

The logo for RDC (Renesas Design Center) is displayed in a bold, blue, sans-serif font. Below the logo, the tagline "Your Best Route" is written in a smaller, orange, cursive font. The background of the logo area features a close-up of a network processor chip with a green and blue color scheme, overlaid with binary code (0s and 1s) and circuit traces.

**RDC**

*Your Best Route*

# ***R321x Network Processors***

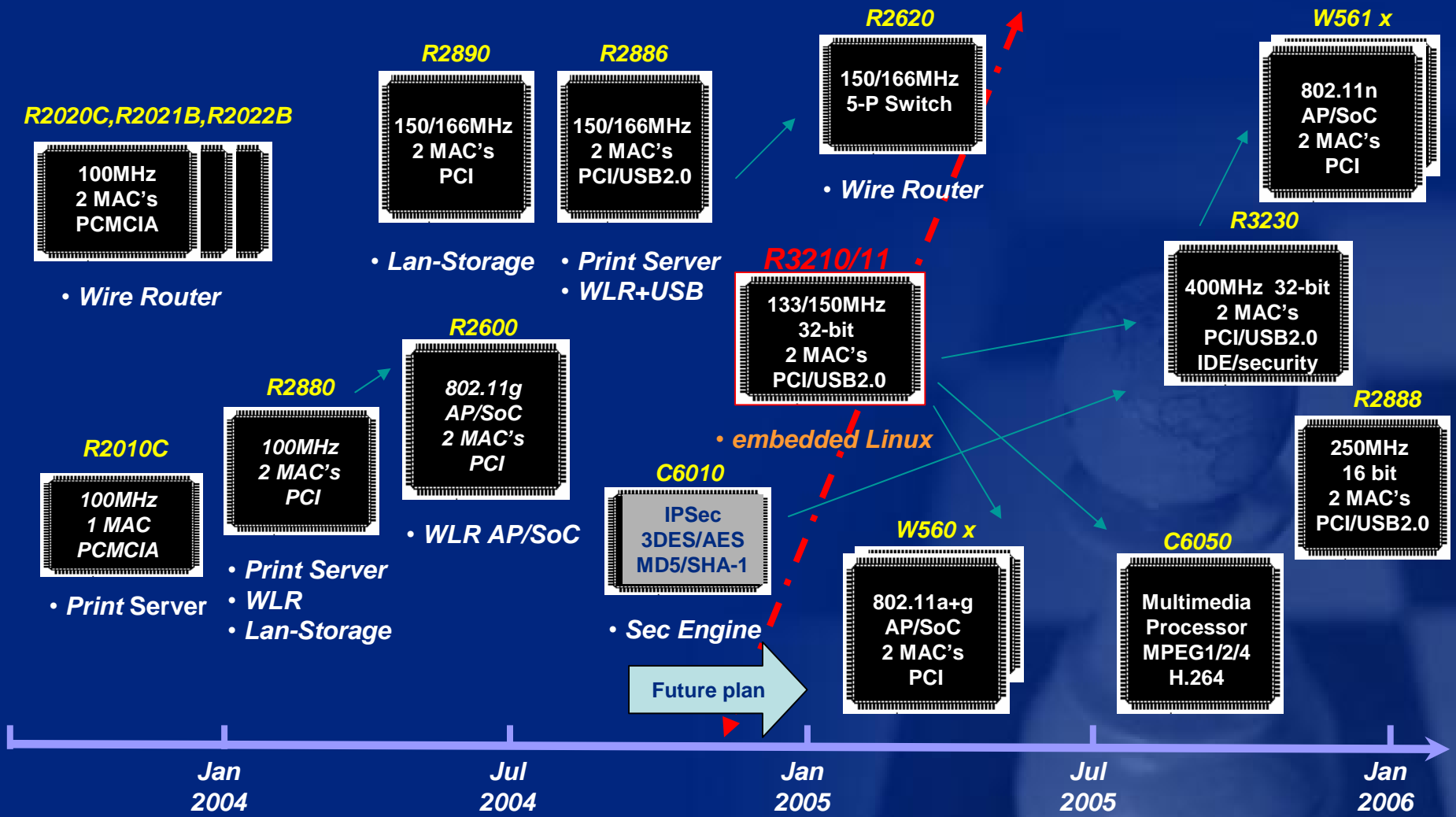
***New Boosters for Your Applications ...***

