Mark Claypool’s Projects

Network Games

Streaming Video

http://www.cs.wpi.edu/~claypool
Effects of Frame Rate and Resolution on Game Performance

- Computer games have many display options
  - Size, Colors, Shadows, Textures ...
- Better quality frames look better, but do they make you play better?
  - Example: High resolution may make it easier to spot distant enemy
- Better quality frames may give you a lower frame rate, so does that make you play worse?
- Methodology: select games, design game maps and mods, and run experiments
Multiplayer Game Server Selection

• Choosing a “good” server is critical for multiplayer games, but how do you define “good”?

• Typical server lists provide ping and CPU load, but how are accurate are these measures?
  - Example: ping based on only 1 or 2 packets

• How do you pick the best server for you and your friend in California?

• Methodology: study All-Seeing-Eye and qstat and others, correlate with performance, build a better one
Understanding and Scaling
Massively Multiplayer Games

• Massively multiplayer games popular, but unknown from scientific point of view
  - Example: what are traffic patterns, session lengths, ping constraints...?

• Scalability is a challenge, for CPU and net
  - Example: want to interact with 100, 1000, 10000 other people at once

• Peer-to-Peer architectures can scale, so can they be used for massively multiplayer games?

• Methodology: study MMRPGs, maybe propose architecture, build prototype
Adaptive Streaming Video

• We have streaming video system that adapts to network loss by adding repair

• Need new transport protocol that adapts to available bandwidth
  – Ex: TCP is no good, need better streaming protocol

• Our system scales video bitrate by discarding frames, but we need better ways of scaling
  – Example: can reduce quality

• Methodology: devise protocol, implement and test or devise scaling method, implement and test
Measuring Streaming Video

• We have a streaming testbed for measuring commercial video and have measured Window’s Streaming Media
  - See: http://www.cs.wpi.edu/~claypool/ms/wsm/
  - See: http://perform.wpi.edu/wsml/

• Want careful study of RealNetworks RealPlayer (and maybe Apple QuickTime)
  - Effects of packet loss, wireless...

• Methodology: design experiments, run, analyze
Questions?

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