

Embedded Processors: Present and Future

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Processor Classification

- Processor market is divided into three main segments;
 - High Performance Processors
 - Server and Desktop Processors
 - Embedded Processors
- Difficult to define boundaries between these segments
- Boundaries are being pushed upwards

A glimpse in to the “near” future



Cool Products



BlackBerry Bold
Marvell "Tavor" PXA930
ARM Architecture Based – Xscale processor



Innovations for learning - Teachermate
ARM9 Processor



D-Link DNS323 Network Storage Enclosure
Marvell 88F5181 Soc – ARM9 processor



Sonosite MTurbo (Portable Ultrasound Device)
Texas Instruments TMS320DM644x - ARM926 Processor



iRiver Unit 2 Multimedia Home Networking device
Telechips and Samsung – ARM9E + ARM11 Processors



Samsung SMT-H30560 Cable STB
Conexant CX2417X – ARM920T Processor



Embedded Automation – mPanel (Digital Home Device)
ARM architecture-based – Marvel XScale



Sunlink International - SunView PMP + Projector
Samsung S3C244A – ARM9 Processor



Garmin Nuvi 205
ST Cartesio Processor - ARM926



Everex Cloudbook UMPC
GCT Semiconductor – ARM9 Processor



Importek Apollo VoIP Video Phone
ARM9 + Marvell Xscale processor



Thomson WiFi Tablet
TI DaVinci TMS320DM6441 – ARM926EJ-S



Artega - Artega GT (Dual-Dashboard Display)
Fujitsu MB86R01 "Jade" graphics controller
ARM926EJ-s + Jazelle Java Acceleration Technology



VivoPay – Vivo Kiosk
ARM Powered



iRiver NV Life PMP
Magic Eyes - ARM926EJ +
ARM946E



Custom Engineering - TK300II Desktop Ticket Printer
ARM Processor (266MHz)



Classification of Embedded Applications

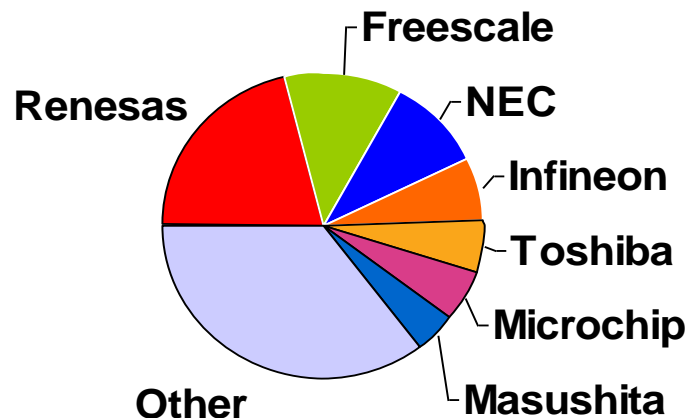


Challenges for the embedded processors

- Extremely Price sensitive market
- Low power design is a must
- No compromise on performance
- What is the average price of an average embedded processor?
- Hardware has become a commodity...

