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SOURCE: Stuart Dunstan, Siemens Ltd.
Matthew Leditschke, Telecom Australia
on behalf of Australian UVC consortium

TITLE: Results for Frequency Scalable Coder Error Resilience Experiment

PURPOSE: Information

1. Introduction

The results of cell loss experiments performed using a simple two layer frequency scalable coder are presented. The results illustrate the superior error resilience of a simple layered scheme compared to that of a single MPEG2 layer coder. This document supplements the results of earlier work (AVC-375 (MPEG92/590)) in which only the first frame was an I frame. In this latest work N=12.

This document accompanies AVC-426.

2. Experiment conditions

The experiment conditions are summarised in Table 1.

sequence	: ballet
layered coder	: two layer frequency scalable coder and decoder
single layer coder	: TM2 frame based
frame structure	: N = 12, M = 1
bit rate	
single layer	: 4 Mbit/s
layered	: 4 Mbit/s, approx. 50 % in each layer
concealment techniques	
scale_8	: display scale_4 data only
scale_4	: display macroblock from previous frame
single layer	: display macroblock from previous frame
AAL functionality	: streaming mode plus 4 bit sequence number
cell loss ratios	
single layer	: 10E-4 to 10E-2
layered	: equivalent to single layer, applied as specified in AVC-345 (MPEG92/490)
layered experiments	: cell loss applied to scale_8 only
	: cell loss applied to scale_8 with fixed cell loss on scale_4
	: equal cell loss applied to scale_4 and scale_8

Table 1. Frequency scalable coder error resilience experiment conditions

The simple frequency scalable coder and decoder used in this experiment are shown in Figure 1 and Figure 2. The coder and decoder each have only one prediction loop.

