Contiguity Warnings and Errors

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Contents

1. Introduction

This document briefly describes how contiguity issues are detected, how the warnings should be interpreted and the issues associated with errors detected during decode.

2. Concealment

The kernel driver has the ability to conceal errors and missing macroblocks by transferring a range of 16x16 blocks from one frame to another. There maybe more than one section that needs to be concealed. The code maintains a list of fault ranges that have a start and end.

3. Missing Frames

In the simplest case, the user mode driver is able to detect loss of all slices of a frame. There will be no slice data provided by the application between the BeginFrame and EndFrame calls.

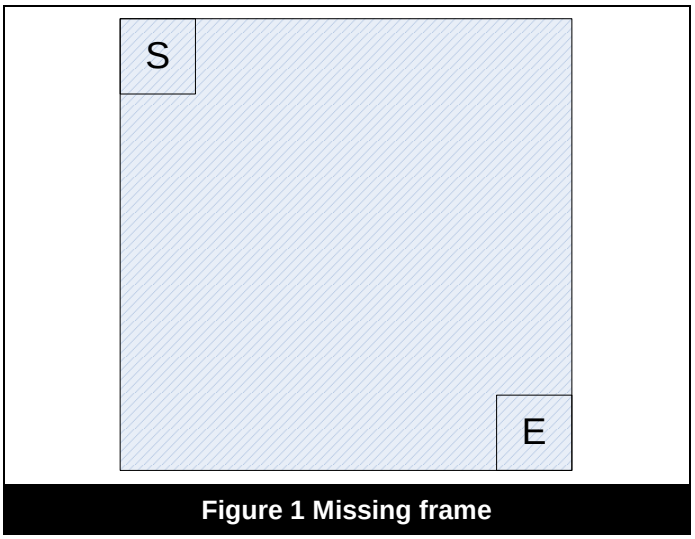

Figure 1 Missing frame

The code provided sends a message to the kernel driver which instructs concealment for the entire frame.

4. Missing Slices

The firmware has the ability to detect and warn the host that a slice is missing, this is detected by a slice being non contiguous with the previous slice. The message sent to the host will contain the start and end macroblock number for the missing range (where this is detectable)

This can only be done in frame switching mode and where the slices are guaranteed to be consecutive (not ASO or FMO)

4.1. Missing mid frame slice

Mid slice contiguity issues are detected by checking that the a slice starts on the macroblock immediately following the last macroblock decoded by the previous slice,

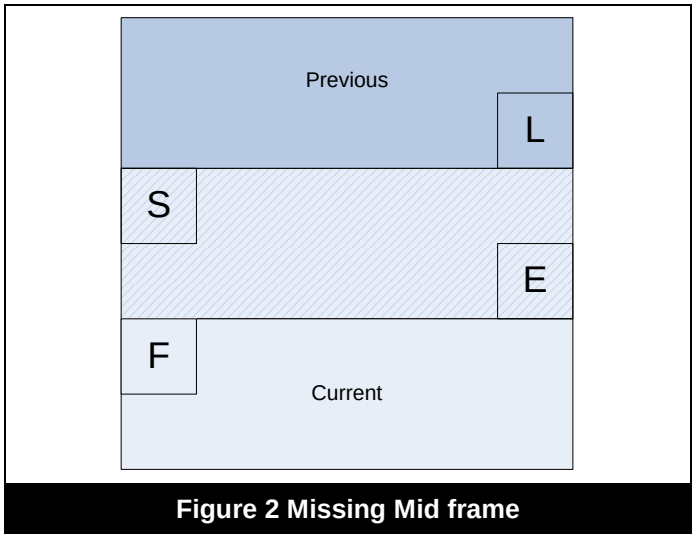

Figure 2 Missing Mid frame

The start and End of the fault range (S , E) are shown in the diagram above, where the fault range start is the macroblock after the Last MB processed of the previous slice (L) and the fault range end macroblock number is the is the macroblock preceding the first macroblock of the current slice (F).

If F does not equal S, then there is a contiguity issue,

4.2. Missing first slice

No checks are performed on a slice that starts at macroblock 0, however the mid frame slice loss code will detect the loss of the first slice.

