

## The Problem

- ▶ To develop a proof of concept of how DDS can improve the distribution of audio and video data
- ▶ What QoS should apply?

## Requirements

- ▶ Adaptable bandwidth usage via DDS QoS policies
- ▶ Automatic discovery via Builtin Topics
- ▶ Transparent deployment on multiple scenarios
  - ▶ IP Webcams
  - ▶ Videoconference
  - ▶ VoIP
- ▶ No codec-architecture dependencies: Topic structure is codec agnostic

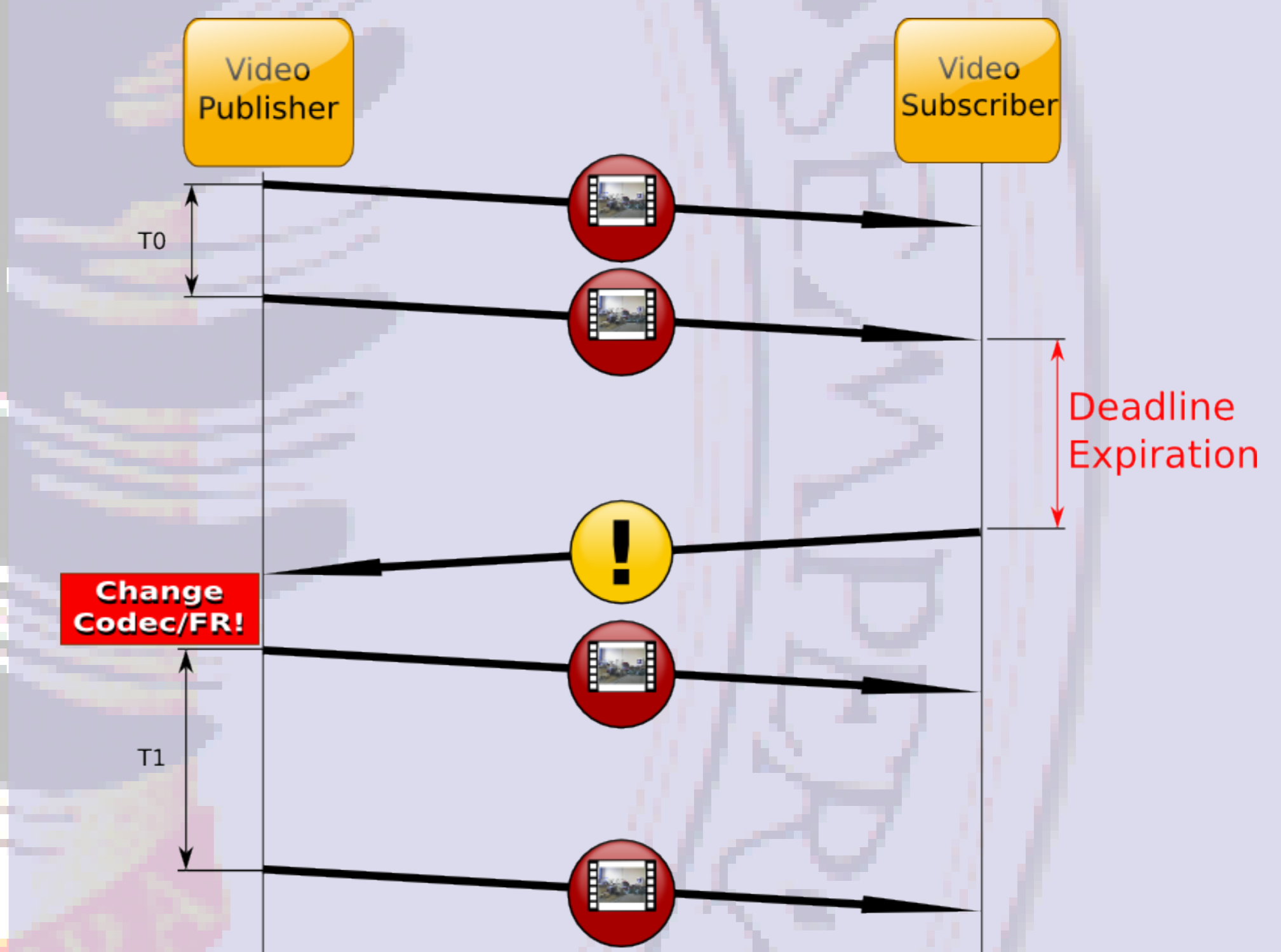
## Scenario



## QoS Policies

- Deadline** This policy is used for congestion detection. There is congestion when the maximum period in which the application expects to receive new video frames or audio packets is exceeded. If a packet arrives too late or a packet loss occurs, the involved peers control the amount of data delivered to the middleware (reduce frame-rate or change codec). When the congestion is overcome, peers recover the previous state.
- Time Based Filtering** QoS policy used in video applications to reduce application load when the DataReader Deadline expires.
- Lifespan** A typical audio/video application is only interested in data with short delay.
- Liveliness** This QoS policy is used for presence control. We can use to detect that an audio or video participant has join or left the domain.
- Ownership/Ownership Strength** Used in audio moderation in a multiuser conversation channel. Determined by a global moderator through the Signaling Topic (See Demo).
- Presentation Order** Ordered access to the stream data. Audio/Video samples should be retrieved in the same order
- Best Effort** Audio and Video frames are supposed to be delivered with minimum latency. A minimum loss of multimedia traffic is not relevant.
- User Data/Topic Data** This policy is used for implement access control to the audio/video rooms. If a participant is not allowed to access to an audio or video topic, he would be ignored during discovering.