**RDC Marketing Department**

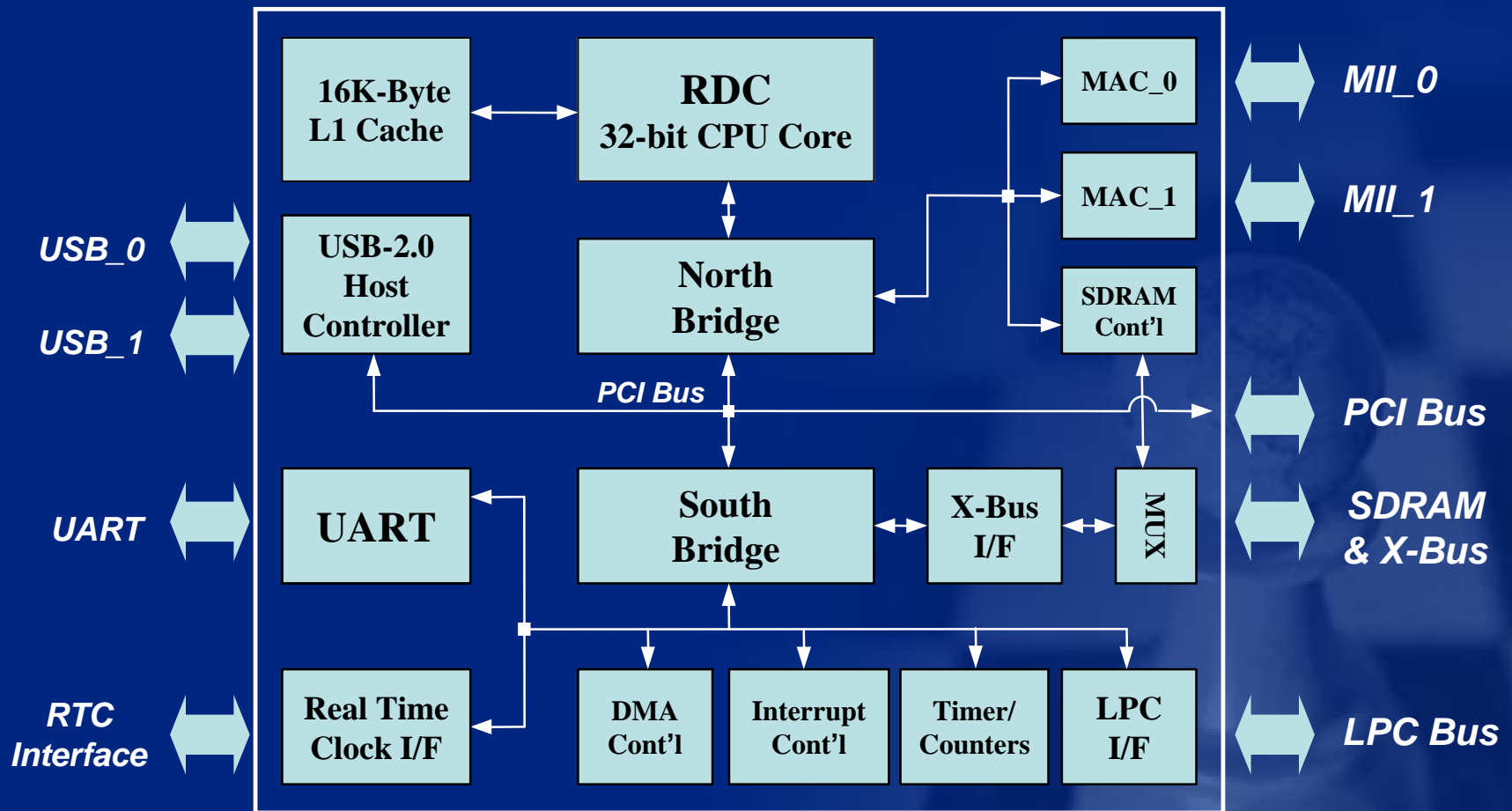
**December 28, 2004**

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# Product Roadmap Highlights



# R3210 Block Diagram



# *R3210 (32-bit NPU) Features*

## **n *Embedded RISC CPU Core***

- p** Full 32-bit RISC architecture, 6-stage pipeline
- p** OS support -- Windows based, Linux, VxWorks, eCos, etc.
- p** Speed up to 150 MHz, MMU support
- p** On-chip L1 16KB unified cache, direct-map matching

## **n *SDRAM Control Interface***

- p** 16-bit data bus width, PC100/133 compliant
- p** Maximum 128 MB memory space support

## **n *Two USB-1.1/2.0 Host Ports***

## **n *Two 10/100Mb Fast Ethernet MAC Ports***

- p** IEEE 802.3u MII interface.
- p** IEEE 802.3x flow control in full-duplex mode.

# R3210 Features (Cont'd)

## **n PCI Control Interface**

- p** PCI Rev 2.2 specification support.
- p** 32-bit bus interface @ 33 MHz
- p** Support up to 3 master devices on PCI.
- p** Support Mini-PCI interface connection

## **n X-Bus Interface**

- p** 8/16-bit Flash ROM interface, 64KB-8MB addressing space.

## **n LPC (Low Pin Count) Bus Interface version 1.0**

## **n 2 x DMA Controllers**

## **n 2 x Interrupt Controllers**

## **n 3 x 16-bit Timers/Counters**

## **n RTC (Real Time Clock) interface**

## **n 1 x FIFO UART Port**

## **n Support up to 56 General Programmable I/O pins**

## **n 1.8V Core, 3.3V I/O operation**

## **n 216-Pin LQFP package**

# R3210 Lab Test

	<i>Test Item</i>	<i>Status as Today</i>	<i>Remark</i>
<i>OS Platforms</i>	MS-DOS 6.22	Pass	
	Windows 3.1	Pass	
	Linux 2.4.19	Pass	
	Linux 2.4.22	Pass	
	Linux 2.4.25	Pass	
	Linux 2.4.26	Pass	
	Linux 2.6.3	Pass	
	Linux 2.6.5	Pass	
	Linux 2.6.6	Pass	
	Linux/Mini-BIOS Flash Boot	Pass	
	Linux/Red-Boot Flash Boot	Pass	
	Win-CE v.5.0 Enterprise Terminal	Pass	
	Windows-98	Pass	
	Windows-95	Pass	
	VxWorks v.5.3	Pass	
	eCos 2.0.b1	In progress	@ 01/14/2005
eCos/Red-Boot Flash Boot	In progress	@ 01/14/2005	

<b>Test Category</b>	<b>Test Item</b>	<b>Remark</b>
<b>Chip Function Patterns</b>	.....	
<b>Peripherals</b>	SDRAM (1MB, 4MB, 8MB, 16MB, 16MBx2, etc.)	
	ROM (8/16-bit via Xbus/LPC/FWHUB)	
	RDC MAC x 2, UART x 1, DMA, Interrupt Controller	
	Timer x 3, WDT x 1, RTC, PCI (Master 1-3, /3 & /4)	
	LPC, USB Host x 2, Super IO (KB/Mouse/UART)	
	PLL, External 14.318 MHz Clock Input	
<b>Applications on DOS</b>	.....	
<b>Applications on Linux</b>	FTP Server & Client, HTTP Server, Telnet Sr&Ct	MAC-1/2 & PCI-NIC's
	Apache Server (Web), IP Tables (NAT Routing)	
	SAMBA (Data Sharing w. Windows)	
	DHCP Server & Client, NFS, SSH	
	WLAN Station & AP	Ralink & IPC WLAN-NIC's
	USB #0 & #1 OCHI & EHCI	Various U-Disk's
	Line Commands ( <i>free, ps, ls, cd, cp, mv</i> , etc.)	
	GCC-Compiler, VI (Editor), Emacs (Editor), etc.	Popular Utilities
<b>PCI &amp; Mini-PCI Bus</b>	PCI Devices - Ethernet NIC's, IDE-Card, VGA-Card	
<b>JTAG I/F for Debugging</b>	.....	
<b>Performance Measurement</b>	LAN Ports Wire-Speed	
	NAT Routing (IP-Tables) Throughput	
	PCI Bus Throughput	
	Telnet & FTP Throughput (Upload/Download)	
	WLAN Throughput in Bridge & Station Modes	
	SAMBA Data Transferring (btn. Linux & Windows)	
	DryStone v.2.1 & HDBench Benchmark Programs	
<b>Temperature Stress</b>	.....	
<b>Power Consumption</b>	.....	
<b>PLL Jitter &amp; SDRAM Timing</b>	.....	

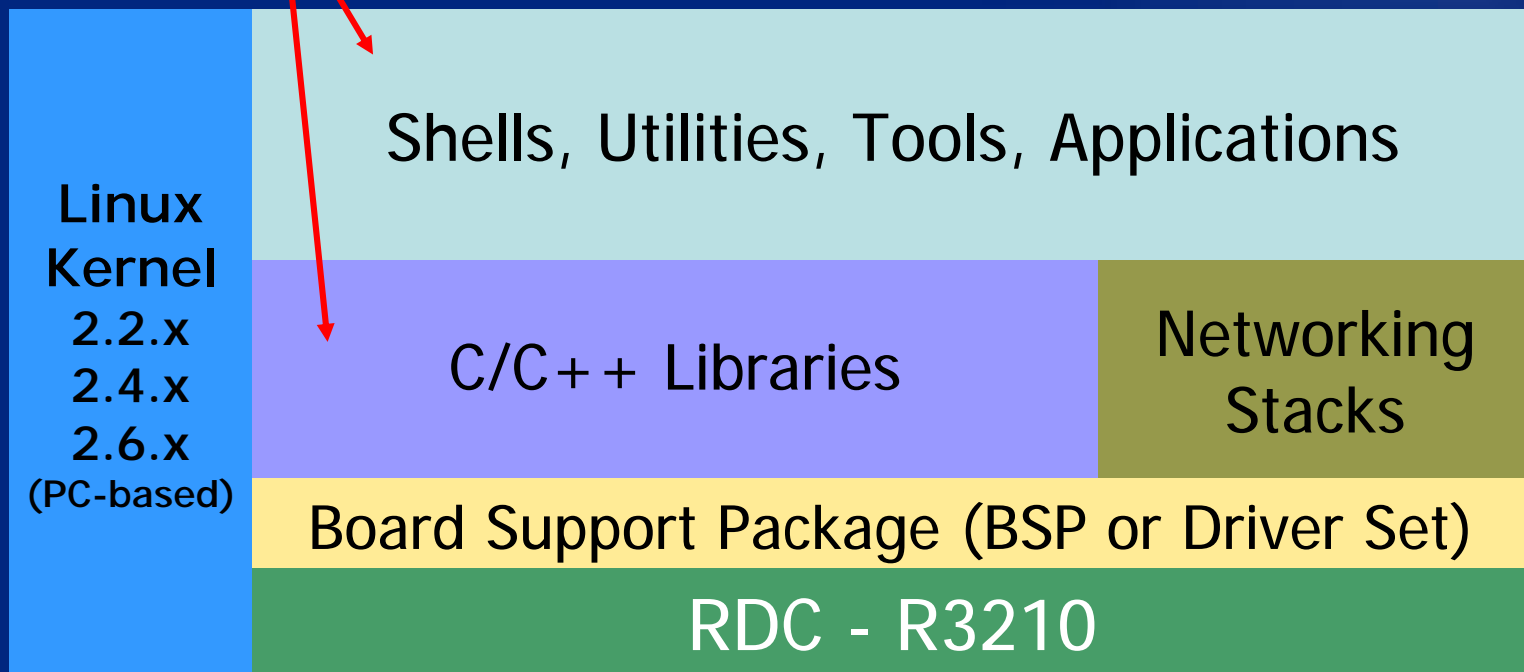
# R3210 Evaluation Deliverables

Deliverable Items		Availability as Today	Promotion Kit @ 01-14-2005	Remark	
<b>H/W Development Kit</b>	Evaluation Board (EVB)	01-14-2005	Available but USB disabled	30 sets	
	Engineering Sample	02-04-2005		ECO needed	
	AP-Router Demo System	02-10-2005			
	LAN-Storage Demo System	02-10-2005			
	PC-104 Demo System	02-10-2005			
<b>S/W Evaluation Kit</b>	Linux	Mini-BIOS Boot Loader	Ready	ö	Compressed as a single flash image file
		Kernel Image			
		Application S/W (NAT)			
		RDC MAC Driver			
	EVB User Guide	01-14-2005	Draft		
	eCos	Red-Boot Loader	01-21-2005		Compressed as a single flash image file
		Kernel Image			
		Application S/W (NAT)			
		RDC MAC Driver			
		EVB User Guide			
<b>Sample Driver (Linux)</b>	MAC	Ready	ö		
	USB	Ready	ö		
<b>Document</b>	Datasheet	Ready	ö	v.0.2	
	EVB Schematic	Ready	ö	v.1.0	
	Performance Test Report	02-04-2005	Draft		
	Power Consumption Test Report	02-04-2005	Draft		

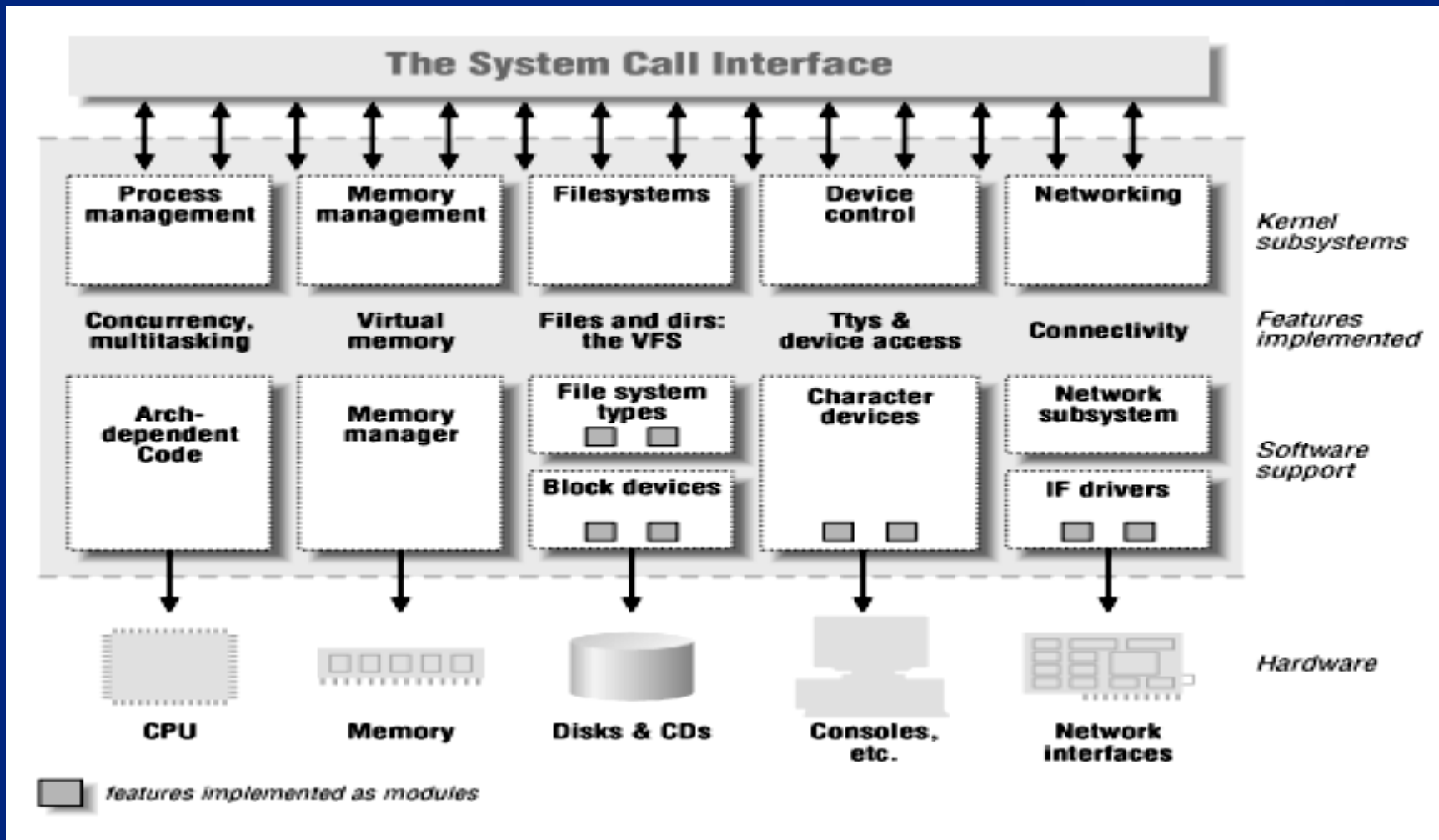


# Linux/R3210 Development Platform

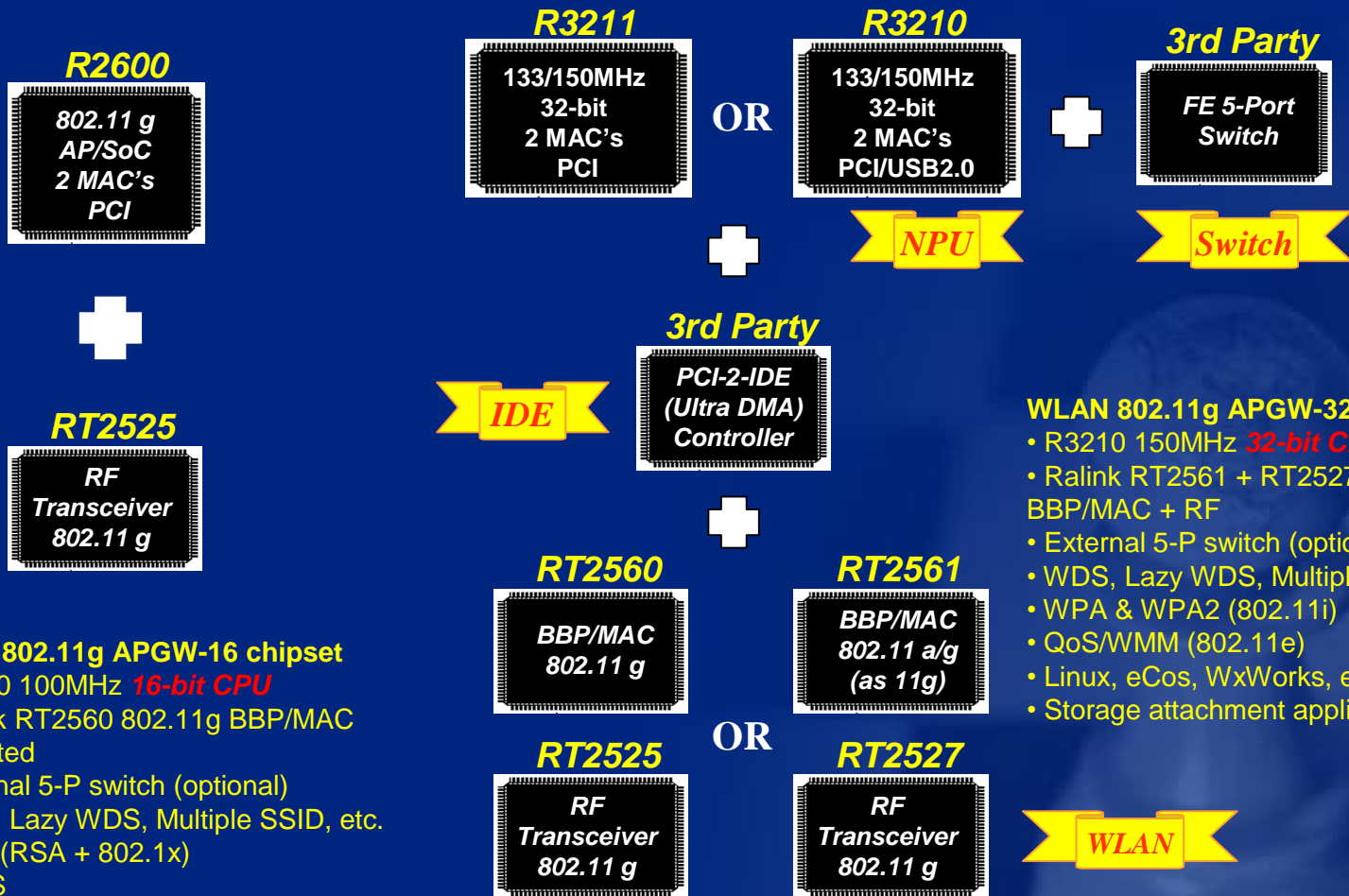
*Code size relatively large ...*



# Splitting the Linux Kernel



# AP-Gateway Solution Highlights



- WLAN 802.11g APGW-16 chipset**
- R2880 100MHz **16-bit CPU**
  - Ralink RT2560 802.11g BBP/MAC integrated
  - External 5-P switch (optional)
  - WDS, Lazy WDS, Multiple SSID, etc.
  - WPA (RSA + 802.1x)
  - RTOS

- WLAN 802.11g APGW-32 chipset**
- R3210 150MHz **32-bit CPU**
  - Ralink RT2561 + RT2527 802.11g BBP/MAC + RF
  - External 5-P switch (optional)
  - WDS, Lazy WDS, Multiple SSID, etc.
  - WPA & WPA2 (802.11i)
  - QoS/WMM (802.11e)
  - Linux, eCos, WxWorks, etc.
  - Storage attachment applicable

# AP-Gateway Paradigms

