The explosive expansion of the World Wide Web (WWW) is the biggest event in the Internet. Since its public introduction in 1991, the WWW has become an important channel for electronic commerce, information access, and publication. However, the long waiting time for accessing web pages has become a critical issue, especially with the popularity of multimedia technology and the exponential increase in the number of Web users. Although various technologies and techniques have been implemented to alleviate the situation and to comfort the impatient users, there is still the need to carry out fundamental research to investigate what constitutes an acceptable waiting time for a typical WWW user. This research not only evaluates Nielsen’s hypothesis of 15 seconds as the maximum waiting time of WWW users, but also provides approximate distributions of waiting time of WWW users.

INTRODUCTION

The growth of the Internet is one of the most astonishing technological phenomena of the 21st century. One such growth is the explosive development of the World Wide Web (WWW). The WWW is an Internet client-server hypertext-distributed system that originated from the CERN High-Energy Physics Laboratories in Geneva, Switzerland. Since its public introduction in 1991, the WWW has become an important channel for electronic commerce, information access, and publication. With exponential growth in the WWW market, the long waiting...
time for accessing web pages has become a major problem for WWW users (Lightner, Bose and Salvendy, 1996), especially with the increasing use of multimedia technology and the doubling of Internet users every 18-24 months. A survey conducted by the Graphic, Visualization, & Usability (GVU) Center at the Georgia Institute of Technology also indicates long download time to be the biggest problem experienced by WWW users (GVU, 1998). This problem is so noticeable that WWW users sometimes equate the “WWW” acronym with “World Wide Wait”!

The WWW has been used for both business and personal purposes. It is used not only by businesses to gain competitive advantage, but also by individuals and groups to publish information in an electronic format for worldwide access. Any individual, group, or organization can make its web pages available to the public. Initially developed to provide scientists and researchers with an easy means of sharing information, the WWW has become one of the world’s most widely used environment for publishing information (Vacca, 1995). In addition, the WWW has become one of the most popular information search tools. The wealth of information available on the WWW makes it an excellent information repository. It puts global information at our finger tips and enables us to access it from the comfort of our home. The WWW also provides an avenue for people to “kill time” by surfing the net (Hayes, 1995).

Since its public introduction, the WWW has diffused rapidly to different geographical locations and to different age groups. Although initial use of the Internet was dominated by technology developers/pioneers and early adopters/seekers of technology, a study reveals that more older and younger users are becoming Web literate (Pitkow and Kehoe, 1996). With this ever-increasing number of Web users, access time of WWW has become a serious concern (Lightner et al., 1996). The findings from the GVU’s (1998) 10th WWW User Survey indicate that the top two problems faced by Web users are the long download time of web pages (61.4%) and the long loading time of advertising banners (62.3%). The situation is gradually worsened by the increasing and excessive use of multimedia data (i.e., audio and video clips). This problem affects both information users and authors since users are less likely to visit websites requiring long access time (Reaux and Carroll, 1997). Therefore, it is important to conduct research studies on WWW access time, ways to reduce the access time, and ways to extend Web users’ waiting time.

Although technologies and techniques have been introduced to partly resolve the problem and to ease the frustration of impatient users, fundamental research to assess web users’ waiting time is lacking. This research attempts to investigate the question, “What constitutes an acceptable waiting time for WWW users?”
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