Stretching the Application Range with MicroTCA and AdvancedMCs

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When PICMG defined AdvancedMC™ in 2005, it opened the door to a wide range of communications and telecom applications. Today, AdvancedMC modules can serve as the basis of systems ranging from home media gateways to metro-level central offices. They offer a flexible combination of size and performance options, plus additional features that make them versatile building blocks for system design.

MicroTCA™ stretches application range by allowing developers to create systems by plugging AdvancedMC modules directly into a backplane. In effect, it uses the mezzanine module as though it were a blade itself. The architecture addresses mid-level performance applications by providing more cost-effective access to AdvancedMC module capabilities than the full AdvancedTCA structure. Designers can create systems as small as one or two modules using MicroTCA.

A typical MicroTCA platform will contain a number of base functions including: MicroTCA shelf, processor blades, switch blades, and element management. Depending on the capacity of a given system, these functions may be implemented in various ways, ranging from separate AdvancedMC modules to a single set of redundant AdvancedMC modules.

Building Block Flexibility

The platform also needs to be populated with I/O interfaces and specialized components depending on the specific application. The key AdvancedMC building blocks required are:

- Telecom interface processing modules
  - T1/E1/J1
  - OC3/12
- Communications processing modules for channelized OC3/DS3/T1/E1 interfaces
- Digital signal processor modules
- Network processor modules
  - General purpose
  - Security flow-through and co-processors
- Gigabit Ethernet interface modules

Internal Communications Flexibility

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Gigabit Ethernet (GE) has demonstrated its ability to support a wide variety of communications and has become the primary communications technology internal to MicroTCA platforms. GE Protocols have emerged to support TDM Voice (Internal TDM and Disk Access) iSCSI.

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However MicroTCA can support pairs of cards connected through other I/O protocols such as PCI Express, SAS/SATA, and Serial Rapid I/O (sRIO). For instance sRIO is frequently used between Processor AdvancedMCs and DSP AdvancedMCs. Similarly Processor AdvancedMCs and Hard Disk AdvancedMCs can be connected via SAS/SATA. This allows pairs of AdvancedMCs to be tightly coupled into a single building block.

AdvancedMCs will also be enhanced to support 10 Gigabit Ethernet XAUI interfaces when the MicroTCA shelves provide this capability.

Application Flexibility

With this base of AdvancedMC building blocks, it is possible to develop specific applications by combining the appropriate AdvancedMCs and software applications. Applications that have been considered for MicroTCA include:

Telecommunications

- IP Multimedia System (IMS)
  - Media Gateway
  - Multimedia Resource Function Processor (MRFP)
  - Session border controller
  - Call Session Control Function (CSCF)
- Wireless
  - Cellular/WiMAX base stations
  - Security Gateway
  - IP Backhaul
- DSLAM/NGDLC
- IP PBX
- Radio Network Controllers
- Audio & Video Mail
- Mobile-to-IP Audio & Video Gateway/Conferencing
- Announcement Server
- Video/Audio Transcoding
- Video Conferencing Server
- IP Virtual Private Network (VPN)
- Optical Aggregation/MSPP
- Test Systems
- Military
- Radar
- Image processing
- Secure Communications

Medical

- Image processing

Industrial/Commercial

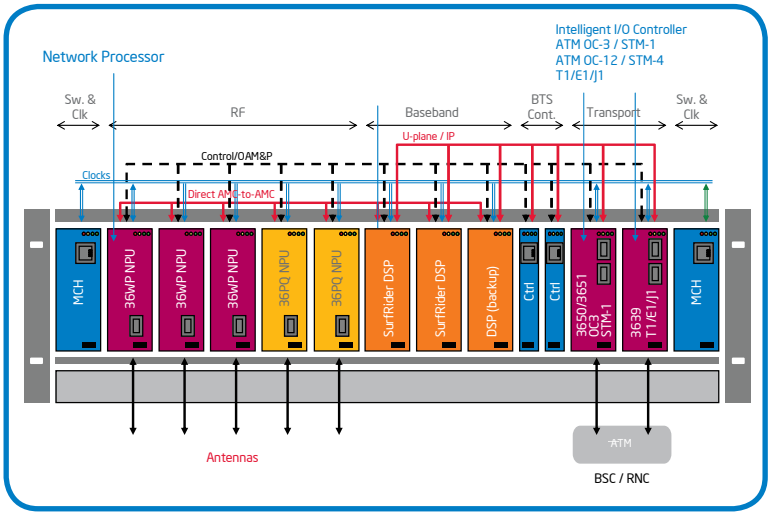
- Integrated Circuit (IC) Measuring/Testing

The example below shows how a wireless base station can be implemented by using the AdvancedMC building blocks.

Summary

Exploiting the variety of AdvancedMC building blocks available in the market and combining these AdvancedMCs in different arrangements with the addition of software-based applications hosted in processor AdvancedMCs provides an incredibly flexible architecture to develop a wide variety of platforms and solutions.

Over time, the variety of AdvancedMCs will continue to expand, supporting and adapting to new requirements. MicroTCA and AdvancedMCs provide a true open systems platform that will revolutionize the industry.



Wireless Base Station