## Signaling Mechanism

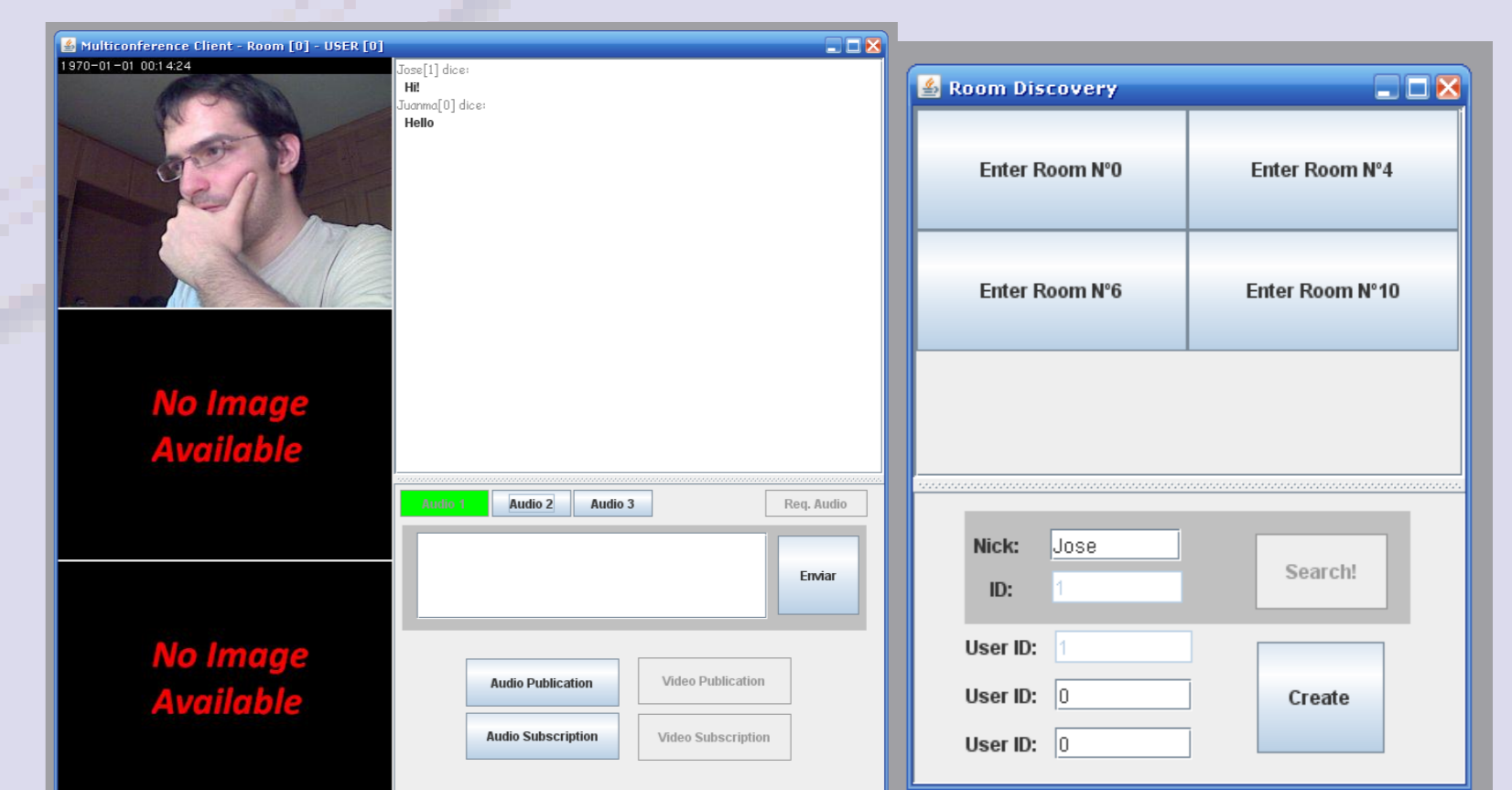


- ▶ Best-Effort Communications
- ▶ Use of Signaling Topic
- ▶ Enable Bandwidth usage reduction techniques by request

## Topics

- Audio/Video** There is one topic for each codec or video framerate/compression used for audio/video transmission. If the communication is Unicast, each subscriber can subscribe to an appropriate topic in order to avoid application or network congestion.
- Signaling topic** This topic is used to notify the publishers about receiver congestion (only useful in Multicast communication), for audio moderation... DDS is perfectly suitable for delivering reliable signaling messages.
- Builtin topics** Builtin topics are used to discover remote peers and to implement access control (Chat Room Discovery,...).

## Demo



## Conclusions

- ▶ DDS is perfectly suitable for audio/video transmissions in many different scenarios
- ▶ Need of traffic shaping mechanisms on Publisher side (reduce bandwidth usage) by QoS