



TECHNICAL MEMO
L1-DSP RECOVERY

*Making***Wireless**

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Plan Approvals

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1. Introduction

This document describes L1-DSP recovery design.

The aim of the L1-DSP recovery is to restart properly the system when the DSP seems to be crashed (due to internal DSP error, or a bad L1 management)

2. Principles

2.1. Generic overview

The purpose of DSP Recovery is to provide some debug information regarding DSP failures. If a DSP error occurs, it is outputted by the MCU in the L1 trace (see L1D_SE_TM080.doc).

Both “Diagnose module” and “Recovery module” actions are based on DSP inputs: Several events (DSP errors) are logged in the DSP/MCU communication interface. Several levels of error criticality are defined and permit to know when DSP recovery is needed.

2.2. TCS5.x applicability

DSP recovery is applicable to all DSP modem modules.

3. Architecture

3.1. Global architecture

The architecture is based on an interaction between DSP, MCU L1 and Protocol Stack (PS):

- MCU L1 analyzes DSP recovery info.
- DSP may recover itself but in some case, MCU-L1 is asked to reset DSP, reload DSP code, and reboot the modem L1-MCU.

3.2. DSP recovery info

The DSP inputs (events) are available in a circular diagnose buffer, in a shared memory (MCU-DSP).

Each event is constituted of an identifier and associated data.

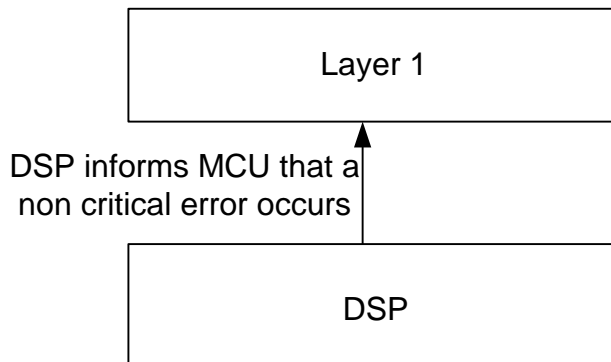
The event ID gives the error group, sub-group, and criticality of the event as shown hereafter.

The Criticality is declined as:

- **Non-critical error** detected, but does not compromise the SW integrity. DSP is taking specific actions if required
- **Critical error** detected that requires a DSP recovery: DSP self-reset, or goes in infinite loop. This is determined by “dsp_recovery_mode” variable defined in MCU/DSP interface at initialization, cf L1D_SE_TM080.doc. Only auto-reset mode will be exposed in the present document. In case the DSP goes in infinite loop, the user has to manually restart the code (for issue investigation).
- **Fatal error** detected that requires an MCU recovery of DSP (DSP re-install)

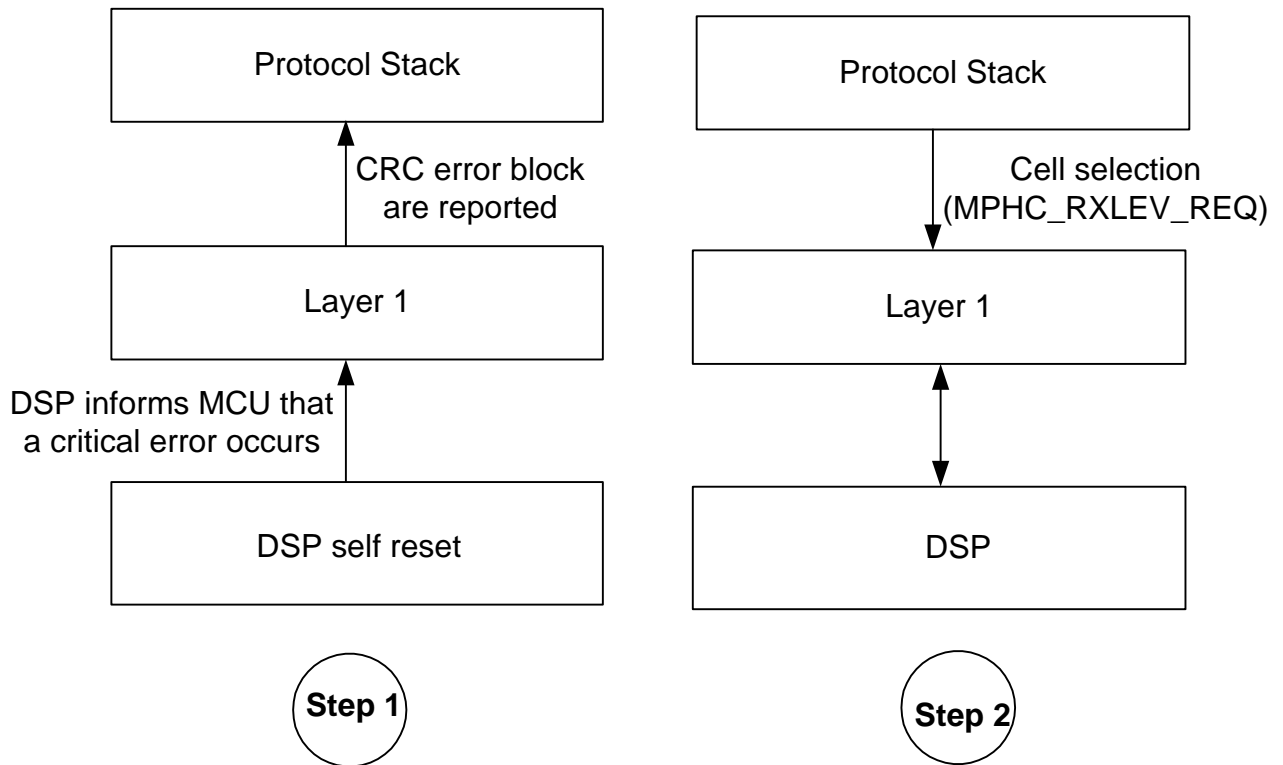
Please see the L1D_SE_TM080.doc for a complete description of these errors.

