IPMI

IPMI(Intelligent Platform Management Interface)
. H/W IPMI
. ( ) IPMI
CPU, FAN, , , , H/W (,
Power) syslog . IPMI
. H/W
IPMI .

IPMI

IPMI , dmidecode . IPMI
. 2.0 (1.5)
.

```
$ dmidecode | grep -A10 IPMI
```

Linux (CentOS)

IPMI . freeipmi, ipmitool ipmitool .

```
$ yum install ipmitool OpenIPMI
$ ipmitool lan print 1          # <-- IPMI                          .
Could not open device at /dev/ipmi0 or /dev/ipmi/0 or /dev/ipmidev/0: No
such file or directory
```

IPMI .

```
$ service ipmi start
$ lsmod |grep ipmi
ipmi_devintf            7729  2
acpi_ipmi               3745  1 power_meter
ipmi_si                44687  2 acpi_ipmi
ipmi_msghandler        38826  3 ipmi_devintf,acpi_ipmi,ipmi_si
```

FreeBSD

ipmitool .

```
$ pkg install ipmitool
```

```
$ kldload ipmi
$ kldstat | grep ipmi
3    1 0xffffffff80fdc000 f970      ipmi.ko
```

IPMI   /boot/loader.conf   . , FreeBSD
8.1   (?)   kernel panic   ,   .

```
ipmi_load="YES"
coretemp_load="YES"
```

IPMI

- (System Event Log, SEL)

```
$ ipmitool sel list
   1 | 06/20/2012 | 21:32:52 | Event Logging Disabled #0x72 | Log area
reset/cleared | Asserted
   2 | 07/18/2012 | 14:19:01 | Power Supply #0x63 | Power Supply AC lost |
Asserted
   3 | 07/18/2012 | 14:19:11 | Power Supply #0x74 | Redundancy Lost |
Asserted
…      …
```

- FRU(Field Replaceable Unit)   .   ,   ,   ,
                                  .   .

```
$ ipmitool fru
…      …
FRU Device Description : iDRAC7
Board Mfg Date        : Wed May  2 17:27:00 2012
Board Mfg             : DELL
Board Product         : PowerEdge R620
…      …

FRU Device Description : PS1 (ID 1)
Board Mfg Date        : Mon Jun  4 18:14:00 2012
Board Mfg             : DELL
Board Product         : PWR SPLY,750WP,RDNT,DELTA
…      …

FRU Device Description : PS2 (ID 2)
Board Mfg Date        : Mon Jun  4 18:44:00 2012
Board Mfg             : DELL
Board Product         : PWR SPLY,750WP,RDNT,DELTA
…      …
```

- •

```
$ ipmitool sensor
…        …
FAN MOD 1A RPM  | 4320.000  | RPM         | ok    | na        | 1920.000  |
na        | na        | na        | na
FAN MOD 2A RPM  | 4440.000  | RPM         | ok    | na        | 1920.000  |
na        | na        | na        | na
FAN MOD 3A RPM  | 4320.000  | RPM         | ok    | na        | 1920.000  |
na        | na        | na        | na
…        …
```

- • SDR(Sensor Data Repository)

SDR(Sensor Data Repository)   FAN   type fan   .
      (type temp), Voltage   (type voltage),   (type batt)
                    .

```
$ ipmitool sdr
…        …
Current 1        | 0.40 Amps          | ok
Current 2        | 0.20 Amps          | ok
Voltage 1        | 216 Volts          | ok
Voltage 2        | 216 Volts          | ok
PS Redundancy    | 0x00               | ok
…        …
$ ipmitool sdr type
$ ipmitool sdr type fan
Fan1A RPM        | 30h | ok |  7.1 | 2400 RPM
Fan2A RPM        | 32h | ok |  7.1 | 2280 RPM
Fan3A RPM        | 34h | ok |  7.1 | 2400 RPM
Fan4A RPM        | 36h | ok |  7.1 | 2160 RPM
Fan5A RPM        | 38h | ok |  7.1 | 2280 RPM
Fan6A RPM        | 3Ah | ok |  7.1 | 2280 RPM
Fan Redundancy   | 75h | ok |  7.1 | Fully Redundant
…        …
```

- • Power   . power   ,
      .

```
$ ipmitool power status
Chassis Power is on
```

