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PowerPC Platform: Macintosh Technology (3/97)

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TOPIC ----------

This article provides an overview of the Macintosh technology involved in the PowerPC Platform (PPCP) (formerly known as CHRP).

DISCUSSION ----------

This information is taken from "Macintosh Technology in the Common Hardware Reference Platform", which is available from the PPCP Web Site:

http://chrp.apple.com/

Apple Computer and the PowerPC Platform

The PowerPC Reference Platform (PReP), Apple RISC architecture, and IBM RISC server systems were used in the development of the PowerPC Platform (PPCP) architecture. The objective was to reduce the porting effort of operating systems and applications coming from each of these environments. The information below describes the relationship of the Apple RISC architecture to the PPCP architecture and of the PowerPC Reference Platform to this architecture. The PowerPC Reference Platform used IBM RISC client and server information.

Many components of the second-generation Power Macintosh architecture are included for compatibility with the desktop products based on that architecture. Features of the second generation Power Macintosh are listed below:

• Based on the PowerPC microprocessor family for main system processing. The instruction set of the Motorola 68LC040 is supported through a built-in emulation system.

• Use of the PCI bus to support all I/O and system expansion. Other buses (such as NuBus, SCSI and IDE) are supported by means of bridge ASICs connected to the PCI bus.

• Use of Open Firmware for system startup and to allow use of expansion cards from other architectures. While the Mac OS continues to be the principal operating system for Power Macintosh computers, Open Firmware lets other operating systems that are ported to the PowerPC instruction set take control of the computer.

• Function of processor bus coherency. Memory systems connected directly to the PowerPC bus, including main RAM and all levels of cache, belong to a single coherency domain.

• Support for both Big-Endian and Little-Endian addressing modes. Besides the support for both modes built into the PowerPC processor, storage subsystems such as frame buffers are accessible to software through both big-endian and little-endian apertures.

• Support for Macintosh-style I/O such as ADB, SCC and LocalTalk.

• Support for PowerPC-native interrupts and native device drivers.

Apple is currently designing computers that will comply with the PowerPC Platform specification. The following table lists the general characteristics of first- and second-generation Power Macintosh computers and the currently-projected characteristics of Power Macintosh computers that comply with the PowerPC Platform specification.

Begin_Table

PPCP-Macintosh feature comparison

Feature	First-Generation Power Macintosh	Second-Generation Power Macintosh	PPCP Spec. Power Macintosh
Processor Type	PowerPC 601	PowerPC 601, 603 or 604	All PowerPC Models
Processor Upgrade	None	By replacing processor subsystem card	By replacing processor subsystem card
External Cache	Up to 1MB	Up to 4MB	Up to 4MB
RAM expansion	32-bit SIMM	64-bit DIMM	64-bit DIMM
Maximum RAM	72-264 MB	1 GB-1.5 GB	To be determined
NVRAM	Macintosh PRAM	8 KB	8 KB

Support for 21-inch monitors	None, 16 bpp, or 24 bpp	16 bpp or 24 bpp	16 bpp or 24 bpp
Sound	Macintosh 16-bit, 44.1 MHz, stereo input and output	Macintosh 16-bit, 44.1 MHz, stereo input and output	Macintosh and SoundBlaster-compatible stereo input and output
Internal hard disk	160 MB to 1 GB	250 MB to 2 GB	To be determined
Additional internal drives	One 5.25-inch, one or two 3.5-inch	One 5.25-inch, one or two 3.5-inch	To be determined
SCSI buses	1 internal, 1 external	1 fast internal, 1 external	To be determined
IDE bus	No	No	Yes
Floppy disk format	MFM or GCR	MFM or GCR	MFM only
Ethernet	AAUI	AAUI or 10BaseT	10BaseT
GeoPort serial ports	2	2	1-2
x86-compatible RS-232 serial ports	None	None	0-2
IEEE P1284 parallel ports	None	None	In some models
NuBus slots	1-3	None	None
PCI slots	None	3-6	3-6
ISA slot	None	None	None

End_Table

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