Smart Video Networking

A software engineering project for BAE systems by Eric Gustavson, Ron Laidley, and Andre Govier

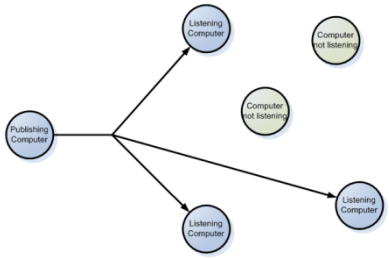
BAE systems needs to send videos over a network using low bandwidth. We did this by splitting and compressing the video using FFmpeg and sending each sub-video using lcm. Only when these sub-video are received by a client are they decomposed into individual images.

lcm-addon

Compresses and streams video files over LCM, and decomposes them into images

LCM is a library for message passing and data marshalling targeted at real-time systems where high-bandwidth and low latency are critical.

- LCM allows for UDP Multicasting over a LAN.
- Using LCM, a server "publishes" to a channel, and all clients "subscribing" to that channel receive the feed.

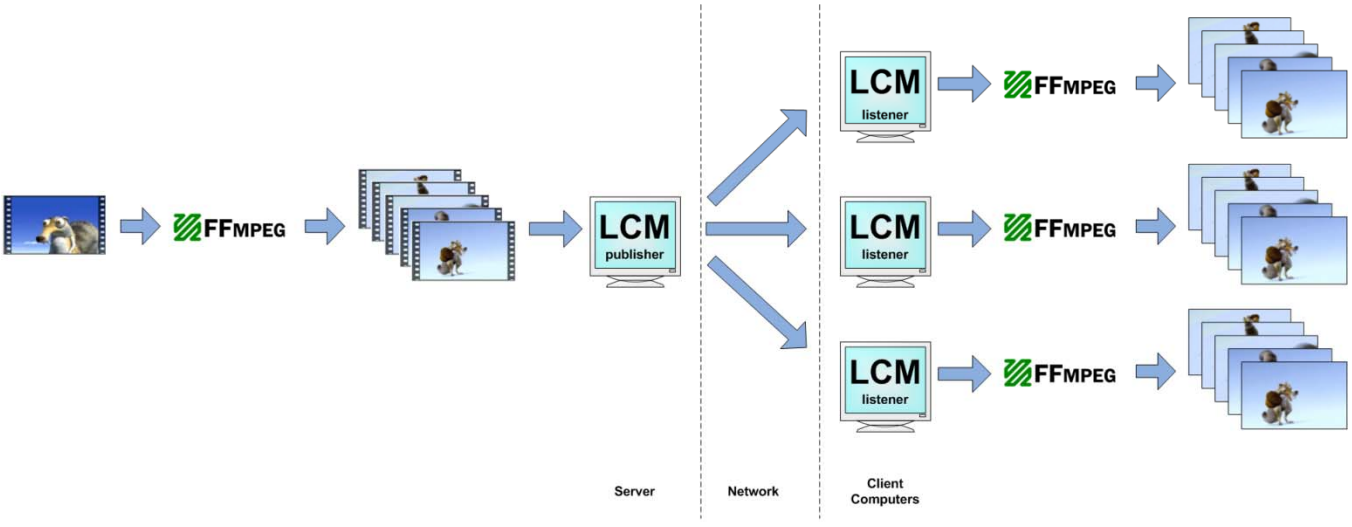


Visual representation of UDP Multicast

FFmpeg

FFmpeg is a complete, cross-platform solution to record, convert and stream audio and video. It includes libavcodec - the leading audio/video codec library.

- Videos can be quickly converted between any of the supported formats (MPEG, AVI, etc.)
- Videos can be split into smaller segments or even single images.
- It also allows for the construction of a video from images.



Typical use case of a video being streamed across a network and being received by three clients.