- • Boot Device

      PXE   , CDROM   .   BIOS
    .   IPMI SOL(Serial Over LAN)   ,
                    BIOS   .   IPMI
SOL   . (※ SOL   .)

```
$ ipmitool chassis bootdev
bootdev [clear-cmos=yes|no]
bootdev [options=help,...]
  none  : Do not change boot device order
  pxe   : Force PXE boot
  disk  : Force boot from default Hard-drive
  safe  : Force boot from default Hard-drive, request Safe Mode
  diag  : Force boot from Diagnostic Partition
  cdrom : Force boot from CD/DVD
  bios  : Force boot into BIOS Setup
  floppy: Force boot from Floppy/primary removable media

$ ipmitool chassis bootdev cdrom      # <-- CD/DVD                .
Set Boot Device to cdrom
$ ipmitool chassis bootparam get 5
Boot parameter version: 1
Boot parameter 5 is valid/unlocked
Boot parameter data: 8014000000
Boot Flags :
   - Boot Flag Valid                                     # <-- Invalid ->
Valid
   - Options apply to only next boot                     # <--      Boot
Device
   - BIOS PC Compatible (legacy) boot
   - Boot Device Selector : Force Boot from CD/DVD       # <-- No override
-> Force Boot ...
   - Console Redirection control : System Default
   - BIOS verbosity : Console redirection occurs per BIOS configuration
setting (default)
   - BIOS Mux Control Override : BIOS uses recommended setting of the mux at
the end of POST

$ ipmitool chassis bootdev bios                       # <--         BIOS
         .
Set Boot Device to bios

$ ipmitool chassis bootparam set bootflag force_bios         # <--
chassis bootparam
Set Boot Device to force_bios
```

                                                 .
            persistent   . Dell 1950   persistent
 , R610   .   R610
     . ^^

```
$ ipmitool chassis bootdev none  options=help        # <--
$ ipmitool chassis bootdev cdrom options=persistent  # <--
CDROM BIOS                       .
```

```
$ ipmitool chassis bootparam get 5
...      ...
Boot Flags :
   - Boot Flag Valid
   - Options apply to all future boots            # <--
...      ...
```

-
  - ipmitool mc info : Management Controller   . IPMI firmware   ,
        , ..
  - ipmitool channel info 1 : Management Controller   . IPMI LAN
    access on/off   (Access Mode)   .
  - ipmitool sol info 1 : SOL(Serial-over-LAN),
                    , Serial BPS
  - ipmitool delloem mac : Dell   OEM   LAN Interface   MAC
    IPMI MAC   .
  - ipmitool delloem powermonitor : Dell   ,
        .

```
$ ipmitool delloem mac

System LOMs
NIC Number□□□MAC Address□□□□□□Status

0□□□□□□??:??:fd:??:??:ba□□□Enabled
1□□□□□□??:??:fd:??:??:bb□□□Enabled
2□□□□□□??:??:fd:??:??:b8□□□Enabled
3□□□□□□??:??:fd:??:??:b9□□□Enabled

iDRAC7 MAC Address ??:??:fd:??:??:54

$ ipmitool delloem powermonitor
Power Tracking Statistics
Statistic       : Cumulative Energy Consumption
Start Time      : Thu Mar 31 16:05:44 2011
Finish Time     : Mon Nov 24 18:21:01 2014
Reading         : 1142.4 kWh
...      ...
```

ipmitool   OEM   freeipmi   ipmi-oem   ,
                    .

```
$ ipmi-oem dell get-power-consumption-data              # <-- ipmitool
delloem powermonitor
Cumulative Energy Start Time : 03/31/11 - 16:05:44
Cumulative Energy            : 1142.39 kWh
...      ...
```

IPMI IP

IPMI 　IP　　　　　　　　　　　　　　　IPMI　　　　　　　 .　　　　　　　　　　　　　　　IPMI
　(?)　　　　　　　　　　　　　　　. IPMI IP　　　　　　　　　　　　　　　　　　　　　　,
　　　　　　　　　　　　　　　. 　　　FAN RPM,　　　　　　　　　 ,　　　　　 ,
　　　　　　　　　.

IPMI IP　　　　　　　　　　　　　　　　?　　　 .
　, IPMI IP　　　　　　　　　　　.　　　　　　 IP　　　　　 IP　　　　　　　 ,
IPMI　　　　　　　　IP　　　　　　　　　　.

IPMI IP　　　　　　　　　　　.

```
$ ipmitool lan set 1 ipsrc static
$ ipmitool lan set 1 ipaddr
$ ipmitool lan set 1 netmask
$ ipmitool lan set 1 defgw ipaddr
$ ipmitool lan set 1 access on
```

