Telchemy

Actively Managing Multimedia

Ensuring Video Quality

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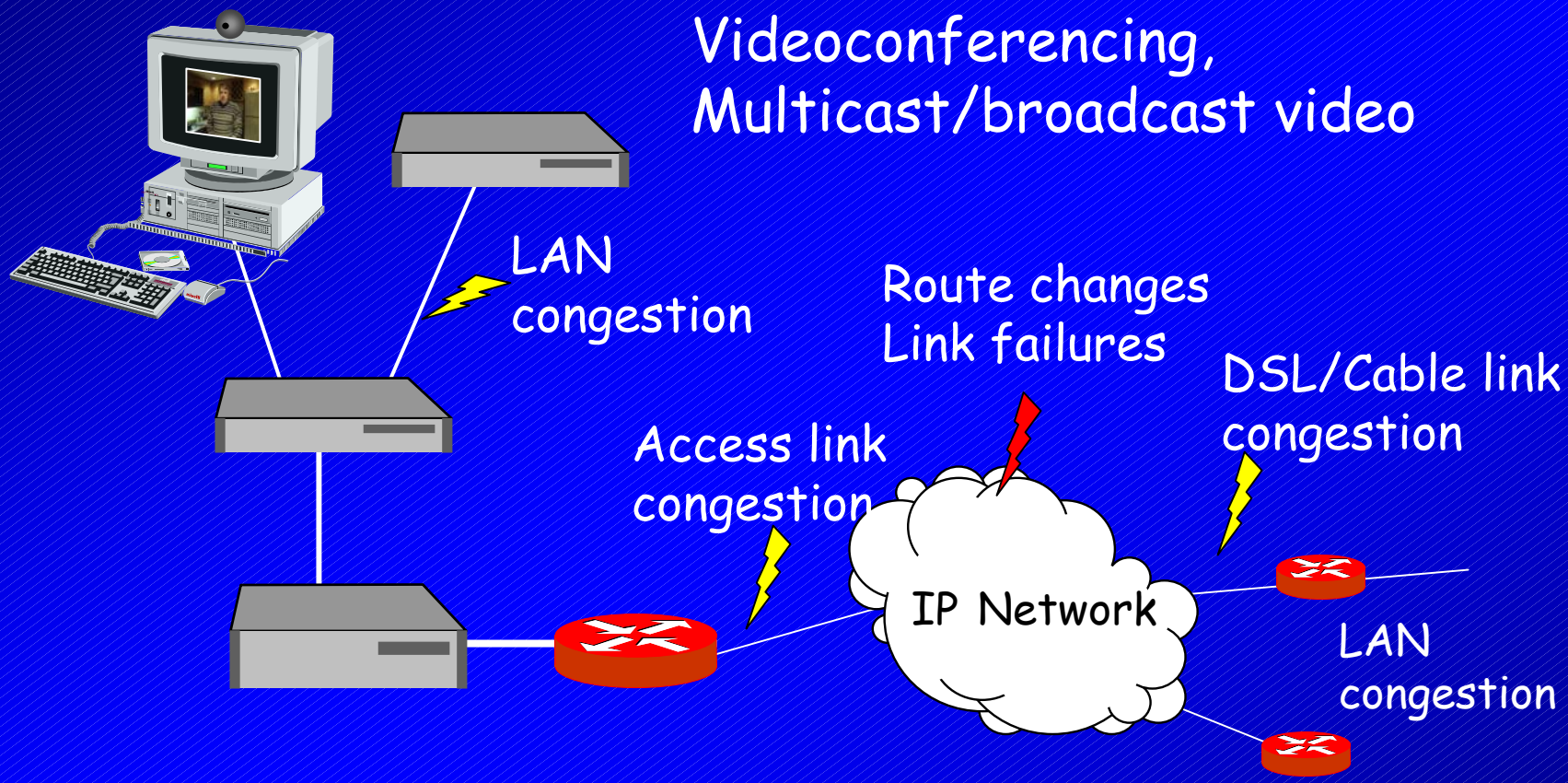
Outline

