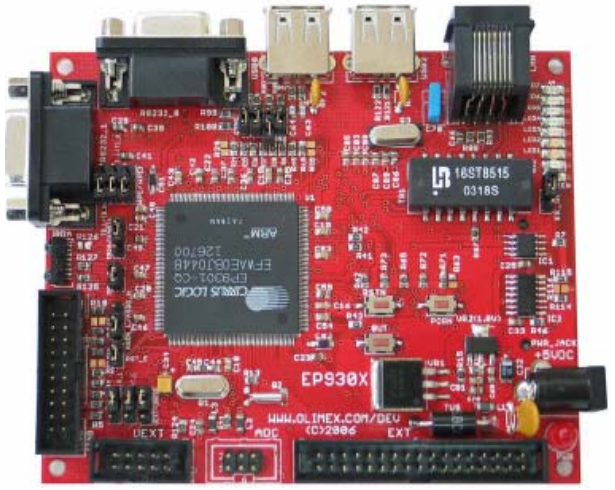
Embedded System Current Trends

Definition…

Difficult to define in current scenario….

- These are the computing systems which are used in electronic devices for specific purpose.
- Any computing system other then a Desktop PC.



Definition…

Processor based system …

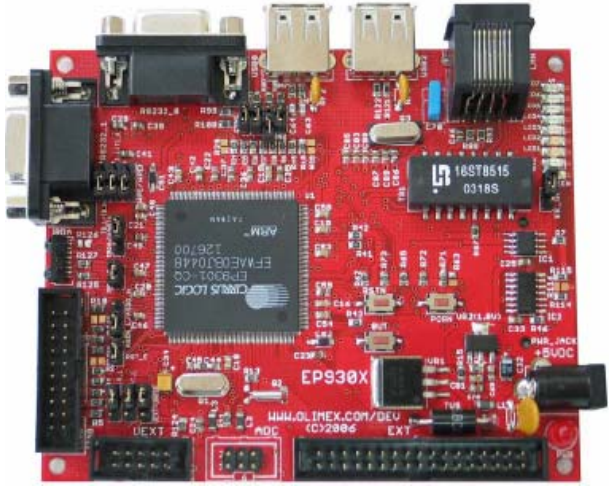
1. General Purpose Systems
2. Embedded System

General Purpose Systems

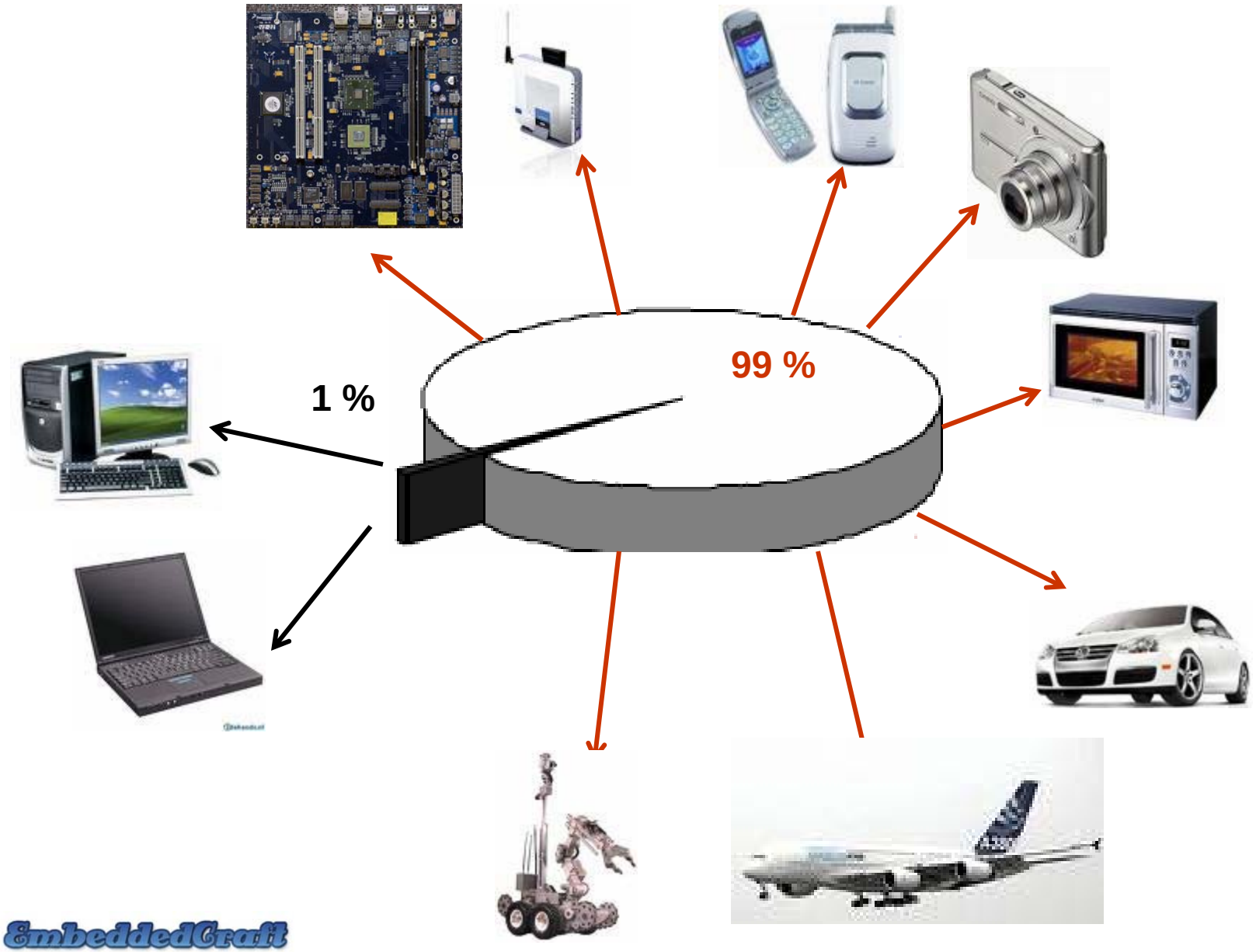
Like Desktop PC, Laptop etc.

Embedded System

Special purpose system which are either used as standalone or part of a big system.



General Purpose vs special purpose



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Characteristics of Embedded Systems

- **Single Function**
- **Complex functionality**
  - Complex algorithms used in mobile phone etc
- **Full of constraints**
  - Limited Memory, Low Cost, Less Power Consumptions
- **Real time performance**
- **Safety Critical**
  - Aircraft, Lifts, Space shuttle, Medical Instruments

Market of Embedded Systems

AUTOMOTIVE
Ignition System
Engine Control
Brake System

Medical
Infusion Pumps
Dialysis Machine
Prosthetic Device
Cardiac Monitor

Networking
Router
Hubs
Gateways

CONSUMER ELECTRONICS
TV
Set-top Box
PDA
Kitchen Appliances
Toys/Games
Telephone/Cell phones
Camera/GPS

Industrial Control
Robotics
Control System
Various Cards
Art. Satellites
Missiles
Nuclear Reactors
Space Stations
Shuttles

Office Automation
Fax
Copier
Printers
Scanners
Card Readers
Monitors

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Heart of Embedded System…

- Off course **MICROCONTROLLER**

Microcontroller Definition

A microcontroller is a computer-on-a-chip optimized to control electronic devices. It is a type of microprocessor emphasizing self-sufficiency and cost-effectiveness, in contrast to a general-purpose microprocessor, the kind used in a PC. A typical microcontroller contains all the memory and I/O interfaces needed, whereas a general purpose microprocessor requires additional chips to provide these necessary functions -Wikipedia

Microcontroller 1970's ……..today

The first microprocessor was developed by what was then a small company called Intel (short for **Integrated Electronics**) in the early 1970s.

