

MASTER'S THESIS

Design and control of an Internet telephony system

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Design and Control of an Internet Telephony System

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Abstract

Internet telephony is a telephony service which delivers traffic through the Internet. It has two main advantages over the traditional telephony service: (1) it has a lower service charge and (2) it can provide many value-added functions to give a better and more comprehensive telephony service. In fact, some consultancy companies predict that Internet telephony will take up a significant portion of the international telephone market.

In this thesis, we design an Internet telephony system for long-distance communication. In each servicing region, a telephony server is used to bridge the local telephone network and the Internet, and the users can use telephones or fax machines to access this server for services. The system provides a real-time service and a store-and-forward service. Using the real-time service, a user can carry out real-time telephone conversation or fax transmission. Using the store-and-forward service, a user can send a non-urgent fax document or voice message at a lower service charge, and the system will forward it to its recipient before a specified deadline. The system can transmit the non-real-time data in the non-busy hours or the temporary idle time in the busy hours so that it can better utilize the bandwidth to earn more revenue, while the users can enjoy a lower service charge for non-real-time communication. We propose two quality measures for the two services, and we derive these quality measures. Based on this analytical result, we investigate admission control which determines whether the proposed system can admit a given service request while the resulting qualities of services are still acceptably good.

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