



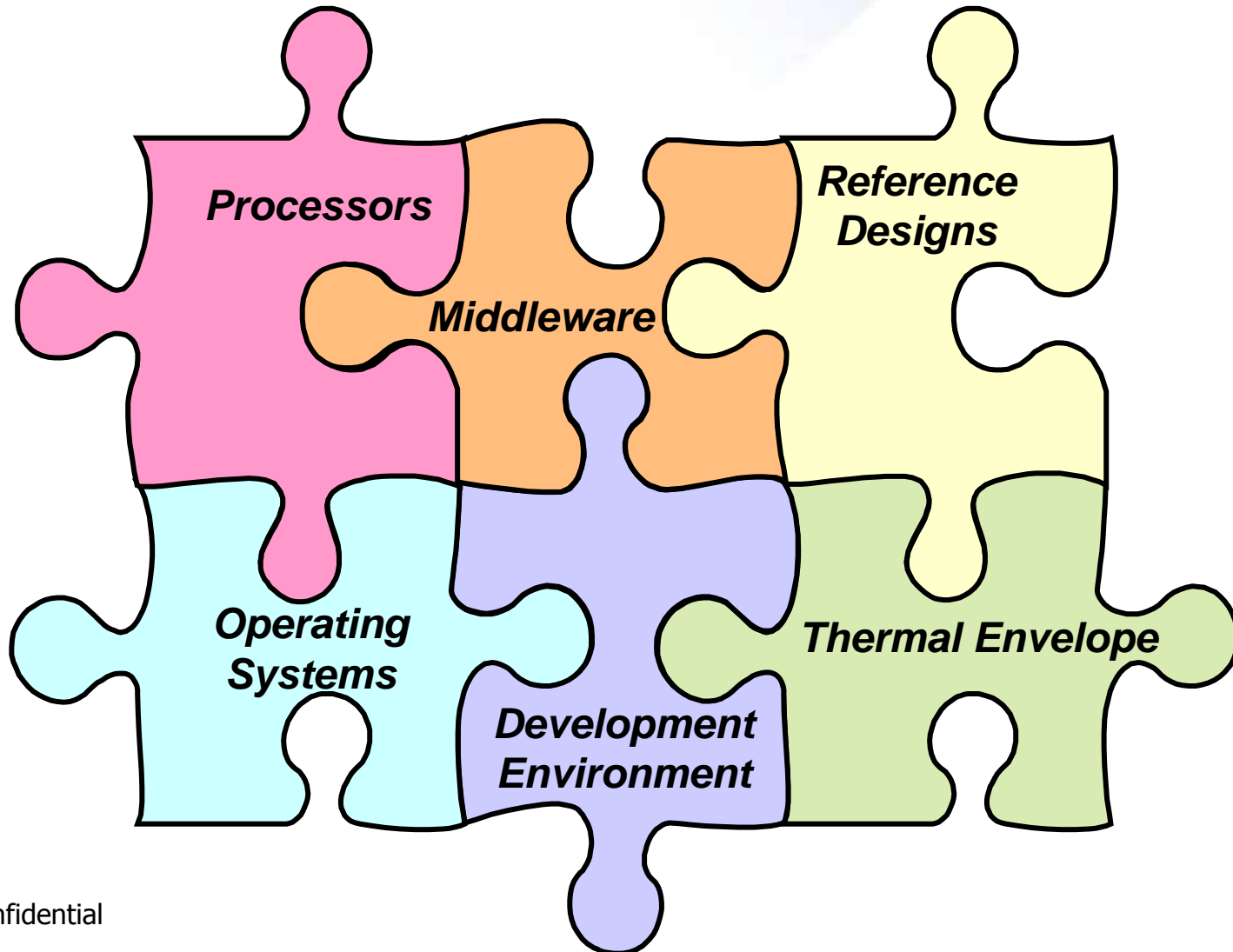
Arches – A RapidIO-based AMC Solution from AMCC

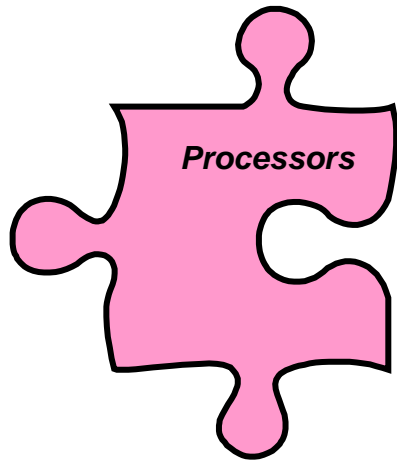
Martin Tuo

- Fabless semiconductor company
- In business since 1979
- Headquarters in Sunnyvale, CA
- Approximately \$300M/yr annual revenue
- System solutions for processing, transporting and storing data
- Embedded processor family based on Power Architecture (PowerPC)
- Major supplier of processors for wireless infrastructure, wireless access and storage applications



- Deliver **processors** matching the customer's needs
 - Performance, Power Dissipation, Integration, Cost
- **Ensure the availability** of everything else the system developer needs
 - Optimized software that best exploits the processor's performance features
 - Support from industry-leading suppliers of middleware, operating systems, tools etc
 - Proven reference designs and software development platforms



