



THE CHINESE UNIVERSITY OF HONG KONG
Institute of Network Coding
and
Department of Information Engineering
Seminar



Fundamental Limits and Bounds for Distributed Data Storage Networks

by

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Abstract

The amount of data being created in modern information technological infrastructures is growing at an exponentially rapid rate. This enormous data needs to be stored, analyzed and managed efficiently in storage networks such as data centers. Distributed data storage networks use multiple storage nodes which can be geographically separated to store a massive amount of information. The most important challenge in designing a storage network is the fault tolerance which leads to the repair problem in these networks. In other word, any failure in the network must be repaired efficiently to ensure the reliability of the storage network.

In this work we consider robust locally repairable coding schemes which guarantee that a failed node can be repaired locally even when there are multiple node failures. We establish a linear programming upper bound on the size of these class of cods. Moreover, we introduce a realistic multi-rack storage network model and we present a code design framework for this model. Using our code construction method, node failures within a rack can be repaired locally by survived nodes in the same rack or by the other survived racks when the information content of the same rack is not sufficient to repair the failed nodes. An explicit code construction method for rack model storage networks is presented based on the introduced rack model storage code design framework.

Biography

Ali Tebbi received his B.Sc. and M.Sc. degrees in Telecommunications Engineering from University of Tabriz and K.N.Toosi University of Technology, Iran, respectively. He was a PhD Scholar from Nov. 2012 to Oct. 2016 at the Institute of Telecommunications Research (ITR), University of South Australia, Australia. He is currently a Postdoctoral Fellow at City University of Hong Kong and a Visiting Postdoctoral at Institute of Network Coding (INC), The Chinese University of Hong Kong. His Research interests include distributed data storage networks, network information theory, Cryptology, and wireless communications.

**** ALL ARE WELCOME ****