The client, a Japanese company called **Busicon**, declined to buy the chipset and Intel, faced with a development cost and no customer, decided to market the chipset as a "general purpose" microprocessing system for use in applications where digital logic chips would have been used.

The chipset was a success and within a short while Intel developed a general purpose 4 bit microprocessor called the 4004.

► http://www.computerhistory.org/semiconductor/timeline.html#1970s

Microcontroller 1970's ……today

YEAR INTEL MAKE

1974 = 8008
= 8080 (+5 V operation)
= 8085
= 8086 (16 bit ….)
= 80186
= 80196 …

Motorola (freescale)

= 6800 (features as 8080)
= HC12 (16 bit…)
= HC16

= 68K
= PowerPC
= MCORE

Microcontroller 1970's ……..……today

8080 Vs 6800

Intel	Motorola (freescale)
8048	6800 (features as 8080)
8085	Zilog
80186	Z80 etc

Microcontroller ……today

Power (PowerPC), ColdFire, MCORE,

ARM7, ARM9, ARM11, Cortex, SecureCore, OptimoDE Data Engine

MSP430, DaVinci, OMAP

PICmicro, dsPIC, PIC32

AVR, 8051, SAM(ARM), AVR32

Others…

32-bit Microcontrollers and Processors - Mozilla Firefox

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http://www.freescale.com/webapp/sps/site/homepage.jsp?nodeId=0162468rH3&tid=FSH

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- 32-bit Automotive
- 68K/ColdFire
- ARM
- MCORE
- Power Architecture Processors
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Product Selector

Search By Parameter

- Bus Frequency - Max (MHz)
  - 0 to 9.9 - (2)
  - 10 to 24.9 - (14)
  - 25 to 39.9 - (23)
  - 40 to 54.9 - (54)
  - 55 to 79.9 - (47)
  - 80 to 99.9 - (12)
  - 100 to 300 - (33)
- Internal Flash(Byte)
  - 0 to 11000 - (4)
  - 12000 to 23000 - (1)

Freescale ▸ 32-bit Microcontrollers and Processors

32-bit Microcontrollers and Processors

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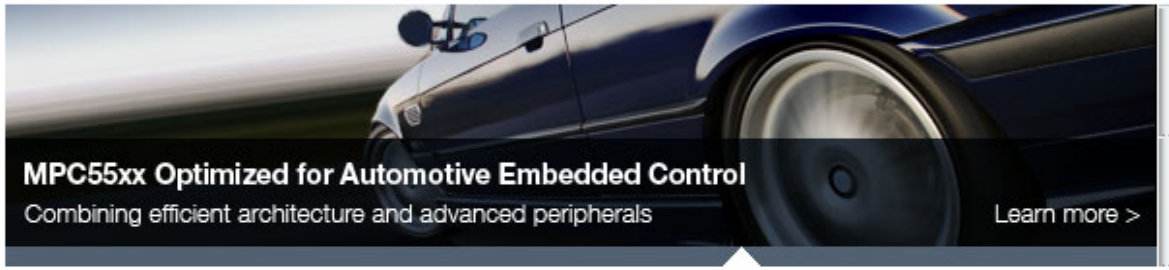

▸ Innovative Green Design
Register for the FTF Design Challenge >

▸ 32-bit Ethernet Solutions
Enabling cost-effective connectivity >

Our 32-bit processor portfolio continues a rich legacy of innovation - and it sets the standard for tomorrow's control-intensive applications across a diverse mix of industries. So when your applications require control, power and intelligence, count on Freescale.

▸ Power Architecture™ Processors

Power Architecture technology provides exceptional performance and superb precision. That's why we offer the broadest portfolio of processors built on Power Architecture technology, including our top-selling PowerQUICC™ processors. Whether you want to design a high-end computing application or a precise automotive application, you'll find the performance and integration expertise you need with Freescale's Power Architecture processors.

▸ 68K/ColdFire

Aggressive pricing and performance are in high demand, which is why we engineered the 68K/ColdFire family. This natural extension of our 8- and 16-bit portfolio gives you the freedom to design with power, control and flexibility - all at a low cost.

▸ ARM® Processors

Freescale's ARM-based processors offer low component count, long battery life and exceptional performance. From multimedia entertainment to file sharing, our i.MX family of application processors delivers. With i.MX, rich multimedia experiences spring to life. Plus, i.MX's renowned integration can help you speed through development.

▸ MCORE Processors

It's reliable and it's proven. The MCORE processor is known in the market for delivering reduced power consumption. Designed for high-performance and cost-sensitive control applications, its uses include portable and mobile battery-operated products.

ARM Processor Families - Mozilla Firefox

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http://arm.com/products/CPUs/families.html

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Processor Families

ASK ARM

With performance up to 2000 MIPS with the Cortex™-A8 processor, power consumption figures measured in microwatts per Megahertz, the industry's broadest feature set, and full architectural compatibility, the ARM processor range provides solutions for open platforms in wireless, consumer and imaging applications, embedded real-time systems for storage, automotive, industrial and networking applications, and secure applications for smart cards and SIM cards.

There are currently eight product families which make up the ARM processor range:

- ARM7 processor family
- ARM9 processor family
- ARM9E processor family
- ARM10E processor family
- ARM11 processor family
- Cortex processor family
- SecurCore processor family
- OptimoDE Data Engines

Further implementations of the ARM architecture are available from our Partners such as the Intel® XScale™ microarchitecture

Market of Embedded Systems

AUTOMOTIVE
m
ol
m

Medical
Infusion Pumps
Dialysis Machine
Prosthetic Device
Cardiac Monitor

ARM
ColdFire
8051
AVR
MSP430

Networking
Router
Hubs
Gateways

ARM **POWER QUICC**

EmbeddedCraft

CONSUMER ELECTRONICS
TV

Office Automation
Fax
Copier
Printers
Scanners
Card Readers
Monitors

ARM
POWER QUICC
8051
AVR
MSP430
DaVinci

Industrial Control
Robotics
Control System
Various Cards
Art. Satellites
Missiles
Nuclear Reactors
Space Stations
Shuttles

freescale™ semiconductor

Power Architecture Processors - Mozilla Firefox

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http://www.freescale.com/webapp/sps/site/homepage.jsp?nodeId=0162468rH3bTdG

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Enter Part Number

Enter Keyword

- Power Architecture Processors
- Automotive Controllers (5xx/5xxx)
- Host Processors (7xxx, 7xx, 6xx)
- Integrated Host Processors (8xxx)
- PowerQUICC Communications Processors
- Imaging
- Passive Optical Networking
- Freescale's Multi-core Platform
- PowerQUICC Industrial Development Platform
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- Documentation
- Software & Tools
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Freescale ▸ Power Architecture Processors

