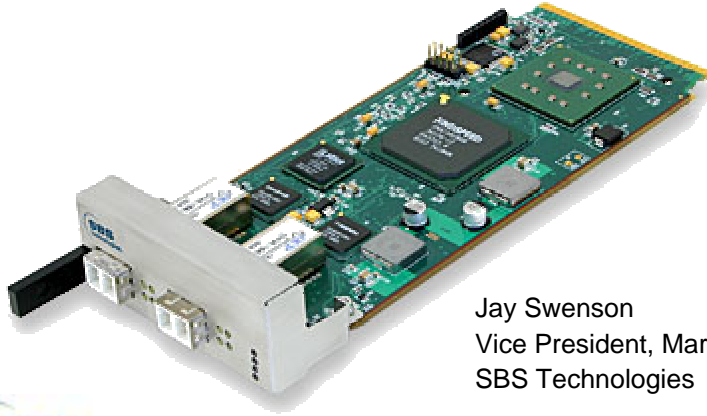


## AMC paves the road to open-architecture, modular computing



Jay Swenson  
Vice President, Marketing  
SBS Technologies



## The current needs of Telecommunications Equipment Manufacturers (TEMs)

- Scalable, standard telecom platforms → *ATCA, AMC, Blade Servers*
- High-Performance Intel-Architecture Computing (Scalability) → *Pentium M, AMD Athlon*
- Demand for higher performance serial interconnects → *Ethernet Fabrics, PCI Express +AS*
- High-availability, redundancy, monitor/management → *APS, Hot Swap, IPMI*
- Cost sensitivity – development and operations → *Open Architecture, multi-vendor components*
- Demand for integrated subsystems → *Blades & Rackmount systems*
- Higher Degree of competition amongst TEMs → *Flexible Business Terms & Lead-time management*



## Enter Open Architecture, Modular Computing

- What is open-architecture?
- What is modular?
- ATCA and AMC offer both
- AMC is truly the heart of modularity
  - although “ATCA” getting all the attention



## ATCA/AMC

### True Scalable, Modular Architectures

- Purpose-Built from the ground-up
- Allow TEMs to outsource Chassis, Blades, Software and Integration
  - Time to market, Cost to Market
  - Designed specifically for the Communications market
  - Multi-vendor components designed to interoperate - more choices
- Scalable
  - Chassis backplane scalable capacity to 2.5Tb/s
  - Intel® architecture processing
  - High level of modularity and configurability



## ATCA/AMC

### True Scalable, Modular Architectures

- High Performance
  - Multiple backplane architectures for high performance interconnect
  - New mezzanine standards (AMC) for high speed I/O
  - Ability to accommodate larger numbers of processors and DSPs than previous open standards
- High Availability
  - Scalable availability with common management interface
  - New standards allow hot swap to the mezzanine card level



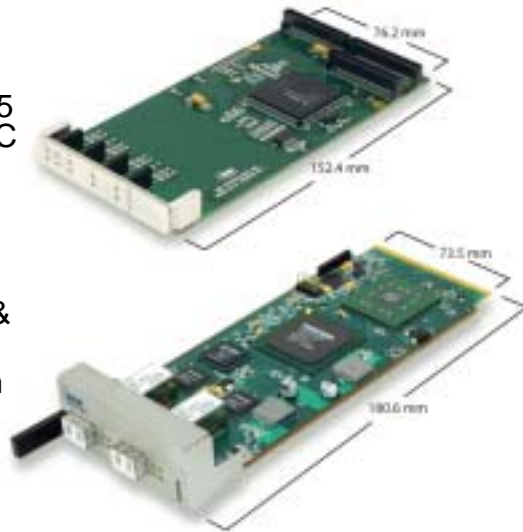
## AdvancedTCA vs. CPCI

- Purpose-built for Telecom and data centers
- More Real Estate – 140 square inches for ATCA and 4 mezzanines vs. 57 square inches for CPCI and only 2 mezzanines
- Increased power – 150-200W vs. 35-50W
- Increased bandwidth - ~2.4 Tbps vs. ~ 4 Gbps
- Built in High Availability & Management
- Moderate Base Cost, Low Lifecycle Cost
- Designed with Input from TEMs & End-users



