Powering the Open Data Center Revolution

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About Inspur

- Top 3 Server Vendor Worldwide
- Leading Full Stack AI Solution Provider
- Leading Open Data Center Products and Solutions Provider

JDM Model

J = Joint digital collaboration with customers & partners
D = Design/Development/Delivery
M = Manufacture

ODCC OCP

Platinum Member of OCP

AI Full Stack Solution

- AI Hardware Products
  - AGX-5
  - AGX-2
  - FPGA
- AI Management Software
- Optimized AI Framework
- Caffe-MPI
- AI Station
- T-Eye

Accelerate

Optimized AI Framework

AI Applications
Open Platform: Making Ecosystem More Open

Embrace Open
- Over billion deployment
- Millions of nodes deployed
- Open Power
- ODCC
- Open Hardware

Deliver Value
- Open Design Platform
- Low Barriers to Entry
- Accelerate Innovation
- Manage Power Consumption
- Decrease TCO
- Lower Failure Rate

Open to Customers

Increase Value

Tencent, Alibaba, NetEase, SOHU, 360, Sina, Baidu
Hardware Management for OCP Rack

- Runs OpenBMC on OCP Compute Node
- Implement Redfish OCP Baseline for compute node and pass the dmtf redfish plugfest
Inspur OpenBMC Key Features

**WebUI** to monitor system status

**Component** Firmware Life cycle Management
1. Version auto discovery
2. Intelligent update for BMC, BIOS, CPLD, FPGA etc.
3. Firmware rollback when error occurs.

**Redfish/Restful Function** support Redfish OCP Baseline Profile

**Fault Diagnosis**
1. Diagnosis system fault directly
2. Output the detailed fault records and recommendations
3. BMC subsystem fault diagnosis.

![WebUI diagram]

![Redfish Resource Map (simplified)]

![Firmware Life cycle Management diagram]

![Fault Diagnosis diagram]
Inspur OpenRack Overview

Upper Node Area

Lower Node Area

Power Supply Area (Integrated RMC)

Network Area
Inspur OpenRack Overview

- Centralized Power
- Centralized Cooling
- Centralized Management
- Rapid Delivery

Copper
Power Shelf

Node
Manage Board
Fan BUS
RMC
PSU
RMC Diagram

PSU
Power Transfer
SDRAM
SPI FLASH

AST2500 (RMC)

GPI0
PSU Present
PS ON
PG ok
Win ok
PSU ALERT
Mid Board Present
Mid Board Sync

RJ45
RTL8211E
UART
ST32F3
WDT
FAN (Reserved)

I2C
KIC
Sensor
Asset Info
PSU
Mid Board
Connections Between RMC & BMC

- **RMC:** Rack Management Controller. **MMC:** Medium Management Controller. **BMC:** Baseboard Management Controller. **FCB:** Fan Control Board. **PCB:** Power Supply Control Board.
- RMC have two networks for remote management & connection to BMC. BMC have two networks in node for remote management & connection to RMC.
- MMC uses IPMB over I2C connections with BMC and uses I2C connections with RMC for communications.
- MMC uses Tach/pwm/GPIO connections with FCB for fan management.

![Diagram of Connections Between RMC & BMC]

- **I2C & Network**
- **MMC & Inner Switch**
- **BMC1**, **BMC2**, **BMC3**, **BMC4**
- **FCB**
- **PMBus1** over I2C, **PMBus2** over I2C
- **PCB**
- **PSU1**, **PSU2**, **PSU3**, **PSU4**
- **PSUB1**, **PSUB2**, **PSUB3**, **PSUB4**
- **FAN1**, **FAN2**, **FAN3**
Connections Between RMC & BMC

Remote Access

Switch

Node 1
- CPU
- BMC1

Node 2
- CPU
- BMC1

Node N
- CPU
- BMC1
Open

Decrease TCO

Manage Power Consumption

Low Barriers to Entry

Accelerate Innovation

Decrease TCO

Lower Failure Rate
Inspur OCP Total Value Solution

User Cases & Technology Experience

Design Base

Contribute IP

JDM
Thank you