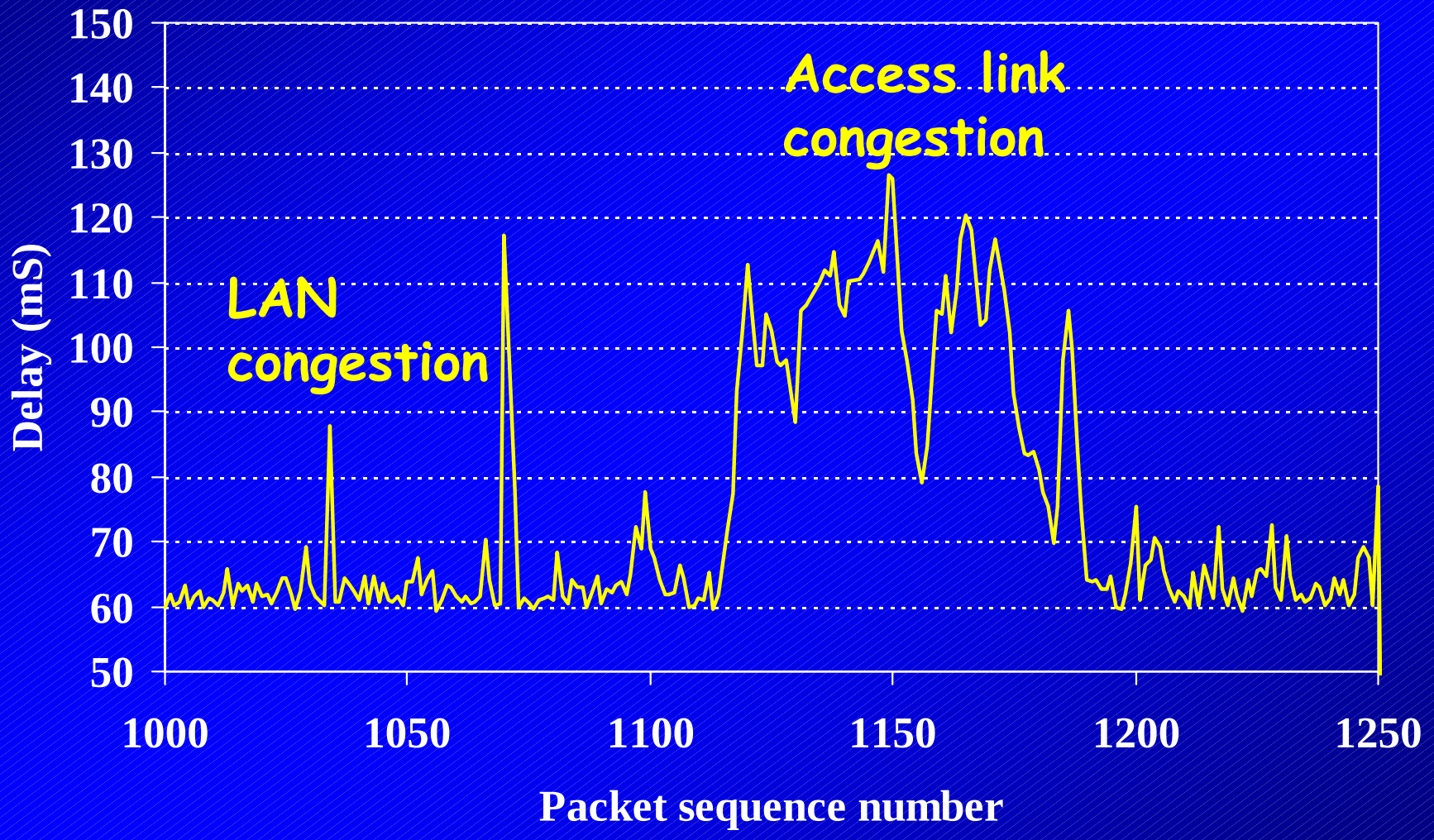
- Current issues and problems?
- Effects of network impairments on video
- Improving the robustness of video
- Monitoring video quality

