RTP Payload Format for JPEG 2000 video streams

<draft-ietf-avt-rtp-jpeg2000-01.txt>

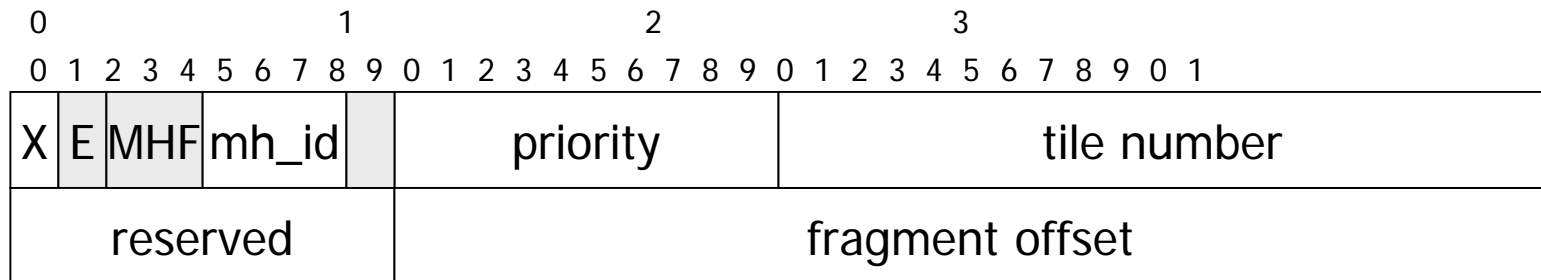2002/07/17

52th IETF(2001/12, SLC) comments

- Too many different RTP packet types
  - Do we need so many types and is type 0 required ?
  - It may be appropriate to use only a reduced subset of these types
  - If the receiver makes use of the type and <u>priority fields</u> to do something different, then it makes sense to have those header fields
- Clarify the keyword MUST, etc.
  - Missing RFC2119 statement in the draft
- Refer to techniques of published RFCs
  - H.263+ picture header redundancy technique from RFC2429
  - Audio redundancy coding from RFC2198

ISO/IEC member comments

- David Singer
  - The ordering of the codesteam is rather important
- WG1 member comments
  - Option for unique identifier envisaged within JPIP standard
  - Useful to include a JPIP description in each such RTP packet
  - Description-scheme should be compatible with the one being developed in JPIP

Disposition of Comments

- ## Reduced the unnecessary RTP packet type
  - Change "type" to "E"+ "MHF"+ "T flag"
  - MHF shows whether MH is packed into the RTP packet
  - Small sized tile-parts can be packed together

