

3PAR 20000 内存异常引起node down日志分析

存储配置 朱袁申 2024-03-31 发表

问题描述

node4 down且无法启动

Time : 2024-01-20 06:14:06.60 CST
Node : 0
Seq : 183895728
Class : Alert,Status change
Severity : Major
Type : Component state change
Component: hw_node:4
Tier : Hardware check
Spare_PN : 872569-001
Message : Node 4 Failed (Node Offline Due to Failure {0xd})

Time : 2024-01-20 06:28:36.16 CST
Node : 0
Seq : 183903329
Class : Service Alert
Severity : Critical
Type : Node-Failure-Analysis File Received From Remote/Local MCU
Component: hw_node:4
Tier : Corefiles
Message : Node-Failure-Analysis file received from Node 4.

过程分析

node4 syslog从05:56开始报错hardware error，打印mcelog，且打印的内容基本为CPU 1: Machine Check: 0 Bank 7: cc0000800 0010092及CPU 1: Machine Check: 0 Bank 11: c800008a00800092报错，只到6:12节点down

Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.683180] mce: [Hardware Error]: Machine check events logged
Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.683213] mce: [Hardware Error]: CPU 1: Machine Check: 0 Bank 7: cc00008 000010092
Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.698812] mce: [Hardware Error]: TSC 0 ADDR 2eae09340 MISC 4404c4e86
Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.712589] mce: [Hardware Error]: PROCESSOR 0:306e4 TIME 1705701415 S OCKET 1 APIC 20 microcode 42e
Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.730931] mce: [Hardware Error]: CPU 1: Machine Check: 0 Bank 11: c80000 8a00800092
Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.746750] mce: [Hardware Error]: TSC 0 MISC c900178f163c1400
Jan 20 05:56:55 CNX148005S-4 vmunix: [3221709.758921] mce: [Hardware Error]: PROCESSOR 0:306e4 TIME 1705701415 S OCKET 1 APIC 20 microcode 42e
Jan 20 05:56:55 CNX148005S-4 mcelog: Hardware event. This is not a software error.
Jan 20 05:56:55 CNX148005S-4 mcelog: MCE 0
Jan 20 05:56:55 CNX148005S-4 mcelog: CPU 1 BANK 7
Jan 20 05:56:55 CNX148005S-4 mcelog: MISC 4404c4e86 ADDR 2eae09340
Jan 20 05:56:55 CNX148005S-4 mcelog: TIME 1705701415 Sat Jan 20 05:56:55 2024
Jan 20 05:56:55 CNX148005S-4 mcelog: MCG status:
Jan 20 05:56:55 CNX148005S-4 mcelog: MCI status:
Jan 20 05:56:55 CNX148005S-4 mcelog: Error overflow
Jan 20 05:56:55 CNX148005S-4 mcelog: Corrected error
Jan 20 05:56:55 CNX148005S-4 mcelog: MCI_MISC register valid
Jan 20 05:56:55 CNX148005S-4 mcelog: MCI_ADDR register valid
Jan 20 05:56:55 CNX148005S-4 mcelog: MCA: MEMORY CONTROLLER RD_CHANNEL2_ERR
Jan 20 05:56:55 CNX148005S-4 mcelog: Transaction: Memory read error
Jan 20 05:56:55 CNX148005S-4 mcelog: STATUS cc00008000010092 MCGSTATUS 0
Jan 20 05:56:55 CNX148005S-4 mcelog: MCGCAP 1000c1b APICID 20 SOCKETID 1
Jan 20 05:56:55 CNX148005S-4 mcelog: CPUID Vendor Intel Family 6 Model 62
Jan 20 05:56:55 CNX148005S-4 mcelog: Hardware event. This is not a software error.
...
Jan 20 06:12:52 CNX148005S-4 mcelog: warning: 24 bytes ignored in each record
Jan 20 06:12:52 CNX148005S-4 mcelog: consider an update
Jan 20 09:03:26 CNX148005S-4 syslogd (GNU inetutils 1.9.4): restart
Jan 20 09:03:26 CNX148005S-4 vmunix: [0.000000] Initializing cgroup subsys cpuset

showeventlog报告node4 DIMM 1.1.0存在异常

2024-01-20 05:56:57.84 CST	4 785625 Internal Communication Degraded	Eagle memory cerr hw_eagle:4 General
CC posted by node 4 MEM ADDR 0x0000002eae09340 - DIMM 1.1.0.		
2024-01-20 06:02:07.87 CST	4 785674 Internal Communication Degraded	Eagle memory cerr hw_eagle:4 General
CC posted by node 4 MEM ADDR 0x00000026cada11c0 - DIMM 1.1.0.		