Typical IP Network Problems

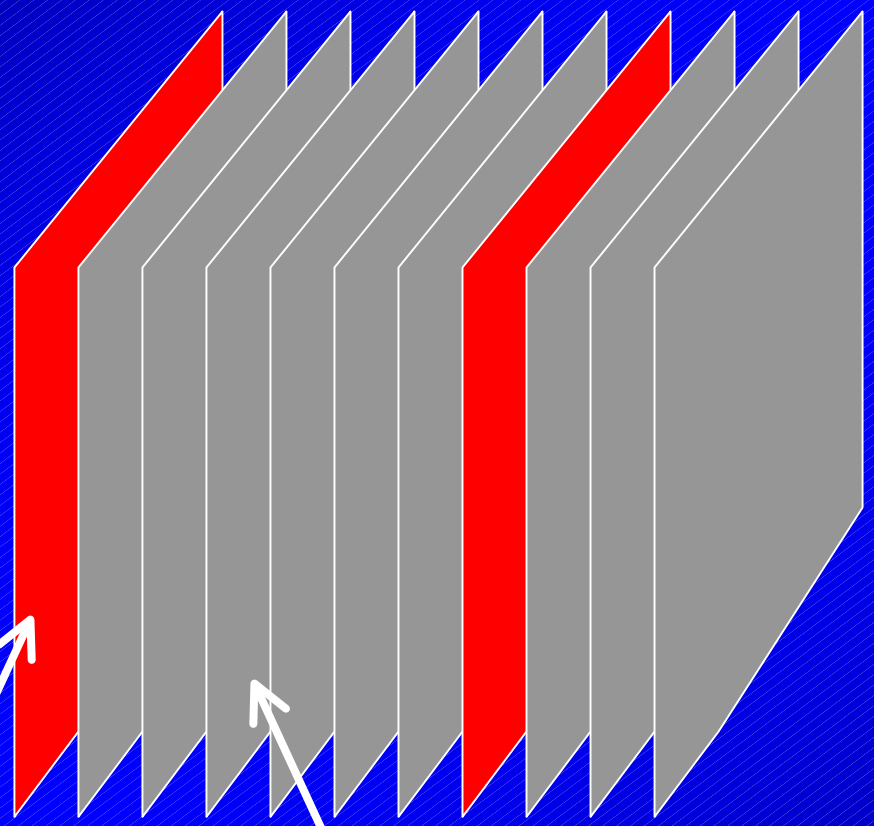


Transient problems

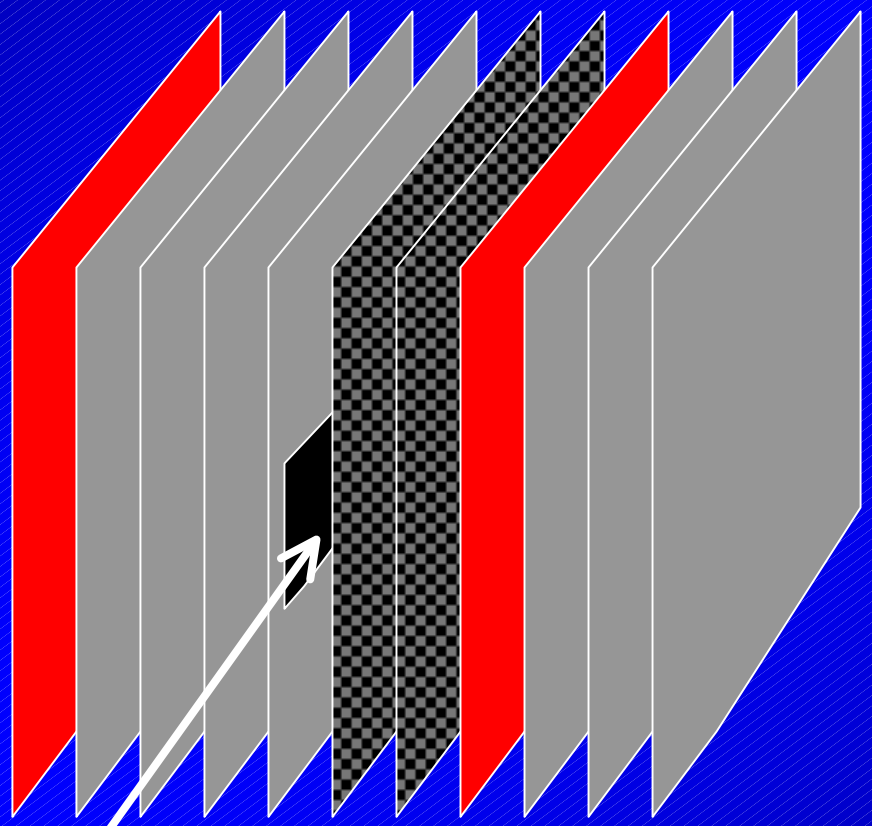
Impact on packet stream



Typical video stream



Effects of packet loss



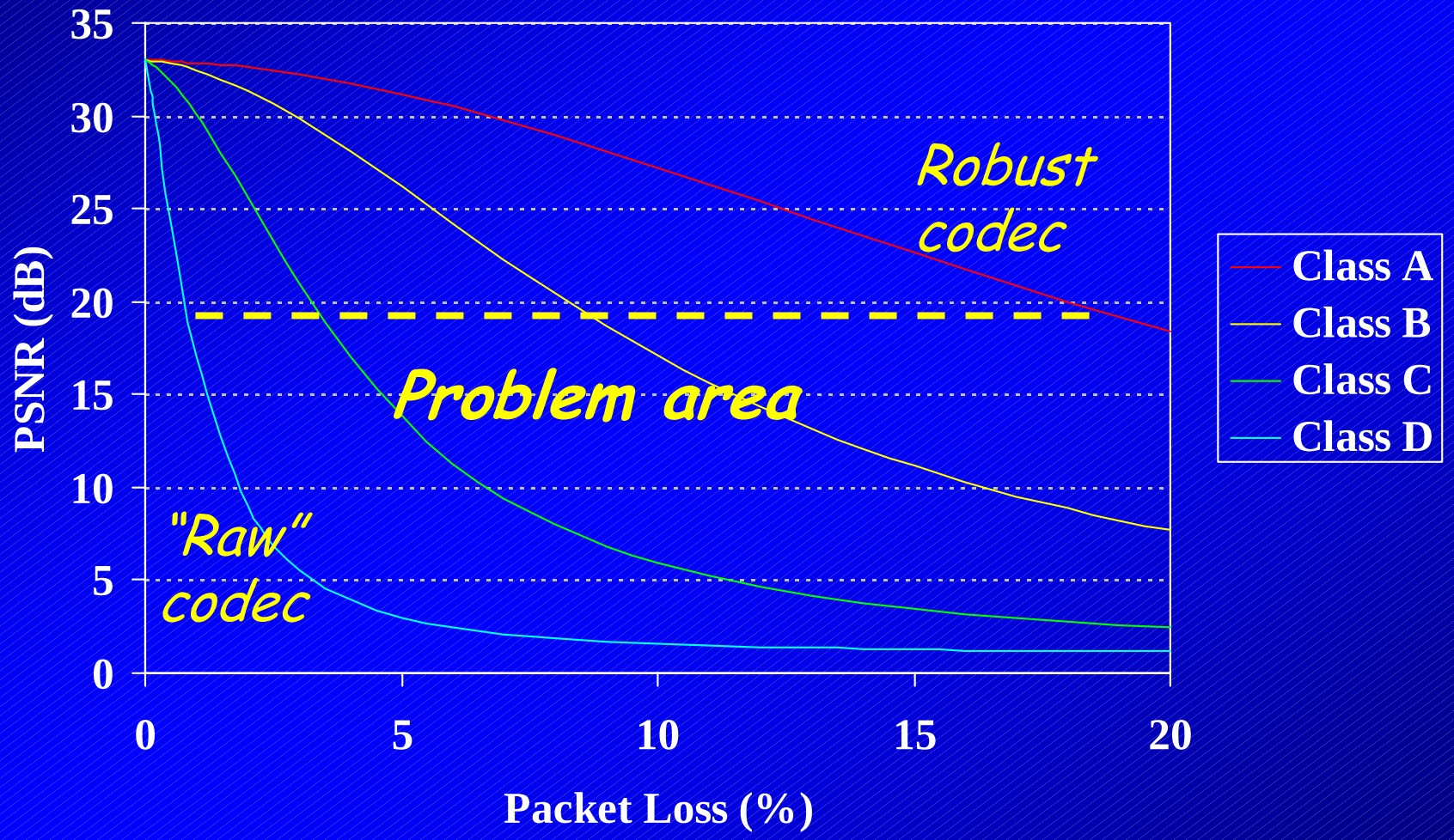
Packet loss

Loss extension due to interpolated frames

Robustness options

- Encoder options
  - Trade off between bandwidth and robustness
  - number of interpolated frames and robustness
  - Forward Error Correction/ Interleaving
- Decoder options
  - Use delayed frames for interpolation
  - Estimate content of missing frames

