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STUDY GROUP 15 - ATM and Other Networks Experts Group

SOURCE:* AT&T, CableLabs, COMSAT, IBM, Telesis Technologies Laboratory

TITLE: Proposal to remove FEC from H.222.1

ABSTRACT

This contribution proposes that the SG 15 Video and Systems Experts Group reconsider their decision to include FEC in the H.222.1 layer. This contribution is the consensus view of ANSI T1S1.

It was recently brought to our attention that the ITU SG 15 Video Coding Experts Group has agreed on the need for Forward Error Correction (FEC) and FEC framing in the H.222.1 layer above the adaptation layer. This is of concern for the following reasons.

- This requires additional hardware in ATM endsystems.
- The current I.363 Recommendation does not support forwarding of corrupted data
- Additional protocol overhead is introduced. Besides the overhead added by the FEC frame, a mapping into the underlying AALs will result in significant AAL overhead (PAD) because the structure is not aligned on length boundaries consistent with the AAL framing mechanisms
- To our knowledge the error characteristics that have been used to motivate this decision have not been justified.
- It is recognized that FEC, if required, is most appropriate on the physical links that require it. The different physical media (e.g., satellite, coax, twisted pair, fiber) have different error characteristics and hence the type of FEC will vary.

The selection of the FEC appears to be based on the assumption that errors are independent and identically distributed. Under this assumption, and given that the error rates are 10 to the minus 7 or better, it is likely that only single, double, or a small number of contiguous bit errors will occur in PDU. Under such assumptions the FEC mechanism will correct the errors.

Unfortunately, the detailed error behavior of transmission links is difficult to characterize. It is generally recognized that the random error model is not applicable to all physical layers. Since it appears impossible to generally characterize the error behavior the best approach would be to detect for the presence of errors, and then attempt to conceal their effects rather than directly correct the bit errors.

Based on this, we believe that the ITU SG 15 Video and Systems Expert Group should reconsider their decision to include FEC at the H.222.1 layer.

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