An Improvement of Quasi-cyclic Minimum Storage Regenerating Codes for Distributed Storage

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***Abstract*—In a distributed storage system, where failure is inclined to happen at one of the storage nodes linked via network, redundancy is often introduced to increase reliability. Erasure coding is universally adopted to optimize the additional storage size for redundancy while enhancing the fault tolerance. Regenerating codes, as a class of erasure codes, make significant contribution to bandwidth-saving when recovering a failed node. A new family of regenerating codes based on quasi-cyclic codes is presented by Bernat Gastón et al. Quasi-cyclic Minimum Storage Regenerating (MSR) codes are very interesting because of their simplicity and low computational requirements. In this paper, an improvement of Quasi-cyclic MSR codes is proposed and its correctness is proven. We not only improve the constraints of construction, but also minimize the number of nodes needed to connect in a repairing process.**

***Keyword*—Distributed Storage, Network Coding, Maximum Distance Separable (MDS) Codes, Regenerating Codes, Quasi-cyclic MSR Codes**

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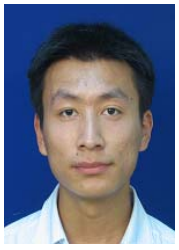

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