

Facebook engineers announce development of Time Cards

August 12 2021, by Bob Yirka



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A pair of Facebook engineers have announced the development of Time Cards—PCIe cards that can be used in x86 architecture machines to serve as a timekeeping device. In their announcement on the [Facebook](#)

[Engineering blog page](#), Ahmad Byagowi and Oleg Obleukhov note that the technology behind the Time Cards is open source.

Computers need to know what time it is—and this requirement becomes increasingly important as computers grow in size, complexity and connectedness. Personal computers, phones and video games, and huge data networks such as those used by Facebook require precise timekeeping to keep applications running in an orderly fashion, which becomes even more critical in distributed networks.

The current method of time tracking for devices like phones is to send and receive messages to and from the internet. Larger operations have devices that connect to satellites or land-based atomic clocks. It was because of all the different ways that computers gain access to time tracking that Byagowi and Obleukhov began their work on a more unified approach. They envisioned a [device](#) that could be plugged into a [computer](#) to keep track of time without relying on internet access—an inexpensive device that anyone could make themselves if they had a few hundred dollars.

The device the pair came up with is the Time Card—a card that fits into a motherboard slot, similar in appearance to other cards such as GPUs. When the Time Card is plugged into a server, it becomes, in Facebook terminology, a time appliance. The cards work by listening in on [radio waves](#) sent by GNSS navigation satellites that are coupled with oscillators—a processor keeps everything running correctly. The cards are also customizable, which allows developers to create them to suit the needs of different user communities. Small networks, for example, could likely get by with a crystal oscillator, whereas large customers may want to add in a miniature atomic clock.

To promote the new standard, the researchers have released their designs with open source licensing—both hardware and software. They also note

that some card makers, such as Orolia, have already begun producing them—and this past March, Facebook's data centers switched to the new technology.

More information: engineering.fb.com/2021/08/11/...urce/time-appliance/

www.opencompute.org/projects/time-server

github.com/opencomputeproject/time-server

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