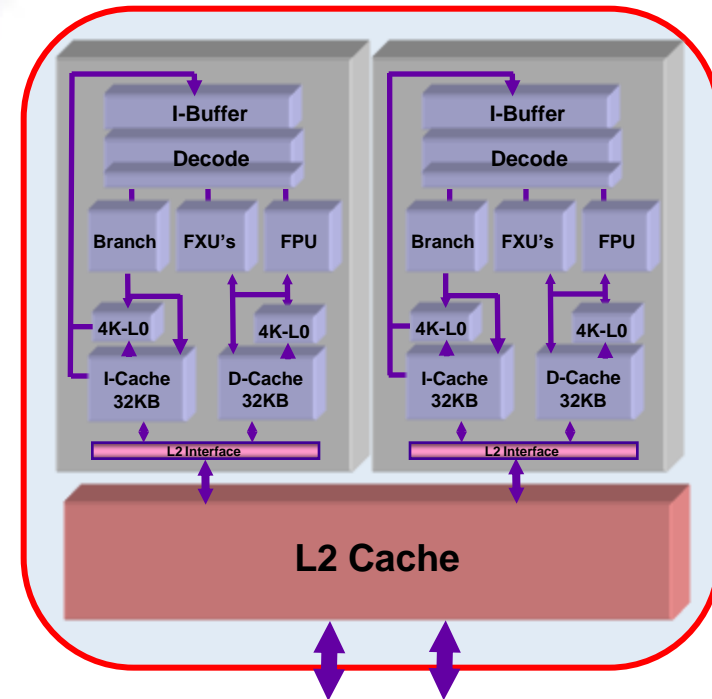


- **Titan core**
 - Unparalleled per Core Performance/Power
 - 2GHz / 2.5W
 - 8000 DMIPS (Dual Core)

