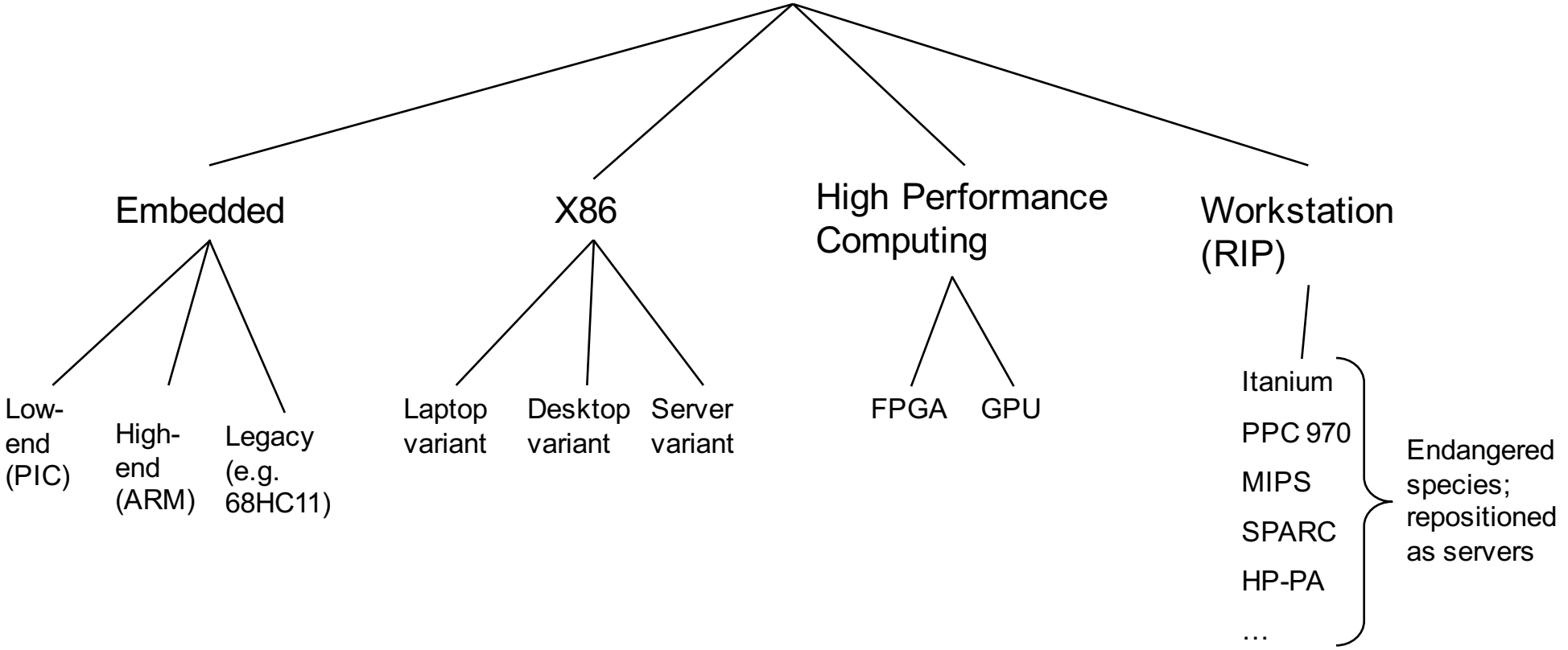
Beyond the PIC32

ECE 2534

Processor Habitats in 2015

