

Integrating User-Oriented Quality of Service Into Internet Browser

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Abstract

In this paper, we introduce a concept of providing User-Oriented Quality of Service for accessing Internet using networks with low-quality connection. The User-Oriented QoS becomes a critical issue here, because the current model assumes a partial approach where access is constrained by the tools used to access the Internet. Furthermore, the tools fully controls the way access is performed, giving no opportunity for the user to specify alternative access arrangements. We therefore need a more flexible access model that allows a user to break the constraints. We propose a new model for accessing Internet that allows a user to keep accessing the Internet even in very low speed and/or with temporary disconnection. In this model, we integrate concept of User-Oriented Quality of Service into Internet browser. The goal is to build user-configurable Internet browser from existing software.

Key words:

Configurable Internet Browser, User-Oriented QoS, low-quality connection.

I. INTRODUCTION

The requirements for QoS of Internet access are traditionally expressed in terms of network oriented or systems oriented parameters. The term QoS refers to a set of performance metrics that provide an objective measurement of a user in a given network. Most of the researches in the provision of QoS have occurred in the context of network-oriented QoS. The research has focused on providing suitable traffic models and service. Many concepts have evolved to define and provide an improved QoS. The concept that observed by Ray (2000) is referred to Policy-based Networking. It is lets network managers define service policies that govern how much bandwidth goes to specific applications and end users. Venkateswaran (2002) refers to QoS as network ability to provide service guarantees appropriate for various applications

while at the same time making efficient use of network resources. More specifically, QoS refers to a set of metrics performance that provides an objective measurement.

One of the definitions of QoS is the ability to guarantee a service level. If infinite network resource were available, then all the above parameters would be well within the applications requirement. Its mean that, QoS have specified by network or systems. Access rate, bandwidth available, reliability of network and performance are the key factors that influence QoS. In the situation with low-quality connection, it is difficult to achieve QoS that satisfied the users. Low-quality connection can be caused by poor communication infrastructure or mobile environment that is characterized by inherently low-speed networks and limited end-systems performance. The problem is when the connection is bad, the application decide to fail the operation without leaving users with any option.

1. Background to the Problem

Most third-world countries like Indonesia have poor communication infrastructure. Fast and reliable Internet connection is a luxury for the majority of people. While cost-effective network infrastructure solutions have been available, most software tools (e.g., browser, file transfer tools, and e-mail clients) do not suit the situation. They assume all users have high-speed connection in accessing the Internet. The problem is that when the connection is bad, they decide to fail the operation without leaving the user with any option. As a result, it is extremely difficult to execute a complete access operation in a low-quality Internet connection. This situation discourages people from harnessing the potential of Internet as a communication medium or a giant information repository.

Until recently the World Wide Web (WWW) and the associated browser have provided no support for accessing Internet in unreliable connection environment. When a user accesses the Internet, he or she does not always expect

instantaneous response from the party in the other side of the Internet. In many cases, the user is willing to wait longer. For example, many Web search attempts do not impose strict turnaround time limitations. Furthermore, a user may want to specify certain alternative actions if access cannot be executed in a specified time frame. This kind of flexible access cannot be facilitated by current browser. The browser do not provide opportunities to the users to specify other access arrangements that may be worth trying.

This paper proposes a new model for accessing Internet that allows a user to keep accessing the Internet even in very low speed and/or with temporary disconnection. In the new model, we will integrate a concept of User-Oriented QoS into Internet browser. Concept of User-Oriented QoS in this study is observed from user perspective. This concept is more emphasize at improving usability aspect for end-user in accessing Internet using networks with low-quality connection. This aspect was achieved by giving mechanism to specify user QoS requirement and mechanism to control access behavior with more dynamic.

2. *The Approach*

One approach to solve the problem is to provide users with more flexibility in controlling access behavior. It is necessary to replace the fixed default behavior with configurable settings that represent dynamic behavior. We present our approach to improve user-perceived QoS in unreliable connection environment, based-on User-Oriented QoS. This can be achieved using an interface between a user and the access modes he or she uses. The interface has a function of capturing a user's wish in accessing the Internet and formulating it into a suitable form for further processing.