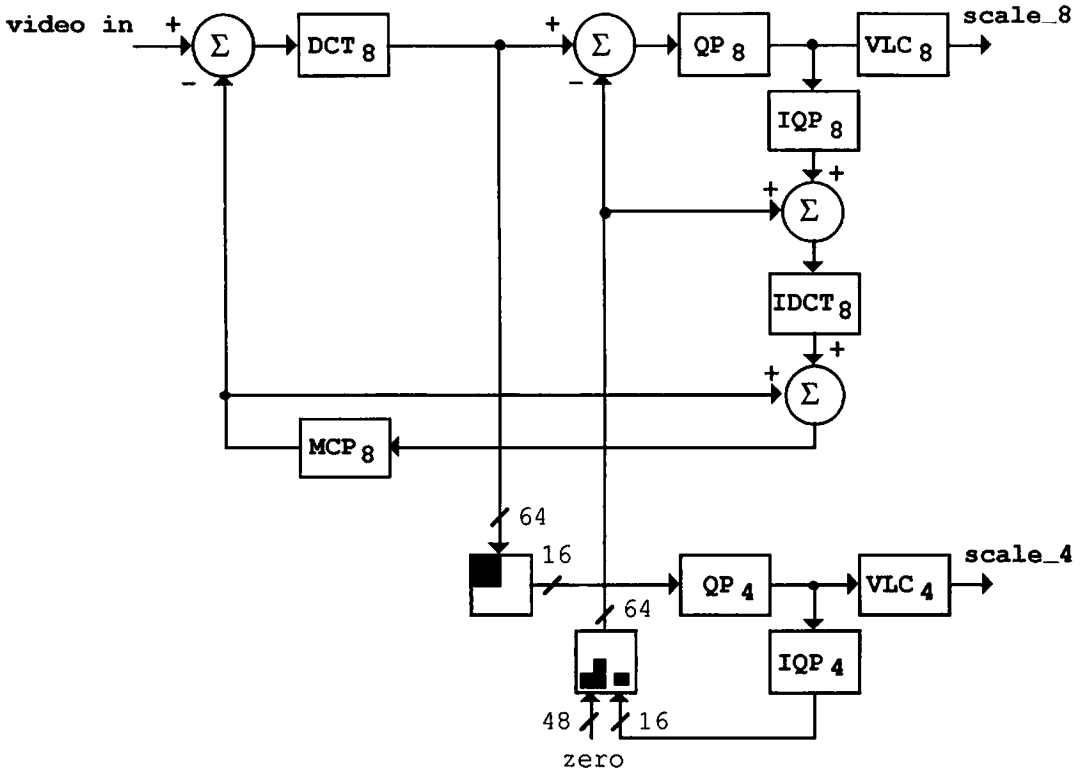

Figure 1. Frequency scalable coder

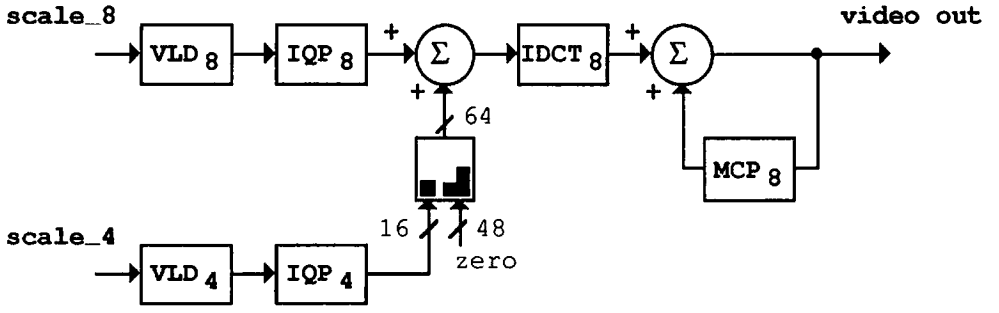

Figure 2. Frequency scalable decoder

3. Results and Discussion

The experimental results are shown in Figure 3.

The following points are observed

- at high cell loss rates the performance of the layered coder is superior to the single layer coder
- the scale_4 bitstream of the layered coder is sensitive to cell loss
- at near zero cell loss rates the layered coder performance, with no scale_4 loss, converges to that of the single layer coder. This indicates that the layered coder is efficient.
- where equal cell loss is applied to the scale_8 and scale_4 bitstreams the error performance is better than that of the single layer coder.

The simple frequency scalable coder has perfomed well with respect to cell loss resilience. It also offers additional functionality (AVC-426).

Video sequences will be demonstrated at the meeting.

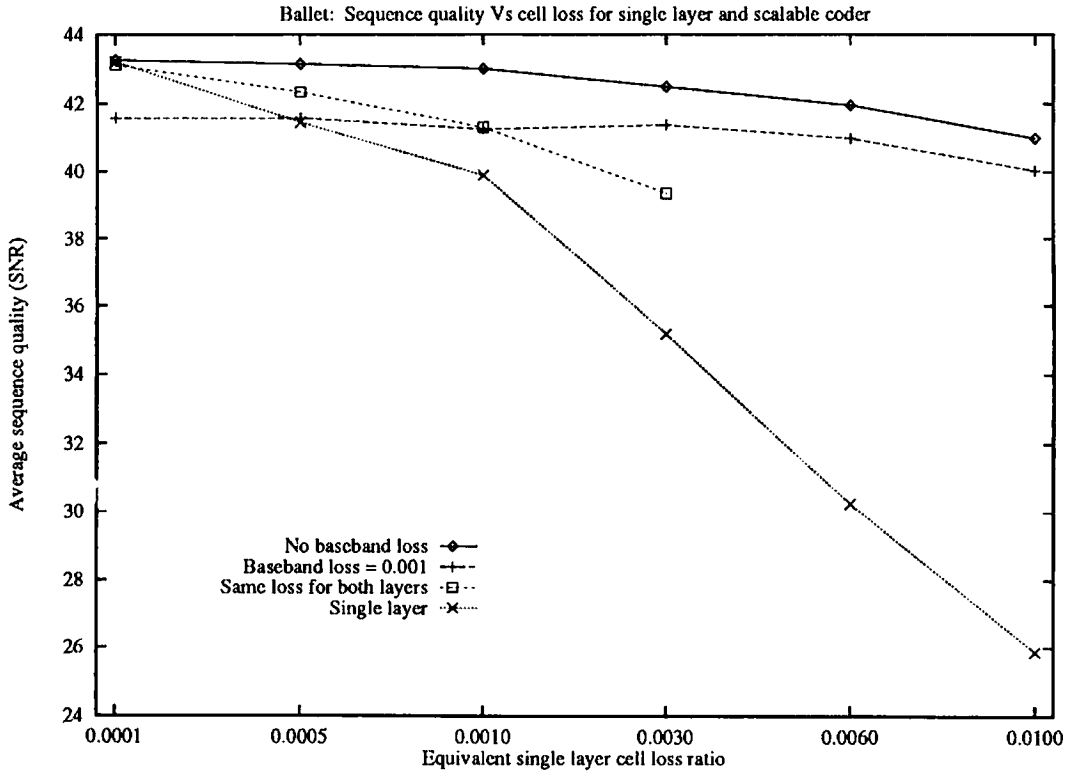

Figure 3: A comparison between single layer coding, and layered coding with: no errors in baseband, CLR=0.001 in baseband & the same error rate in both layers.