## AMC vs. PMC / XMC

- Also purpose-built for telecom
- Larger – only 18 square inches on a PMC vs. 20.5 square inches on an AMC
- Increased power – 20W on PMC vs. 60 W on AMC
- Increased bandwidth
- Built in High Availability & Management
- Designed with Input from TEMS & end-users

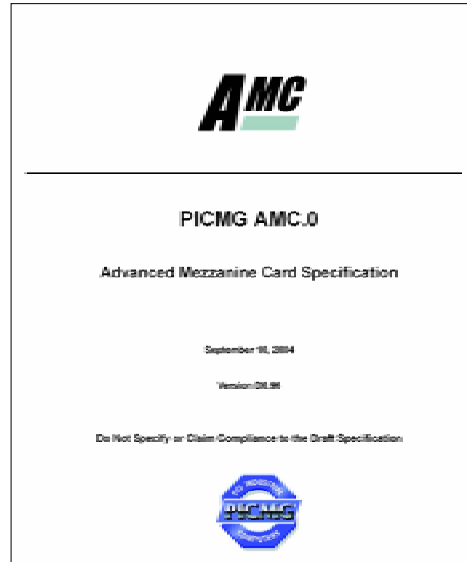


## How is this different from yesterday?

- Intel® and other industry leaders are behind ATCA and promoting it very strongly
- End-users are seeing the value of this open standard
- The business model is driving towards the more economical PC or Server model

## How is AMC defined?

- AMC Specification is managed by PICMG
- ~~Currently at Draft D0.96 as of September 10, 2004~~
- AMC.0 (base) and AMC.1 (PCI Express) in final ballot; publication anticipated 4Q2004
- Other protocol definitions planned for 1H2005



## Card edge Interconnects

- PCI-Express
- Rapid I/O
- Ethernet
- Manageability – IPMI
- AMC can be I/O functions or processors

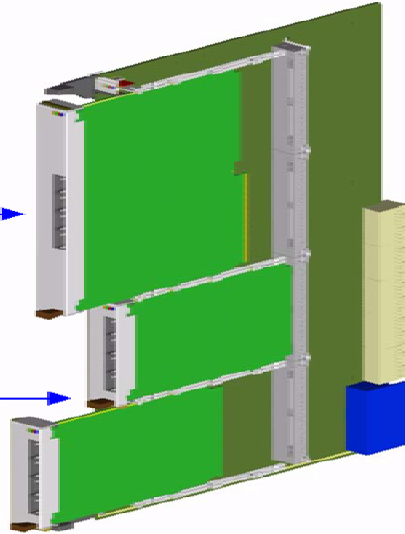


## AMC offers several size options

- Full height or half height
- Single or double wide
- Boards slide on rails into a card edge connector

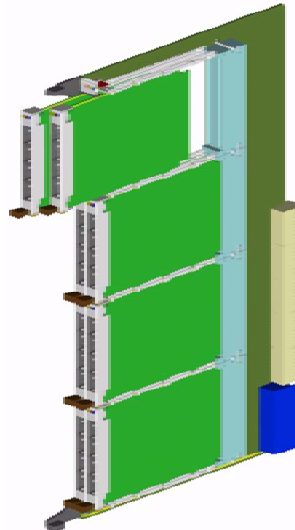
Double-Width,  
Full-Height  
Module

Single-Width,  
Full-Height  
Modules



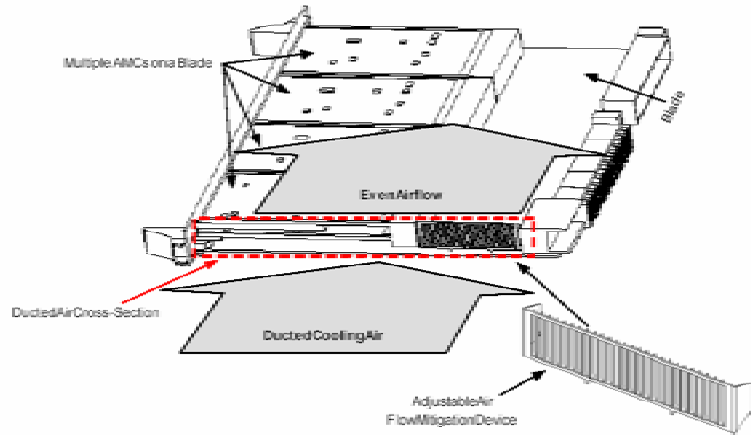
## Half height AMCs increase the density

