Software-Defined Network-Coding-Based Storage for Geo-Distributed Cloud Data Centers

#2020 #Cloud #Network #Security #Data

PROJECT QUICK FACTS

Principal Investigator

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

- **Funding**
  Innovation and Technology Commission
- **Collaboration**
  - Unissoft Technology Co. Ltd., - Microsoft Hong Kong Limited, - Hong Kong Telecommunications (HKT) Limited and - Huawei Technologies Noah's Ark Lab

Enterprises increasingly support hyper-scale data storage in production, yet providing performance and reliability guarantees for big data storage remains a non-trivial challenge. We propose a software-defined network-coding-based cloud storage system, called nCloud, that supports geo-distributed cloud data center storage with storage efficiency, performance, and fault tolerance in mind. nCloud adapts the network coding theory to specifically target major performance-critical operations. Its novelty is to address the hierarchical nature of geo-distributed cloud data centers, such that it first computes partially encoded results from the data stored in each local data center, followed by aggregating the partial encoded results across multiple data centers to obtain the final encoded data. We envision that our project findings will benefit the big data storage industry in general. nCloud supports applications including Backup and archival storage, Document management, Virtual disk management etc.

Uniqueness and Competitive Advantages:

- High storage efficiency
- High repair performance
- Security guarantees
- Scalability for geo-distributed environments
- Software-defined storage management

nCloud provides scalable storage by striping data across multiple nodes (servers).

With our multi-cloud Strategy, nCloud ensures data availability and reliability against unexpected cloud failures and vendor lock-in.

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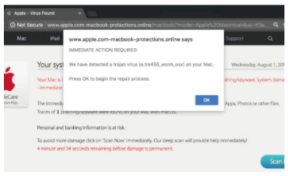

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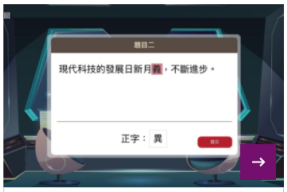

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