browserCloud.js - A federated community cloud served by a P2P overlay network on top of the web platform

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BSc in Communication Networks

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–To all of the first followers, you undoubtly changed my life.

Abstract

Grid computing has been around since the 90's, its fundamental basis is to use idle resources in geographically distributed systems in order to maximize its efficiency, giving researchers access to computational resources to perform their jobs (e.g. studies, simulations, rendering, data processing, etc). This approach quickly grew into non grid environments, causing the appearance of projects such as SETI@Home or Folding@Home, that use volunteered shared resources and not only institution-wide data centers as before, creating the concept of Public Computing. Today, after having volunteering computing as a proven concept, we face the challenge of how to create a simple, effective, way for people to participate in this community efforts and even more importantly, how to reduce the friction of adoption by the developers and researchers to use this resources for their applications. This work explores current ways of making an interopable way of end user machines to communicate, using new Web technologies, creating a simple API that is familiar to those used to develop applications for the Cloud, but with resources provided by a community and not by a company or institution.

Resumo

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Palavras Chave

Computação na Nuvem Redes entre pares Computação voluntária Partilha de ciclos Computação distribuida e descentralizada Plataforma Web Tolerância à faltas Mecanismo de reputação Nuvem comunitária

Keywords

Cloud Computing Peer-to-peer Voluntary Computing Cycle Sharing Decentralized Distributed Systems Web Platform Javascript Fault Tolerance Reputation Mechanism Community Cloud.

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"Your system can fail no matter how well you thought you tested it... what users will not tolerate is losing their data". – [1]

1.1 Overview

1.2 Problem Statement

1.3 Extended motivation and Roadmap

1.4 Research Proposal

1.5 Contributions

1.6 Publications

1.7 Structure of the thesis

[1] *Lehene C. HStack, http://hstack.org/why-were-using-hbase-part-2*

2 Related Work

No sensible decision can be made any longer without taking into account not only the world as it is, but the world as it will be. – *Isaac Asimov, writer and scientist (1919 - 1992)*

SOMETHING SOEMTHING

2.1 yo

(Marc Shapiro & Carlos Baquero 2011).

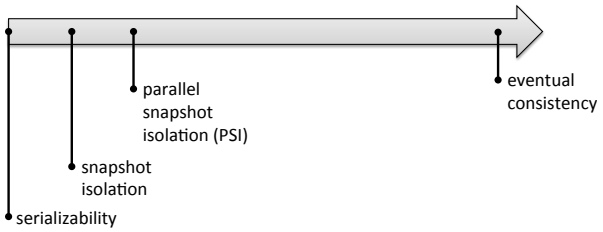

Figure 2.1: Transactional Storage for geo-replicated systems from (Sovran et al. 2011)

Summary

3 Architecture

"The greatest pleasure in life is doing what people say you cannot do." – *Walter Bagehot (British political Analyst, Economist and Editor, one of the most influential journalists of the mid-Victorian period.1826-1877)*

SOMETHING

3.1 System Architecture Overview

Summary

4 Implementation

"Keep it simple, stupid" K-I-S-S, is an acronym as a design principle noted by the U.S. Navy in 1960. The KISS principle states that most systems work best if they are kept simple rather than made complex; therefore simplicity should be a key goal in design and unnecessary complexity should be avoided. – *Kelly Johnson, aircraft engineer (1910 - 1990)*

4.1 Overall implementation approach

4.2 Integrating a HBase-QoD module

Summary

5 Evaluation

"Everything that can be counted does not necessarily count; everything that counts cannot necessarily be counted"– *Albert Einstein*

5.1 Overview

5.2 Experimental Testbed

5.3 Performance benchmarking suite

Summary

6 Conclusion

"The last mile is always the most difficult, and (looking backwards) the best" –

Miguel Mira Da Silva, professor at IST

6.1 Concluding remarks

so many conclusions

6.2 Future Work

what do you see

Bibliography

Marc Shapiro, N. P. & M. Z. Carlos Baquero (2011, July). Conflict-free replicated data types. Technical Report RR-7687.

Sovran, Y., R. Power, M. K. Aguilera, & J. Li (2011). Transactional storage for geo-replicated systems. In *Proceedings of the Twenty-Third ACM Symposium on Operating Systems Principles*, SOSP '11, New York, NY, USA, pp. 385–400. ACM.