the disaster and CSP trigger out process. The roll back process too needs IP conflict procedure for analysing the failure calculation as the location of the database. According to the admin request original database can be transfer to the default location and also transfer of duplicate database also possible.

EXPERIMENTAL ANALYSIS:

Natural disaster management needs to deal with large amount of data originated from various organizations and mass people. Therefore, a scalable environment provided with flexible information access, easy communication and real time collaboration from all types of computing devices. Even though grid computing having some excellent disaster management tools, it will not perform up to the range of cloud service provider. There is still the absence of the cloud service provider whereas in our proposed system, because of the availability of cloud service provider the cloud disaster remote monitoring system can be executed successfully. A highly prioritized database is available in order to prior up the data base tables during the time of destruction. In order to avoid data loss , high data transfer is possible due to the availability of higher bandwidth. So that while disaster data loss will not occur. In previous paper, there were no proper security measures to safe the data from hacker. So to avoid this problem we introduced a IP conflict procedure by which only that authorized IP can do the read, write and update permission of the database. Other persons will be consider as hackers. Admin also provided with roll back facility to retrieve their data. They also provided with more accuracy in data retrieval.

CONCLUSION & FUTURE WORK:

In this paper, we propose an effective and flexible distributed scheme with explicit dynamic data support to ensure the correctness of users' data in the cloud. We rely on erasure correcting code in the file distribution preparation to provide redundancies and guarantee the data dependability. This construction drastically reduces the communication and storage overhead as compared to the traditional replication-based file distribution techniques. By utilizing the homomorphism token with distributed verification of erasure-coded data, our scheme achieves the storage correctness insurance as well as data error localization: whenever data corruption has been detected during the storage correctness verification, our scheme can almost guarantee the simultaneous localization of data errors, i.e., the identification of the misbehaving server(s). It is concluded that the application works well and satisfy the owner and customers. The application is tested very well and errors are properly debugged. The site is simultaneously accessed from more than one system. Simultaneous login from more than one place is tested. The site works according to the restrictions provided in their respective browsers. Further enhancements can be made to the application, so that the web site functions very attractive and useful manner than the present one. The speed of the transactions become more enough now.

The system can be further enhanced by adding new features and facilities. Now the system is platform dependent and it can be made as platform independent software. Once it is made as platform independent software, it is can be used by any intranet user of the shop. The system can be also be added with other data mining techniques such as K-nearest neighbours search, neural network and genetic algorithm to find some interesting patterns in the data base.

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