Quality of Service when Streaming: Starting a Joint Project - FAIL!

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Abstract

This poster summarizes an initial research proposal and then critically assesses where novice researchers failed. The research aim was to "find a better Quality of Service control mechanism for Internet Streaming". However, neither topic nor question was properly "tamed"!

Keywords

Research proposal, Streaming, Quality of Service

Introduction

This research project was drafted late during the visit by four junior members of staff from university in China.

Observations

There were warning signed all along the way:

(1) eMails sent to do project after their departure, mostly went unanswered
(2) Internal research funding approved but committee didn't have subject field knowledge for constructive criticism.
(3) External organization never shared with us, their project approvals and the study of current literature
(4) Referees of CITRENZ 2011 assessed Abstract submitted and invited full paper, qualifying: "It is not clear what is the novel contribution from this paper. Perhaps the title is misleading, it seems the focus is on building a simulation model?"

So I reviewed documentation to assess the case with my weak subject knowledge re internet technology and network performance, but having reasonable research skills.

Project setting

TCP is the dominant protocol in the Internet, but RTP is the dominant protocol in the application of streaming media transmission. However, it can neither provide reliable packet delivery mechanism by itself, nor provide flow control and congestion control mechanisms. It only provides the framework agreement. So it has important theoretical value to study the QoS of streaming media.

Aims and main content

1) Detailed study of the present situation of streaming media, the features and the Transmission Control Protocol.
2) Studying the causes of network congestion, the control elements of network congestion, the relationship between network congestion and network quality of

5) The OPNET Emulation Programme is used to study the phenomenon and control method of Network congestion, the characteristics of the real-time streaming media when using Congestion control strategy in transmission, the necessity and and the important theory significance of congestion control.

Creative and special features

1) Studying on video compression to make the compression more easily controlled and get higher compression ratios.
2) To find a better QoS control mechanism to control the transmission of media streaming and it more continuous, more suitable for network transmission at present.
3) Network congestion is a complex issue and it will be studied from different angles, mainly from the video data compression, the control protocol of the end system, the control algorithm of Router, client-side caching etc. We will look for the breakthrough from theory and practice.
4) A simulation about the result of the research is provided through OPNET software to make sure the effects.

Approach, technology routes and uses

We will analyse the performance of Various congestion control algorithms from different angles, simulate and analysis by using the network simulation platform OPNET and compare the influence of various Congestion control algorithm to the quality of service(QOS) properties.

Scheduled plan

The external proposal indicated stages as Preparation, Implementation and Analyse & Summarise. My funding proposal provided for early external review by CITRENZ paper referees since we do not have the technical skills re networking performance and the simulation software their institution holds.

Finalized individual actions plan and agreements – Feb 2011 (Christo)

Completed study of present situation of Streaming media Application – Mar 2011 (CDU)

Completed draft template/schematic paper – Apr 2011 (Christo)

→ Submitted overview for CITRENZ conference in July – May 2011 (Christo)

Planning this early external feedback, was a blessing.

Criticism: Top 5 items

(1) Definitely not clear what _research_ problem/question is
(2) Poor language, therefore meaning often unclear
(3) Many duplications, often with contradictions!
(4) Unsubstantiated "contextualization" (ie Literature?!)
(5) Mixing what exists and what to create

Basically, I should have seen the writing on the wall…

Can this project be saved?

Network performance is important subject, but one needs to formulate clear research problem/question from which added benefits like case studies or tools for teaching, are derived.

References

Potgieter, C. & Rajendran, D. (2011). Proposal for funding: Quality of Service in Real-Time Video streaming. _WINTEC document, January 2011._

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