

RTP Payload format for ATRAC-X

Matthew Romaine
Mitsuyuki Hatanaka
Jun Matsumoto
(Sony Corporation)

Previously Disclosed Issues

- Ambiguity in timestamp definition
- Reasoning behind multiplexing not convincing
- Redundancy not via RFC 2198
- Decoding ambiguity after fragmentation

Modifications and New Features (for today)

- Timestamp and sample rate clarification
- Redundant data framework modified
- New method for multi-channel data decomposition introduced
- Multiplexing/QoS reasoning solidified

Modifications/Clarifications

- Time Stamp
 - time stamp corresponds to the **presentation time** in milliseconds
- Sample Rate
 - sampling frequency of all ATRAC-X streams during a single session **must be identical**
 - Reasoning
 - Synchronization with other audio or video data

Revision of Redundant Data Framework

Comment: “For redundancy to be useful the redundant copy may need to be separated further in time than one slot.”



“TimeStampOffset” added: 14bit unsigned offset value

Earliest accessible ATRAC-X frame:

256 frames@32kHz sampling frequency

352 frames@44.1kHz sampling frequency

384 frames@48kHz sampling frequency

- What’s wrong with RFC 2198?
 - RFC 2198 would require payload headers for primary and redundant data; unnecessary overhead
 - Block length field defined at 10bits; insufficient for high bit-rate data
 - Complexity in managing fragmentation data

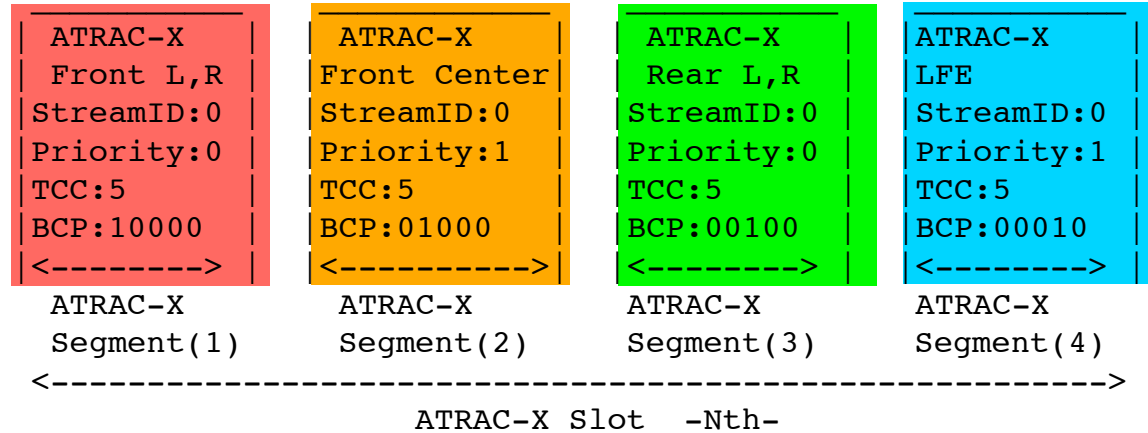
Multi-Channel Decomposition

- Introduction of Block Coupling Pattern (BCP); 5 bits
- Introduction of Total Channel Configuration (TCC); 3 bits

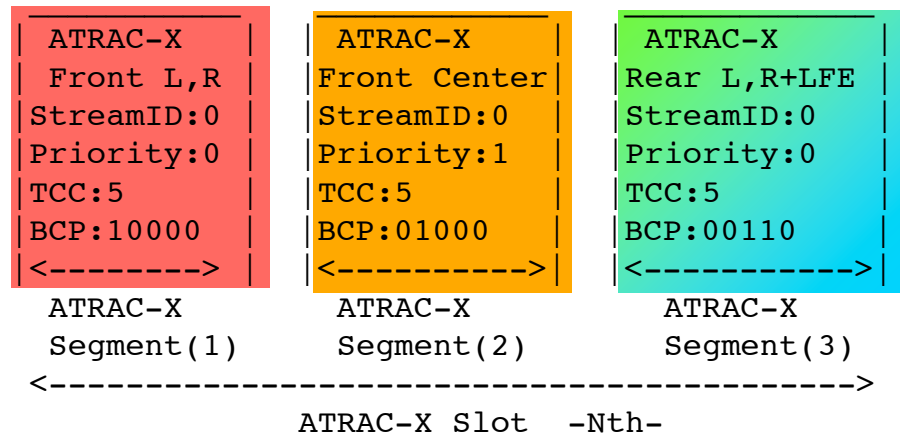
TCC		BCP		
5	5+1	stereo_channel_block	front: left, right	10000
		mono_channel_block	front: center	01000
		stereo_channel_block	rear: left, right	00100
		mono_channel_block	low frequency effects	00010
6	6+1	stereo_channel_block	front: left, right	10000
		mono_channel_block	front: center	01000
		stereo_channel_block	rear: left, right	00100
		mono_channel_block	rear: center	00010
		mono_channel_block	low frequency effects	00001
7	7+1	stereo_channel_block	front: left, right	10000
		mono_channel_block	front: center	01000
		stereo_channel_block	rear: left, right	00100
		stereo_channel_block	side: left, right	00010
		mono_channel_block	low frequency effects	00001