Power Architecture Processors

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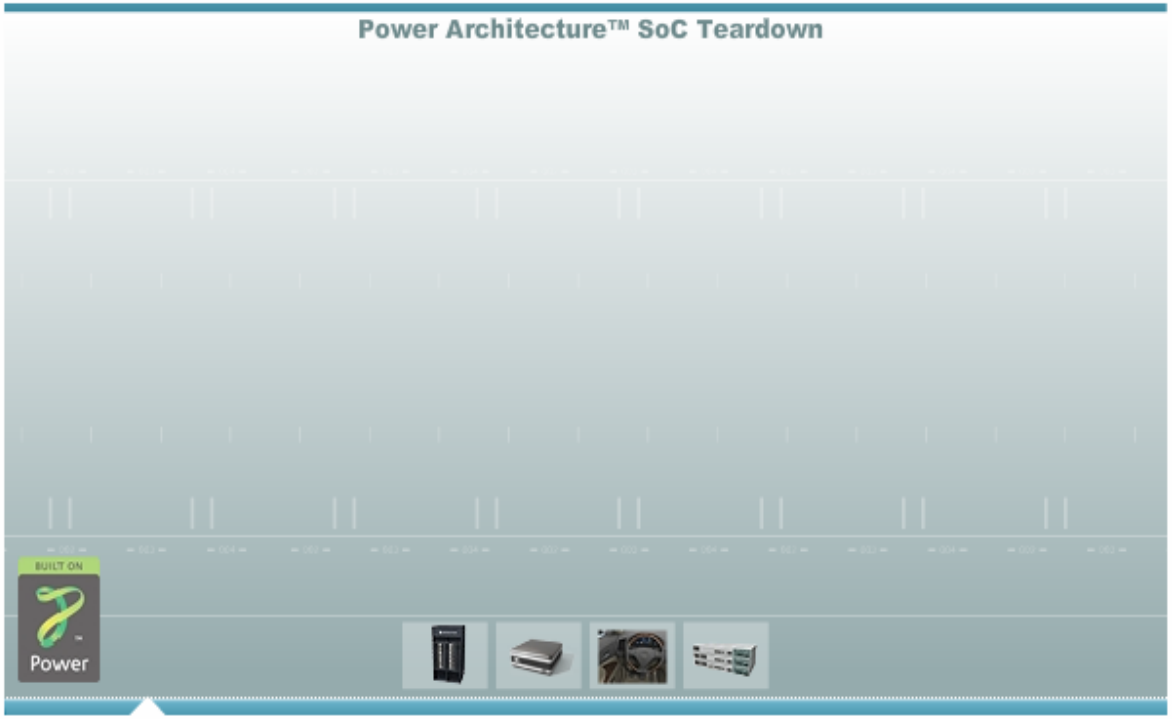

Power Architecture™ Products and Markets

Freescale offers the broadest portfolio of processors built on Power Architecture™ technology in the world, enabling applications in networking, automotive, consumer and industrial control.

Automotive	Consumer	Industrial	Networking
MPC5XX	MPC51XX	MPC5XX	MPC603e
MPC51XX	MPC52XX	MPC51XX	MPC7XX
MPC52XX	MPC7XXX	MPC52XX	MPC7XXX

Featured Products

- MPC512X 32-bit Embedded Processor
- MPC8544E PowerQUICC Processor
- MPC8313E PowerQUICC II Pro Processor
- MPC8572 PowerQUICC III Processor
- MPC5567 Automotive Microcontroller

Development Platforms

- MPC8349E-mITX Office-in-a-Box Platform
- MPC8349E-mITX Media Server-in-a-Box Platform
- MPC8349E-mITX Digital Home Center Platform

LRTV Video Link

See what Light Reading TV has to Say About Power Architecture

General Information

- Power Architecture Portfolio Brochure
- Freescale's Power Architecture

ARM Processor Selector - Mozilla Firefox

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http://arm.com/products/CPUs/core_selector.html

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products & solutions

Processor Selector

ASK ARM

ARM offers a broad range of processors to address a wide variety of applications while delivering optimum performance, power consumption and system cost. these processors are designed to meet the needs of three system categories:

Embedded real-time systems

- Embedded real-time systems for storage, automotive body and power-train, industrial and networking applications

Application platforms

- Devices running open operating systems including Linux, Palm OS, Symbian OS and Windows CE in wireless, consumer entertainment and digital imaging applications

Secure applications

- Smart cards, SIM cards and payment terminals

ARM CPU processors cover a wide range of performance and features enabling system designers to create solutions that meet their precise requirements. ARM offers both synthesisable and hard macro products, together with a range of coprocessors and debug facilities . The table below provides an at-a-glance guide to ARM processors and their performance characteristics, with links to each.

ARM CPU PROCESSORS


ARM Processor Overview - Mozilla Firefox
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http://arm.com/products/CPUs/index.html
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» Fabric IP
» Graphics Solutions
» On-chip Debug & Trace
» Physical IP
» Processors
Processor Overview
Processor Selector
Processor Families
Architecture
Reference Methodology
Performance Packages
Application Processors
Embedded Processors
» Data Engines
» Operating System Support
» Security Solutions
» Licensing
» Markets
» Books
power consumption and system cost.
The ARM processor range provides solutions for:
Open platforms running complex operating systems for wireless, consumer and imaging applications.
Embedded real-time systems for mass storage, automotive, industrial and networking applications.
Secure applications including smart cards and SIMs.
The Processor Selection Guide lists the key features of each ARM processor. The ARM Connected Community now provides a wealth of standard development tools, operating systems, optimized application software, and design services which together ensure rapid time to market for ARM processor-based designs.
PROCESSORS RANGE
ARM offers a wide range of processor cores based on a common architecture, that deliver high performance together with low power consumption and system cost.
Application Processors
ARM Cortex-A8
ARM Cortex-A9 MPCore
ARM Cortex-A9 Single Core Processor
ARM1020E
ARM1022E
ARM1026EJ-S
ARM11 MPCore
ARM1136J(F)-S
ARM1176JZ(F)-S
ARM720T
ARM920T
ARM922T
ARM926EJ-S
Embedded Processors
ARM Cortex-M1
ARM Cortex-M3
ARM Cortex-R4(F)
ARM1026EJ-S
ARM1156T2(F)-S
ARM7EJ-S
ARM7TDMI
ARM7TDMI-S
ARM946E-S
ARM966E-S
ARM968E-S
ARM996HS
SecurCores
SecurCore SC100
SecurCore SC200
Other ARM Websites | Help with Accessibility
Glossary | Sitemap | Help
LEGAL STATEMENT

8051 Architecture from Atmel - Mozilla Firefox

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http://atmel.com/products/8051/

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Product / 8051 Architecture

8051 Architecture

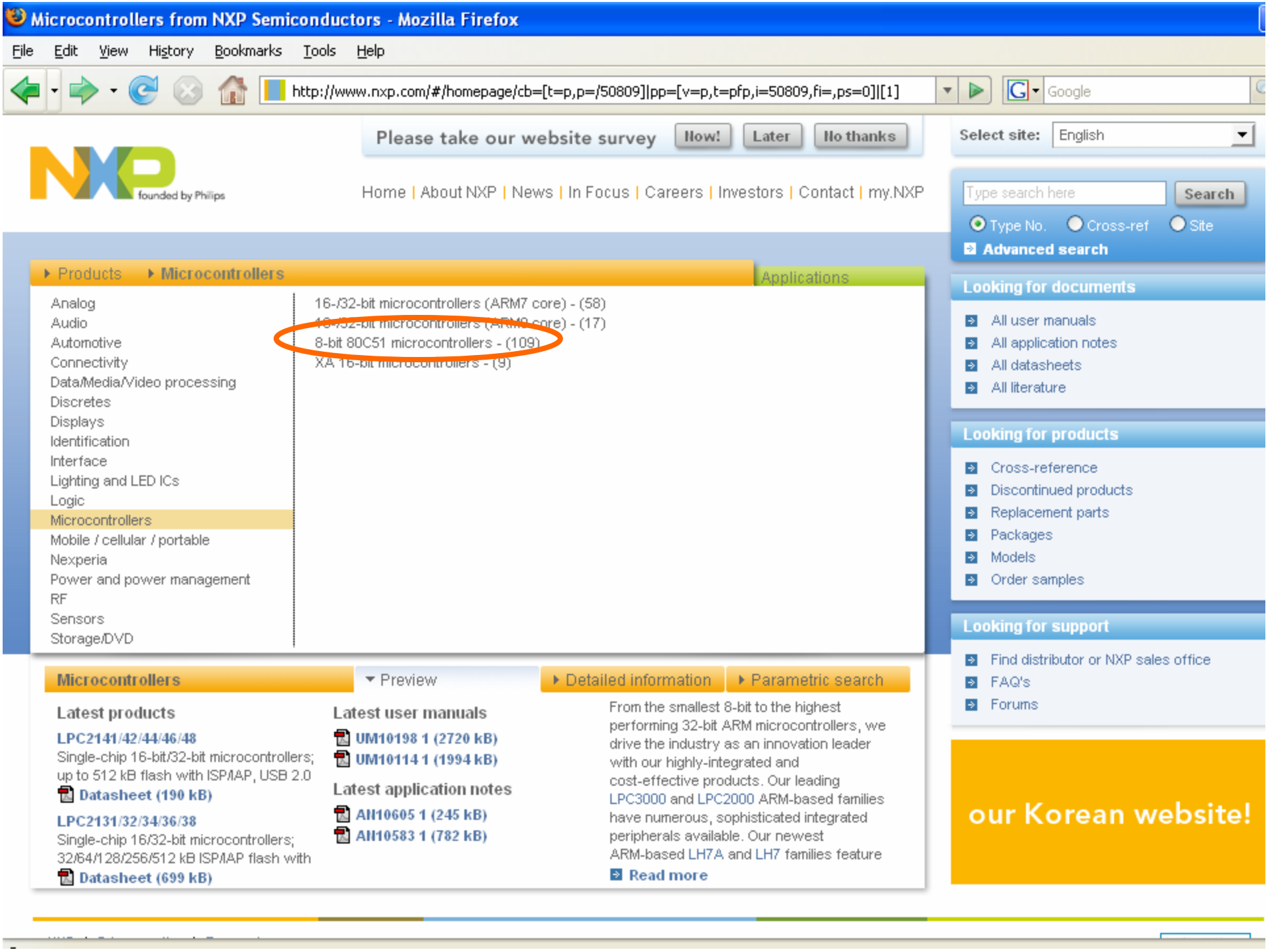
Atmel offers a broad range of microcontrollers based on the 8051 architecture. The product line includes MCS-51® industry standard socket drop-in devices, In-System Programming capability, and small footprint 20-pin derivatives in ROMless, ROM, OTP & Flash flavors (see on-line selection table). Some of the devices also take advantage of the high-speed core (X2) mode which doubles the internal clock frequency for CPU and peripherals upon selection.

The 8051 derivatives also include Application Specific Products with specialized functions to serve dedicated markets:

- CAN Networking
- MP3 Applications
- Smart Card Readers
- USB Applications

Atmel also offers 8/16 bit microcontrollers based on the powerful C251 architecture. Our C251 devices allow a direct and easy performance increase by upgrading existing 80C51-based applications.

March 07, 2007
Atmel Introduces 8051 Microcontrollers For High Volume USB Applications


Microcontrollers from NXP Semiconductors - Mozilla Firefox
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Automotive
Connectivity
Data/Media/Video processing
Discretes
Displays
Identification
Interface
Lighting and LED ICs
Logic
Microcontrollers
Mobile / cellular / portable
Nexperia
Power and power management
RF
Sensors
Storage/DVD
16-/32-bit microcontrollers (ARM7 core) - (58)
8-bit 80C51 microcontrollers - (109)
Looking for documents
All user manuals
All application notes
All datasheets
All literature
Looking for products
Cross-reference
Discontinued products
Replacement parts
Packages
Models
Order samples
Looking for support
Find distributor or NXP sales office
FAQ's
Forums
Microcontrollers
Preview
Detailed information
Parametric search
Latest products
LPC2141/42/44/46/48
Single-chip 16-bit/32-bit microcontrollers; up to 512 kB flash with ISP/IAP, USB 2.0
Datasheet (190 kB)
LPC2131/32/34/36/38
Single-chip 16/32-bit microcontrollers; 32/64/128/256/512 kB ISP/IAP flash with
Datasheet (699 kB)
Latest user manuals
UM10198 1 (2720 kB)
UM10114 1 (1994 kB)
Latest application notes
AN10605 1 (245 kB)
AN10583 1 (782 kB)
From the smallest 8-bit to the highest performing 32-bit ARM microcontrollers, we drive the industry as an innovation leader with our highly-integrated and cost-effective products. Our leading LPC3000 and LPC2000 ARM-based families have numerous, sophisticated integrated peripherals available. Our newest ARM-based LH7A and LH7 families feature
Read more
our Korean website!

Embedded System Development

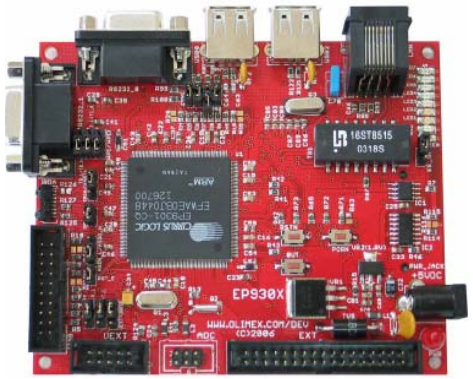
- Cross platform development
- Debug in target, which is separate Hardware
- Limited visibility

Cross Platform Development…

- code is developed on one platform
  but will execute on different platform

Coding, Compilation

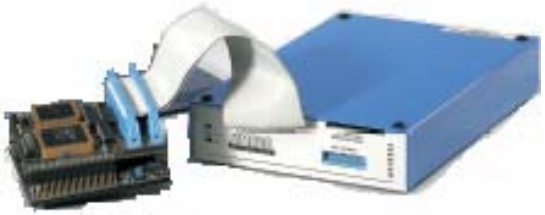
Programmer



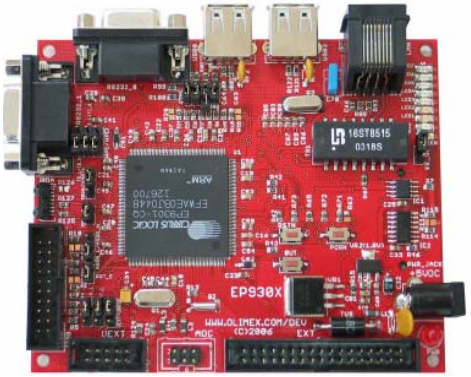
Target

Cross Platform Development

Coding, Compilation



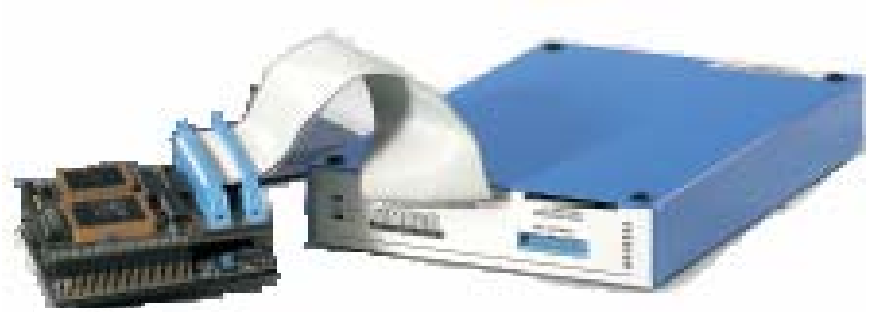
In Circuit Emulator

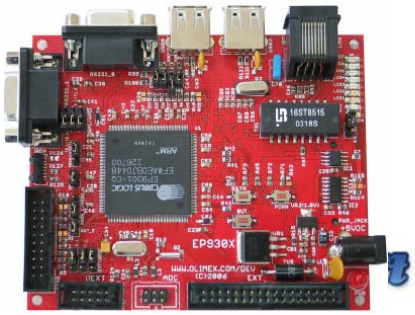


Target

Difference Between In Circuit Emulator

Difference Between In Circuit Emulator





Embedded System Development

Programming Language Used…

- **Assembly Language (Specific to Microcontroller)**
- **C or Embedded C**
- **Ada**
  http://en.wikipedia.org/wiki/Ada_(programming_language)
- **Embedded C ++**

Embedded System Development Tools

Medium and Small Level Development Tool

Designing phase

Commonly Used Tools

Coding & Compilation

KEIL™ An ARM® Company

IAR SYSTEMS

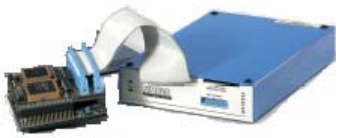
GCC

freescale™ semiconductor

Codewarrior

Code Composer Studio™ IDE

Hardware Debugging

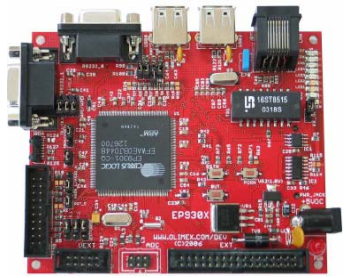


Emulator

Programmer

Target Board

8051. MSP430, AVR etc



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Embedded System Development Tools 32/64 bit Processors

Designing phase

- Designing Phase
- Compilation
- RTOS, Middlewares
- Hardware Debugging
- Testing Tool
- Target Board
- Reliability Prediction

Commonly Used Tools

ARTiSAN SOFTWARE

Telelogic

UML and SysML Tools

Rational Rose

Green Hills SOFTWARE, INC.

WIND RIVER

Compilers, IDE, RTOS

GCC

freescale semiconductor

Codewarrior

LDRA

PolySpace TECHNOLOGIES

ARM, PowerPC, DSP etc

Relex

Leader in Reliability and Maintainability analysis software tool

Reliable Software

Embedded System Development Commonly used RTOS

Linux Kernel 2.6.x

VxWorks

WIND RIVER

INTEGRITY

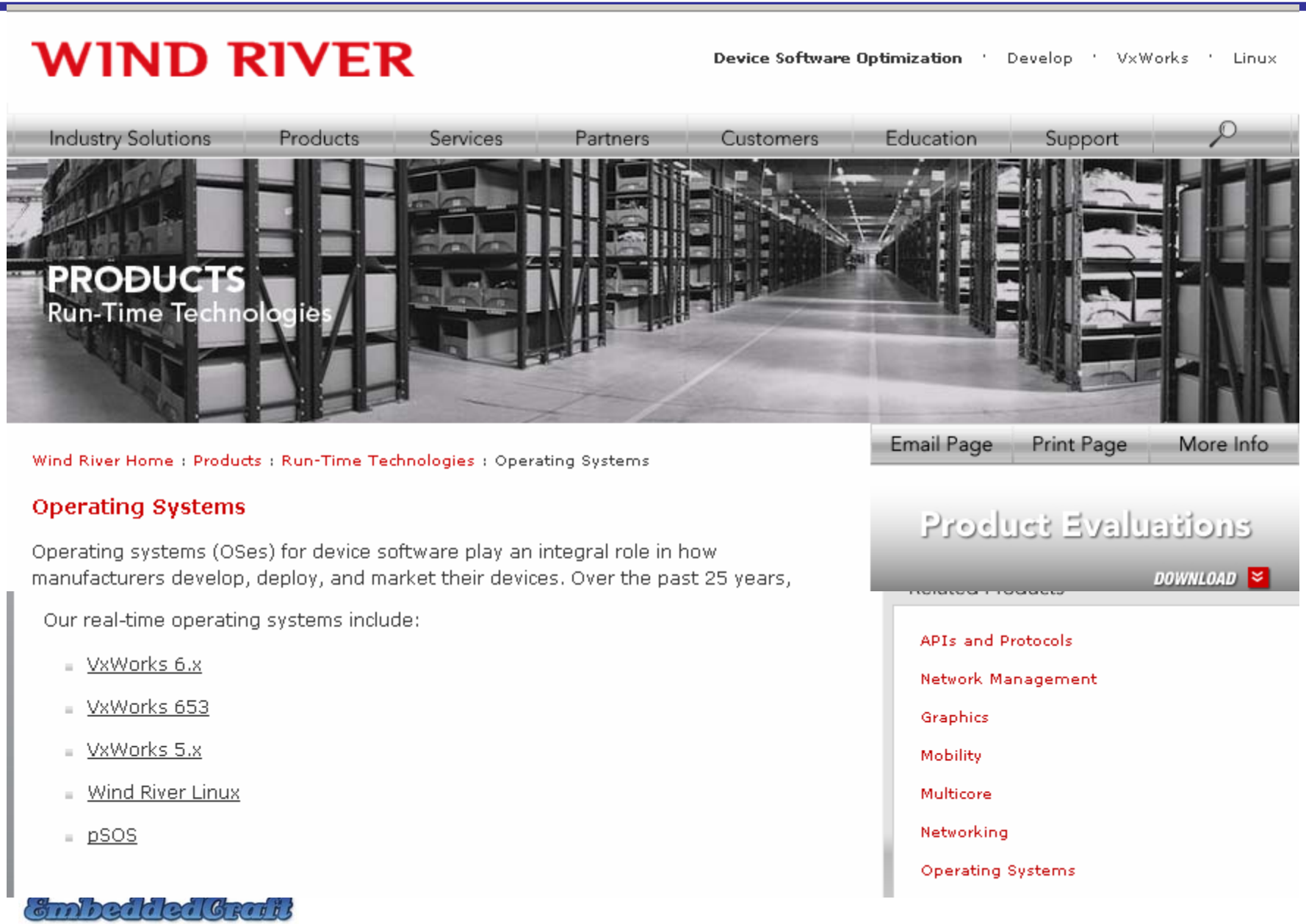
Green Hills
SOFTWARE, INC.

symbian

Other Linux Flavor

1. Montavista Linux
2. Windriver Linux
3. Symbian

Professional RTOS…



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Professional RTOS…

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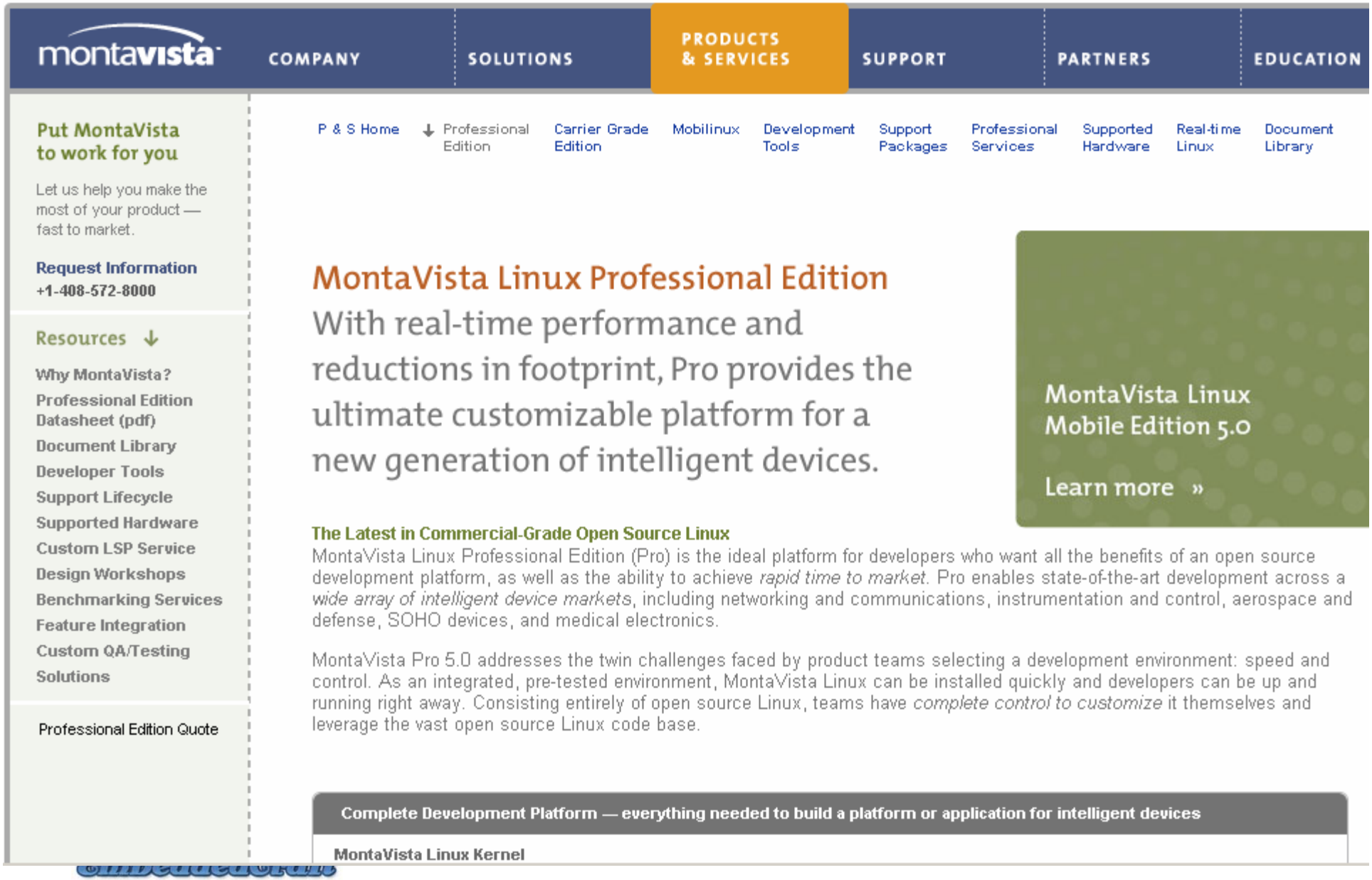
Professional RTOS…



Professional RTOS…

The Linux Kernel Archives

Welcome to the Linux Kernel Archives. This is the primary site for the Linux kernel source, but it has much more than just Linux kernels

Frequently Asked Questions

Protocol	Location
HTTP	http://www.kernel.org/pub/
FTP	ftp://ftp.kernel.org/pub/
RSYNC	rsync://rsync.kernel.org/pub/

Protocol	Location
HTTP	http://www.eu.kernel.org/pub/
FTP	ftp://ftp.eu.kernel.org/pub/
RSYNC	rsync://rsync.eu.kernel.org/pub/

The latest stable version of the Linux kernel is:	**2.6.23.9**	2007-11-26 17:57 UTC	F V VI C Changelog
The latest prepatch for the stable Linux kernel tree is:	**2.6.24-rc4**	2007-12-04 05:01 UTC	B V VI C Changelog
The latest snapshot for the stable Linux kernel tree is:	**2.6.24-rc4-git4**	2007-12-06 19:01 UTC	B V C
The latest 2.4 version of the Linux kernel is:	**2.4.35.4**	2007-11-17 17:44 UTC	F V C Changelog
The latest prepatch for the 2.4 Linux kernel tree is:	**2.4.36-pre2**	2007-11-17 19:28 UTC	B V VI C Changelog

Professional RTOS…

µClinux

Embedded Linux/Microcontroller Projec

Home

What is uClinux?

Status

Getting started with uClinux

FAQ

uCsimm Hardware Project

uClinux Ports

The Developers

E-Mail Forum

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The Linux/Microcontroller project is a port of Linux to systems without a Memory Management Unit (MMU).

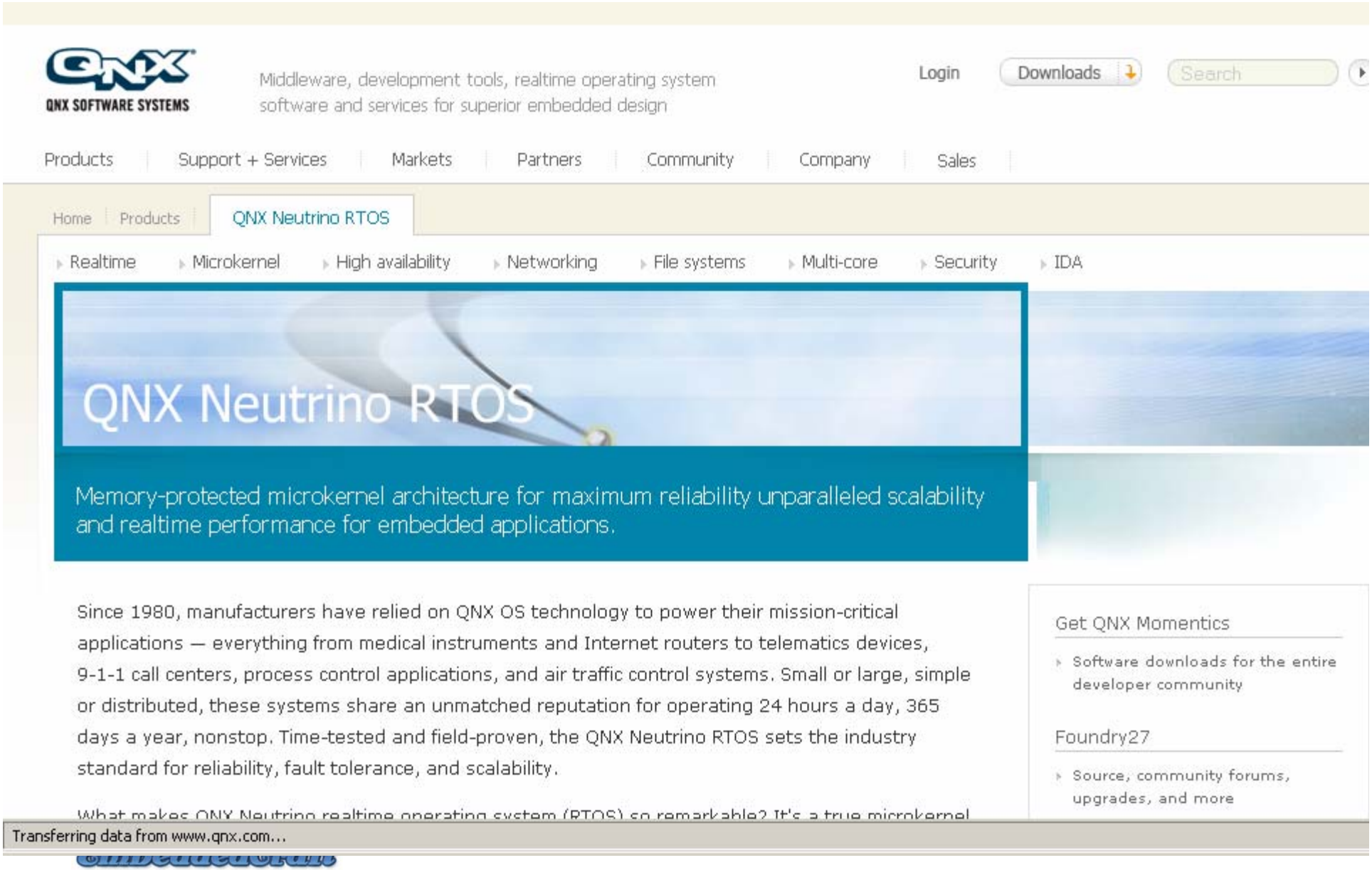
Pronounced "you-see-linux", the name uClinux comes from combining the greek letter "mu" and the english capital "C". "Mu" stands for "micro", and the "C" is for "controller". uClinux first ported to the Motorola MC68328: DragonBall Integrated Microprocessor. The first target system to successfully boot is the PalmPilot using a TRG SuperPilot Board with a custom boot-loader created specifically for our Linux/PalmPilot port.

July 2007
Greg Ungerer has been posting patches against the dist for those wishing to follow the mid-release updates. The Patches can be found at the following link: http://www.uclinux.org/pub/uClinux/dist/patches/ Feed back on these patches can be posted to the uClinux-dev mailing list. If you wish to subscribe to the mailling list you can do it here https://mailman.uclinux.org/mailman/listinfo/uclinux-dev/.

July 2007
The current uClinux-dist release is dated January 30, 2007. Here is a quick links to the tar.gz and tar.bz2 packages.

EmbeddedCraft

Professional RTOS…



RTOS Middlewares …

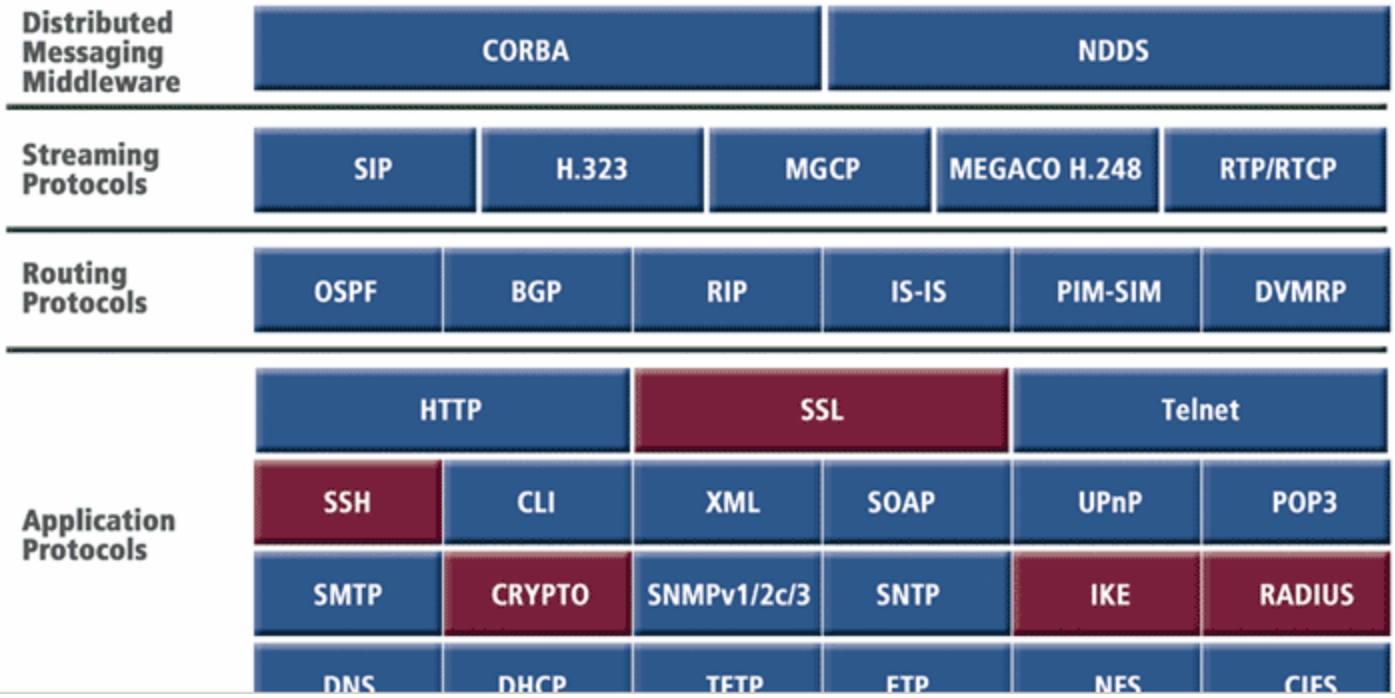
Networking and Communication

Communications Software

Green Hills Software provides a complete and scalable suite of integrated networking products to support a broad range of network connected devices - from devices requiring basic IPv4 connectivity to those that demand the most comprehensive and robust network security and advanced routing functionality. These products were developed from the ground up to address the requirements of embedded systems spanning a range of markets, including Wireless, Automotive, Consumer, Military, Aerospace, Networking and Telecommunications. The scalable feature set and footprint can be configured to support devices from low power handsets to enterprise class routers.

The Green Hills suite of networking products is seamlessly integrated with the *u-velOSity* kernel, the *velOSity* real-time operating system, INTEGRITY real-time operating system, INTEGRITY-178B and MULTI development environment, providing a total solution for all your networking needs.

Please click on the image to receive information about each section.



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RTOS Middlewares …

File Systems

There is no one size fits all solution when it comes to file system support for embedded devices. For example, the requirements of a file system for a digital camera differ greatly from an in car infotainment system or carrier grade telecommunications system. Green Hills Software offers a wide variety of file system support integrated with INTEGRITY and *velOSity* to meet the specific needs of your device.

INTEGRITY and *velOSity* use a file system framework model, commonly referred to as a virtual file system (VFS), to make it easy to add and remove support for various file systems. The file system server (VFS server) provides file system services to applications that utilize file system APIs such as C stdio (fopen(), fread(), fwrite(), etc.), C++ iostreams (cout, cin, etc.), or the low-level POSIX interfaces (open(), read(), write()).

Wear Leveling Flash Storage (WLFS)

WLFS gives you the ability to access a bank of flash memory through the file system as if it were a disk. Wear leveling technology manages the underlying flash in a manner that guarantees wear on the flash will be evenly distributed across the entire device, and is also resilient against power failures and other unexpected interruptions.
Both NOR and NAND flash device types are supported with WLFS. Any of the supported file system formats may be used in conjunction with WLFS.

File System format types available with INTEGRITY and *velOSity*

- **Unix/Linux Compatible Fast File System (FFS)**—The Berkeley Fast File System (FFS) is an inode-based file system that first appeared in the BSD UNIX distribution from the University of California. The FFS file system, sometimes referred to by its predecessor's name, UFS (UNIX File System), is used by many BSD derivative operating systems such as NetBSD, FreeBSD, and OpenBSD.
- **DOS/FAT 12/16/32**—The MSDOS file system originated with the Microsoft DOS operating system. It is sometimes referred to by its primary data structure, the file allocation system (FAT). Like FFS, MSDOS is a hierarchical, disk-based file system. The MSDOS file system comes in several variants named after the number of bits in each entry in its file allocation table: FAT12, FAT16, and FAT32. The original MSDOS file system supported filenames of up to 8 characters followed by a dot, and a 3 character extension. With Windows 95, Microsoft layered a long filename scheme onto the FAT file system. This long filename support is sometimes referred to as VFAT. INTEGRITY supports all of these variants.
- **CDROM ISO9660/CDFS/CDA**—The ISO9660 file system is commonly found on Compact Disc media. INTEGRITY supports the generic ISO9660 standard format as well as the Rockridge and Joliet extensions. The Joliet extension is favored in the MS Windows world. It allows Unicode characters to be used for all text fields, which includes file names and the volume name. The RockRidge extension is favored in the Unix world. It lifts file name restrictions, but also allows Unix-style permissions and special files to be stored on the CD.
- **UDF DVD (read only)**—The UDF file system (Universal Disk Format) is the file system used on DVD's as well as other media. INTEGRITY's UDF library allows

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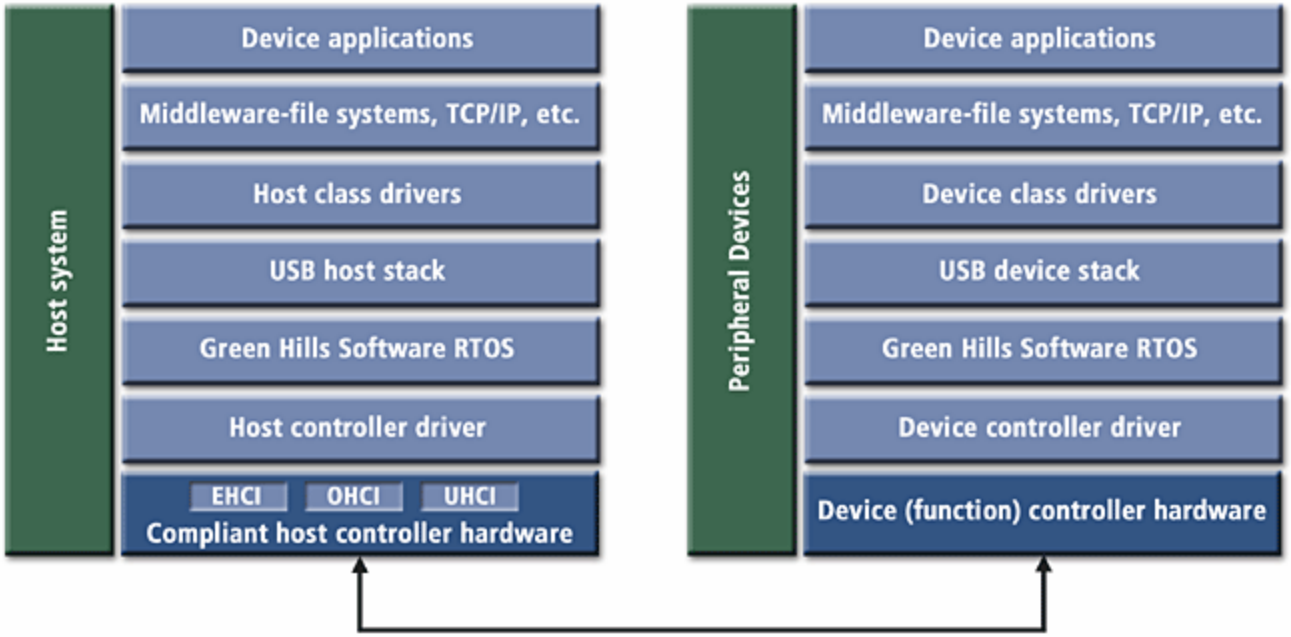
RTOS Middlewares …

USB Solutions for INTEGRITY and *velOSity*

Green Hills Software offers complete, high-performance USB 2.0 solutions for the royalty-free INTEGRITY Real-Time Operating System (RTOS) and *velOSity* kernel. Both Host and Device (Function) stacks are available in addition to numerous class drivers and example applications for using both stacks. The stacks and drivers are all delivered with full source code. These products allow developers to quickly and easily add USB connectivity to INTEGRITY and *velOSity* based devices.



Host Stack:

- Responsible for enumerating the USB devices connected to the host

RTOS Middlewares …

INTEGRITY® Real-Time Operating System - Graphics and Video

Graphics support

ALT Software's embedded graphics products provide advanced 3D graphics for leading edge products for automotive, avionics, industrial controls, and 3D visualization applications.

The Portable Embedded GUI (PEG) is integrated with INTEGRITY and provides a comprehensive library for creating graphical user interfaces for touch screens and LCD displays while requiring a minimal memory footprint.

PEG consists of a C++ based library and device drivers that make it simple to include powerful graphics in embedded real-time applications. PEG applications can be run in either virtual address spaces or in kernel space, and reside in less than 100KB. It is small, fast, and royalty-free, yet powerful enough for advanced real-time graphics needs.

Three dimensional graphics, including OpenGL and highly tuned graphics accelerator drivers for next generation displays, are also integrated with INTEGRITY.

ALT Software's embedded graphics products support a wide range of CPUs, safety standards and ASICs. Intended applications range from low-powered portable devices to high-performance leading edge products designed for automotive, avionics, industrial controls, and 3D visualization. These OpenGL drivers conform to specifications for OpenGL 1.2, 1.2.1, 1.3. and support several OpenGL 1.4 and 2.0 functions as well as most OpenGL extensions.

» Back to INTEGRITY page
» RTOS
» MULTI IDE
» AdaMULTI IDE
» Compilers

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Selecting Good Tools Embedded System Development

Code Generation

1. Highly optimized Compiler
2. optimization in term of speed or size
3. Able to generate different output file formats
4. Customizable and easy to use IDE

Programmer

1. Universal programmer
2. Stand alone operation
3. Flash memory programming capability
4. Fast Downloading speed

In Circuit Emulator

1. Fast Downloading speed
2. Universal Emulator
3. No of hardware breakpoint
4. Trace capability

Single Board Computer

1. Maximum peripherals
2. Port pins open
3. Modular Approach

For beginning ….

Microcontroller 8051
Programming Language C and Assembly
Knowledge of Electronics Recommended

Intel 8051

From Wikipedia, the free encyclopedia
(Redirected from 8051)

The **Intel 8051** is a Harvard architecture, single chip microcontroller (µC) which was developed by Intel in 1980 for use in embedded systems. It was popular in the 1980s and early 1990s, but today it has largely been superseded by a vast range of enhanced devices with 8051-compatible processor cores that are manufactured by more than 20 independent manufacturers including Atmel, Infineon Technologies, Maxim Integrated Products (via its Dallas Semiconductor subsidiary), NXP (formerly Philips Semiconductor), Winbond, ST Microelectronics, Silicon Laboratories (formerly Cygnal), Texas Instruments and Cypress Semiconductor. Intel's official designation for the 8051 family of µCs is **MCS 51**.

Intel's original 8051 family was developed using NMOS technology, but later versions, identified by a letter "C" in their name, e.g. 80C51, used CMOS technology and were less power-hungry than their NMOS predecessors - this made them eminently more suitable for battery-powered devices.

SAB-C515-LN by Infineon is based on the 8051

Contents [hide]

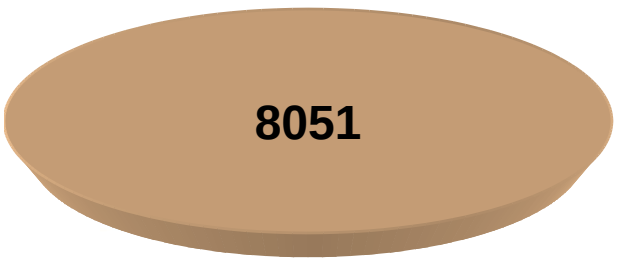
8051 Microcontroller Family…

8048 Used by IBM in Keyboards, still present in some keyboards

8031 Same as 8051 but without ROM

8052 Advance then 8052

ATMEL 8051 Microcontroller Family



	Flash	RAM	Ports	Speed	Pin Package
89S52	8KB	256 B	32	33 Mhz	40 to 44
89x51	4KB to 64 KB	512 B 8448 B	32-34	Up to 60 Mhz	40 to 44
89x4051	4 KB	128 B - C 256 B - S	15	24 Mhz	20
89x2051	2KB	128B - C 256 B - S	15	24 Mhz	20
8051					

ATMEL 8051 Microcontroller Family

S= ISP
C = CMOS

89S52	AT89S52	
89x51	AT89S51	AT89C51xx
89x4051	AT89S4051	AT89C4051
89x2051	AT89S2051	AT89C2051

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And after 8051…

ARM 7 as per me.

Because of following reasons

1. ARM7 is considered as link between 8 bit and 32 bit processors
2. Free Toolchain are also available
3. Books are also available.
4. Cheap ARM Development boards are also available


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