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
```

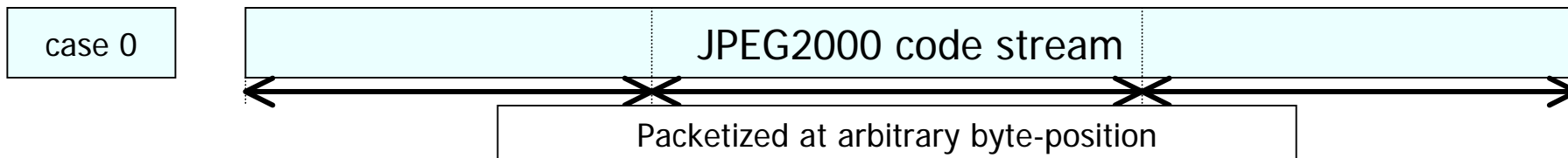| X	E	MHF	mh_id		priority	tile number
reserved					fragment offset	

E (enable flag): shows whether the packetization in "intelligent" or not

MHF (main header flag): shows whether and which part of the main header is packed.
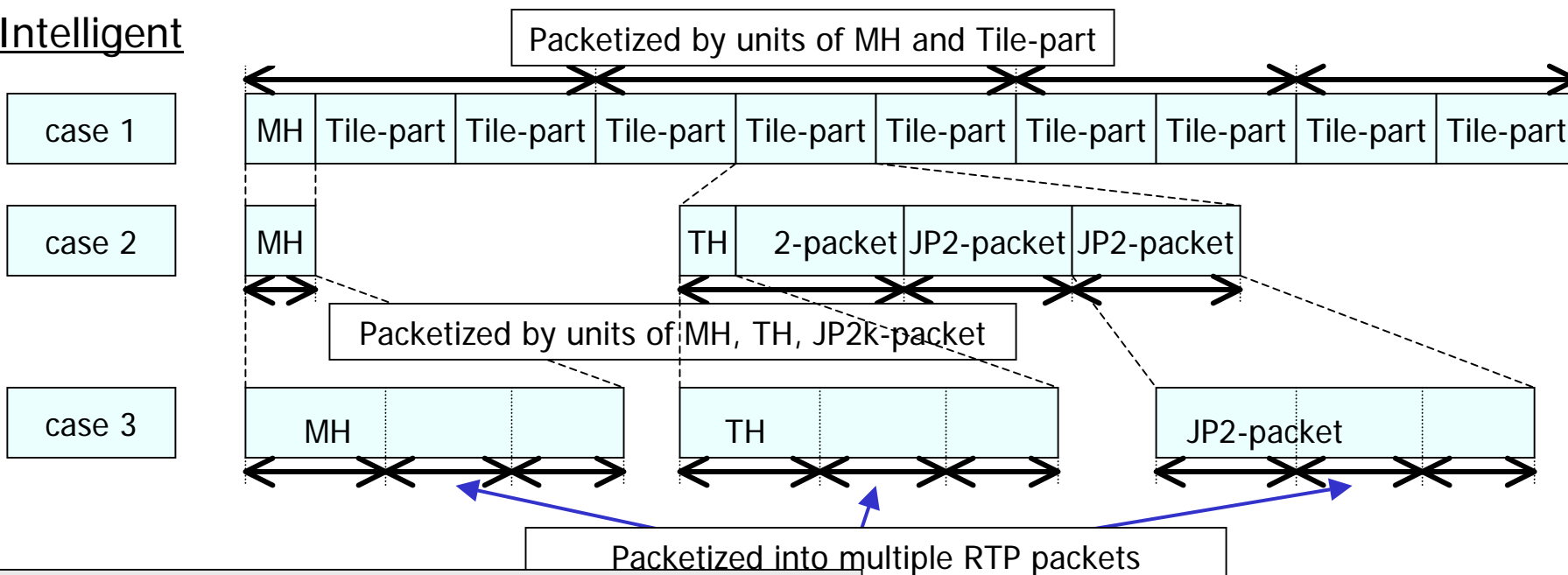
T(tile flag): shows whether tile number field is valid or not

RTP packetization of JPEG 2000

Non-intelligent

	RTP packet

case 0	JPEG2000 code stream

Packetized at arbitrary byte-position

Intelligent

Packetized by units of MH and Tile-part

case 1	MH	Tile-part	Tile-part	Tile-part	Tile-part	Tile-part	Tile-part	Tile-part	Tile-part	Tile-part

case 2	MH		TH	2-packet	JP2-packet	JP2-packet

Packetized by units of MH, TH, JP2k-packet

case 3	MH	TH	JP2-packet

Packetized into multiple RTP packets

• Non-intelligent and intelligent must not be mixed
• Case 1-3 may be mixed

2000-01.txt

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Disposition of Comments

- Text issues
  - Add RFC2119 statements
  - Introduction to JPEG 2000 was shortened

Disposition of Comments

- ## H.263 picture header redundancy technique
  - The picture header redundancy technique from RFC2428, an RTP payload for H.263+, is quite intelligent and useful.
  - In JPEG 2000, there can be instances where the Main Header of the codestream can become incredibly large, larger than the MTU size if many encoding options are used.
  - In such a situation, sending the Main Header with each codestream packet would not be viable.
  - The codestream header is already quite compressed during JPEG 2000 development.
  - Another technique will be used in this standard to do something similar. Through the optional payload header extension using the optional Marker Segment Optional Header, the sender could include all the important data.

Disposition of Comments

- Scalable audio technique
  - The scalable audio technique from RFC2198 is quite interesting
  - JPEG 2000 was developed to be a highly flexible standard for digital imaging, target applications from ultra-thin clients to image archiving.
  - At the imaging archiving level, the technique would be useful as we move down to thinner clients, such a technique may not be optimal when memory resources are scarce
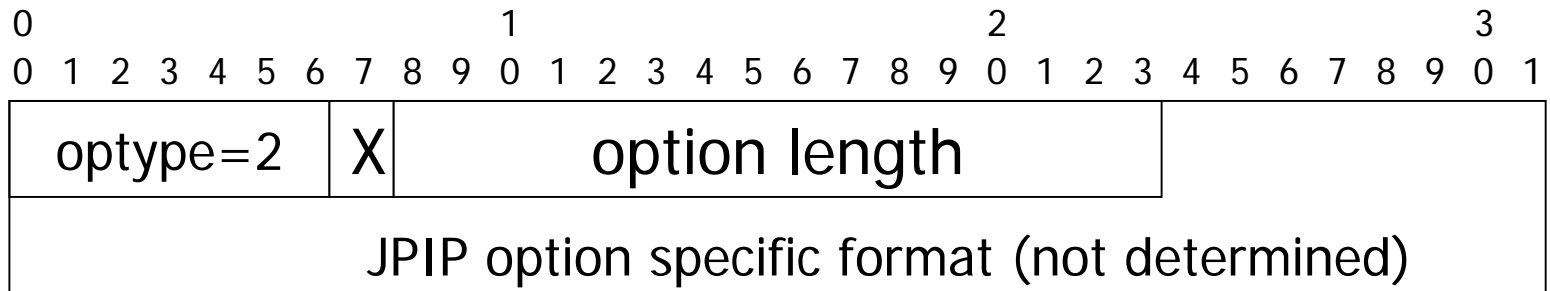
Disposition of Comments

- Optimal packet reordering
  - JPEG 2000 packet reordering and transmission may give a much lower error rate when packets are lost or dropped as the error would not be immediately apparent and can just "smear" over from frame to frame.
  - With packet reordering, the client must store all the packets and rearrange them in memory for decoding.
  - The authors feel this would be incredibly taxing on some target devices and not sure if such a scheme's result would be effective.

Disposition of Comments

– Added optional header support for JPIP