3.2.1 Non Critical error



This error has no impact on a Protocol Stack point of view. DSP is the only component to take any action if required

3.2.2 Critical error

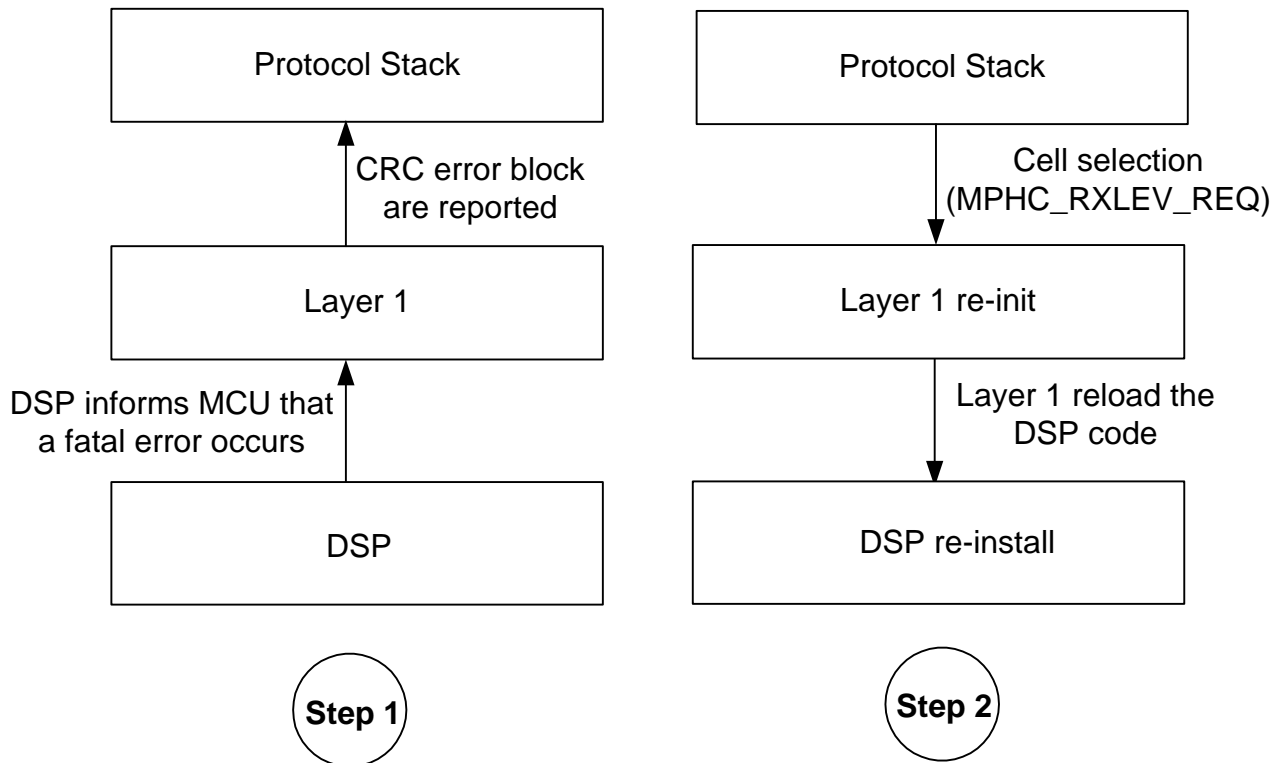


Step 1: The L2 link is broken (blocks are reported with CRC errors). The DSP is reported a critical error, then DSP is resetting itself (RESET OP CODE).

Note: at this stage, in case the number of critical error reported exceed a threshold, please go to 3.2.3 Fatal error, step 2

Step 2: Protocol stack ask for a cell selection (MPHC_RXLEV_REQ), then normal mode operation is resumed.

3.2.3 Fatal error



Step 1 : The DSP is reported a fatal error, the L2 link is broken.

Step 2 : When the L1 receives a MPHC_RXLEV_REQ :

- the modem is reinit (ABB, TPU drivers and all MCU variables GSM+GPRS)
- the DSP is reloaded and restarted.

Then, normal operation is resumed.