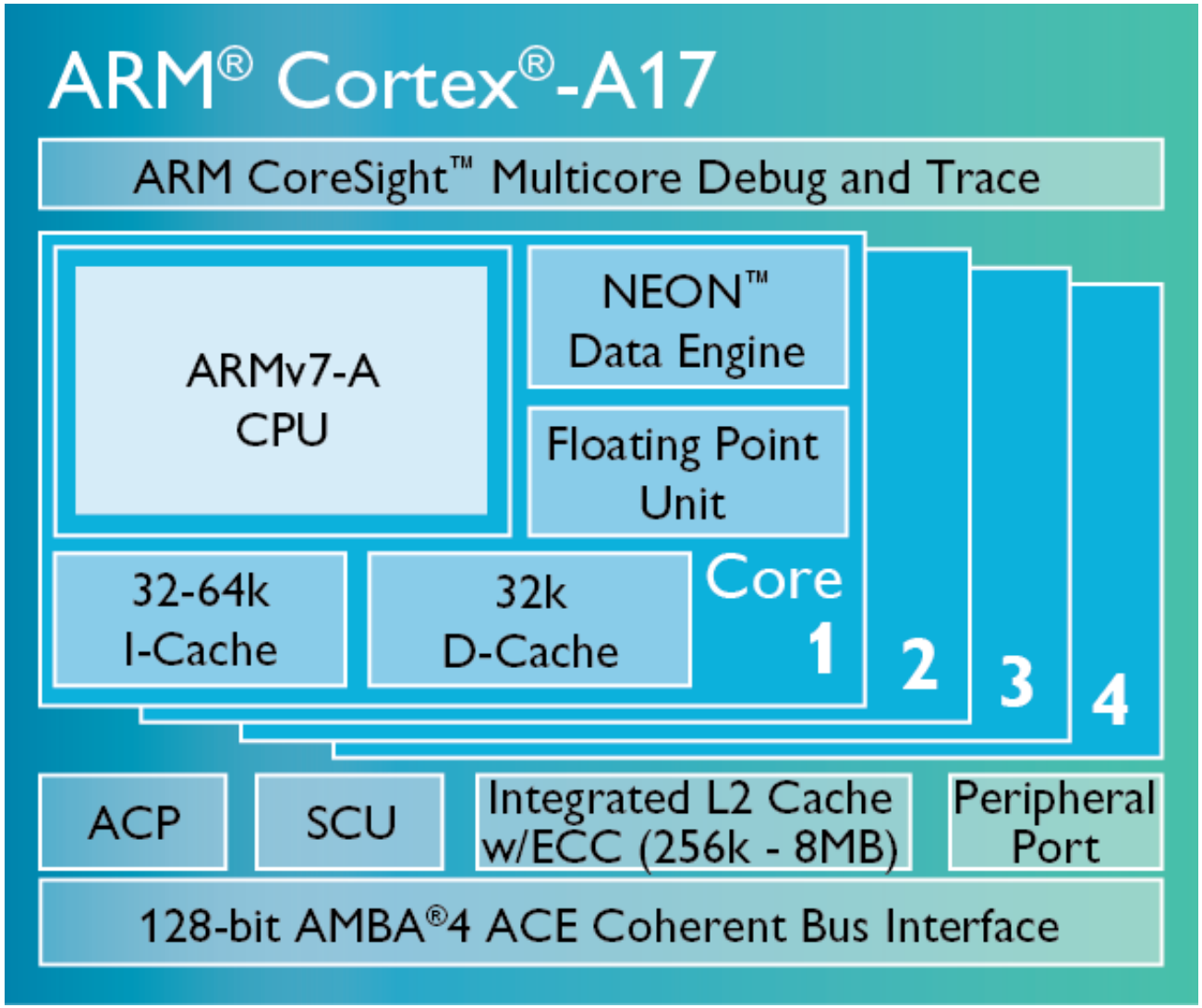


Also: Digital Signal Processors (DSP)

