

Overview of ATCA Shelf, Shelf Manager, Blades and IPMC Orgnization

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August, 2007

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ATCA[®] Specifications

- PICMG (PIC Industrial Computer Manufacturers Group) created ATCA specifications, also known as PICMG 3.x. The specifications are designed to meet the demands by advanced telecommunication devices for greater reliability, availability and serviceability. The ATCA shelf is built according to these specifications.



A Closer Look at ATCA Shelf

- The shelf consists of the subrack, front boards(aka blades), backplane, cooling devices (fans) and power entry modules.



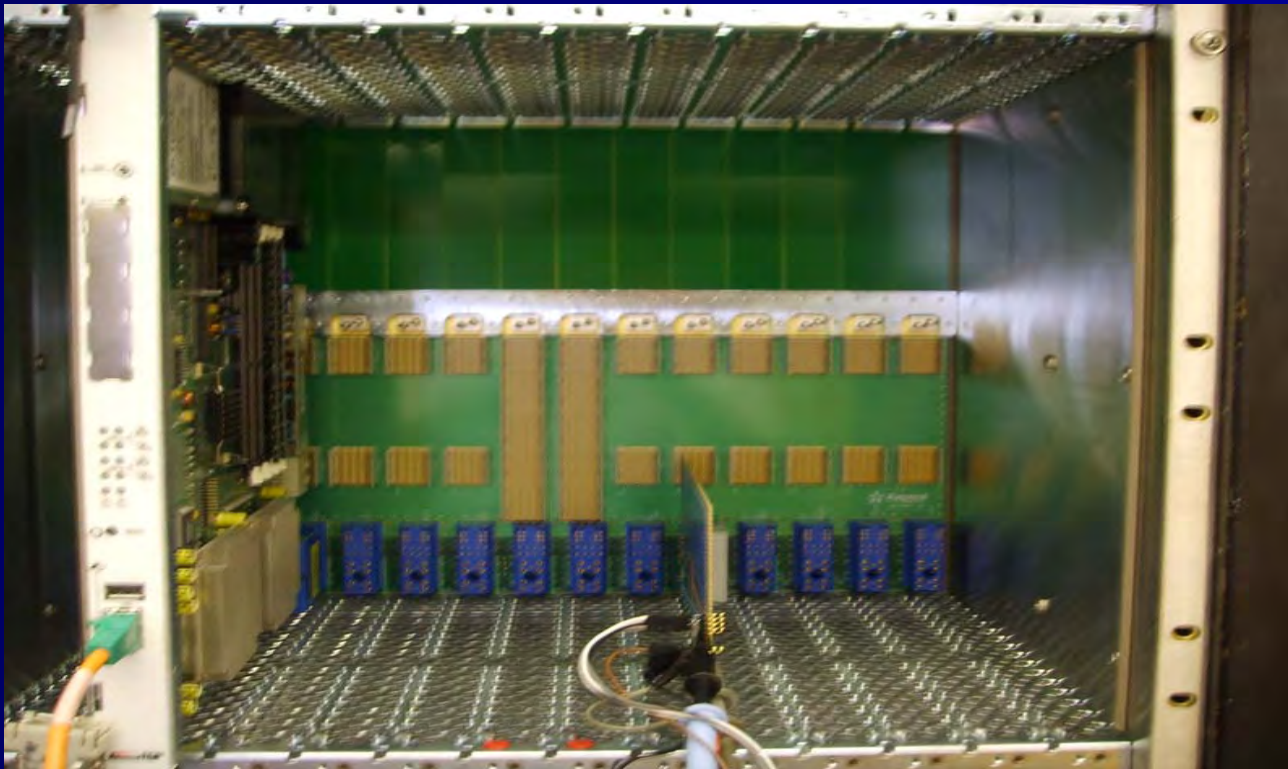
Backplane

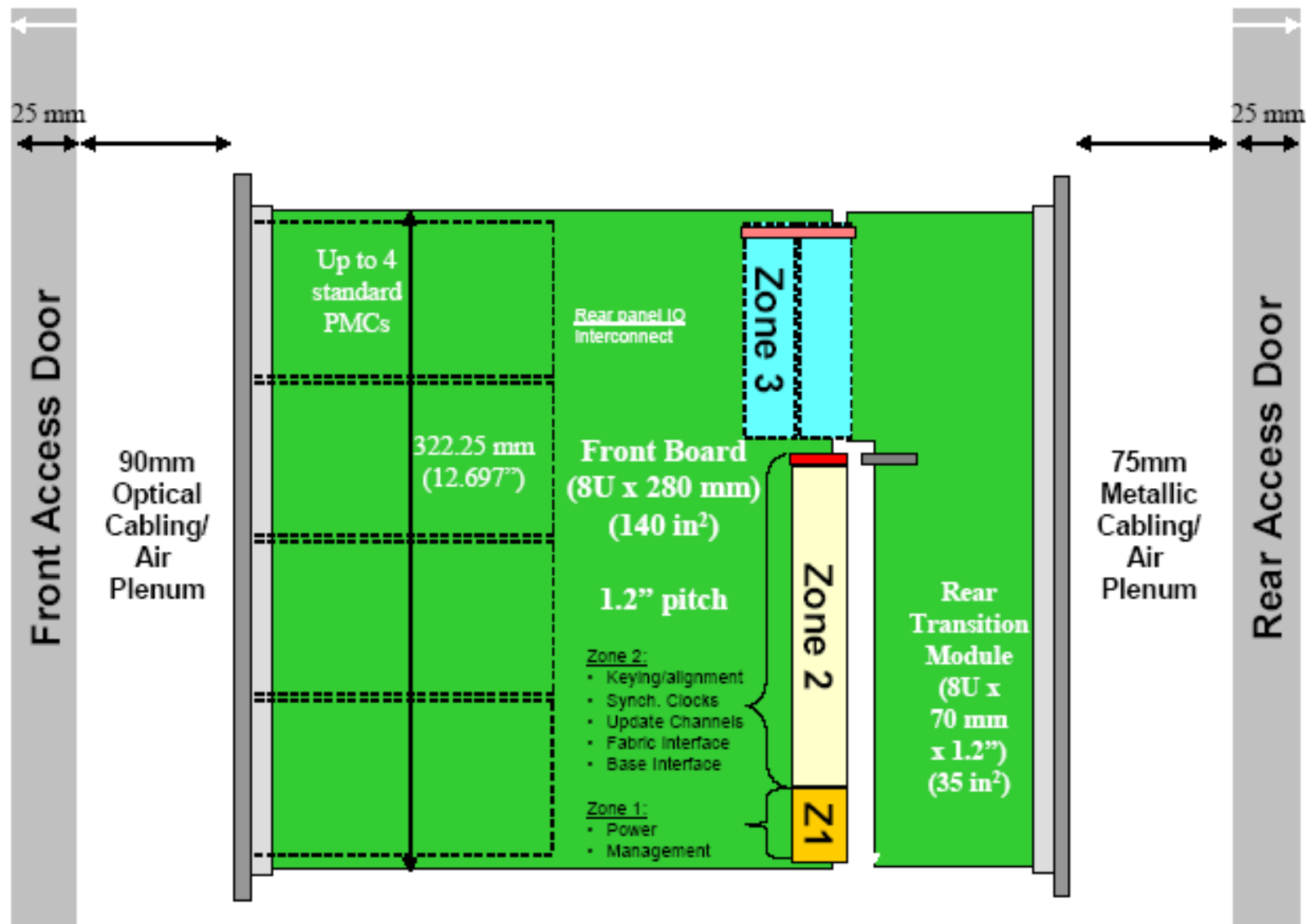
- Backplane consists of three zones, zone 1, zone 2 and zone 3, each of which provides for connector interfaces for the front boards.
 - Zone 1 provides power support and management.
 - zone 2 provides data transport interfaces among the front boards.
 - Zone 3 is user customizable.



Front boards

- The front boards, or blades connect to the backplane through zone 1 and zone 2 connectors, and zone 3 if desired. They operate under PICMG 3.x specifications (ATCA).





