

Section «Computational Mathematics and Cybernetics»

Experiments of Cache Size / File Size Ratio in Transmission of Large Files

Ivanov Anton Victorovich

Student

Gyeongsang National University, Natural Science, Jinju, Korea, South

E-mail: ian7on@gmail.com

The present day computing systems are comprised of large data-intensive applications. The examples of such large scale data-intensive applications are database systems, distributed systems, and different kinds of client-server systems. In addition there exist different kinds of data-intensive applications such as multimedia streaming. The characteristic of large scale data-intensive distributed applications is quality of service maintenance. Another aspect of such applications is maintenance of high performance. However large scale data-intensive distributed applications face two kinds of problems such as:

- 1) Network bandwidth variation in an unpredictable manner.
- 2) The limitations of the disk (hard disk) bandwidth.

Researchers have proposed two kinds of solutions for these problems. The caching algorithms try to minimize disk latency by caching a large dataset into main memory (RAM). On the other hand, the network latency between the client and the server can be managed by designing application level protocol for communication between client and server. However the performance gain by designing the application level smart protocol is limited because the underlying network (wired or wireless) is inherently unpredictable in nature in terms of instantaneous bandwidth variations and reliability of the connection. The effects on the performance of data-intensive distributed application are more visible when client and server are connected by wireless network. Hence, it would be interesting to investigate the dynamical correlation between data caching and network latency.

In this paper we have designed and implemented a data-intensive distributed streaming application comprised of client and server connected by variable bandwidth wired network. The different set of caching policies is employed to cache the multimedia data in the main memory of server under the network having variable bandwidth. The experimental evaluations demonstrate that there exists a definitive correlation between the amount of cache and the underlying network bandwidth variation. Our results have been analyzed and presented in graphical fashion in this paper.