- **440/460 platform**
 - Performance through integration
 - 667MHz - 1.2GHz



405 platform
Power/cost optimized

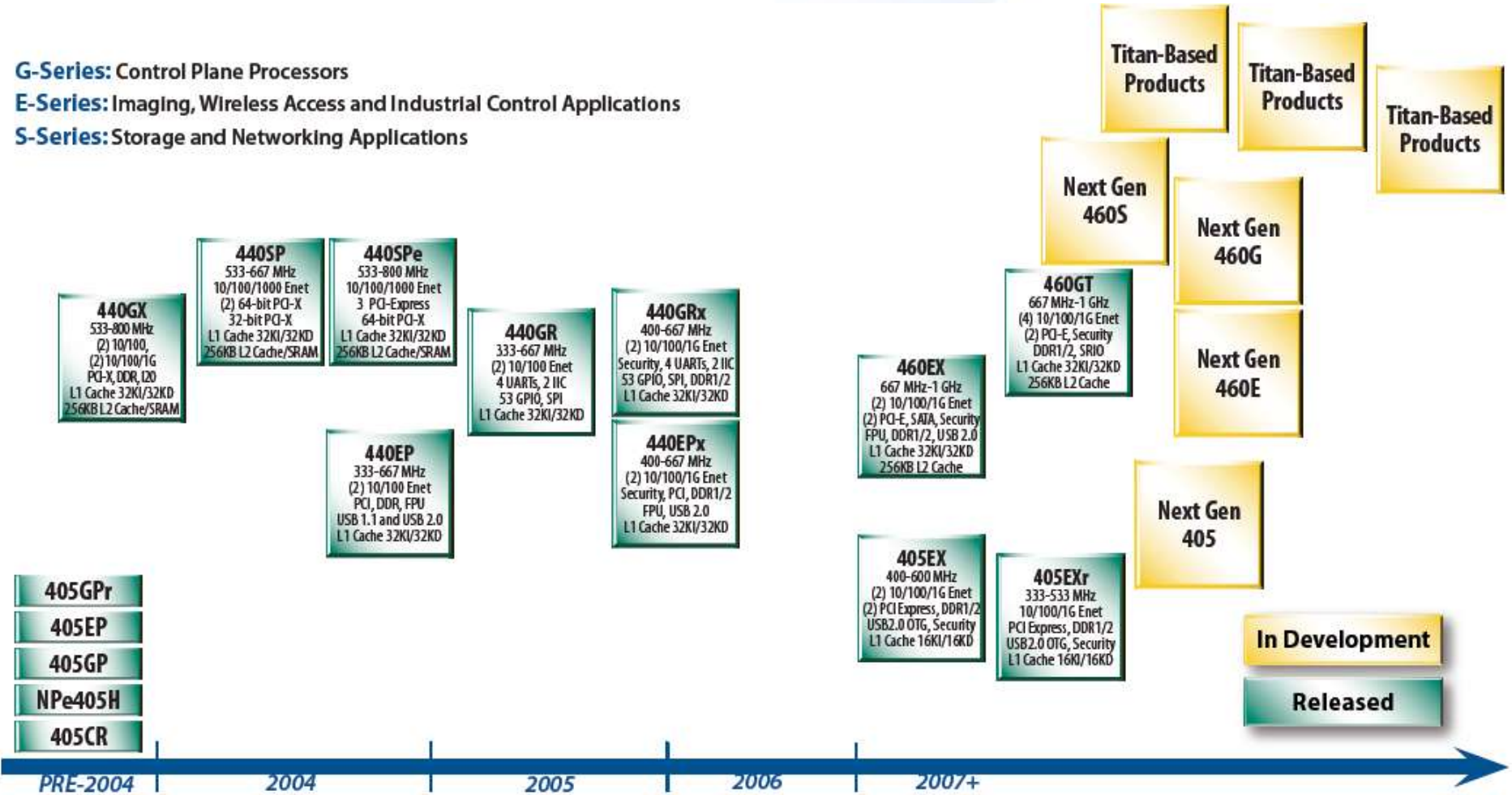


AMCC Processor Family

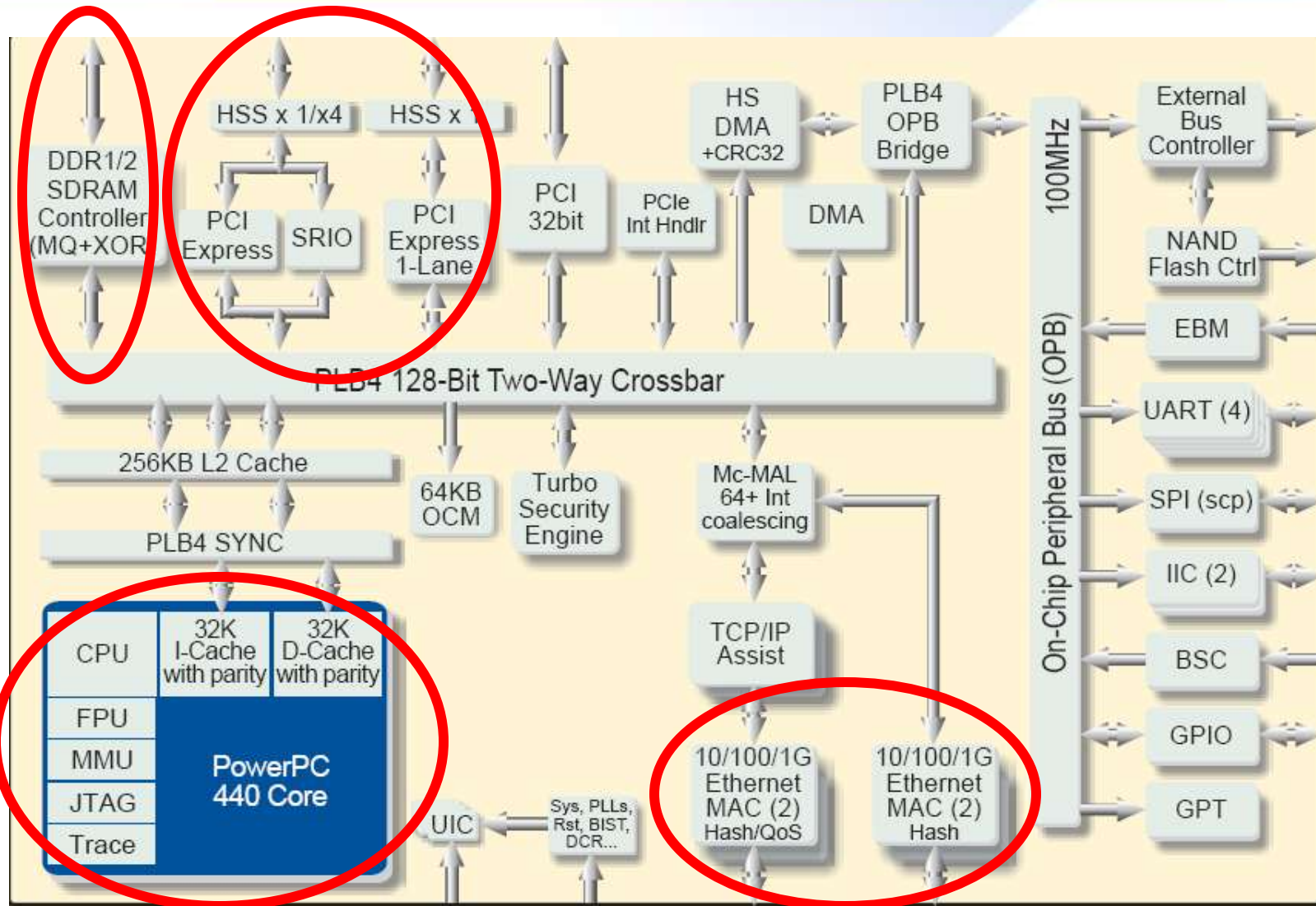
G-Series: Control Plane Processors

E-Series: Imaging, Wireless Access and Industrial Control Applications

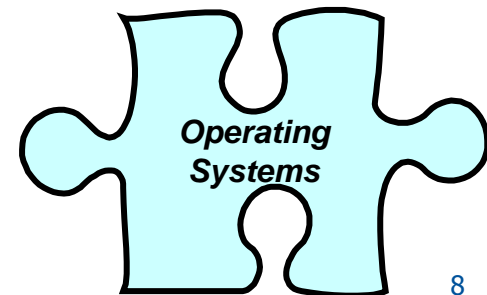
S-Series: Storage and Networking Applications