Field Replaceable Unit (FRU)

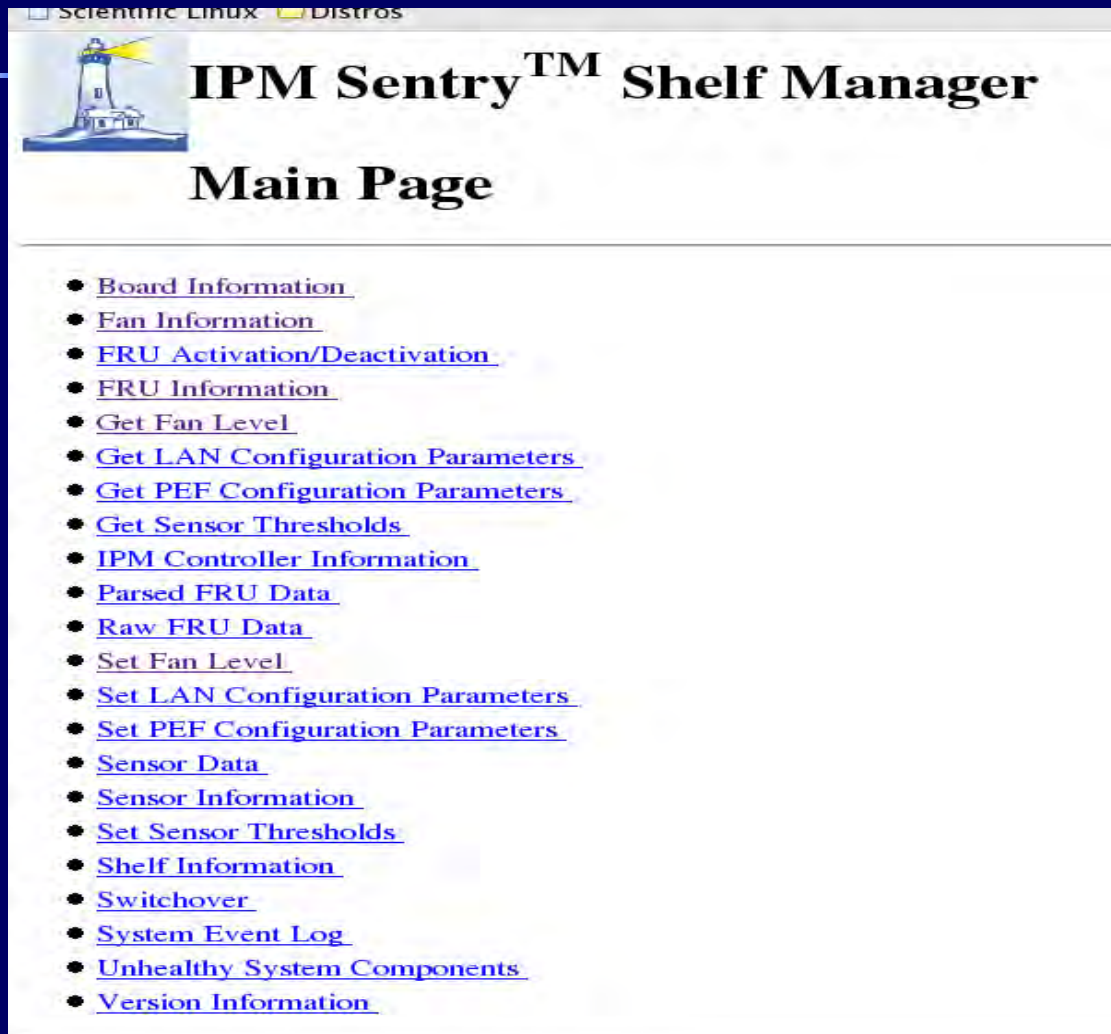
- Cooling devices, such as fans, and power entry modules (PEM) are examples of FRU, which are individual entities that carry out specific functions independent of the boards.
- FRUs may or may not have IPMCs (Intelligent Platform Management Controller) on them. Those with IPMCs are called Intelligent FRUs, which can be summoned directly by shelf manager.

