Which Network Streaming Protocol Should I Pick?

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Who am I?

• GNOME developer since 1999 (20 years!)
• GStreamer developer at Collabora since 2007
• Started with VVoIP: Telepathy & Farstream
Network protocols?

- RTP
- SRT
- RIST
- WebRTC
- RTMP
- MMS
- RTSP
- HLS
- SIP
- SDI
- Icecast
- AVB
- RTSP/RDT
- VNC (RFB)
- MPEG-DASH
- SmoothStreaming
- HTTP streaming
- MPEG-TS over UDP
- SMPTE ST2110
Trade-off

Latency

vs

Reliability
Adaptivity

- None
- Server-side
- Client-side
Low latency
Local network only

- Uncompressed high bandwidth
  - SDI
  - SMPTE ST2110
  - Uncompressed video over RTP
- Layer 2 with reserved bandwidth
  - AVB
Local network only: IP based

• RTP
  - With dynamic config: RTSP/UDP
    • Security cameras
  - Without: plain RTP

• Legacy: MPEG-TS over UDP

• Avoid NDI ... just plain evil
Low latency
< 1 second
Lowest latency

- SRT
  - MPEG-TS transport
  - Guarantees order, not delivery
  - Tries to retransmit
  - Popular in TV/Broadcast world
- RTP based
RTP/UDP Based

- MPEG-TS stream
  - RIST, much less popular than SRT
- Legacy VoIP
  - SIP (or XMPP)
- Modern video call
  - WebRTC
Medium latency
< 10 seconds
Medium latency

- CDN scalable
- Pushed over TCP
- Specialized
- Legacy
CDN scalable

- Client adaptive
- Low latency MPEG-DASH
- Low latency HLS
Pushed over TCP

• Security camera
  – RTSP/TCP

• Upload to live cloud streaming
  – RTMP (but consider SRT is available)

• Internet Radio
  – HTTP Streaming / Icecast
Specialized

- Desktop sharing
  - VNC (RFB)
Legacy interop

• RealPlayer
  - RTSP / RDT
• Microsoft players
  - MMS
Highest latency
CDN scalable

- Client adaptive
- MPEG-DASH
- HLS
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Questions?