UMass Dartmouth
COLLEGE OF ENGINEERING

Computer and
Information Science
Department

MASTER'S PROJECT (SUMMER 2013)

TOPIC: ***A Secure and Efficient Cloud-Based Storage System for Large Files***

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ABSTRACT

With the trend of cloud computing, more and more software systems use cloud services to store their contents externally in order to reduce the cost of associated hardware and software maintenance. Although major companies such as Google and Amazon provide their cloud services that can be easily integrated with software applications, the issues of efficiency and security of storing information with cloud remain unresolved. Especially, when storing large files with the cloud, the process is typically very time-consuming and unsecured. In this project, we propose a novel way of cloud-based storage for large files by splitting a large file into a number of pieces, and storing them with different cloud services. This approach not only solves the problem of file size limitation restricted by major cloud providers, but also has the following major advantages. First, since each cloud service only stores a portion of a large file, the contents of the original file cannot be easily compromised. Second, the pieces of a large file can be uploaded to or downloaded from multiple cloud servers concurrently; therefore, the uploading and downloading time for the large file can be significantly reduced. In order to demonstrate the effectiveness of our approach, we adopt Google App Engines as cloud services for our experiments. We implemented the web services for information storage using App Engines, and also developed a standalone GUI (graphical user interface) based application that used the multi-threaded technique to upload/download pieces of a large file into/from multiple App Engines concurrently. The GUI application can automatically split a large file into pieces before uploading them into cloud, and combine multiple pieces of the file into the original one after downloading them from cloud. Since only the GUI application can restore the pieces of the file into the original one, our cloud storage approach is secure. Based on our experimental results, we show that our approach not only supports efficient storage of large files in cloud, but also the contents of the original file cannot be readily comprised.