Shelf Manager

- Shelf Manager is the command center of the shelf. It assures the proper operation of the boards and the rest of the shelf. It monitors the health of the system, retrieves inventory information and controls the performances of FRUs, such as setting fan level.
- Shelf Manager can be accessed and serviced through a terminal connected directly to the shelf or through a web browser.



Accessing Shelf Manager through Web Interface



The screenshot shows a web browser window with the title "Scientific Linux" and "Distros". The main content area features a logo of a lighthouse on the left and the text "IPM Sentry™ Shelf Manager" in a large, bold font. Below this, the text "Main Page" is displayed. A list of 22 menu items is provided, each preceded by a bullet point and underlined. The items are: Board Information, Fan Information, FRU Activation/Deactivation, FRU Information, Get Fan Level, Get LAN Configuration Parameters, Get PEF Configuration Parameters, Get Sensor Thresholds, IPM Controller Information, Parsed FRU Data, Raw FRU Data, Set Fan Level, Set LAN Configuration Parameters, Set PEF Configuration Parameters, Sensor Data, Sensor Information, Set Sensor Thresholds, Shelf Information, Switchover, System Event Log, Unhealthy System Components, and Version Information.

IPM Sentry™ Shelf Manager

Main Page

- [Board Information](#)
- [Fan Information](#)
- [FRU Activation/Deactivation](#)
- [FRU Information](#)
- [Get Fan Level](#)
- [Get LAN Configuration Parameters](#)
- [Get PEF Configuration Parameters](#)
- [Get Sensor Thresholds](#)
- [IPM Controller Information](#)
- [Parsed FRU Data](#)
- [Raw FRU Data](#)
- [Set Fan Level](#)
- [Set LAN Configuration Parameters](#)
- [Set PEF Configuration Parameters](#)
- [Sensor Data](#)
- [Sensor Information](#)
- [Set Sensor Thresholds](#)
- [Shelf Information](#)
- [Switchover](#)
- [System Event Log](#)
- [Unhealthy System Components](#)
- [Version Information](#)

FRU Information

Verbose mode turned on

20: FRU # 0

Entity: (0xf0, 0x1)

Hot Swap State: M4 (Active), Previous: M3 (Activation In Process), Last State Change Cause: Normal State Change (0x0)

Device ID String: "IPM Sentry 1"

Site Type: 0x03, Site Number: 01

Current Power Level: 0x01, Maximum Power Level: 0x01, Current Power Consumption: 5.0 Watts

20: FRU # 1

Entity: (0xf2, 0x60)

Hot Swap State: M4 (Active), Previous: M3 (Activation In Process), Last State Change Cause: Normal State Change (0x0)

Device Type: "FRU Inventory Device behind management controller" (0x10), Modifier 0x0

Device ID String: "IPM Sentry 1.1"

Current Power Level: 0x01, Maximum Power Level: 0x01, Current Power Consumption: 5.0 Watts

20: FRU # 2

Entity: (0x1e, 0x60)

Hot Swap State: M4 (Active), Previous: M3 (Activation In Process), Last State Change Cause: Normal State Change (0x0)

Device Type: "FRU Inventory Device behind management controller" (0x10), Modifier 0x0

Device ID String: "Fan Tray"

Current Power Level: 0x01, Maximum Power Level: 0x01, Current Power Consumption: 20.0 Watts

5e: FRU # 0

Entity: (0xf0, 0x60)