Multi-Channel Decomposition

Complete BCP separation
For 5.1

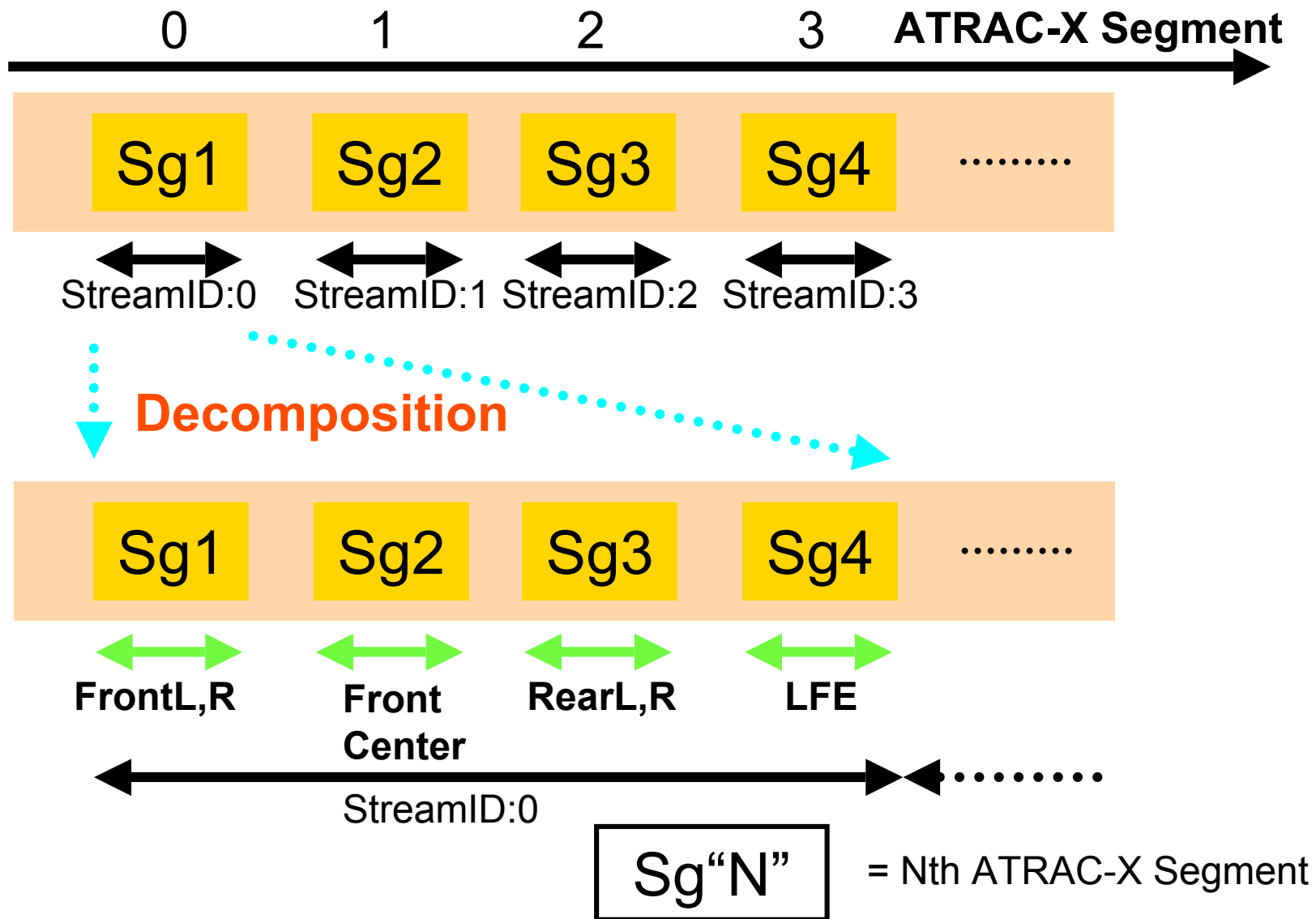


Rear L,R and LFE
channel blocks combined

