Troubleshoot DDFreload Due To Bad Dheader Magic Number

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Introduction

This document describes the DDF reload event when the Cyclic Redundancy Check (CRC) Error occurred. The event is reported with Simple Network Management Protocol (SNMP) trap DDFreload. The trap is introduced with the CRC Error Restart Notification for Operation and Maintenance feature.

Problem

DDF Field-Programmable Gate Array (FPGA) is a DMA engine on the DPC and DPC2. DDF FPGAs are susceptible to receive a CRC_ERROR. The DDF FPGA driver decides whether or not the error can be recovered. This decision is based on how many times and the rate at which these errors occur. When the driver decides that these errors can be recovered, it indicates to the application program that such an error has occurred.

```
Thu Apr 01 02:54:09 2021 Internal trap notification 1332 (DDFreload) card 3 ddf-dev DDF1

2021-Apr-01+02:54:09.277 card 3-cpu1: Bad dheader magic number. previous=0xf1234567 (p[12345678.123456]
2021-Apr-01+02:54:09.327 card 3-cpu0: [12345678.123789] DF2 Complex-0 Program DDF2 CAF_DF1_PROG_ERR err
```

The sessmgr crashes with dhdr.bdh_magic can be observed here:

<#root>

Assertion failure at midplane/libsn_midplane.c:1845
Function: sn_midplane_dma_buffer_packet_get()
Expression: packet-

```
>dhdr.bdh_magic

 == 0x1974
  Proclet: sessmgr (f=87000,i=40)
  Process: card=3 cpu=1 arch=X pid=40961 cpu=~18% argv0=sessmgr
  Crash time: 2021-Apr-28+14:54:10 UTC
  Recent errno: 11 Resource temporarily unavailable
  Build_number: 76955
  Stack (2680@0x0xffd28000):
    [ffffe430/X] __kernel_vsyscall() sp=0xffd28378
```

```
[0d0d4c67/X] sn_assert() sp=0xffd283d8
[0d1cef88/X] sn_midplane_dma_buffer_packet_get() sp=0xffd28478
[06b85352/X] sessmgr_med_data_receive() sp=0xffd284f8
[0d15cca4/X] sn_epoll_run_events() sp=0xffd28548
[0d16979a/X] sn_loop_run() sp=0xffd289f8
[0ce5bc25/X] main() sp=0xffd28a68
```

Solution

The DDF reload fixes the CRC_ERROR issue and no further actions are required usually. Rarely the subscriber impact is reported after the DDF reload in such a case the manual card migration fixes the traffic issue.

```
# card migrate from <affected card> to <standby card>
```

In release 21.19 (or later) additional feature is introduced, the feature monitors the internal pipeline of the FPGA and triggers recovery if any issues after the DDF reload are detected.