Telecommunication Standardization Sector
Study Group 15
Experts Group for ATM Video Coding
(Rapporteur's Group on Part of Q.2/15)

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SOURCE : Japan
TITLE : Problems in Data Partitioning syntax
PURPOSE: Discussion

1.Introduction
    Data Partitioning is one of the most effective scheme for error resilience. DP has already been included in MPEG2 standards, however some serious problems exist. We should fix the problems as soon as possible.

2.Syntax and Semantics
    Syntax and semantics of DP are not found in WD3 (New York version). Table 1 gives some syntax to achieve the data partitioning. When DP is applied for different QOS channel transmission, fine rate control in each partitioned layer is mandatory. For the purpose, syntax in TM5 appendix L would be the most appropriate. The following discussions are based on the TM5 syntax.

Table 1 Comparison of Data Partitioning syntax

| Position where DP syntax is described | Seq./Pic./Slice header | Extension syntax | Informative part |
|---|---|---|---|
| Syntax | TM5 appendix L | New extension which contains DP information is needed | not described |
| Assistance of system layer | yes (multiplex the layers) | yes (multiplex the layers) | yes (DP information and multiplex the layers) |
| change PBP | yes (slice by slice) | yes (picture by picture) | no |
| Rate control | yes (slice by slice) | yes (picture by picture) | no |
| Merit | fine rate control available | minimum change from WD3 | no change from WD3 |

DP information means 'data_partition_flg','intra_pbp' and 'pbp'.

3.Start code emulation
    Startcode emulation occurs when a layer consists of only priority class 4 (CBP and DC coef./1st non-zero coef.). In the case, dc -1 of luminance ("000") and dc 0 of chrominance ("00") cause the startcode emulation (Fig.1). To avoid the emulation following solutions are available :
    (a) change the DC coefficients code in DP mode
    (b) insert a marker bit ("1") after DC coefficients in DP mode
    (c) change the PBP semantics and DC coefficient and following non-zero coefficient are coupled.
    (d) inhibit the layer which consists of only priority class 4
Solution (d) might be the most reasonable.
Startcode emulation does not occur except the case mentioned above.
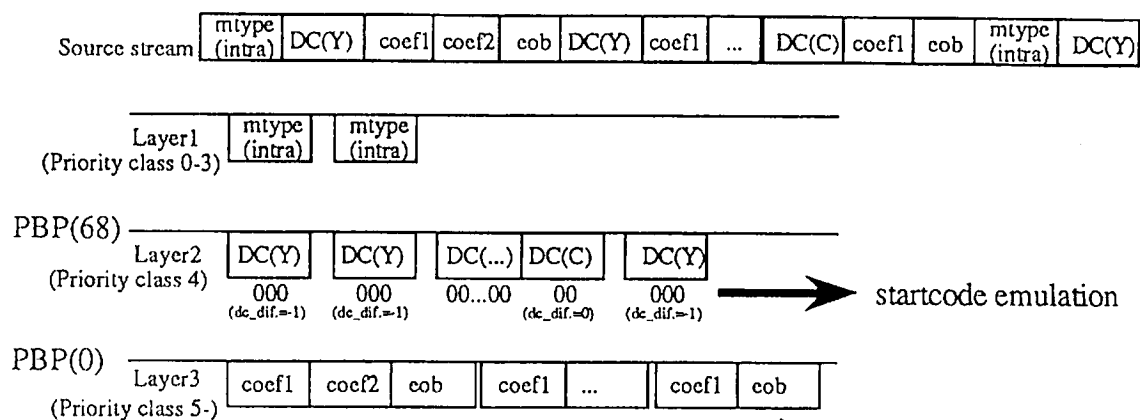
Fig.1 Example of Startcode Emulation

## 4. Other issues

-Some ambiguity exists in semantics of header. The definition of 'VBV delay' or 'bit rate' in the header of each layer .

- Video decoder does not know the total number of the layer without system layer assistance.

## 5. Conclusion

Syntax and semantics of Data Partitioning should be fixed and should be adopted in working draft as soon as possible. Modification of syntax and semantics described in TM5 appendix L would be proper way.