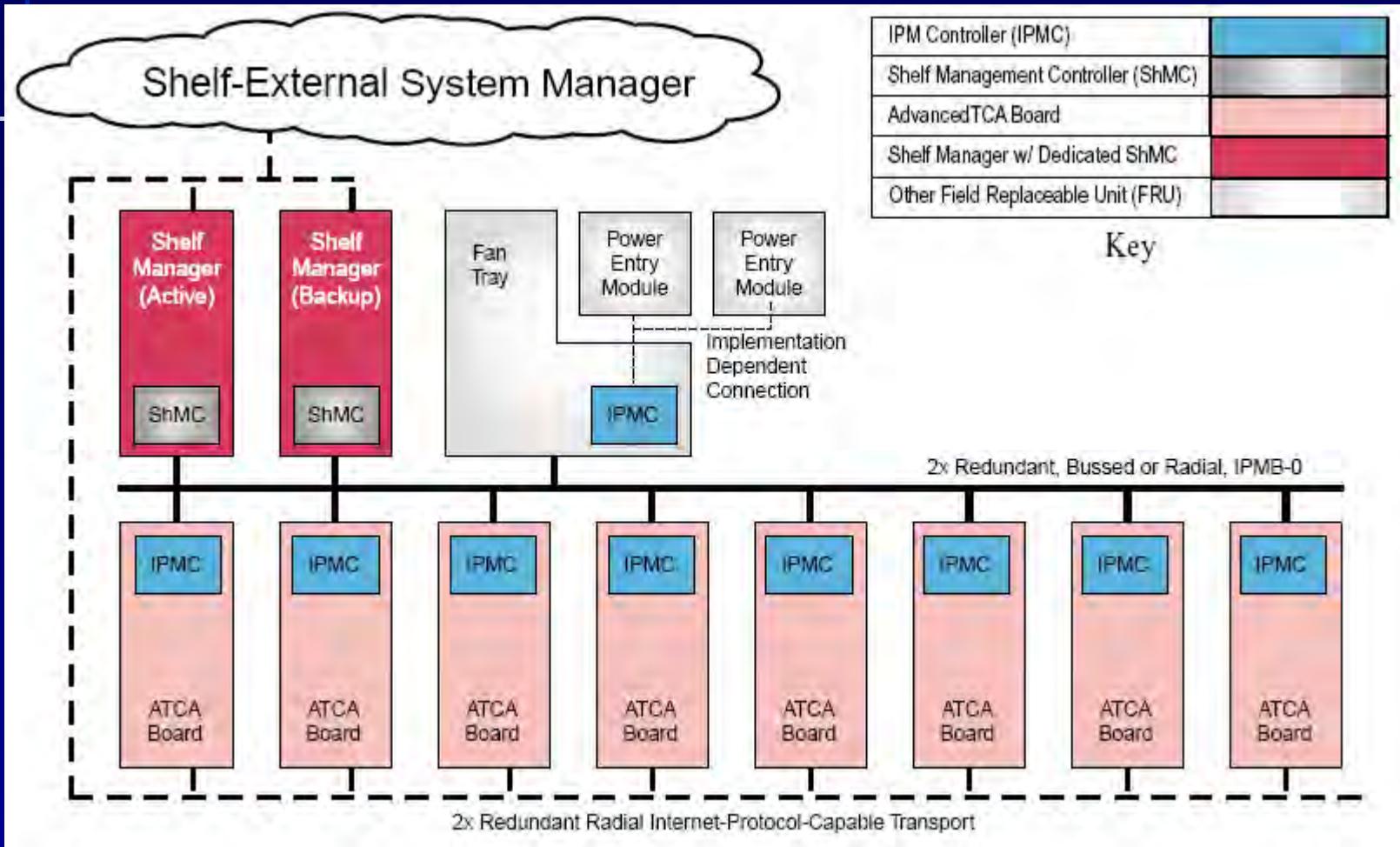
Hot Swap State: M1 (Inactive), Previous: M0 (Not Installed), Last State Change Cause: Normal State Change (0x0)

IPM Controllers

- Intelligent Platform Management Controllers (IPMC) are microcontrollers that reside in ATCA boards and certain FRUs. They control and monitor the operations of their hosts. IPMCs are responsible for the communication between Shelf Manager and the various components in the shelf. IPMCs play the role of relaying data to and from Shelf Manager.

IPMB Communication

- Responsible for the communication within the shelf: between the shelf manager and the various entities.
- Based on I²C bus and part of Intelligent Platform Management Interface (IPMI) architecture.
- Redundant, two buses: IPMB-A, IPMB-B, aggregated as IPMB-0
- All intelligent FRUs have access to IPMB. They do so through IPM Controllers.



IPMB Address

- IPM Controller uses the address to transmit and receive data on IPMB.
- I²C uses 7-bit addresses, the LSB determines read or write.
- In IPMB, every transaction is a master write, therefore the LSB is always 0.