USTO.RE: A Private Cloud Storage System

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Abstract. *This paper presents the **USTO.RE** project which aims at become an effective and low-cost alternative for storing data, built over the peer-to-peer network overlay solution.*

1. Related Works

There are a number of platforms in the cloud data storage [3], the most of which have common features: i) the need to assemble a dedicated infrastructure to ensure the availability of data when the user requests access; or ii) the lack of reliability from the standpoint of ensuring the availability of data, which can be clearly identified from the analysis of contracts of service providers.

The main advantage in the USTO.RE approach stay into reduce or fit the company budget related to the total cost ownership, associated to new storage units acquisition, as a mean to use of the idle hard disks spread into company machines.

Table 1. Comparison of related works and its the replication strategy

Solution	Replication strategy
Amazon S3 [1]	Servers (3 copies)
Megastore [2]	Servers
MSFSS [5]	Servers (2 copies, configurable)
HDFS (Hadoop) [4]	Servers, it could be generates excessive replicas
USTORE	Simple peers based upon its availability history

As shown in Table 1, these solutions infer the need to purchase infrastructure in order to provide a dedicated service aiming to take replicas. In order to improve this scenario, USTO.RE aims at providing the cloud data storage created over the P2P technology followed by the needs to establish the data federations to taking consistent replicas.

2. The USTO.RE

The architecture of USTO.RE was designed envisioning a set of quality attributes aligned to distributed storage systems nature and comprising the main benefits offered by P2P architectures, such as: scalability, resources optimization, availability, and lately, security.

The Figure 1 depicts the USTO.RE architecture as well as its deployment viewpoint, which comprises a set of components structured where each ones has different roles to perform to.

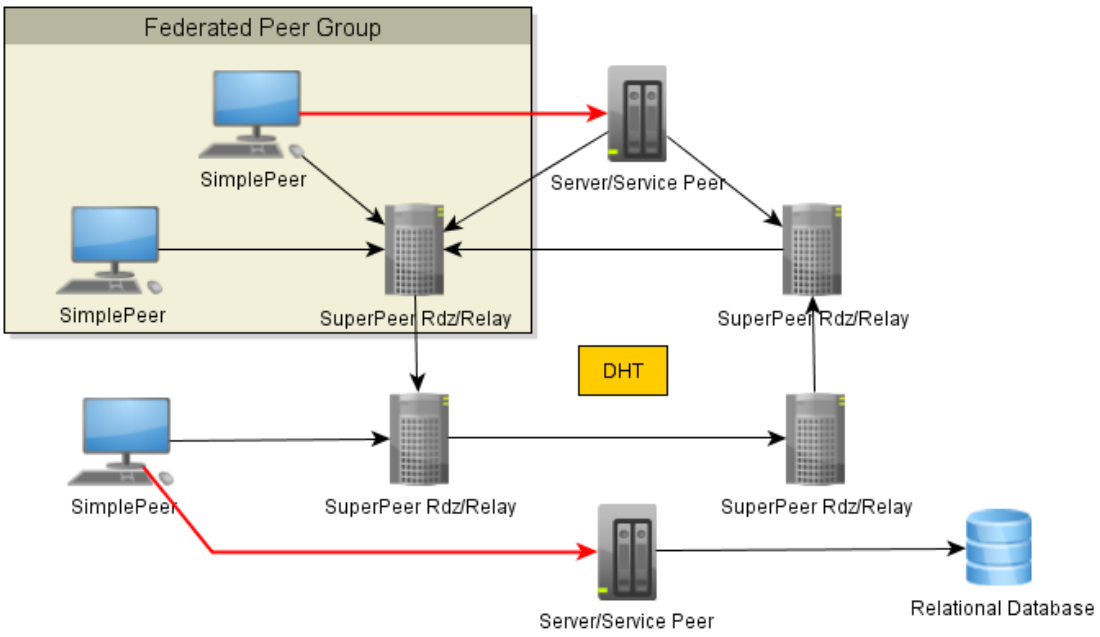

Figure 1. USTO.RE Architecture

3. Acknowledgments

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References

[1] Amazon. Amazon Simple Storage Service (Amazon S3), March 2012. URL: http://aws.amazon.com/pt/s3/, last access 05-Mar-2012.

[2] J. Baker, C. Bond, J. Corbett, J. J. Furman, A. Khorlin, J. Larson, J.-M. Leon, Y. Li, A. Lloyd, and V. Yushprakh. Megastore: Providing scalable, highly available storage for interactive services. In *CIDR'11*, pages 223–234, 2011.

[3] G. DeCandia, D. Hastorun, M. Jampani, G. Kakulapati, A. Lakshman, A. Pilchin, S. Sivasubramanian, P. Vosshall, and W. Vogels. Dynamo: amazon's highly available key-value store. *SIGOPS Oper. Syst. Rev.*, 41:205–220, Oct. 2007.

[4] K. Shvachko, H. Kuang, S. Radia, and R. Chansler. The hadoop distributed file system. In *Proceedings of the 2010 IEEE 26th Symposium on Mass Storage Systems and Technologies (MSST)*, pages 1–10. IEEE Computer Society, 2010.

[5] L. Yu, G. Chen, W. Wang, and J. Dong. Msfss: A storage system for mass small files. In W. Shen, Y. Yang, J. Yong, I. Hawryszkiewycz, Z. Lin, J.-P. A. Barthes, M. L. Maher, Q. Hao, and M. H. Tran, editors, *11th International Conference on Computer Supported Cooperative Work in Design (CSCWD)*, pages 1087–1092, Los Alamitos, CA, USA, April 2007. IEEE Computer Society Press.

[1]URL: `http://www.ines.org.br`, Last access em 04/04/2012