ARM Wants to Put the Internet in Your Umbrella

Chip designer ARM wants to put the internet in your fridge. And it insists this cliche of tech prognostication is no longer just talk. Really.

Yes, ARM sees these as internet devices. Photo: Rev Dan Catt [1]*/Flickr On*

Tuesday, the company unveiled its new ARM Cortex-M0+ processor, a low-power chip designed to connect non-PC electronics and smart sensors across the home and office.

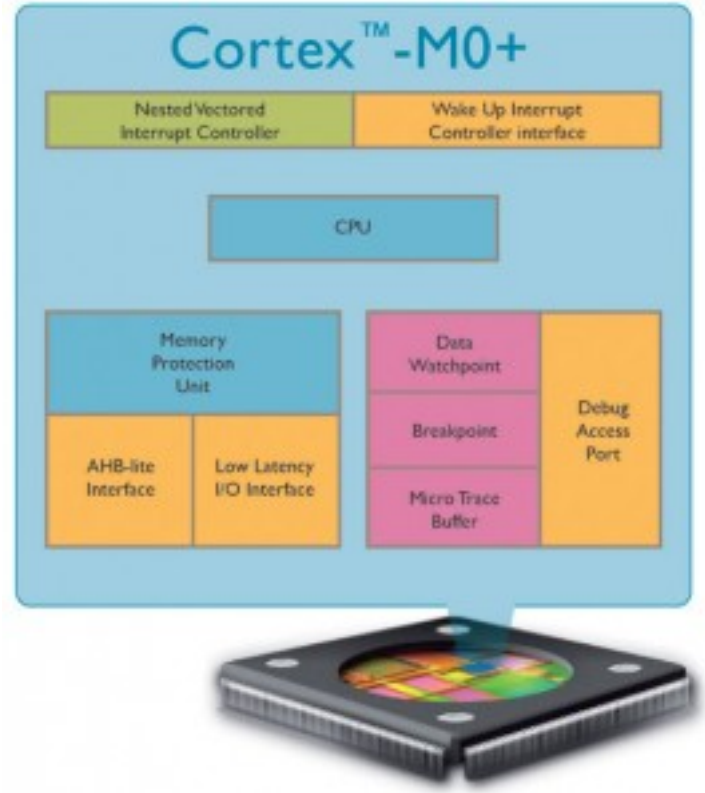
Previous iterations of the Cortex family of chips had the same goal, but with the new chip, ARM claims much greater power savings. According to the company, the 32-bit chip consumes just nine microamps per megahertz, an impressively low amount even for an 8- or 16-bit chip. Gary Atkinson, ARM's director of embedded applications, says the chip is 40 percent more efficient than its predecessor. This reduction, he says, will finally allow "fixed function" chips to integrate with everyday devices — and start telling them what to do.

"If you look at the edge of the internet today, [it's] your mobile phone, your tablet, your PC. That's what you interact with, and that's what sends and receives data," Atkinson tells Wired. "What we're talking about with the 'Internet of Things' is extending that connectivity out, connecting every day devices to the internet."

This is hardly a new idea. Tech companies and pundits have trumpeted this sort of thing for years, envisioning a world where smart sensors do everything from regulating your home's air temperature to flipping the lights on and off. But Atkinson believes we're finally on the verge of such a world, and he takes the vision a step further, imagining world filled with things like "smart umbrellas." Rather than

checking the weather each morning for rain, you could buy an umbrella that beeps at you when it's needed.

Today's chips are small enough for this sort of thing. But, according to



Atkinson, they consume too much power. With the Cortex-M0+ processor, he says, ARM has changed that, offering a chip that consumes virtually no power when it's turned on but not actually doing work — i.e., when it's in sleep mode. Geoff Lees, vice president of Freescale's microcontroller division, who has partnered with ARM on the chip, says this power efficiency is crucial for devices that generate a lot of data, such as blood glucose monitors or underground flowmeters. Now you essentially "don't need an on or off switch," he says.

The new model took the popular Cortex-M0 processor and added a single-cycle input and output, which speeds up information access to the chip's pins and peripherals. ARM also reduced the number of cycles per instruction by adding a two-stage pipeline, which improves parallel processing. The company also improved the chip's debug and trace tools, but it uses the same C-friendly programmer's model as its predecessor, and it works with existing Cortex-M0 processor tools.

Freescale and NXP Semiconductor have already inked deals to offer the new processor. "Now you get an event immediately after the instruction is fetched. There's no longer a delay in the pipeline before the event actually happens," Lees says.

"By reducing the gate count and reducing the power … the Cortex M0 is now simpler to use and, long term, provides a better roadmap than the eight and 16 bit architectures." Next year, he says, the company will be able to offer 32-bits chips in the same price range as the 8-bit chips it offers today.

According to ARM's Atkinson, the new chip can potentially provide Wi-Fi- and Bluetooth-connected devices with years of battery life. Which is a good thing. No one likes charging an umbrella.

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Posted by Janine E. Mooney, Editor

March 14. 2012

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