FILE CONSISTENCY PROBLEM OF FILE-SHARING IN PEER-TO-PEER ENVIRONMENT

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Abstract. *In this paper, file consistency problem of file-sharing with malicious processors in Peer-to-Peer (P2P) networks is investigated. We propose a novel hybrid approach integrating the clustering algorithm and consensus protocol to provide better Quality of Service (QoS) and solve the file consistency problem in the P2P file-sharing system. First, the clustering algorithm is introduced in our approach to provide better QoS. After clustering, we use consistent hash function to assign each processor and key to the corresponding processor in the de-Bruijn network. The de-Bruijn graph is nearly optimal and feature very short average routing distances. Finally, we use the consensus protocol to reach the consistent file information.*
Keywords: Peer-to-peer systems, Consensus, Clustering, De-Bruijn graphs, File consistency problem, File-sharing and malicious faults

1. **Introduction.** In nowadays, the file-sharing application has been the most popular application in Peer-to-Peer (P2P) systems, so the file consistency problem of file-sharing has become an important topic in P2P systems. As malicious attackers may modify files arbitrarily and spread inconsistent files to other processors, inconsistent files will not only spread in P2P networks but also waste resources, such as bandwidth, space of storage and transmission time. Hence, how to make fault-free processors ensure that the files they hold are correct is an important topic. So far, no previous study has attempted to solve the file consistency problem of file-sharing with malicious processors in P2P networks. In this paper, we visited the file consistency problem of file-sharing with malicious processors in P2P networks. Moreover, a P2P network is composed of heterogeneous processors, and the ability of each processor may vary with its computation capability (CPU), bandwidth, space of storage, etc. To provide better quality of service (QoS), we should group processors by their abilities to reduce waiting time. In this paper, the clustering algorithm is employed to cluster the large sets of processors into groups of smaller sets of similar processors. That is, we propose a novel hybrid approach that clusters similar processors into the same group to provide better QoS and solve the file consistency problem of file-sharing with malicious processors in P2P networks.