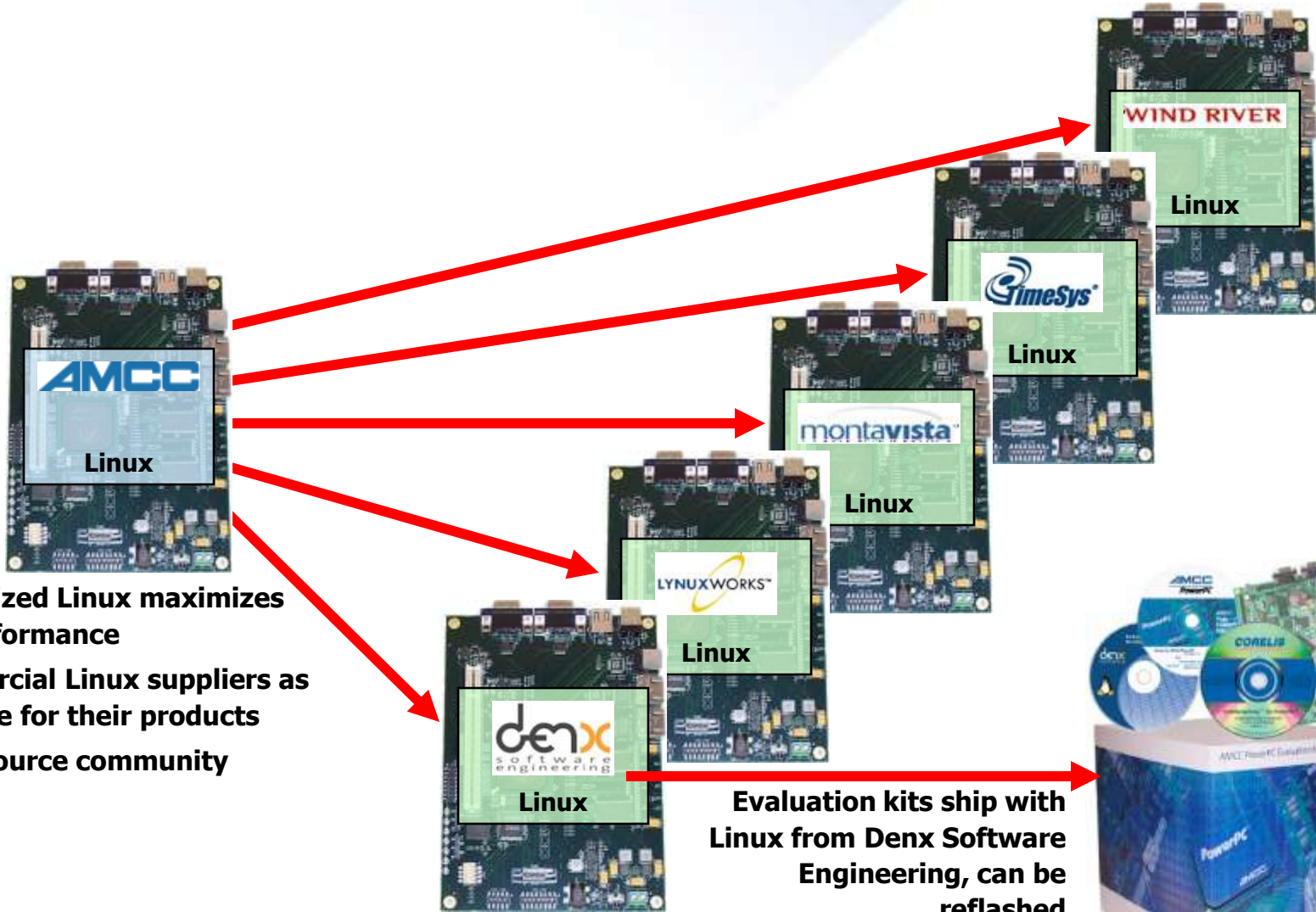
460GT: Ideal for Processor AMC Cards



- Wide range of operating systems are used in the embedded market
 - Linux
 - Roll-your-own / commercial supplier
 - Professional grade / carrier grade
 - Proprietary
 - VxWorks, Neutrino, OS/E, INTEGRITY, ThreadX etc