- This allows for a more diverse I/O board mix
- More total ports on a carrier card



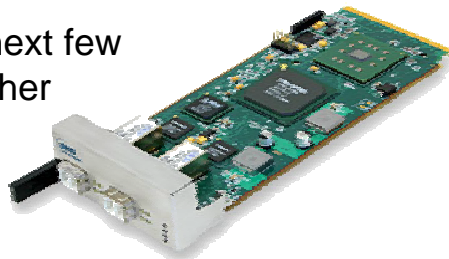


## Appropriate AMC cooling is built into ATCA carrier boards



## Although the specification is still in draft form, a number of vendors are already offering AMC Products

- SBS announced the first PCI Express based AMC in June 2004, the TELUM 1001-O3M
- Artesyn introduced the first Gigabit Ethernet AMC in January 2004
- Expect many more in the next few quarters from these and other vendors



## Why is AMC so important?

- AMC offers true modularity
- Redundancy from density and failover
- TEMs no longer need to swap out entire blade to replace one mezzanine card
- The Time to Market and Cost to market factors
- Modularity offers an upgrade path for the end user



## AMC technology being deployed across platforms

- Bridges the gap from proprietary to standard ATCA designs

Examples:

- Proprietary: Optical Switching with AMC compute engines
- ATCA: Media Gateway in a Blade



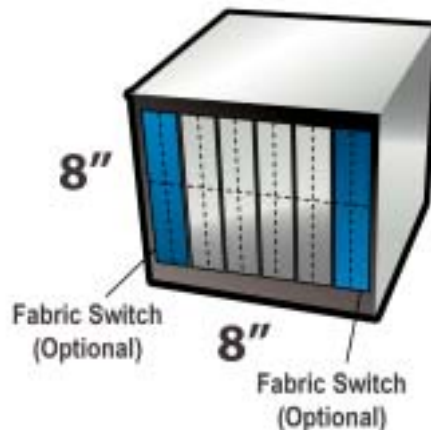


## Standalone AMC – enter MicroTCA

- AMC plugged directly into a passive backplane instead of a carrier card
- Smaller platform than ATCA
- Allows the use of this great technology in other markets – commercial, military
- Standards definition work started Oct 2004

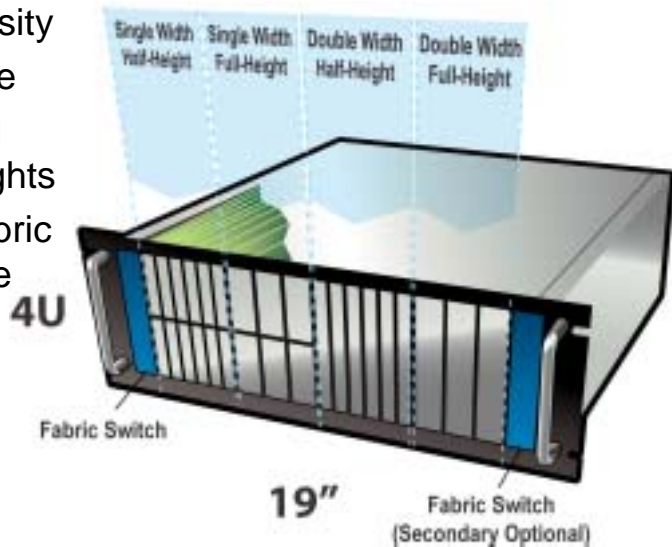
## MicroTCA in a stand alone chassis

- Excellent form for industrial applications
- Stand alone or remote computer
- High density, Hot swappable CPCI alternative
- High performance serial backplane



## MicroTCA in a 19" rack mount chassis

- Very high density
- Hot-swappable
- Flexible board sizes and heights
- Redundant fabric switch capable



## AMC summary

- AMCs are hot-swappable mezzanines
- AMCs will be used to customize and differentiate ATCA carriers
- AMCs take advantage of new serial interconnects for high performance
- AMC also supports higher performance general purpose processor engines
- Look for MicroTCA solutions in about a year