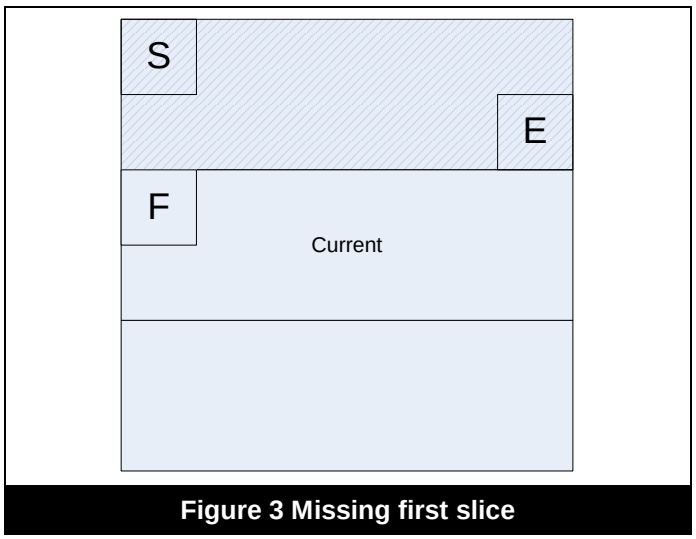

Figure 3 Missing first slice

4.3. Missing end slice

On reception of a FW_DEVA_HOST_BE_OPP message, the firmware will check that the previous slice finished on the last macroblock of the frame.

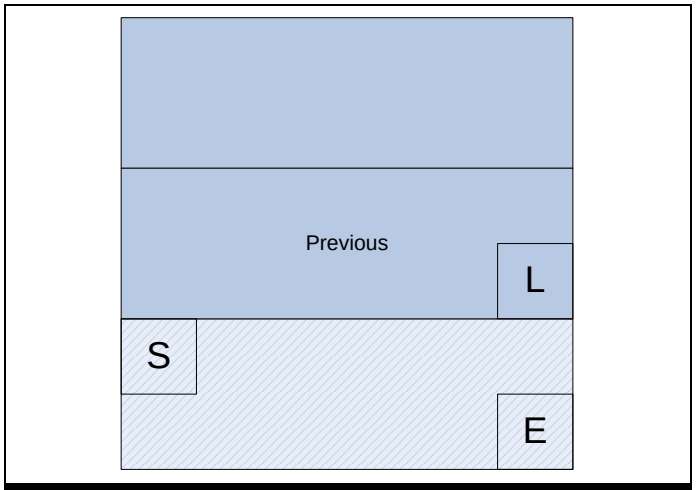

Figure 4 Missing last slice

If L is not the last macroblock in the picture, then a contiguity warning message will be sent to the host.

4.4. Error Detection

When errors are detected, the firmware will return a panic message to the host. This will contain the number of the last macroblock processed by the back end and also the first macroblock of the slice that faulted.

On continuation of decode after the core reset, a continuity warning will be sent which will indicate the end location of the fault range.

These two messages will allow the host code to determine the fault range, and make a decision on what to conceal.

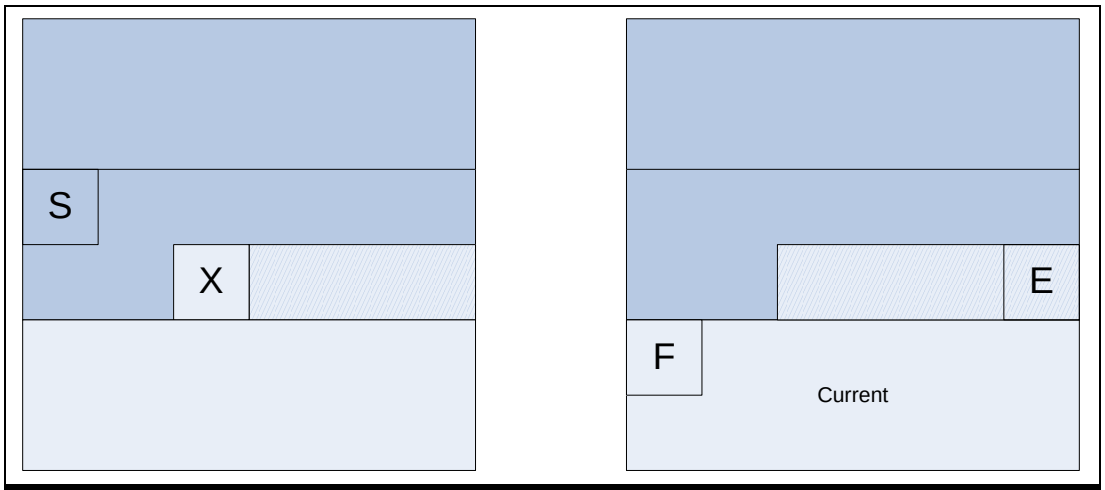

Figure 5 Fault

The diagram above shows the macroblocks S and X which are returned to the host in the panic message. The contiguity warning will provide the end Macroblock E which allows the host to determine that the range in error is from X to E.

Due to the many possible types of error that may be present in the bitstream, it is not always possible to trust the faulted macroblock value returned from the host in the panic message (X). It is therefore necessary for the host code to validate the values and make adjustments to the values.