AMCC Directly Enables Commercial Linux Suppliers

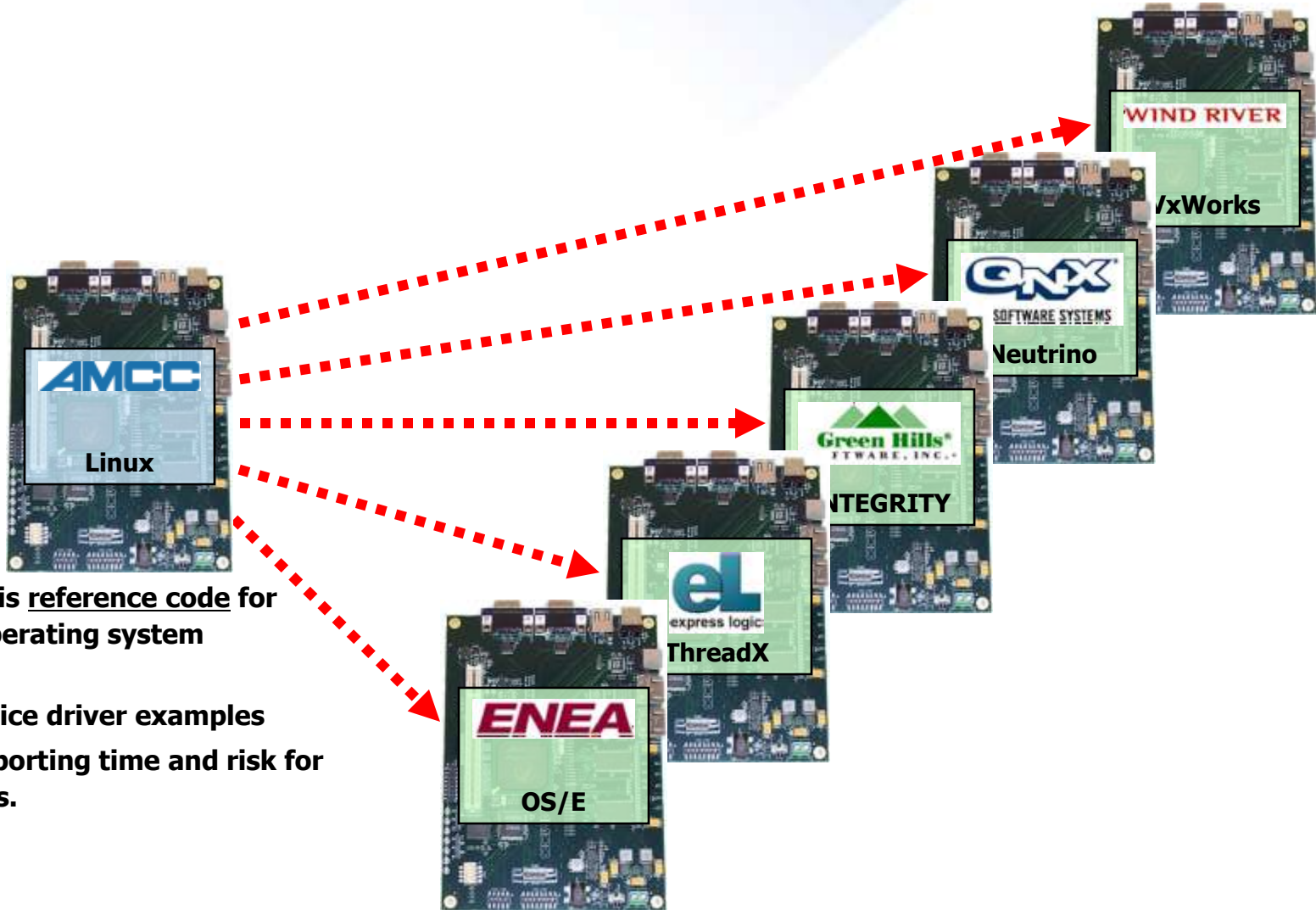


AMCC's optimized Linux maximizes processor performance

- For commercial Linux suppliers as the baseline for their products
- For open-source community

Evaluation kits ship with Linux from Denx Software Engineering, can be reflashed

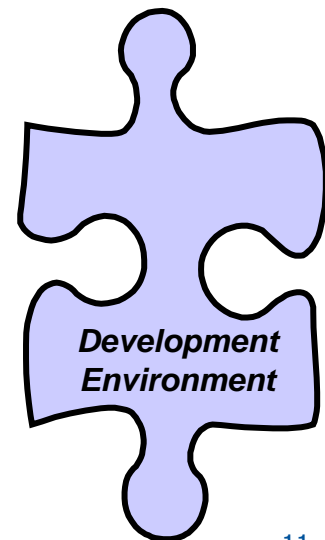
Reference Code for Proprietary OS Suppliers



AMCC's Linux is reference code for proprietary operating system suppliers

- Proven device driver examples
- Minimizes porting time and risk for OS partners.

- Comprehensive tools support is critical
 - Everyone has their own preferred tools suppliers
 - AMC developers, system integrators, end customers
 - Software development and debug tools
 - Hardware development tools: probes and analyzers
 - System configuration tools



- Software tools provided by operating system supplier
 - Denx, Enea, Express Logic, Green Hills, LynuxWorks, MontaVista, TimeSys, Wind River etc.
- Serial RapidIO configuration tools
 - FETCorp
- JTAG probes
 - Abatron, Green Hills, Lauterbach, Macraigor Systems, Wind River etc.
- Trace probes
 - Green Hills, Lauterbach, Wind River
- PCI-Express analyzers
 - LeCroy etc.

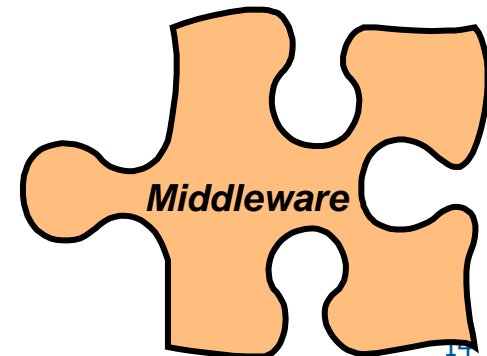
RapidFET Network Management Tool

The screenshot displays the RapidFET Professional software interface. On the left, a 'Network Browser' pane lists various registers and ports. The main window shows a network map with nodes connected by links. A yellow callout box highlights several features. On the right, a 'Traffic Efficiency - Node 3, Part 1' window shows three line graphs for Packet Rate, Average Packet Size, and Utilization. At the bottom, a 'Register Editor' window shows a table of registers.

