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RTP Payload Format for Uncompressed Video: Additional Colour Sampling Modes

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Abstract

This memo extends the RTP Payload Format for Uncompressed Video to support additional RGB sampling modes.

1. Introduction

The RTP Payload Format for Uncompressed Video [1] defines a scheme to packetise uncompressed, studio-quality, video streams for transport using RTP [2]. A range of standard and high definition video formats

are supported, and parameters are defined so sender and receiver can signal the image size, colour space, pixel depth, etc.

A limitation of the format is that the number of bits per sample is signalled as being the same for each colour component. For example, it is not possible to signal transport of RGB format video using 5 bits each for the Red and Blue components and 6 bits for the Green, packing one pixel into two octets. Such video formats can easily be supported in the payload format, but cannot be signalled using the parameters defined. This memo extends [1] with additional colour sampling modes, to signal such video formats.

2. Conventions Used in this Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in RFC 2119 [3].

3. Payload Format Parameters

This memo defines six new colour sampling modes that MAY be signalled for use with [1]. The new modes are "RGB+", "RG+B", "R+GB", "BGR+", "BG+R" and "B+GR". These sampling modes use the same packing order of samples as do the RGB and BGR colour sampling modes respectively, except that an additional bit of colour depth is available for the component marked by the + symbol (i.e. when "depth=N" is signalled, N bits are allocated to unmarked components, but N+1 bits MUST be allocated to the marked component). All other features of the payload format remain as defined in [1].

The primary use of these colour sampling modes is to enable efficient packing of data into small pixel groups ("pgroups"). The most common use case is expected to be video with five bits per sample, where the additional bit of colour depth enables a single pixel to fit into two octets without padding. The new colour sampling modes MAY be used for other depths, however, should that prove useful.

4. Example

A common uncompressed video format is RGB with 5 bits for the Red and Blue components and six bits for the Green component, for a total of 16 bits per pixel. Using the sampling modes defined in this memo, this can be signalled in SDP according to the following example:

```
v=0
o=jdoe 2890844526 2890842807 IN IP4 10.47.16.5
s=-
c=IN IP4 10.47.16.6
t=2873397496 2873404696
a=recvonly
m=video 51372 RTP/AVP 99
a=rtpmap:99 raw/90000
a=fmtp:99 sampling=RG+B; width=1024; height=768; depth=5;
  colorimetry=SMPTE240M
```

(some of the lines in have been wrapped due to formatting constraints on this memo).

5. Security Considerations

The security considerations of [1] apply. No additional security considerations are introduced by support for new colour sampling modes.

6. IANA Considerations

The video/raw media type is extended with six new values for the "sampling" parameter according to the rules defined in section 6.2 of [1]. The new values are "RGB+", "RG+B", "R+GB", "BGR+", "BG+R" and "B+GR" as described in this memo.

7. Acknowledgements

Thanks to Jeremy Searle and Andrew Lee.

8. Normative References

[1] Gharai, L. and C. Perkins, "RTP Payload Format for Uncompressed Video", draft-ietf-avt-uncomp-video-06 (work in progress), February 2004.

[2] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, RFC 3550, July 2003.

[3] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

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