


Chapter 16

Integration of Multiple Cache Server Scheme for User-Based Fuzzy Logic in Content Delivery Networks

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ABSTRACT

The internet plays important role in the modern society. With the passage of time, internet consumers are increasing. Therefore, the traffic loads during communication between client and its associated server are getting complex. Various networking systems are available to send the information or to receive messages via the internet. Some networking systems are so expensive that they cannot be used for the regular purpose. A user always tries to use that networking system that works on expansion of optimizing the cost. A content delivery network (CDN) also called as content distribution network has been developed to manage better performance between client and list of available servers. This chapter presents the mathematical model to find optimization among client and cache server during delivery of content based on fuzzy logic.

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INTRODUCTION

Due to the invention of the computer, network services become increasingly popular around the world. Network services comprise two basic tools, one is computer hardware, and another is computer software. Comprising two tools data are transmitted from one computer to another computer. In computer networks, computers are generally connected in two ways: one is peer to peer networks system, and another is server-centric network or client-server network system. In server-centric network, several client computers are connected to a server which provide certain services to them (Mangili et al., 2016). In this scenario, clients have opportunity to make request from the server. But in peer-to-peer network, client computers are connected to each other. They can request and share data or information among them. Client-server is a software architecture model with two parts namely, (i) Client system (ii) Server system. This network architecture is very much easy to use and reliable due to its structural setup. Every clients gets information from a reliable source. Server helps in administering the whole setup and facilities delivered by them.

There exists one server to hose the resource which is requested and used by clients (Bhadoria et al., 2017). But in client-server model, traffic congestion is an important issue and for this reason the total network system becomes slow and sometimes it becomes failed. However, in peer-to-peer network, although there is no server-side support but, due to its client-client connection, the network system is too much fast for information interchange. As the reliability of information is at high priority, a client-server network is too much acceptable besides these disadvantages. To improve and use most of its advantages, a new distributed architecture Content Delivery Networks (CDN) has developed. There is required to optimize the cost for both the clients and servers to provide best of the services. Internet content delivery service improves the performance of delivering of content. In computer network architecture, 'Content' is a collection of information. This can be nicely represented using the notion of set theory as follows:

$$Content = \{i : i \text{ is an information available for retrieval by client}\}$$

So, contents may be web pages, audio clippings, video clippings, images, software, etc. To get the better performance, server-side has to make multiple copies of contents and distribute to different Cache servers. One has to design a management process so that the distance from the origin server to a client is minimum. In this process, nearest cache server serves for the client who is requesting content. This forms a network and requires optimizing the cost of content delivery whose diagrammatical representation is shown in Figure 1.

GENERAL WORKING CONCEPT BETWEEN CLIENT AND SERVER IN COMPUTER NETWORK

The computer network architecture of server-to-client model is categorized into three stages, which are as follows:

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