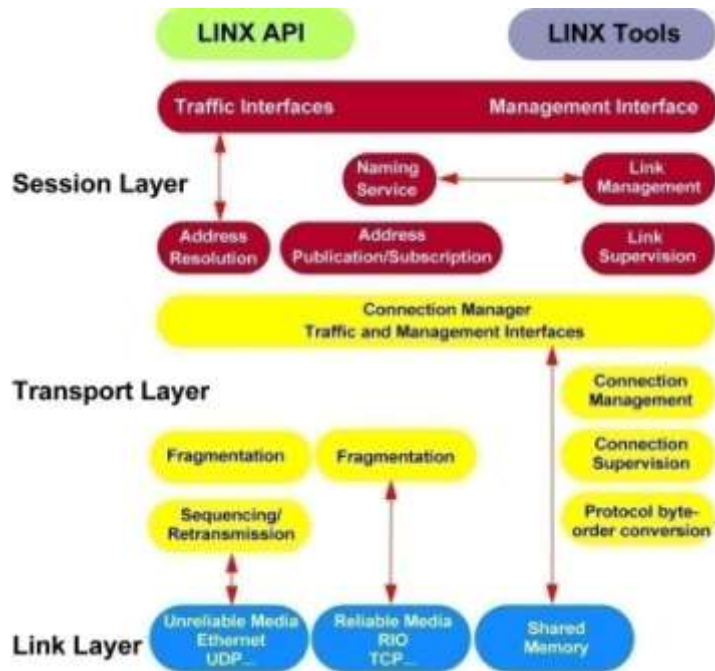
- **Interactive network map**
- **Initialize, discover and enumerate**
- **Monitor errors**
- **Monitor performance**
- **Visually edit registers**
- **Generate traffic**
- **Edit and visualize routing**
- **Log system faults**
- **Generate reports**

Register Name: Switch Port Information CSR	Register Offset: 0x10 (Word 1)								
Register Name: Switch Operations CSR	Register Offset: 0x10 (Word 1)								
Bit	0	1	2	3	4	5	6	7	
0001	Fast C	Fast to Slow Read C	Fast to Control C	Data Cache Snooping C	Control C	Data Cache Flush C	RD Read C	Instruction Cache Snooping C	
0000	TLP Inhibit Delay C	TLP Inhibit Error Delay C	Reserved						
0020	Bitland C	Write C	Streaming Write C	Write With Retention C	Data Memory C	Forward C	Reserved C	Always Read and Sleep C	
2401	Flow Control Handshake C	Monitor Performance C	Flow Control C	Monitor Clear C	Forward C	Packet With C	Flow Control Handshake C		

- Standard middleware packages available for AMCC processors support typical ATCA and microTCA applications
 - Carrier-grade networking (Afore)
 - High-availability platforms (Enea, GoAhead software)
 - Interprocessor communication (Enea, Wind River)
 - Security (SafeNet, TeamF1)
 - Storage (Wasabi Systems)

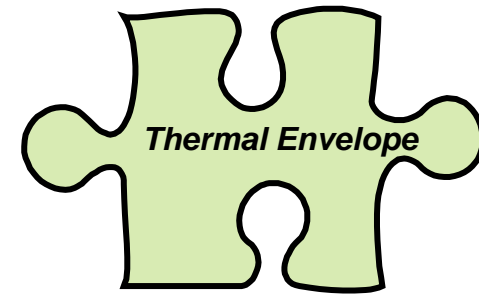


Industry Leading Components for System Development



- **LINX** open-source solution for distributed system IPC, which scales regardless of system topology
<http://sourceforge.net/projects/linux>.
- Architected for the performance required for high traffic bearing components
- Provides higher performance, ability to scale down to DSP devices, and addressing flexibility

- Power drives operating expense
- Power = heat
 - Constrains the environmental conditions in which a product can be used
- Heat drives complexity
 - Complexity drives product cost
 - Constrains the range of applications into which a product can be sold
 - Always-on operation precludes power management



- ✓ **Energy-saving designs**
- ✓ **Optimized for always-on systems**
- ✓ **High reliability for 5-nines applications**
- ✓ **Specified for complete SoC power, not just the core**