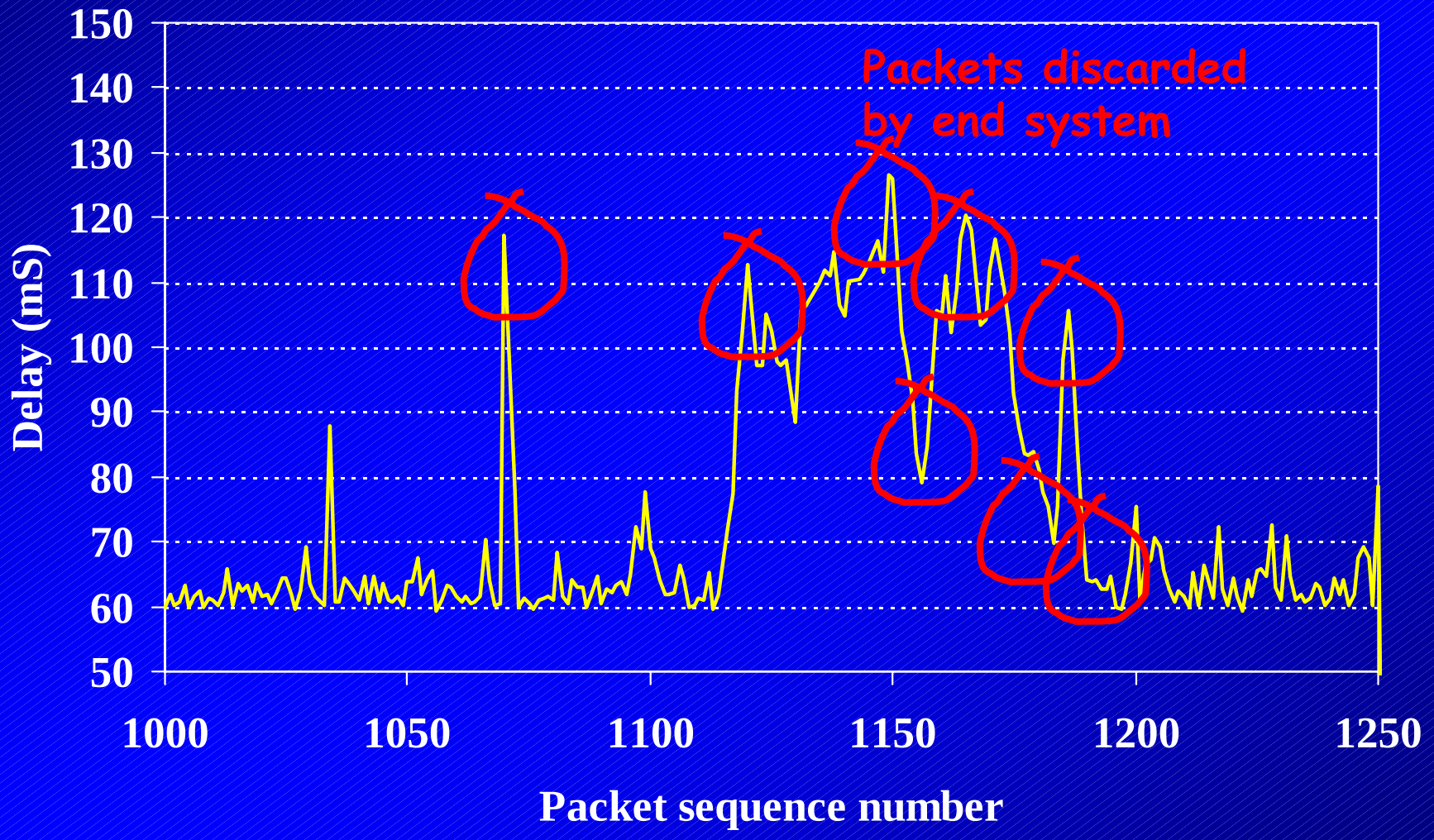
Effects of robustness strategies



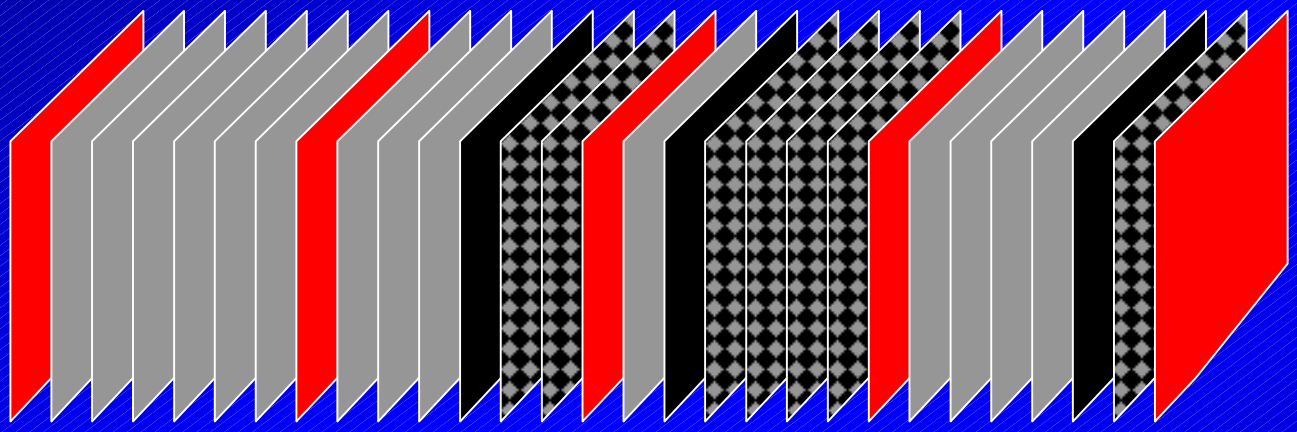
Approaches for monitoring video

- Full reference – compares a known reference video signal signal
- Partial reference – compare properties of original and decoded video stream
- Packet based approach – focuses on the impact of the IP transport on video quality