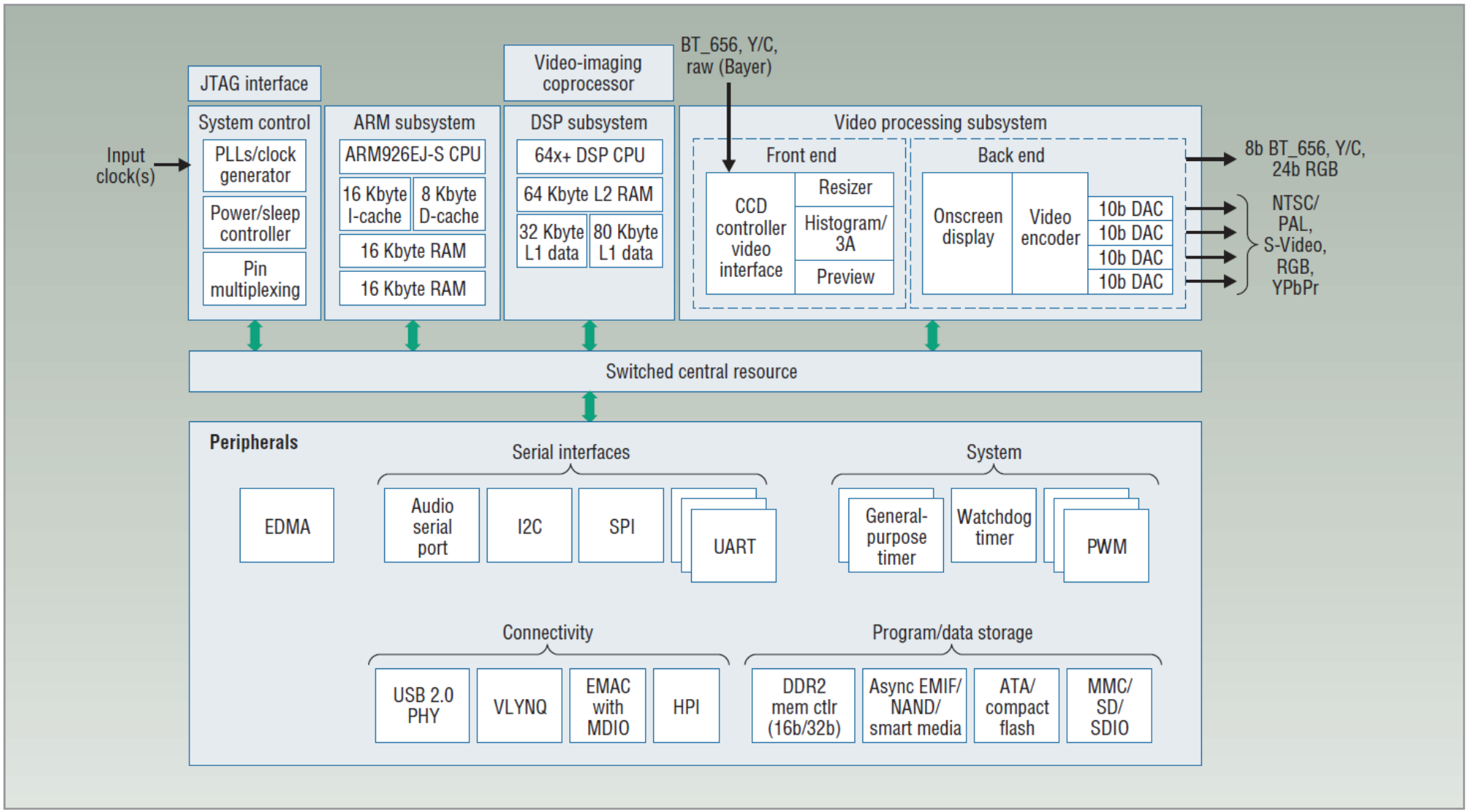
Microprocessor progression (Intel)

Name	Date	Transistors	Microns	Clock speed	Data width	MIPS
8080	1974	6,000	6	2 MHz	8 bits	0.64
8086	1978	29,000	3	5 MHz	16 bits	
80286	1982	134,000	1.5	6 MHz	16 bits	1
80386	1985	275,000	1.5	16 MHz	32 bits	5
80486	1989	1,200,000	1	25 MHz	32 bits	20
Pentium	1993	3,100,000	0.8	60 MHz	32 bits 64-bit bus	100
Pentium II	1997	7,500,000	0.35	233 MHz	32 bits 64-bit bus	~300
Pentium III	1999	9,500,000	0.25	450 MHz	32 bits 64-bit bus	~510
Pentium 4	2000	42,000,000	0.18	1.5 GHz	32 bits 64-bit bus	~1,700
Pentium 4 "Prescott"	2004	125,000,000	0.09	3.6 GHz	32 bits 64-bit bus	~7,000