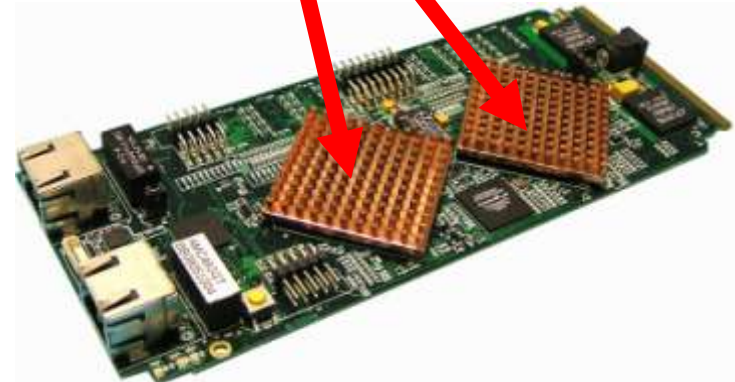
PowerPC 460GT

- **6W typical @ 1GHz**



One 1GHz processor under a full-size heatsink

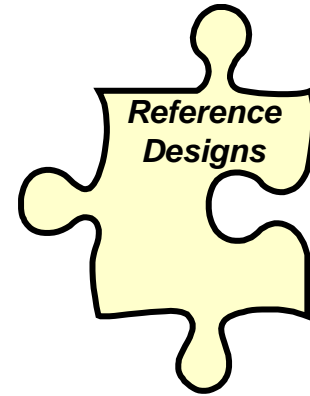
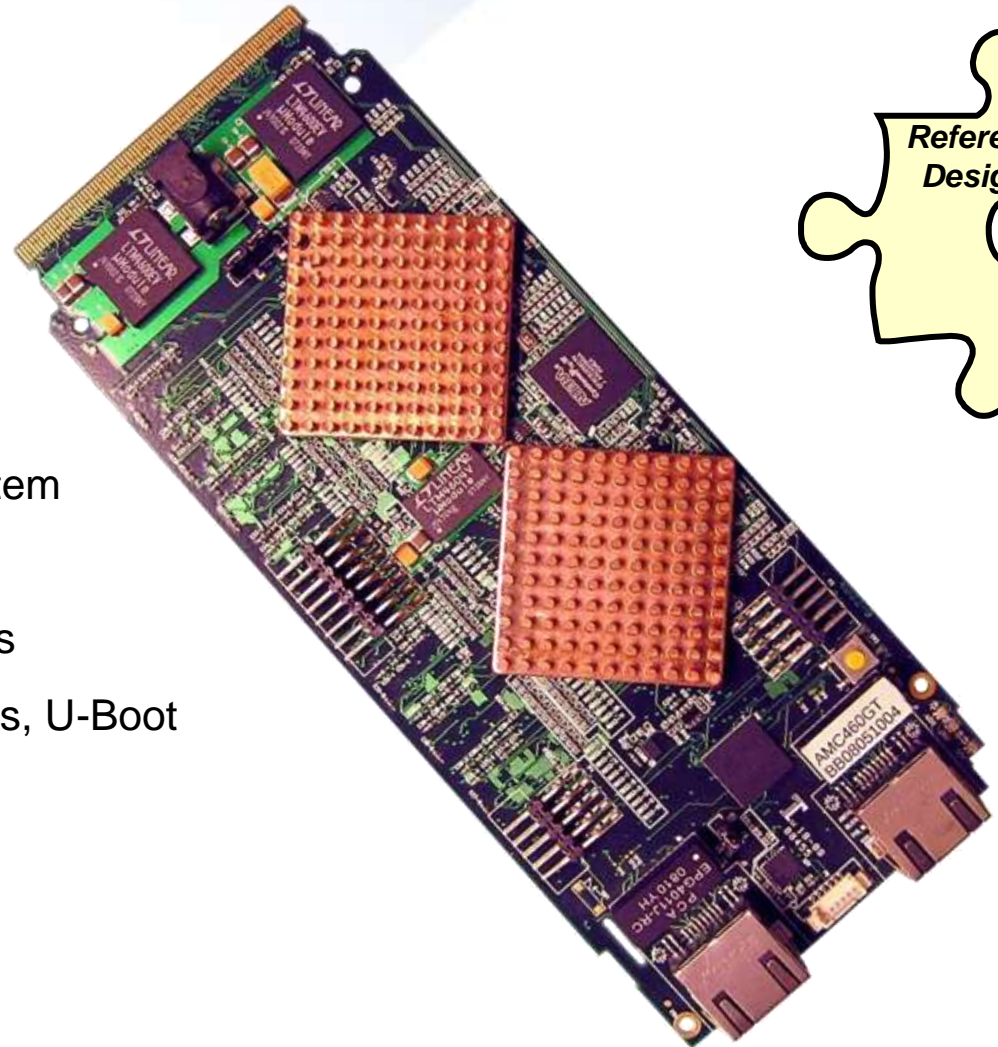
Similar compute power



Two 1GHz AMCC 460GT processors with small heatsinks

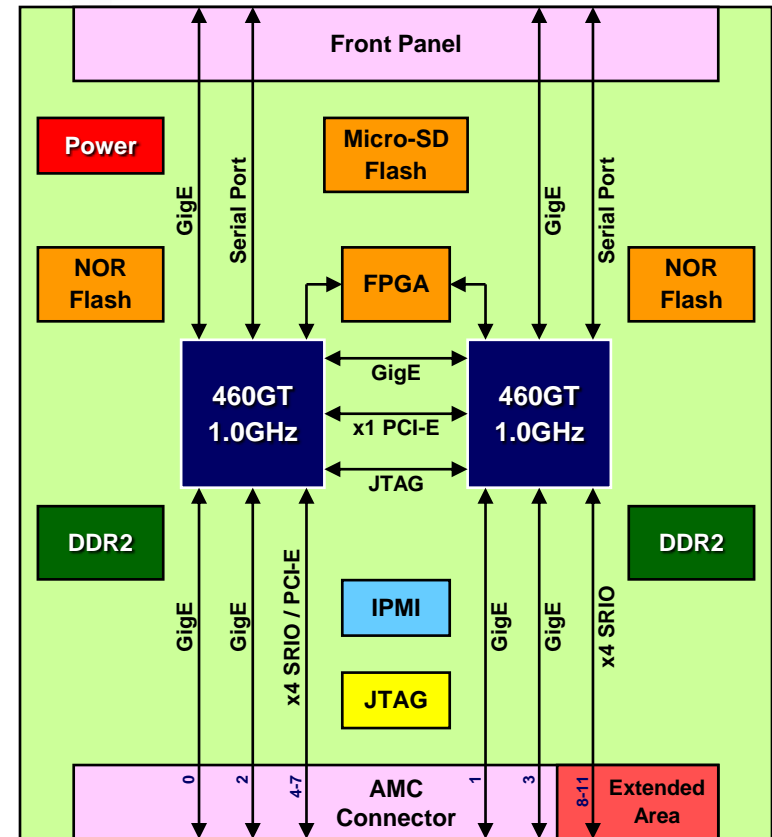
Comprehensive reference design for AdvancedTCA and MicroTCA systems