　　　　　　　　　　.

```
-     IP : 10.10.1.120  (ifconfig         IP. IPMI      )
- IPMI IP : 10.10.20.120
- IPMI GW : 10.10.20.1   (                IP            IPMI
     .)
```

```
$ ipmitool lan print 1
Set in Progress        : Set Complete
Auth Type Support      : NONE MD2 MD5 PASSWORD
Auth Type Enable       : Callback : MD2 MD5
                       : User     : MD2 MD5
                       : Operator : MD2 MD5
                       : Admin    : MD2 MD5
                       : OEM      :
IP Address Source      : Static Address      # <-- static
IP Address             : 192.168.0.120       # <--
Subnet Mask            : 255.255.255.0
MAC Address            : ??:??:c4:ee:??:??
SNMP Community String  : public
IP Header              : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10
BMC ARP Control        : ARP Responses Enabled, Gratuitous ARP Disabled
Default Gateway IP     : 192.168.0.1
Default Gateway MAC    : 00:00:00:00:00:00
...      ...

$ ipmitool lan set 1 ipsrc static              # <-- DHCP
             .           static              .
```

```
$ ipmitool lan set 1 ipaddr 10.10.20.120
Setting LAN IP Address to 10.10.20.120

$ ipmitool lan set 1 netmask 255.255.255.0
Setting LAN Subnet Mask to 255.255.255.0

$ ipmitool lan set 1 defgw ipaddr 10.10.20.1
Setting LAN Default Gateway IP to 10.10.20.1

$ ipmitool lan set 1 access on

$ ipmitool lan print 1
Set in Progress        : Set Complete
Auth Type Support      : NONE MD2 MD5 PASSWORD
Auth Type Enable       : Callback : MD2 MD5
                       : User     : MD2 MD5
                       : Operator : MD2 MD5
                       : Admin    : MD2 MD5
                       : OEM      :
IP Address Source      : Static Address
IP Address             : 10.10.20.120             # <--
Subnet Mask            : 255.255.255.0
MAC Address            : ??:??:c4:ee:??:??
SNMP Community String  : public
IP Header              : TTL=0x40 Flags=0x40 Precedence=0x00 TOS=0x10
BMC ARP Control        : ARP Responses Enabled, Gratuitous ARP Disabled
Default Gateway IP     : 10.10.20.1               # <--
Default Gateway MAC    : 00:00:00:00:00:00
...      ...
```

IPMI 2   ,   ping 10.10.20.120   . ping   .
ping   IPMI over LAN(IPMI   )   .

IPMI user

              user   .

```
$ ipmitool user list 1
ID  Name□□□     Callin  Link Auth□□□IPMI Msg   Channel Priv Limit
2   root               true    true        true       ADMINISTRATOR

$ ipmitool user set password 2            # <--    2        ID
ID       .           'root' ID.
Password for user 2:  <-- PW
Password for user 2:  <-- PW

$ ipmitool user summary 1
Maximum IDs□□□     : 16
```

```
Enabled User Count  : 1                          # <-- enable       1        .
Fixed Name Count    : 1
```

```
   Enabled User  0           ipmitool user enable 2        enable     .
   interactive              , ipmitool user set password 2 <        >
     .
```

```
$ ipmitool -I lan -H 10.10.20.20 -U root power status
Password:
Chassis Power is on

$ ipmitool -I lan -H 10.10.20.20 -U root -P <       > power status
Chassis Power is on
```

IPMI event

```
ipmievd       SEL(System Event Log, ipmitool sel info        )   10
     syslog                   .        syslog  LOCAL4 facility              . CPU,
FAN,      H/W    , RAID          ,       Redundancy      , Disk            H/W
   SEL                   .
```

Linux   (CentOS)

```
/etc/sysconfig/ipmievd        . (120                       )
```

```
IPMIEVD_OPTIONS="sel timeout=120 pidfile=/var/run/ipmievd.pid"

# # #

$ service ipmievd start
```

FreeBSD

```
ipmievd   rc                                  /usr/local/etc/rc.d/ipmievent
        , rc.conf   ipmievent_enable="YES"              .
```

```
$ service ipmievent start
```

- ipmievent rc

```
#!/bin/sh
#
```

```
# ipmievd daemon
#
# PROVIDE: ipmievent
# REQUIRE: LOGIN
# BEFORE:  securelevel
# KEYWORD: shutdown
#
# Add the following lines to /etc/rc.conf to enable 'ipmievd':
# ipmievent_enable="YES"
#
# by truefeel (        , http://coffeenix.net/)

. /etc/rc.subr

ipmievent_enable=${ipmievent_enable:-"NO"}

name="ipmievent"
rcvar="ipmievent_enable"□□□□□□# `set_rcvar`
command="/usr/local/sbin/ipmievd"

[ -z "${ipmievent_flags}" ] && ipmievent_flags="timeout=120"
ipmievent_flags=" sel ${ipmievent_flags}"
required_files="/dev/ipmi0"
pidfile="/var/run/ipmievd.pid0"

load_rc_config $name
run_rc_command "$1"
```

  • IPMI event   syslog   ,

syslog   (/etc/syslog.conf)

```
# IPMI
local4.debug□□□□□□□□□□□□□□@10.10.1.123
```

rsyslog   (/etc/rsyslog.d/ipmi.conf)

```
# IPMI
local4.debug□□□□□□□□□□□□□□@10.10.1.123:514
```

LCD   (Dell   )

Dell   LCD   (   )   .   (Service
Tag)   . coffeenix.net   .

```
$ ipmitool delloem lcd
…        …
   lcd set mode {none}|{modelname}|{ipv4address}|{macaddress}|
   {systemname}|{servicetag}|{ipv6address}|{ambienttemp}
   {systemwatt }|{assettag}|{userdefined}
…        …

$ ipmitool delloem lcd set mode userdefined coffeenix.net
LCD info
    Setting: User defined
    Text:    coffeenix.net

$ ipmitool delloem lcd set mode servicetag
LCD info
    Setting:   System Tag
```

  * http://coffeenix.net/board_print.php?bd_code=1765