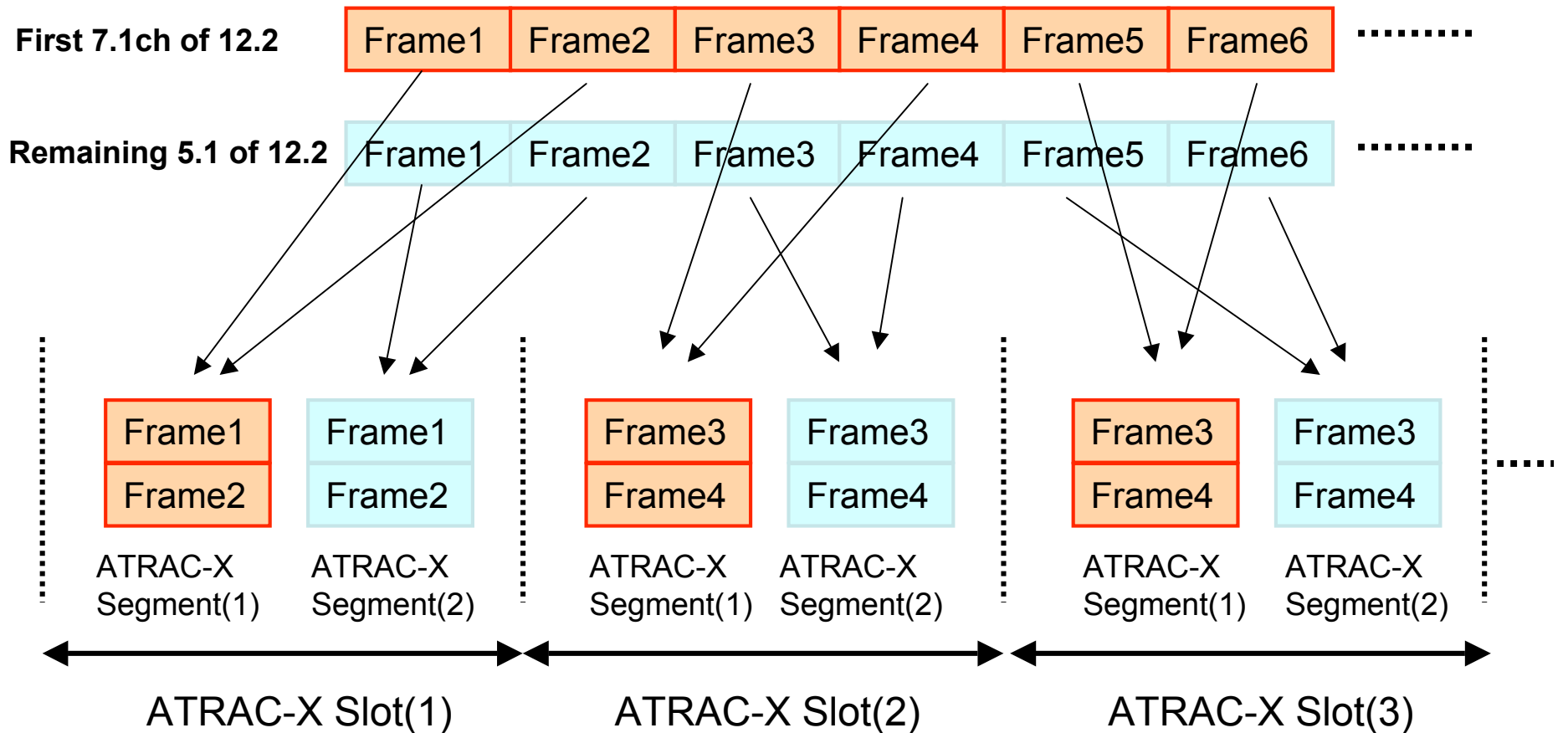


Multi-Channel Decomposition

StreamID"0" contains 5.1channel ATRAC-X Bit Stream

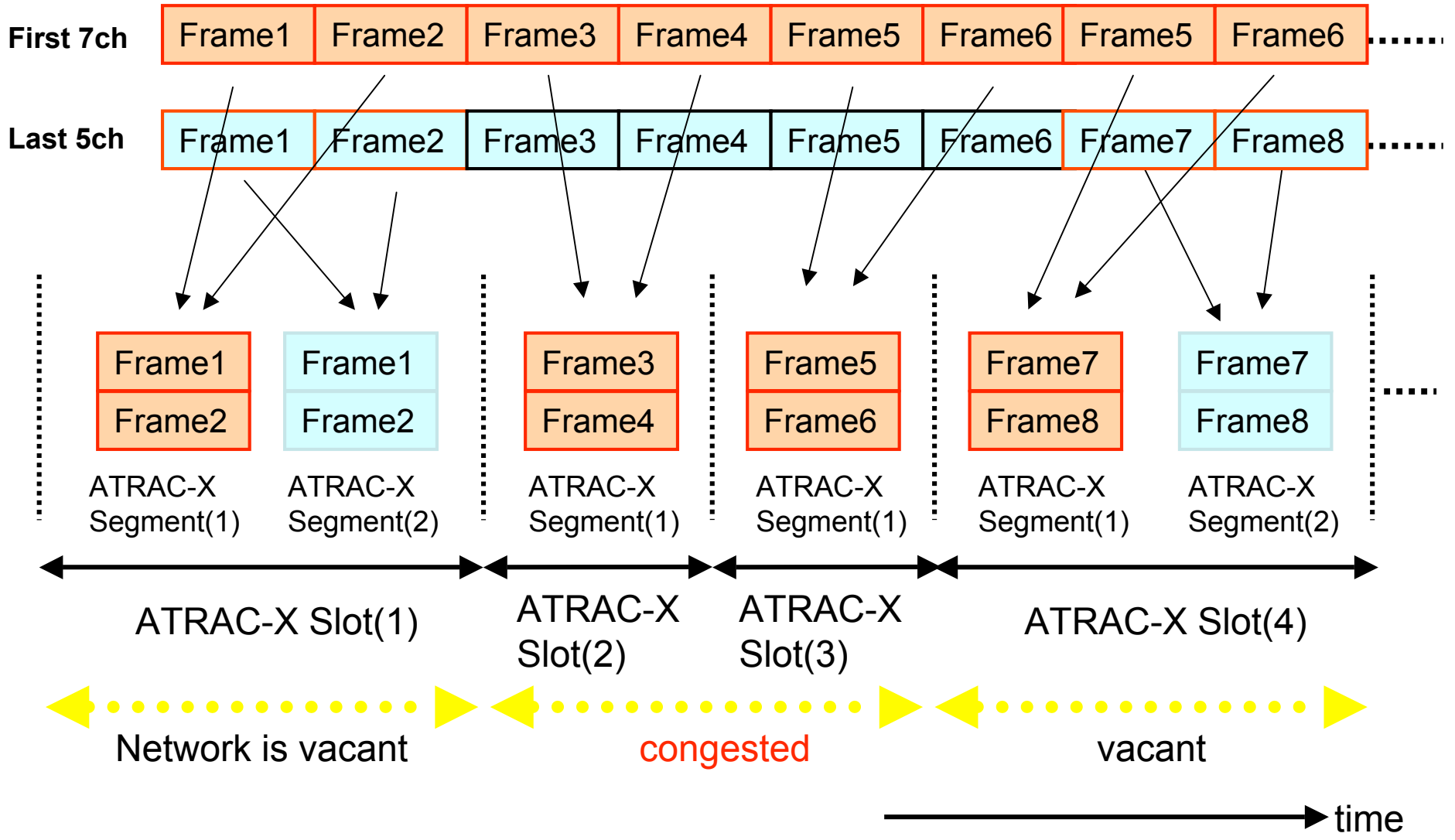


Exceeding 7.1ch ATRAC-X streaming (an example of 12.2)



QoS Example (1)

Example of 12 channel ATRAC-X



QoS Consideration(2)

Example of ATRAC-X 5.1channel

