From:	Mamoon Ansari
Sent:	Tuesday, August 01, 2017 8:23 AM
To:	Jeff Syme; DL-AMER-SPS; DL-SN-SES; DL-Service EMEA - SW
Subject:	RE: <internal only> Dead / failed IPMI / iDRAC symptoms in Dell Servers and remediation

Thanks Jeff.

Thanks,

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[Quantum.
BE UNDAUN]

From: Jeff Syme
Sent: Monday, July 31, 2017 9:19 AM
To: DL-AMER-SPS <DL-AMER-SPS@Quantum.Com>; DL-SN-SES <DL-SN-SES@Quantum.Com>; DL-Service EMEA - SW <DL-ServiceEMEA-SW@Quantum.com>
Subject: <internal only> Dead / failed IPMI / iDRAC symptoms in Dell Servers and remediation

Team,

I know we all know this, but here is a refresher for those of us that are a little less familiar <& future notes for myself>.

- Quick Facts
- What it looks like from the Notification perspective
- What it looks like from the Hardware perspective
- What it looks like from the Software perspective
- What it looks like from the Firmware perspective / Bugs
- What it looks like from the License perspective
- Terms Defined
- Engaging Dell -> CSweb - > StorNext Metadata Appliances -> Manuals -> StorNext M-Series Service Plan : <u>have an asset tag available</u>

The short answer:

1. # ssh to the MDCx and issue # racadm racreset   and wait for the iDRAC to reboot <this does not affect the Server>
2. Hold down the "locate server button" for longer than 15 seconds to reset the iDRAC <this does not affect the Server> observe LCD
3. Collect a DSET and server asset number to pass on to Dell support, create the Oracle Task and call Dell 866.292.3355 pin #11888

The long answer:

Our M440's are comprised of the Dell PowerEdge R520 servers. Of course they have our Quantum branding on them, but everyone knows what they are.

> (Inside this Acura there's still a Honda underneath, which is a fine automobile. Moving on...)

IPMI hardware can fail, but contrary to popular lore, its' _NOT_ a daughter card that can be replaced as a CRU/FRU. It's literally soldered into the motherboard/system board. iDRAC

- If the hardware were a Dell 'DRAC' instead of an 'iDRAC' (integrated), then we could champion replacing a daughter card as a FRU. But there are all integrated.
- The IPMI is also the environmental control for temps sensors, fan speeds, voltage irregularities etc.
- Customers do not regularly attach to the IPMI IP as it is a dedicated IP and usually only used by Quantum Field Services

Quick Facts:

- M440/PowerEdge R520 IPMI / iDRAC Ethernet port is not normally plugged into Ethernet network though preconfigured with default IPs
    - ssh and http/https MDC1: 10.17.21.51 / 255.255.255.0
    - ssh and http/https MDC2 10.17.21.52 / 255.0
    - laptop should be set to 10.17.21.200 / 255.0
    - Admin / Qa@lp00!
- M660/PowerEdge R710 IPMI / iDRAC
- Xcellis/ PowerEdge R630XL IPMI/ iDRAC
- Other resources are: The M660 User Guide and the M660/R710 Field Service Guide Page 82

Notification:

Failure footprint:
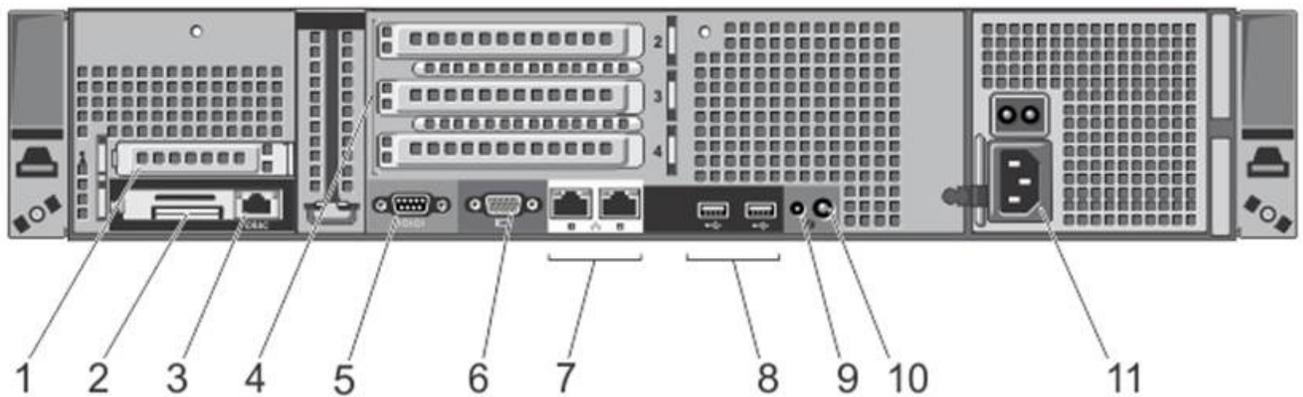
- Usually the customer will get an email saying the IPMI has failed <I haven't seen it and can't copy it here>
- You'll also see this in /var/log/messages (and then I suspect it's only a reboot one time message – not confirmed)
    - Jul 7 18:39:38 node-q2 kernel: IPMI System Interface driver.
    - Jul 7 18:41:05 node-q2 fw_bundle: ERROR: Failed to get the IPMI BMC data.
    - Jul 7 18:54:21 node-q2 hwmond: E0000(1)<00069>:SRVCLOG RCOMP: 1 RINST: 2 VCOMP: 69 VINST: IPMI VPINST: 2 EVENT: 7 TEXT: Node 2 The IPMI Controller IPMI has failed.
- /var/log/messages when it's working
    - Jul 1 13:55:51 node-q1 kernel: IPMI System Interface driver
    - No other lines complaining at init
- LCD display has 3 colors: Amber, Blue and Black(off).

- o Displays system ID, status information, and system error messages. The LCD lights blue during normal system operation
- o The LCD lights amber when the system needs attention, and the LCD panel displays an error code followed by descriptive text
- o If the View is BLACK: This is controlled by the IPMI and is an indicator that the IPMI module has failed
  - http://www.dell.com/support/manuals/us/en/19/poweredge-r520/r520systemsownersmanual-v2/front-panel-features-and-indicators?guid=guid-fde0e997-29e2-4c46-985d-fba210f0ec1e&lang=en-us

- o
- o LCD itself (part number RRRK8)
- LED on the REAR:

-

-

3	iDRAC port (Optional)		Dedicated management port for the iDRAC F
10	System identification button	ⓘ	The identification buttons on the front and bac can be used to locate a particular system with When one of these buttons is pushed, the LCD the front and the system status indicator on th blink until one of the buttons is pushed again. Press to toggle the system ID on and off. If the hangs during POST, press and hold the system button for more than five seconds to enter BIO progress mode. To reset the iDRAC (if not disabled in System S press and hold for more than 15 seconds.

-
- The identification buttons on the front and back panels can be used to locate a particular system within a rack. When one of these buttons is pushed, the LCD panel on the front and the system status indicator on the back blink until one of the buttons is pushed again.
- Press to toggle the system ID on and off. If the system hangs during POST, press and hold the system ID button for more than five seconds to enter BIOS progress mode.
- To reset the iDRAC (if not disabled in System Setup) press and hold for more than 15 seconds.

Hard reset Dell iDRAC 7 - Dell R620 & R720 - fix for error RAC0218

https://www.youtube.com/watch?v=DFovxsbqspI

You can perform a reset of your iDRAC without having to power down your server if you receive the following error and SSH doesn't work for you.

"RAC0218: The maximum number of user sessions is reached."

This is a known- issues for iDRAC firmware 1.50.50, 1.51.51, 1.51.52, 1.55.55 & 1.56.55.

Remember to update your firmware once you have access to your iDRAC again. <upgrade within the StorNext firmware>

Where to get logs:

One can acquire a DSET from the primary MDC from the GUI and contained in the snapshot. GUI – Service – Capture DSET ~ 4 MB

Service > Capture DSET

A Capture DSET job is currently running; please wait until completed before running again.

File	Date ▼
☐ dset-downm660-20170712123634.zip	2017-07-12 12:46:19
☐ dset-downm660-20160517133113.zip	2016-05-17 13:40:19

[Capture] [Download] [Delete] [Refresh]

The secondary MDC DSET must be acquired from the MDC via the service.sh script via Linux/ssh

- /opt/DXi/scripts/service.sh
  - 2) more tools
    - 3) Dell Collect
    - Moving DSET log to /usr/adic/gui/logs/capture_dset/dset-upm660-20170713093526.zip

Log review:

Looking at the MDC snapshot \usr\adic\tmp\platform\hw-info\current.config   all of the IPMUI values are blank.
The remediation is to reload the IPMI driver so that future snapshot will hook the correct information.
-ipmi-
   IP Address:
   MAC Address:
   Gateway IP:
   Gateway MAC:
   Board Mfg:
   Board Product:
   Board Number:
   Product Version:
   Manufacturer ID:
   Product ID:
   Device Revision:
   Hardware Revision:
   Firmware Version:
   Firmware Build Number: 0
   SEL Percent Used:
   Completed Transactions:

Remediation:
This is a race condition on boot and the driver fails to load.
The workaround for this issue is to restart Dell services. This Bug is fixed in 5.4.0.x
The remediation is to reload the IPMI driver so that future snapshot will hook the correct information.
-or- this is evidence that the IPMI really has failed.

Looking at the MDC snapshot \usr\adic\tmp\platform\hw-info\current.config   all of the ipmi values are populated.

This is what it looks like when it's working:

MDC1 current.config in the ### -ipmi- section

-ipmi-
   IP Address: 10.17.21.51
   MAC Address: 90:b1:1c:2e:76:7f
   Gateway IP: 10.17.21.254
   Gateway MAC: 00:00:00:00:00:00
   Board Mfg: Sat Dec 15 05:54:00 2012
   Board Product: PowerEdge R520
   Board Number: 0DFFT5A06
   Product Version: 01
   Manufacturer ID: 674
   Product ID: 256 (0x0100)
   Device Revision: 1
   Hardware Revision: 32
   Firmware Version: 2.0a
   Firmware Build Number: 310A0A
   SEL Percent Used: 0%
   Completed Transactions: 2507

Attempt to software reset the IPMI / iDRAC: <thanks to Oliver Lemke>

- You should _NOT_ experience any risk to your production environment to do so
- MDC2# /etc/init.d/instsrvcdrv start
- MDC2# /etc/init.d/dataeng start
- MDC2# service –status all
- Look for the 2 services
    - [+] = running
    - [-] = not running
- MDC2# dellsysteminfo
- MDC2# ipmitool bmc info

- MDC2# ipmitool lan print 1

- MDC2# racadm racreset soft
- MDC2# ipmitool bmc reset cold
    o credentials are admin/Qa@Ip00!

Software:

IPMI in the service.sh script # sh /opt/DXi/scripts/service.sh
- MDC1 iDRAC 10.17.21.51   or https://10.17.21.51
- MDC2 iDRAC 10.17.21.52   or https://10.17.21.52
- Both with the subnet of 255.255.255.0 and a gateway: 10.17.21.254
- Admin / Qa@lp00!

- # /opt/dell/srvadmin/sbin/srvadmin-services.sh stop
- # /opt/dell/srvadmin/sbin/srvadmin-services.sh start

Here are the results when the IPMI is dead: <or the services are not started, I haven't fleshed this out yet>

```
[root@node-q2 stornext]# ipmitool bmc info
Could not open device at /dev/ipmi0 or /dev/ipmi/0 or /dev/ipmidev/0: No such file or directory

[root@node-q2 stornext]# ipmitool lan print 1
Could not open device at /dev/ipmi0 or /dev/ipmi/0 or /dev/ipmidev/0: No such file or directory

[root@node-q2 stornext]# ipmitool bmc reset cold
Could not open device at /dev/ipmi0 or /dev/ipmi/0 or /dev/ipmidev/0: No such file or directory
```

Results of DESET

from a working IPMI / iDRAC <left> and failed IPMI / iDRAC <right> where you'll notice all environmental details are missing from MDC2 DSET right

<Screens capture>

Hardware:

The IPMI controls the LCD on the front panel. 2 options:

- the LCD panel is actually dead (no back light, no response the buttons)
  - o Consider replacing the LCD panel alone or taking one along a just-in-case it's not the IPMI with the system board
  - o Part number:
- The IPMI controller drives the LCD panel
- The daughter card is a pass through fancy cable. There is no intelligence in it. Though rare- it could still fail, but all the log reporting would still work

Dell PowerEdge R710 | Dell Remote Access Card | DRAC 6 Enterprise (Gen. I, II)

Dell 2827M Poweredge R320 R420 R520 iDrac Access Card
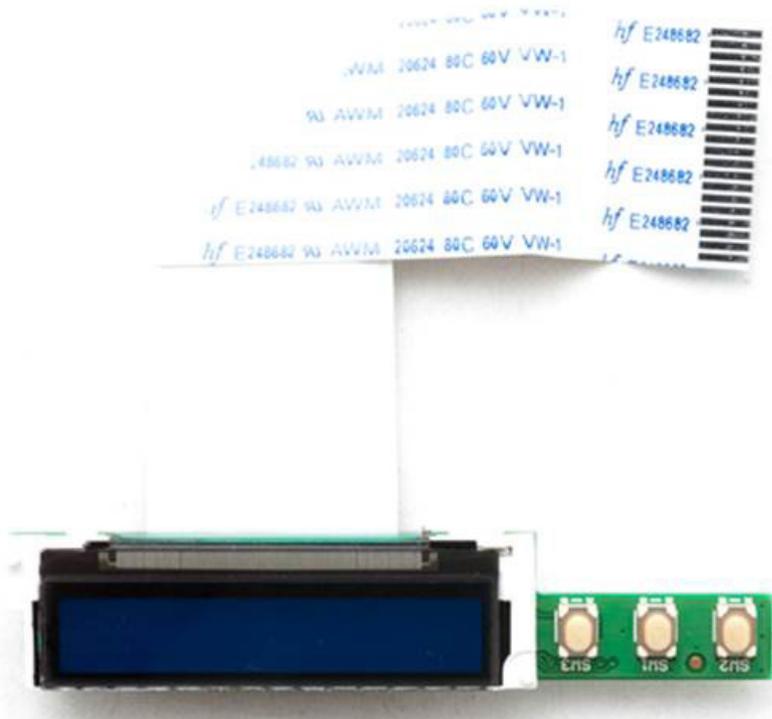
If the customer is willing to reboot a MDC: /// Compliments of Danny Barbour on or about Nov 29. 2016:

1. Boot up with a laptop plugged into the iDRAC port
2. Press F2 on bootup
3. Go to iDRAC Settings -> Network -> NIC Selection -> Make sure it's set to 'Dedicated' -> Note the IP address listed
4. Set the laptop IP to 1 above or below that IP from Step 3.
5. Ping the IP from Step 3 from your laptop
6. Open a web browser
7. Go to the IP address in Step 3.
   If the iDRAC IP is pingable in step 5, and the GUI comes up in Step 7, then iDRAC is working fine.
   He also mentioned that if the iDRAC is bad, the entire motherboard would need to be replaced because it's onboard

Firmware:

Bug 63498 - iDRAC FW bug causes permanent iDRAC failure on R630 Motherboards after updating from 2.15.10.10 to 2.21.21.21

Licenses:

Since our license is based on Eth2 MAC address (a PCIe card), the StorNext license.dat does not have to change with a system board replacement.

```
# Product:        maintenance
# System:         Not_provided
# Company:        <company here>
# Serial Number:  CX123xxxxxxxxx
```

```
# Identifier:       782BCB646191
# Expiration Date:   2016 11/30
# License:  AAAHS/L2AAA/EADU5/ENGJS/CN7CP/KS4LM/5ZLLH/6SDNU/5B9BK/C7TNA/LS
# Authorization String:
maintenance 1 782BCB646191 0 AAAHSL2AAAEADU5ENGJSCN7CPKS4LM5ZLLH6SDNU5B9BKC7TNALS
<xxxxxxx>
```

Terms defined:

- iDRAC - integrated Dell Remote Access Controller (iDRAC) with Lifecycle Controller is embedded in every Dell PowerEdge server
- https://www.dell.com/learn/us/en/555/solutions/integrated-dell-remote-access-controller-idrac

DRAC - Dell Remote Access Controller
- https://en.wikipedia.org/wiki/Dell_DRAC

Dell Chassis Management Controller (CMC) – Blade servers each have an iDRAC and are managed as a group in CMC. Not to be confused with Lattus CMC

IPMI - The Intelligent Platform Management Interface (**IPMI**) is a set of computer interface specifications for an autonomous computer subsystem that provides management and monitoring capabilities independently of the host system's CPU, firmware (BIOS or UEFI) and operating system.
- https://www.intel.com/content/www/us/en/servers/ipmi/ipmi-home.html

HP's iLO and RiLO Integrated Lights-Out (iLO) and Remote Integrated Lights-Out (RiLO)
- http://www.serverwatch.com/server-reviews/server-management-tools-comparison-a-closer-look-at-hps-ilo-and-dells-idrac.html

generic BMC - baseboard management controller (BMC)
Lenovo's ThinkServer EasyManage

An overview of the different versions:[3]

Type	[hide]	Family	Year	Server	Comme
DRAC II[4]		2	1999	N/A	Extra card
DRAC III[5]		3	2002		
DRAC iV[6]		4	2005	Generation 8	
DRAC 5[7]		5	2006	Generation 9	Extra card, virtual console requires Firefo
iDRAC 6 embedded		6	2008	First version for blade servers	Integrated on motherboard on all servers
iDRAC 6 Express		6	2008		Standard on all midrange systems
iDRAC 6 Express		6	2008	Blade servers[8]	
iDRAC 6 Enterprise[9]		6	2008		Additional software features in combinati
iDRAC 6 Enterprise[10]		6	2008	Blade	Additional software features in combinati
iDRAC 7[2]		7	2012	Generation 12	New licensing model, hardware based, N
iDRAC 8[11]		8	2014	Generation 13	Quick sync, NFC configuration, UEFI sec

What version are you running?

GUI - IPMI - Help – about Integrated Remote Access Controller 6 - Enterprise   1.92

dmidecode -s bios-version

6.1.0

Engaging Dell

CSweb - > StorNext Metadata Appliances -> Manuals -> StorNext M-Series Service Plan ->

- Service Plan 0-16035-01_Plan_Service_Xcellis_RevB.pdf
- https://qsweb.quantum.com/files_plugin_files1.php?mycategory=1849
- http://qsweb.quantum.com/wiki/tiki-download_file.php?fileId=12812
- Dell 866.292.3355 pin #11888
- Oracle Task Template

  ○

I have found that emailing the DSET as an attachment is ALWAYS stripped when sending to DELL, so I just create an outgoing FTP folder for DELL to pull it themselves.
- http://srscratch/cgi-bin/anonout_chucker.cgi

What Dell recommends to do to reset the iDRAC when the LCD is dark:
Ensure that the BIOS and iDRAC firmware is up to date and attempt each of the following steps.

1. A soft reset of the iDRAC with the racadm racreset command and allow a few minutes for iDRAC to boot and if no change.....
2. Drain the system flea power by shutting down the server and removing power cables. Press and hold the power button for 15 seconds and reboot.
3. Update the IDRAC firmware. Select appropriate link below:
4. Reseat the LCD cables
When re-seating the control panel, ensure the ribbon cable is re-seated on both ends i.e at the control panel and motherboard connections.
Because the LCD runs on AUX power, the power cable must to be pulled as well to allow the LCD to re-initialize after re-seat.

http://en.community.dell.com/support-forums/servers/f/956/t/19985288
http://en.community.dell.com/support-forums/servers/f/956/p/19627363/20753703?rfsh=1468248797399
https://www.youtube.com/watch?v=1yr8Tn-HOdk

Misc

Dell PowerEdge R630 / Xcellis Look for this document: iDRAC8-with-lc-v2.05.05.05_User-Guide.pdf ~9.3MB
- \\file01dn\SPS\Jeff_Syme_Docs\
- Recall that we're using version 6, and this doc is version 8 for R630/Xcellis

Dell PowerEdge R520 / M440 integrated-dell-remote-access-cntrllr-7-v1.50.50_User's Guide_en-us.pdf ~7.3MB
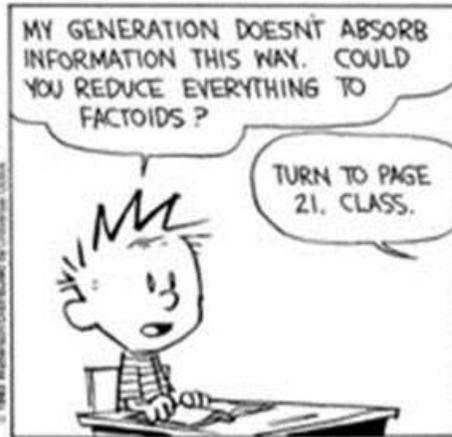- \\file01dn\SPS\Jeff_Syme_Docs\
- This is version 7 of iDRAC

https://sourceforge.net/projects/ipmitool/

Best regards,

Jeff D. Syme *StorNext - Software Product Support (SPS)*
SN_docs & SN5_docs & *Gateway_docs* & Lattus_docs & Xcellis_docs & Artico_docs & SN-NAS docs
Staffed M-F:8AM-5PM MT O: 719.536.6411 | Jeff.Syme@Quantum.com
"The most difficult thing is the decision to act. The rest is merely tenacity. The fears are paper tigers. You can do anything you decide to do. You can act to change and control your life; and the procedure, the process is its own reward." – Amelia Earhart (born 1897- disappeared in 1937), American aviation pioneer and author