Collaborative Load Shedding for Media-Based Applications

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1 Introduction

Load Shedding: As resources become scarcer, applications reduce their demands on the system. Collaborative: When Shedding Load, applications take the user's priorities into account, rather than shedding load uniformly.

This author experimented on a system for maniulating video streams on workstations.

The problem is when two or more video windows are displayed, the quality of service provided is significantly degraded, resulting in jerky, un-natural pictures.

An important insight of this paper is the user-centered idea. "Perceptual" time: The response objective is not the support of the finest real-time temporal granularity achievable. Rather the objective is to achieve temporal granularity to support perceptual time meida, such as voice and video, which is relatively slow.

"Optimal" load shedding: The author considered the "optimal way" of load shedding is the one that most closely matches the use of the resources to the interests of the users, which is different from scheduling to find the optimal ordering of proesses that presetn a demand that is equal or less than the available resources.

2 When to shed load and how to detect

- The workstation is overloaded. Sources to detect: application, kernel
- When the allocation of resource does not reflect the priorities of the user. Sources to detect: the kernel, application, user interface

3 How to shed load

- By operating System
- By applications

Enforcement(two ways)

- Kernel kill the program
- Market

4 Experiment

They experimented with 3 methods of load shedding using a "video in a window" viewstation application

- Make load directly proportioal to user attention
- Measure the overall system load
- Depends on the application itself to determine how many frames one second it can achieve and know how many it can achieve on an otherwise unloaded machine

5 Future Work

The experiments are not encouraging because they involves minimal collaboration. The future work aims to finding the minimum set of information that is essential to collaboration.

Pieces of information for successful collaboration: