

MMUSIC



RTSP Caching

Mark Green

markg@entera.com

IETF Draft



Caching Support in RTSP/RTP Servers

draft-periyannan-rtsp-caching-01.txt

Authors:

Ron Frederick

Jay Geagan

Mike Kellner

Alagu Periyannan

Entera

Streaming Media Caching



- Dynamic replication of streaming media
 - Bring content closer to users
- On-demand Stored Movies
 - Replicate into cache
 - Playback from cache

Streaming Caching Issues



- Issues to be resolved
 - Transfer Loss
 - Transformation Loss
 - Cache Coherency
 - Access Accounting
 - Authorization
 - Copy Protection
- Varied levels of solutions
 - Cache / Origin Server under common administrative control
 - Owned by separate entities

Transfer/Transformation Loss



■ Transfer Loss

- UDP packet loss
- Harder to create a perfect copy
- HTTP does not have this problem

■ Transformation Loss

- Important information in original media file is lost
- Some information harder to parse from packets than from file
- HTTP servers usually do not transform data

Cache Coherency and Access Logging



■ Cache Coherency

- Users must get the latest copy of media
- Overhead for coherency not as high as in HTTP caching

■ Access Logging

- Content owners want accurate hit counts
- HTTP does not attempt to solve this problem

Authentication and Copy Protection



■ Authentication

- Caches should not serve restricted streams without authenticating with the origin server
- An airtight solution can be very complex

■ Copy Protection

- Streaming content is perceived to have more value than web content
- Open specifications can lead to the development of rogue caches
- An airtight solution can be very complex

Packet Recording Approach

- Record RTP/UDP packets by acting as a client to the origin server
- Replay packets when real clients request the stream
- Benefits:
 - No changes to origin servers
- Problems:
 - Packet loss during recording
 - Not enough information in packets as in original file

File Transfer Approach

- Use the RTSP/TCP connection to transfer original file
- Serve the file from cache as if it were an origin server
- Benefits:
 - Perfect copy created at caches
- Problems:
 - Caches need to know about many different file formats
 - Hard to solve copy protection issues

Streaming Caching Proposal

- Hybrid approach:
 - File Transfer + Packet Recording = Packet Transfer
- Use RTSP/TCP connection to transfer RTP packets
- Use a special “metachannel” within the RTSP connection to transfer additional information
 - Transmission timestamp, I, B, P frame, etc.

Packet Transfer Approach



■ Benefits:

- Provides a loss-less copy of content at the cache
- Avoids transformation loss
- File format independent
- RTP payload format independent

■ Problems:

- Requires special support at origin servers
- Copy protection, authentication and access logging

Open Issues



- Copy protection
 - Rogue caches can create illegal copies
 - Packet transfer is not much worse than packet recording (which one can do today with currently deployed servers)
- Enforcement of authentication and access logging
 - Rogue caches can choose not to participate in the logging and authentication scheme