Net+ARM Drives Network Black Box

ARM7-Based Chip Ships With Code and Silicon for Networking Neophytes

by Jim Turley

Harkening to the call for networking in embedded systems, equipment maker Osicom has bundled its software expertise with other vendors' silicon experience to produce an Ethernet chip for networking neophytes. Called Net+ARM, the chip "set" includes an ARM-based processor delivered with an operating system and drivers ready to run. By hooking the chip to a system bus and an Ethernet cable, hardware OEMs can add Ethernet or Internet connectivity to their embedded systems with little software effort.

The chip is typical of a new class of integrated devices that integrate engineering designs (intellectual property in the current parlance) from various sources. In Osicom's case, the Net+ARM combines a processor from ARM, Atmel's Ethernet media-access controller (MAC), the pSOS operating system from Integrated Systems (*www.isi.com*), and Osicom's own networking software.

About the only things missing are the Ethernet physical-medium interface (PHY) and memory. The chip requires 256K of RAM and 256K of ROM to run the supplied software. To the host system, the Net+ARM presents a general-purpose 32-bit bus, as Figure 1 shows.

Supplied Software Is the Real Value

Built by Atmel in a 0.5-micron process, the ARM7/Thumb core gets marquee billing in Osicom's chip, even though it plods along at just 15 MHz. Future plans call for Osicom to integrate the Ethernet PHY, move to more modern processes, and eventually integrate an ARM9, all within the next 12 months.

More important than the Net+ARM hardware is its software, however. The $32.50 selling price (in 10,000-piece quantities) includes pSOS and Osicom's networking drivers; the chip will not be sold without the software. At that volume, an end-user royalty for pSOS would amount to just a few dollars, so most of the value is in Osicom's software. Support for the basic Internet protocol (IP) is included; IPX and PPP are optional software components. Likewise, TCP and UDP are standard network protocols, while RARP and ICMP are optional.

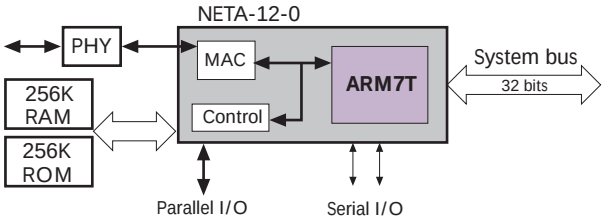

Figure 1. Osicom's Net+ARM processor combines an ARM7TDMI core, 100-Mbit/s Ethernet MAC, memory controller, and serial and parallel ports to create an intelligent network controller.

Trading Hardware Features for Design Time

The Net+ARM is priced about the same as several of Motorola's midrange networking controllers in the PowerPC 850 series (see MPR 3/30/98, p. 12). In terms of hardware value, the Motorola parts provide far more for the money: two Ethernet interfaces, HDLC, ATM, USB, and the not inconsiderable advantages of a much faster PowerPC core.

Osicom counters with its software suite: parts like the MPC850DH are delivered without a real-time operating system, much less network drivers. Although neither solution includes memory, Osicom points out that the ARM/Thumb combination should use much less external RAM and ROM than a PowerPC-based chip, potentially lowering overall cost.

Osicom's arguments are sound, and the value of having pretested code is significant. The Net+ARM chip (with its associated software) should appeal more to customers who don't have any in-house networking expertise and don't wish to develop any. This classification covers a lot of embedded OEMs that prefer to focus on their "added value," or main area of differentiation and experience. Adding TCP/IP compatibility might be intriguing to, say, a maker of instrumentation that has no experience in networking and would run a fair risk of delays if it tried to develop code on its own.

In a sense, Osicom's chip fills a role similar to iReady's hardware-only network layer (see MPR 10/6/97, p. 14). Both provide a drop-in network interface for network novices, but Net+ARM is for board designers, while iReady's product is for ASIC developers only.

For cutting design time, Osicom's hardware/software bundle is an attractive schedule-shortener. The hardware is nothing unusual, but the sales approach is. It's also indicative of where certain segments of the industry—PostScript printing, image compression, networking—are heading, as those with specialized expertise sell their experience to those without it. For accelerating the move to add internetworking to common embedded systems, Osicom gets high marks. M

Price & Availability

Osicom's NETA-12-0 Net+ARM processor is currently in production. In 10,000-unit quantities, the chip and firmware together are priced at $35. For more information, contact Osicom (Santa Monica, Calif.) at 888.638.2764 or set your browser to *www.netarm.com*.