通过node4 的NFA日志也可以发现MRC log报告socket 2 CPU， DIMM 1.1.0异常

insplore.4B-CF22085-005S.node0.20240120.0958/var/core/nemoe/node4-nemoe-nfa-2024-01-20_06:28:35/console
MRC log data - Socket: 0x1, Channel : 0x1, DIMM: 0x0, Rank: 0x0
Corresponding DIMM on node board: DIMM 1.1.0
OemHook Assert discovered: codetype: 0x38 subcode: 0x311C data: 0x1010000

Intel(r) Machine Check Exception Decoder, Version 2.18

MCE Parameters...

Select Processor: **IYB-EN/IYB-EP**

Select MCE Bank: **IA32_MC11**

Select MCE Register: **STATUS**

Enter 64-bit HEX Register Value: **8800004600800092**

Control

Decode

Copy Decode to Clipboard

Clear All

About

Description

MC11 (Bank 11) reports status within the iMC2 (Integrated Memory Controller 2).

The MC11 bank implements:

- CTL at MSR 0x42c
- STATUS at MSR 0x42d
- ADDR at MSR 0x42e
- MISC at MSR 0x42f
- CTL2 at MSR 0x28b

Binary Decode

```

6 6 6 6 5 5 5 5 5 5 5 5 5 5 4 4 4 4 4 4 4 4 3 3 3 3 3 3 3 3 2 2 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1
3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0 9 8 7 6 5 4 3 2 1 0
1 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 1 1 1 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 1 0 0 1 0

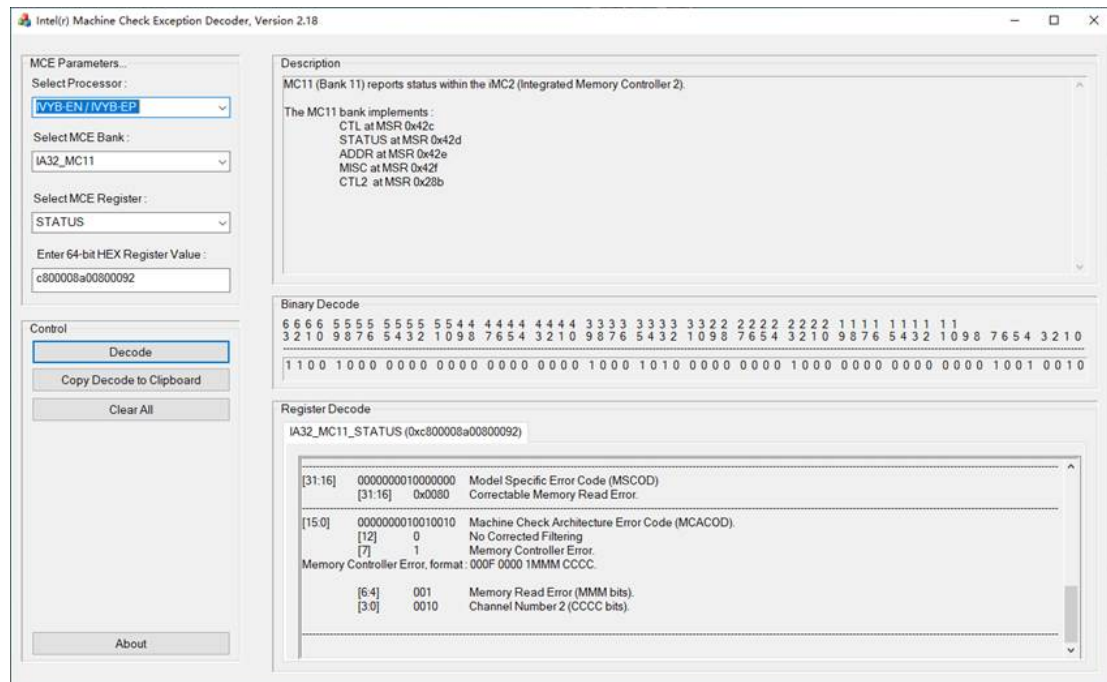
```

Register Decode

IA32_MC7_STATUS (0x8c00004000010092) IA32_MC11_STATUS (0x8800004600800092)

The MSB is a sticky overflow bit. The count increments until written with all 0s by software or a PwrGood deassertion.

[37:32]	000000	Other information. Contact Intel for non-zero values that are listed here.
[31:16]	00000000000000000001	Model Specific Error Code (MSCOD)
[31:16]	0x0001	HA Read Data Error.
[15:0]	0000000010010010	Machine Check Architecture Error Code (MCACOD).
[12]	0	No Corrected Filtering
[7]	1	Memory Controller Error.
Memory Controller Error, format: 000F 0000 1MMM CCCC.		
[6:4]	001	Memory Read Error (MMM bits)
[3:0]	0010	Channel Number 2 (CCCC bits)



node4 control cache DIMM 1:1:0异常引起节点故障，需要更换内存修复