```
 0                   1                   2                   3
 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
```

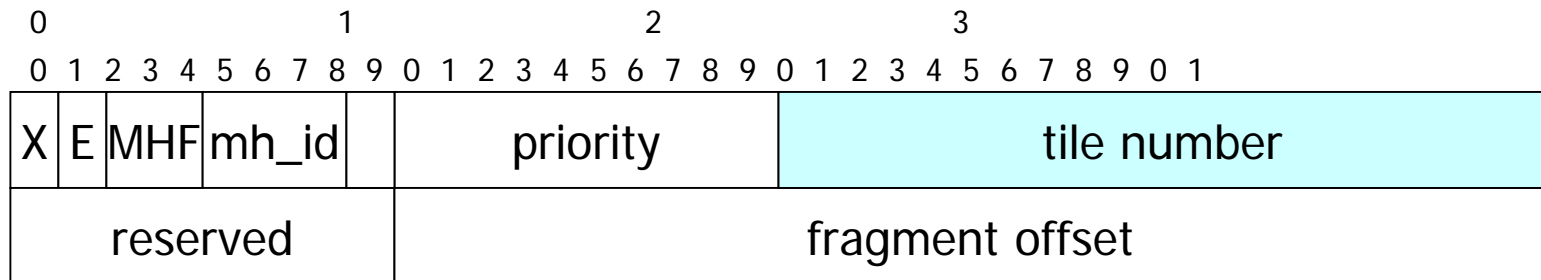| optype=2	X	option length	
JPIP option specific format (not determined)			

option type (7 bits) : JPIP option type is 2.
X (1 bit) : more extension bit. This optional header is followed by another optional header, this bit MUST be set to 1.
option length (16 bits) : length of the option specific format part.

Disposition of Comments

- ## Introduce "tile number" field
  - easy to retrieve an arbitrary tile which is a part of the image

0										1										2										3		
0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1

X	E	MHF	mh_id		priority		tile number
reserved				fragment offset			

Disposition of Comments

– Introduce default priority numbering
  - Set to lowest jp2k-packet ordering number if multiple jp2k packets included in a RTP packet

Intellectual Property Right

- There are format and mechanisms included in a pending patent application that have been FILED to the Japanese Patent Office.

- It must be stressed that as of this document's submission they have only been filed and have not been granted.

- If the mechanisms are granted as patents, the patents will be licensed under reasonable and non-discriminatory conditions to any person(s) who wishes to implement such mechanisms.

Open Issues

- Should we include support for priority mapping tables in the specification?

The Path Forward

- Reconcile any additional comments from IETF and WG1 experts

- Produce new Internet-Draft

- Circulate for comments

- Last call

- Move to Standards Track