Packet loss distribution



Effects of bursty loss

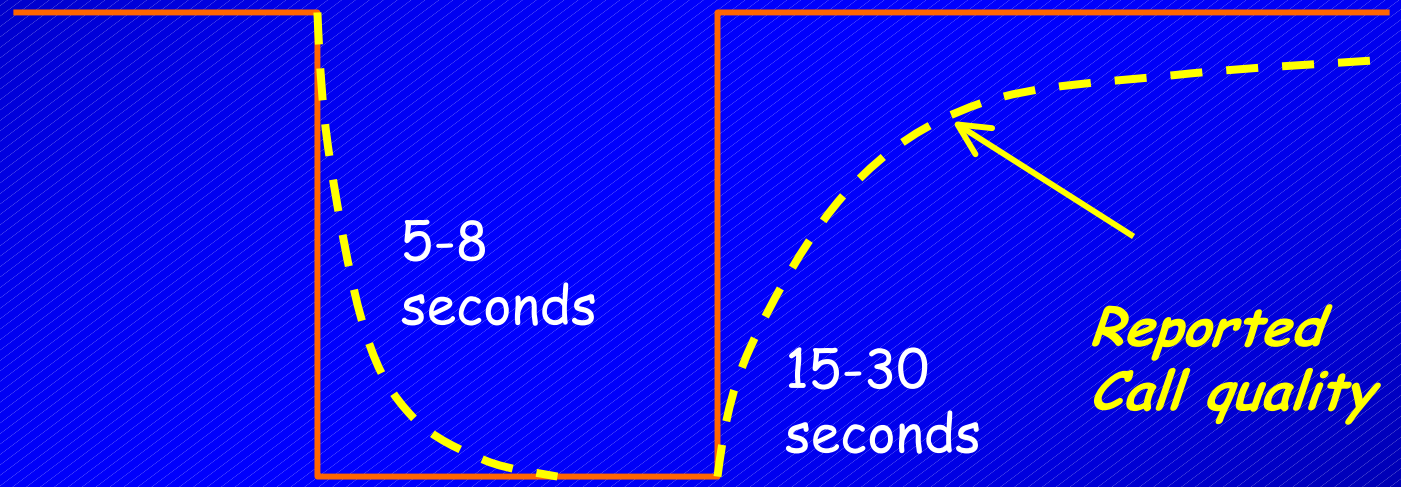


Good quality

Severely degraded quality

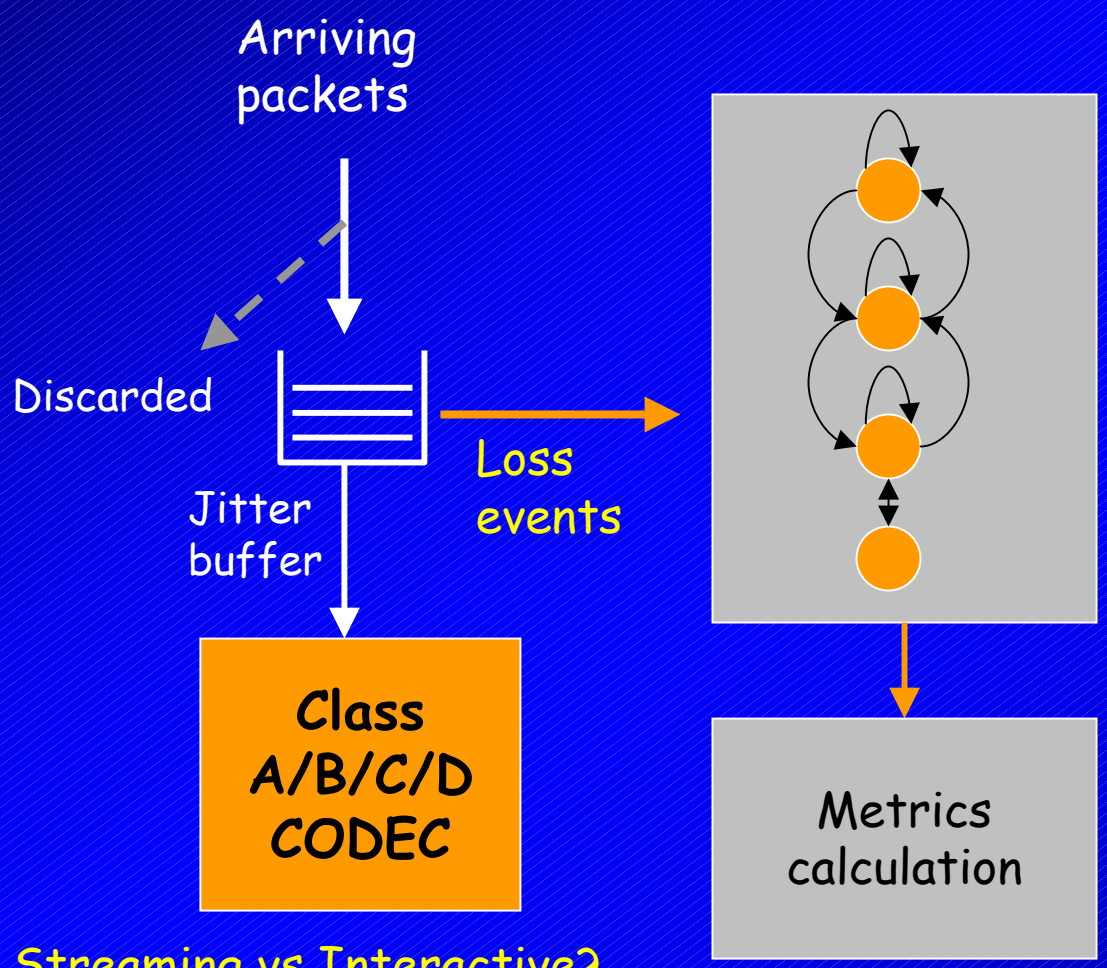
Effect - changing quality

Good quality most of the time



Poor quality during burst of loss/discards

Impact of network impairments



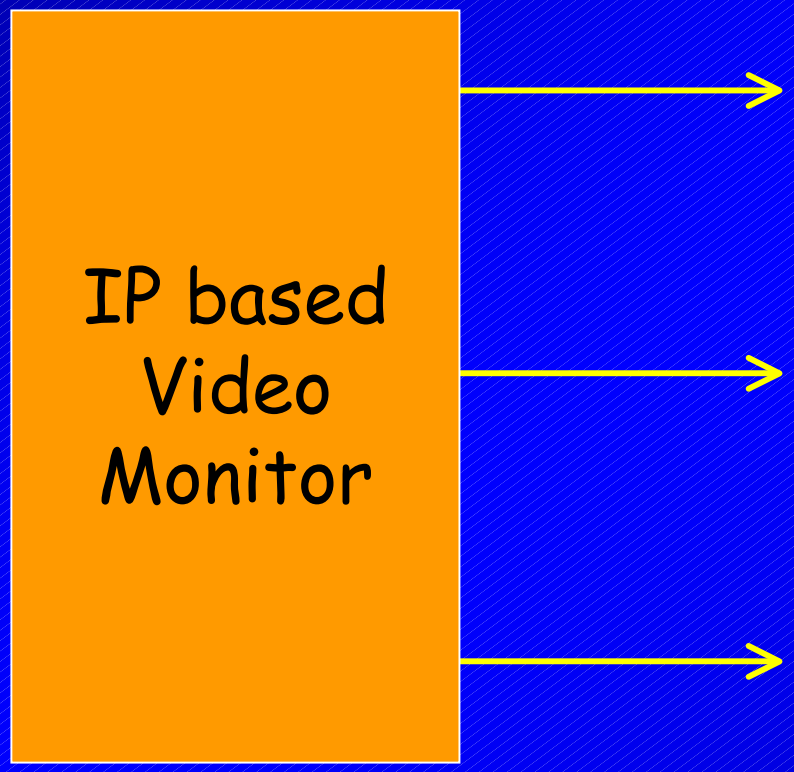
4-state Markov Model
Gather detailed packet loss info in real time

Measures *Burstiness*

Calculate session quality metrics

Streaming vs Interactive?

Output Metrics



Codec independent
IP transport quality
rating

Codec dependent
Quality score
Estimated PQS

Supporting
diagnostic data

IP Based Monitoring

- Can be applied anywhere on packet path
- Supports pre-deployment/ pre-session verification that IP path will support adequate quality
- Provides real time feedback on session quality
- Complementary to video based approaches

About Telchemy

- Based in Atlanta
- Develop technology for managing quality of service for Voice over IP and Video
- VQmon technology
  - Partners include Artiza, Brix Networks. Brooktrout, Finisar, Texas Instruments, Trinity Convergence