Overclockers can celebrate Raspberry Pi turbo mode

September 20 2012, by Nancy Owano

Photograph taken of a Raspberry Pi computer

(Phys.org)—Up to now, overclockers hungry for more processing power had to trade off on the possibility of a shorter life of the SoC and a voided warranty. Eben Upton, a founder of the Raspberry Pi Foundation, had remarked earlier this year, that "This is a mobile phone chip. The voltage this chip runs at, you can't just give it a significant voltage overhead without harming the overall chip lifetime.' The Raspberry Pi

designers have good news for power enthusiasts this week, however. The team has developed a turbo mode that boosts performance by about 50 percent while keeping warranties intact. The turbo mode is a key feature of its latest firmware update. Its blog headline is "Introducing turbo mode: up to 50% more performance for free."

The team notes that since the device's launch, the designers supported overclocking and overvolting the Raspberry Pi by editing config.txt. They acknowledged how overvolting was going to provide those who did it with more headroom, but voided the warranty. "We were concerned it would decrease the lifetime of the SoC; we set a sticky bit inside BCM2835 to allow us to spot boards which have been overvolted."

Not that they were going to leave it at that—support yet no warranty. The whole point of the little, low-priced, device is to explore. The team said they did a lot of work to understand the impact of voltage and temperature on lifetime. The result is the "turbo mode."

A new technique can dynamically enable overclocking and overvolting under the control of a cpufreq driver with no effect on the user's warranty.

"We are happy that the combination of only applying turbo when busy, and limiting turbo when the BCM2835′s internal temperature reaches 85°C, means there will be no measurable reduction in the lifetime of your Raspberry Pi."

Users are told that the level of stable overclock that can be achieved will depend, though, on the specific Pi and on the quality of the user's power supply. Raspberry Pi recommends Quake 3 as a stress test to check if a particular level is completely stable.

The new upgrade brings a number of attractions to light for computer

enthusiasts. These include a choice of one of five overclock presets in raspi-config, the highest of which runs the ARM at 1GHz, and better analogue audio quality. The Raspberry Pi team says there is "Wi-Fi support out of the box"—well, if your WiFi driver is supported by the default linux tree, or is based on the popular RTL8188CUS chipset, then WiFi should work out of the box.

Instructions say, Boot the image with the WiFi dongle plugged in. Run startx and select "WiFi Config". You can scan for wireless networks and enter your wireless password and connect from the GUI. There is no need to install additional packages or scripts, they add.

Another attraction is a pre-installed Penguins Puzzle, with the instructions to "guide the penguin to the exit without falling in the water," and a pre-installed SmartSim. SmartSim is a cross platform digital logic circuit design and simulation package for Windows and Linux. Ashley Newson, a sixth-form student, first developed a home-grown circuit design and simulation package and subsequently polished it off and released it for public consumption under the GPLv3.

More information: www.raspberrypi.org/archives/2008

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