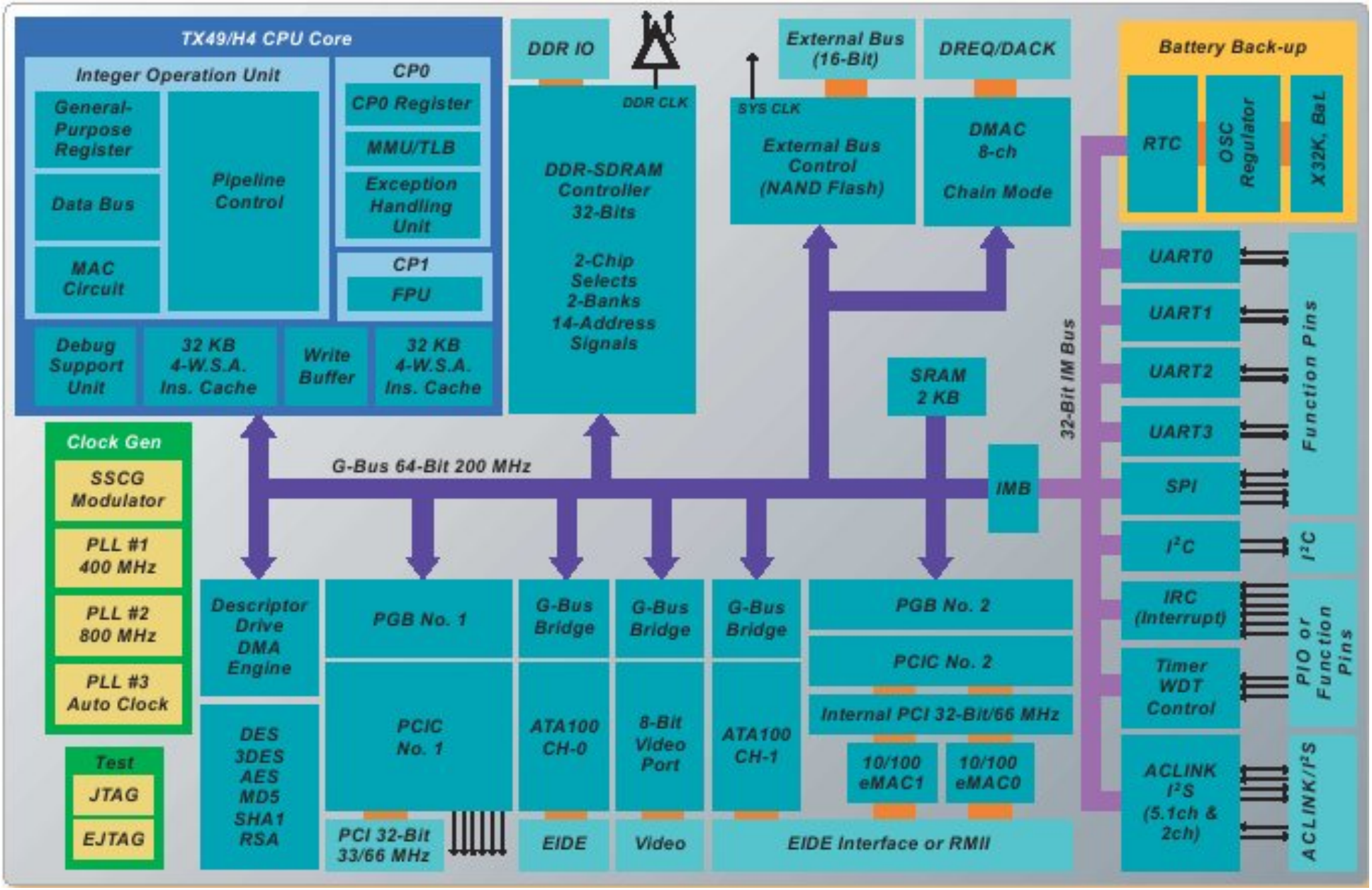
Source: http://computer.howstuffworks.com/microprocessor2.htm
(Compiled from The Intel Microprocessor Quick Reference Guide and TSCP Benchmark Scores)


ARM® Cortex®-A17
ARM CoreSight™ Multicore Debug and Trace
ARMv7-A CPU
NEON™ Data Engine
Floating Point Unit
32-64k I-Cache
32k D-Cache
Core 1
2
3
4
ACP
SCU
Integrated L2 Cache w/ECC (256k - 8MB)
Peripheral Port
128-bit AMBA®4 ACE Coherent Bus Interface

