بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

AIN SHAMS UNIVERSITY
FACULTY OF ENGINEERING
Electronics and Communications Engineering Department

Congestion Avoidance in IP Networks

A Thesis

Submitted in Partial Fulfillment for the Requirements
of the Degree of Master of Science in Electrical Engineering
(Electronics and Communications Engineering)

Submitted By

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STATEMENT

This dissertation is submitted to Ain Shams University for the degree of Master of Science in Electrical Engineering (Electronics and Communications Engineering).

The work included in this thesis was carried out by the author at the Electronics and Communications Engineering Department, Faculty of Engineering, Ain Shams University.

No part of this thesis has been submitted for a degree or qualification at any other university or institution.

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To my beloved family for their continuous help and support.

To the memory of my grandmother

ABSTRACT

With the profilerence of multimedia traffic over the Internet, it seems natural to move over to ATM technology which has been designed specifically to support integration of data, voice, and video applications. While multimedia applications are still in the development stage, most of the traffic on the Internet today is data traffic in the sense that they are bursty and relatively delay insensitive. It is, therefore, natural to ask how the current applications will perform over the ATM technology. Although ATM technology has been designed to provide an end-to-end transport level service and so, strictly speaking, there is no need to have TCP or IP if the entire path from source to destination is an ATM path. However, in the foreseeable future, this scenario is going to be rare. A more common scenario would be where only part of the path is ATM. In this case, TCP is needed to provide the end-to-end transport functions (like flow control, retransmission, ordered delivery) and ATM networks are used simply as "bit pipes".

Since the Available Bit Rate (ABR) service class has been developed specifically to support data applications, it is important to investigate the performance of the dominant Internet protocol Transmit Control Protocol (TCP) over it.

The thesis has three main contributions. First, it presents a novel technique for the design of an ATM switch supporting ABR flow control using fuzzy logic. The second contribution of the thesis is the design and implementation of an event-driven object-oriented network simulator, which can be used to evaluate the performance of any given ATM network topology running TCP applications. Third, simulation results are performed to maximize the throughput of TCP over ATM, as well as ensuring the best possible fairness among different competing user requirements.