- AdvancedMC Compliant
 - Serial RapidIO (AMC.4)
 - Gigabit Ethernet (AMC.2)
 - PCI Express (AMC.1)
- Single width Mid-size form factor
- U-Boot firmware, Linux operating system
- Linux software development tools
- Industry leading development partners
- Includes board schematics, layout files, U-Boot and Linux source
- Commercially available solution



Comprehensive reference design for AdvancedTCA and MicroTCA systems

- Dual 1.0GHz 460GT processors
- Two 512MB DDR2 Memory subsystems with ECC
- Two 64MB NOR Flashes
- Shared 1GB MicroSD Flash
- Front Panel
 - Two Serial Ports
 - Two 10/100/1G Ethernet Ports
- AMC Connector
 - Four 10/100/1G Ethernet Ports
 - x1/x4 Serial RapidIO
 - PCI-Express/x1/x4 Serial RapidIO Port



Designed by Silicon Turnkey Express

Arches Kit Contents

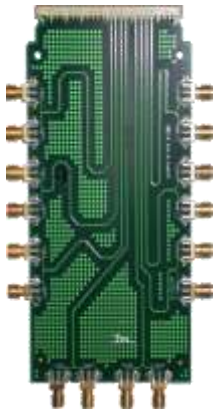
- Dual 460GT AMC
- LINUX, an open-source solution for Inter-Process Communication
- Supports RapidFET™, a network management and diagnostic tool
- Resource CD with benchmarks, sample applications, and comprehensive documentation
- Industry-standard U-Boot firmware and Linux operating system
- Software development tools CDs from industry-leading suppliers
- Serial cable provides direct connection to the host system
- Ethernet crossover cable for direct connection to the host
- On-board JTAG connector enables connection of any compatible external JTAG probe for run-control debugging
- Universal 120-240 V power adapter
- Board schematics, layout files, U-Boot source and Linux source





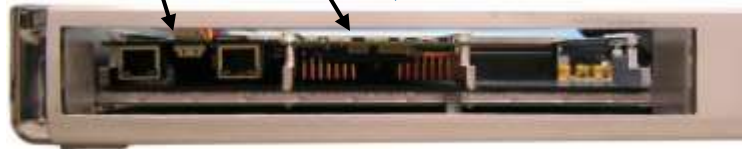
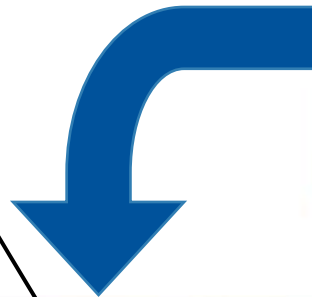
**Infiniband
Cable**

AMCSMA
AMC to 16 SMA



Arches

AMC70K2000
Quad TI DSP



SRDP

Tundra Switch Carrier

<http://www.amcc.com/Embedded/Downloads/Arches/>

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Arches - Dual 460GT AMC Reference Design Kit

Comprehensive reference design kit for AdvancedTCA and MicroTCA systems, including industry-standard hardware and software solutions

- Dual 460GT processor based design
- AdvancedMC Compliant
 - Serial RapidIO (AMC 4)
 - Gigabit Ethernet (AMC 2)
 - PCI Express (AMC 1)
- Single width Mid-size form factor
- Includes LINK, an open-source solution for distributed system Inter-Process Communication that is platform/interconnect independent
- Supports RapidFET™, a network management and diagnostic tool with a powerful graphical user interface (GUI) for RapidIO-based systems
- Commercially available solution

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Download Product Brief

Overview Sample Applications and Utilities Partners Board Specs Processor Specs Downloads

Product Overview

The AMCC Arches reference design kit provides users with a solution which allows for quicker time to market and thus a quicker time to revenue. The Arches AMC Card, incorporating the industry standard Linux operating system and U-Boot firmware, is a comprehensive reference design kit specifically for AdvancedTCA and MicroTCA systems. The AMC card schematics and layout files for the reference design kit are available so that customers can customize their designs from a proven baseline. In addition, cards are available as a commercial off the shelf

- AMCC working with partners provides complete solutions to address the challenges in the Wireless Infrastructure market
- AMCC 460GT processor is in production and offers lower power/MIPS than competitors
- Arches reference design kits (RD-460GT-AMC-01) are available
- Kit cost is \$2995
- More Information can be found at

<http://www.amcc.com/Embedded/Downloads/Arches/>

Questions and Answer