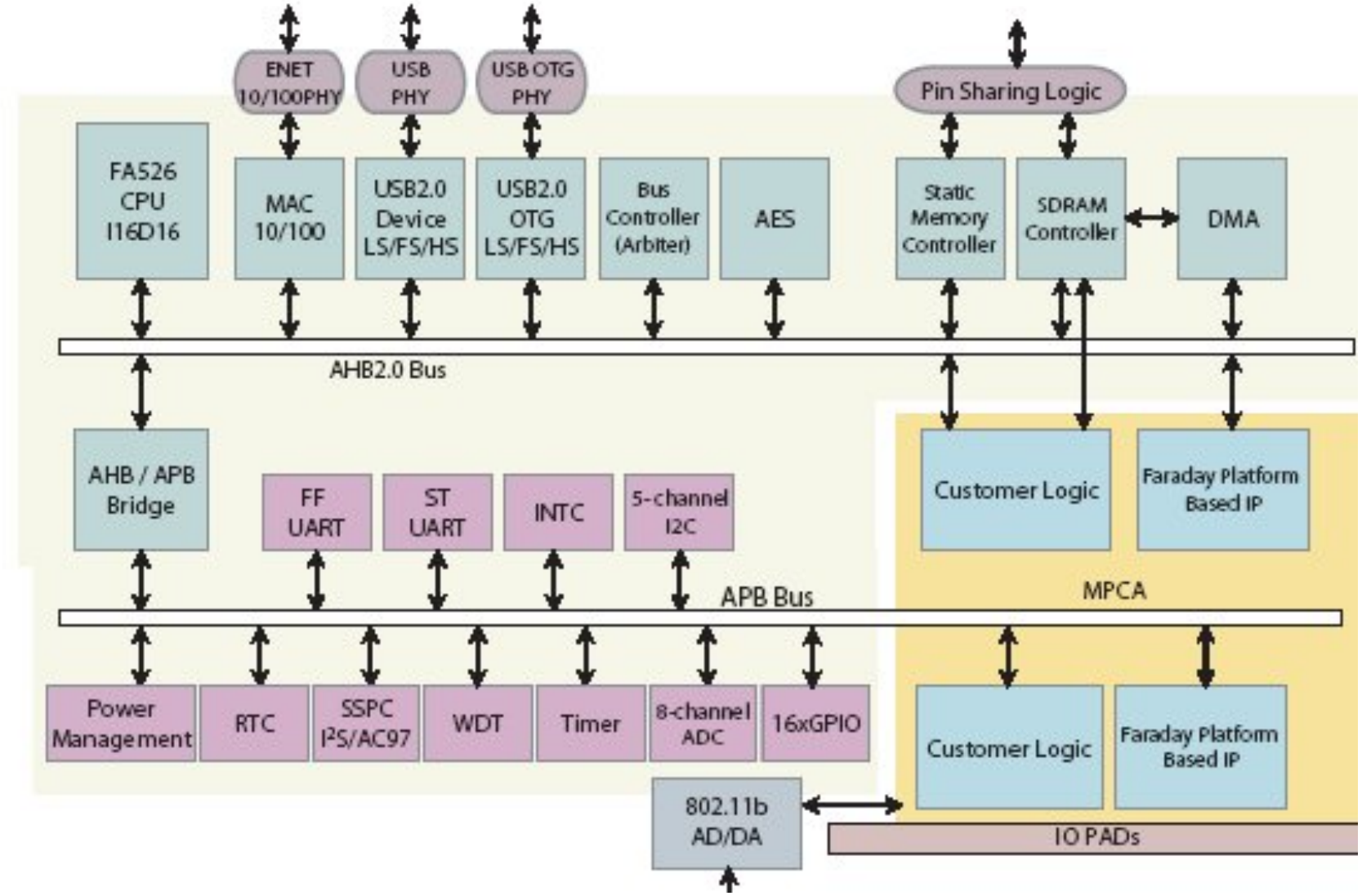
Texas Instruments *DaVinci* (TMS320DM6441)



Toshiba TX4939XBG-400



Faraday Technology



Microprocessor vs. Microcontroller

- Not always a clear distinction
  - Today's microprocessor may be tomorrow's microcontroller
- Microprocessor
  - Includes memory management unit
  - Lots of cache
  - Performance is most important feature
    (cost is important, but secondary)
  - Used mainly in desktop/laptop machines