

COST ESTIMATION QUEUING MODEL FOR LARGE-SCALE FILE DELIVERY SERVICE

Chih-Chin Liang
National Formosa University
lgcwow@gmail.com

Hsing Luh
National Cheng-Chi University
slu@nccu.edu.tw

ABSTRACT

A large-scale content delivery service within a company in Taiwan uses 40 servers to deliver files from the company's ordering system. In a content delivery system, servers and connections are the resources for sending files. However, because of increasing business needs, the content delivery service must be used for transferring various files rather than just a single business unit. This increases the content delivery frequency. Once a connection is used for delivering a file, the occupied connection serves no other file delivery purpose. Because each connection has a cost, the use of a connection that delivers no other packets represents an opportunity loss, with the necessity of delivering a higher number of packets creating a higher opportunity loss for the existing service. Further, each file sent through this content delivery service has its specified importance because of the different business needs. The average loss caused by the failure to send an important file is considerably larger than that when sending a regular file. That is, the opportunity costs of sending various types of files are different. Because the connections are sparse resources, it is important to discuss a way to use these connections efficiently for delivering various files. In other words, the manager must find a way to control the loss caused by the content delivery service because the opportunity cost of failing to deliver content with different priorities must be endurable. Therefore, this work analyzes the cost function of the queuing model of the proposed content delivery service. The results show that a manager can control the reservation of connections in order to deliver important packets with a minimum cost. That is, the manager can manage content delivery as efficiently as possible.

Keywords: cost estimation, content delivery
