# ATRAC family payload "-00"

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# Purpose

- Adoption
  - Competitive alternative
  - Standardization for streaming a potential value in future applications

# Background

- Previous attempts
  - ATRAC-X specific
  - Feature bloat
- Rebirth
  - Payload type for all ATRAC versions
  - Considerably simpler

# Issues from -00

- Clarification of codec in Introduction
- Clarification of Frame Offset field
- Definition of MIME types
  - channel assignment rules (RFC 3551?)
- Clarification of Offer-Answer model

# Codec Clarification

- MIME types being registered for:
  - ATRAC3, ATRAC-X
- Aggregate features are:
  - 32kHz ~ 96kHz
  - 1 ~ 8 channels
  - Sample-frame sizes: 1024, 2048
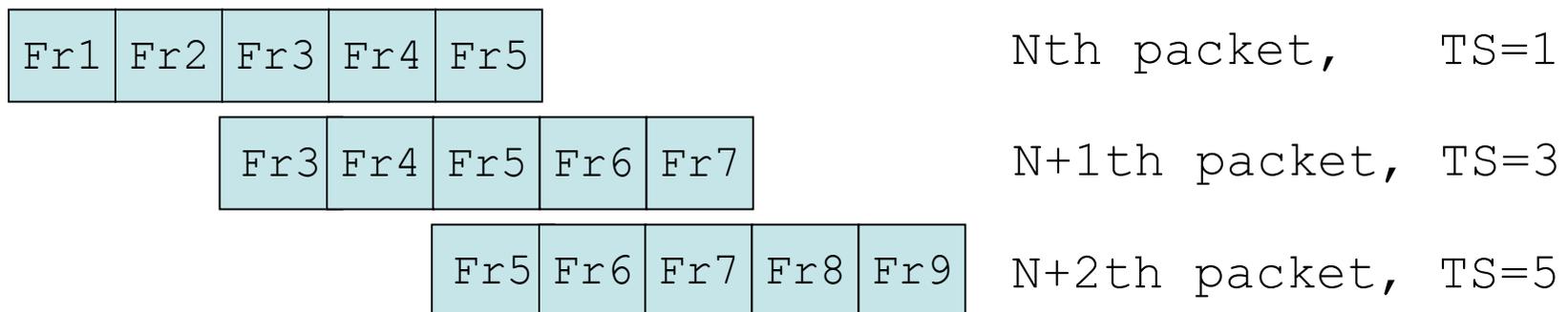  - Bit-rate range: 8kbps ~ 1400kbps

# Frame Offset

- 4 bits, rudimentary means for redundant data

```
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|C|FrgNo| Rsrvd |NFrames| FrOff |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- Example: FrOff = 3, Frame Size = 1024, 44100Hz

```
Fr1 Fr2 Fr3 Fr4 Fr5          Nth packet,    TS=1

        Fr3 Fr4 Fr5 Fr6 Fr7      N+1th packet, TS=3

            Fr5 Fr6 Fr7 Fr8 Fr9  N+2th packet, TS=5
```

∴ 3 * 1024 = 3072 samples of redundant data precede
   new data

# MIME types

```
Media Type name:        audio
Media Subtype name:     ATRAC-X
```

- ## Required

```
sampleRate (Hz):        32000, 44100, 48000,
                        88100, 96000
frameLength (bytes):    8 ~ 8192
channelID:              0, 1, 2, 3, 4, 5, 6, 7
```

- ## Optional

```
delayMode: 2, 4    - utilizes low-delay feature for ATRAC-X
encryptionMode:  Type1 ("OpenMG"), Other ("Reserved")
```

# MIME types (cont)

```
Media Type name:      audio
Media Subtype name:   ATRAC3
frameLength (bytes): 192 (66kbps)
                     304 (105kbps)
                     384 (132kbps)
```

- Sample rate fixed at 44100Hz
- Channels fixed at 2

# SDP Initialization

- Example usage of ATRAC with stereo at 44100Hz encoded with ATRAC3

```
m = audio 49120 RTP/AVP 99
a = rtpmap:99 ATRAC3/312
```

-  Example usage of ATRAC with 5.1 setup at 48000Hz encoded with ATRAC-X:

```
m = audio 49120 RTP/AVP 99
a = rtpmap:99 ATRAC-X/48000/1156/5
a = fmtp:99 delayMode=4
```

# Offer-Answer Model

- When creating offer with high requirements (i.e. 8ch @ 96kHz), also offer reasonable configuration with lower requirements (i.e. 2ch @ 44.1kHz)

- Downgrade subsets of "sampleRate", "frameLength", and "channelID" possible

- "delayMode", "encryptionMode" non-negotiable

# Open Issues

- MIME type parameters & SDP mappings
- Offer-Answer Model

Supplementary Data…

# Channel Mapping Table

| ChannelID | Channel Number | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 1 | c | | | | | | | |
| 2 | Fl | Fr | | | | | | |
| 3 | Fl | Fr | Fc | | | | | |
| 4 | Fl | Fr | Fc | Srnd | | | | |
| 5 | Fl | Fr | Fc | Rl | Rr | LFE | | |
| 6 | Fl | Fr | Fc | Rl | Rr | Rc | LFE | |
| 7 | Fl | Fr | Fc | Rl | Rr | Sl | Sr | LFE |