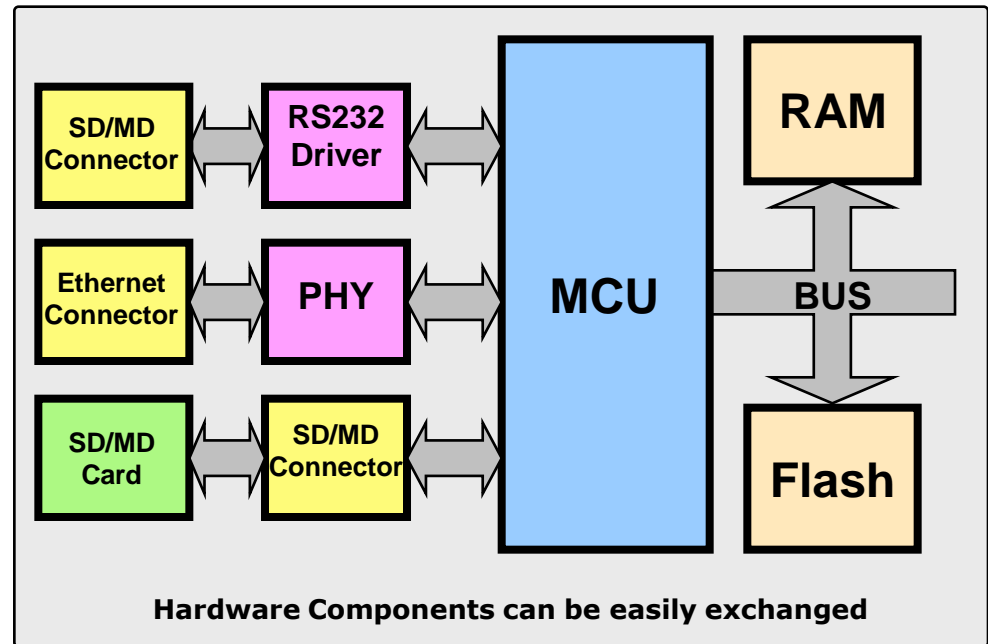
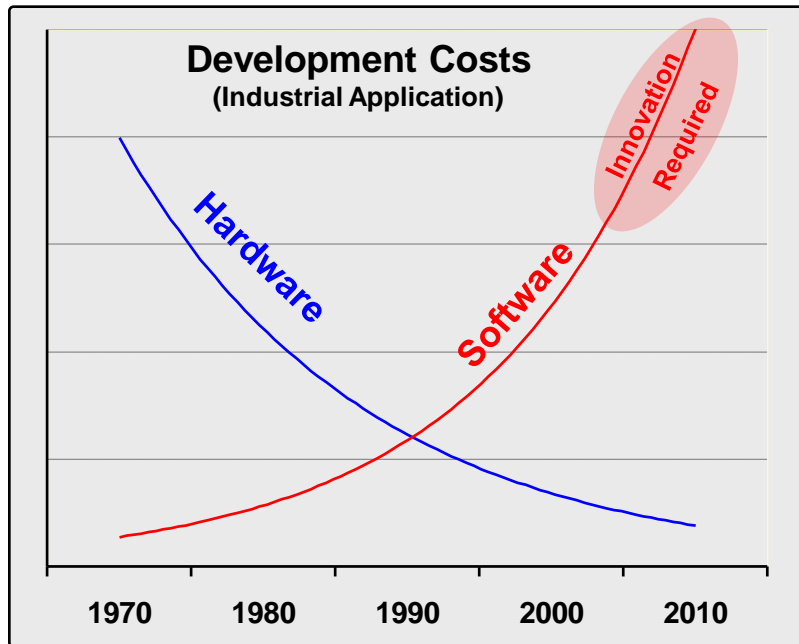
But the biggest challenge is...

2006 Standard MCU Market Share



- **What would happen in the Desktop Computer Software industry if..**
 - Every new PC used a different CPU architecture
 - You had to maintain different compilers for every new PC

Software Complexity – The Challenge



- Well-known issues that drive software costs
 - Increasing product requirements that are implemented by software
 - Hardware problems tend to become compensated by software
- Up to now software components cannot be easily exchanged

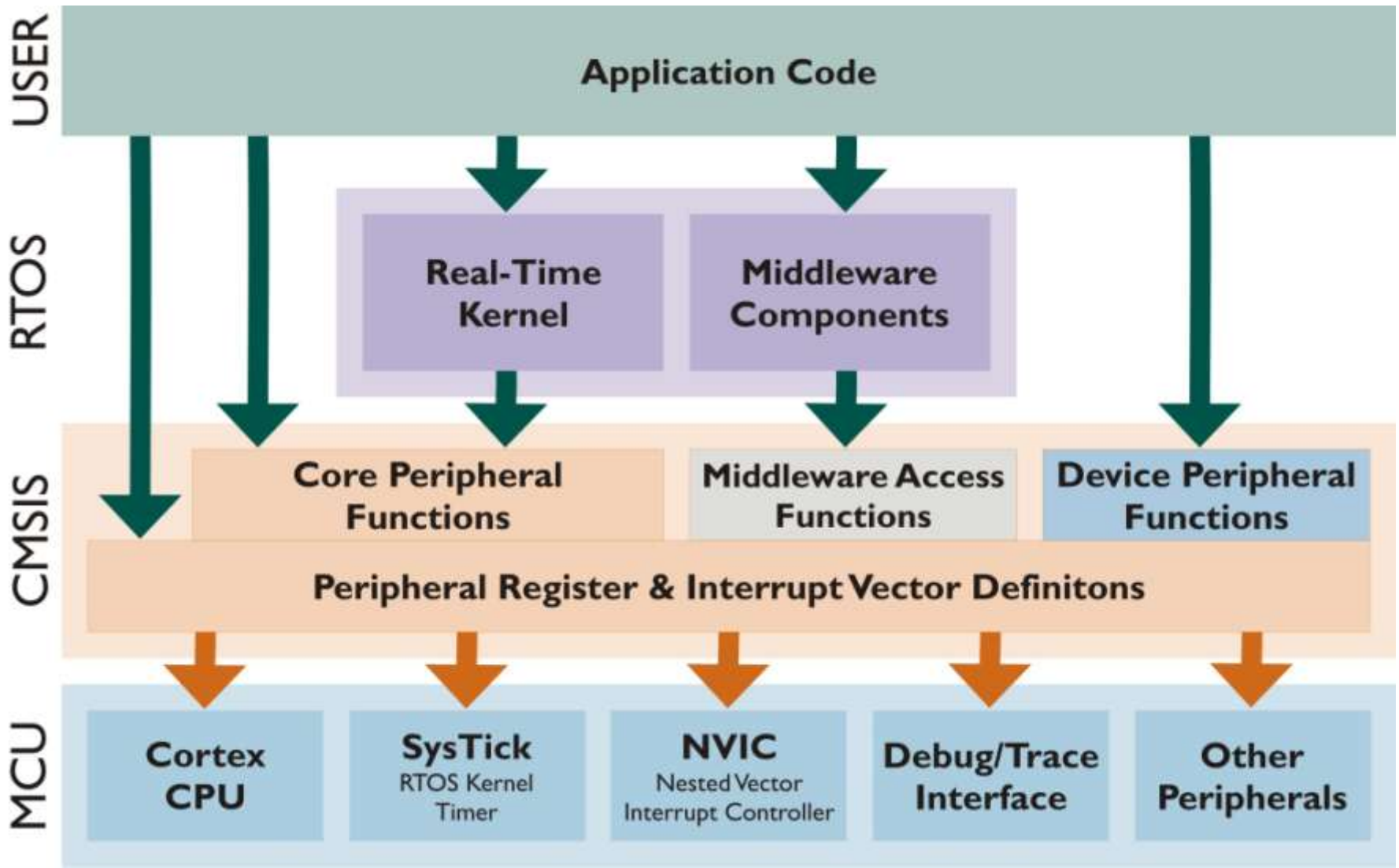
A Microcontroller Software Interface Standard is Required!

CMSIS – Abstract

The Cortex Microcontroller Software Interface Standard (CMSIS) enables deployment of software components to physical Microcontroller Devices.

- **CMSIS Peripheral Access Layer** defines
 - Consistent layout to all peripheral registers
 - Vector definitions for all exceptions and interrupts
 - Functions to access core registers and core peripherals
 - Device independent interface for RTOS Kernels
 - Debug channel (for printf-style + RTOS Kernel)
- **CMSIS Middleware Access Layer** provides
 - Common methods to access communication peripherals
- **CMSIS** compliant software components allow
 - Easy reuse of example applications or template code
 - Combination of software components from multiple vendors

CMSIS – Structure



Conclusion

- Hardware has become a commodity
- Industry expects / assumes faster and more power efficient processors every year
- Software compatibility holds the key

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