WebPageTest

Testing your website on different browsers? You may be using a Raspberry Pi server farm you never knew existed. **Rob Zwetsloot** uncovers the details

MAKER

Patrick Meenan

A software engineer at Cloudflare who specialises in web performance. He uses Pi boards in a lot of his testing.

webpagetest.org

O ne of the most invaluable tools to a web developer is the ability to quickly test your current build on a variety of browsers. Chrome, Firefox, Safari, Internet Explorer (unfortunately), and even mobile browsers need to be tested for. Fortunately, there are a lot of online services that can test it for you. One of these is WebPageTest (**webpagetest.org**), which just so happens to use a lot of Raspberry Pi boards.

"I largely use the Raspberry Pis as POE-powered computers to control smartphones for testing mobile web performance," its creator Patrick Meenan tells us. "The public instance of WebPageTest has upwards of 80 Raspberry Pis driving the mobile testing for all of the Android and iOS devices."

Patrick began using a similar setup while he was at Google working on web performance. Since then, he's built it up and deployed it under the WebPageTest website, and the Raspberry Pi was the only option for it.

Perfect with Pi

"There are a ton of things that make them perfect for my use case," Patrick explains. "They are inexpensive enough that I can use a dedicated Raspberry Pi for each phone or tablet in the lab.

"They provide enough power over their USB port to both power and control most devices. They can be powered over PoE, which gives me a way to remotely hard-reboot a device if needed (used to be a regular issue, but it has been months since I have had to reboot a device)."

He continues, "The hardware watchdog integrated with my software nicely so the device
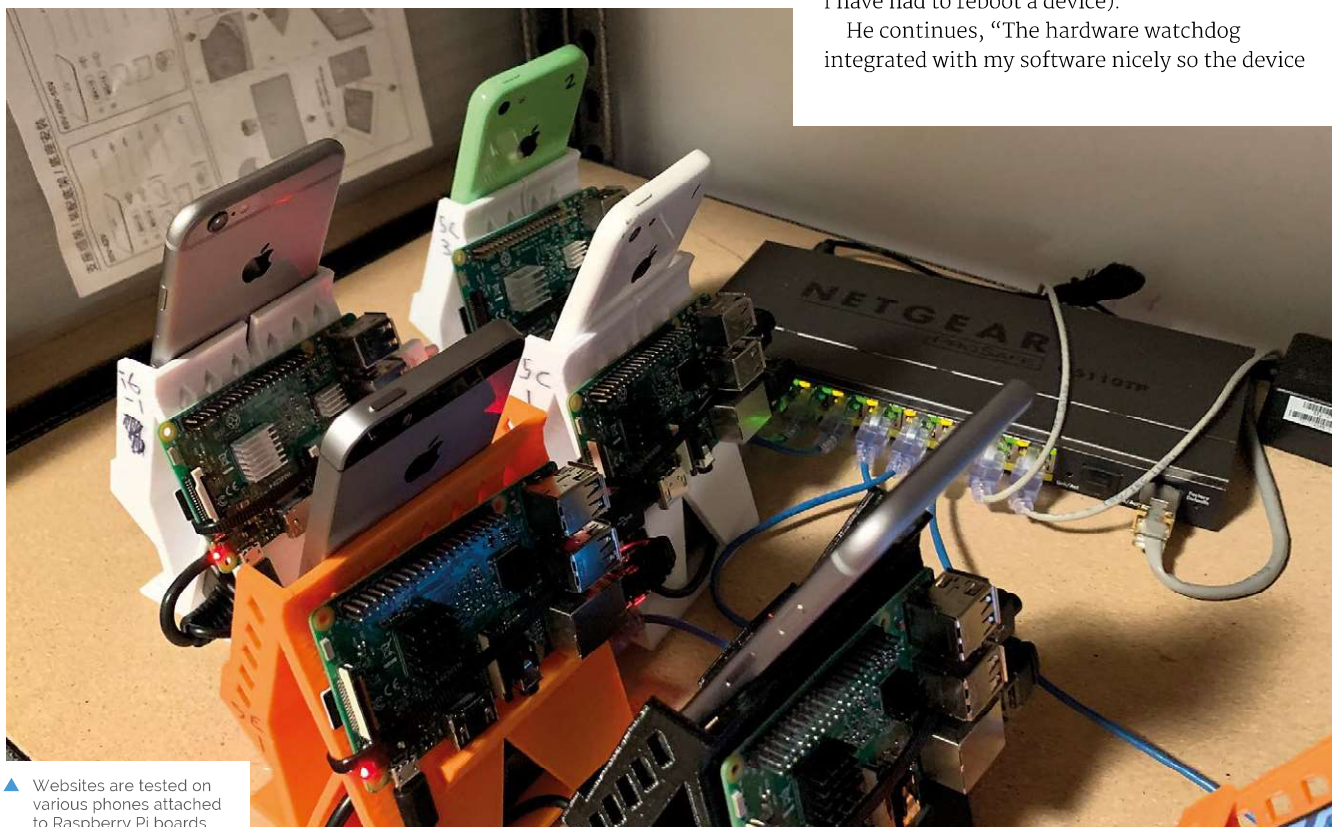
▲ Websites are tested on various phones attached to Raspberry Pi boards

Various Android phones, iPhones, and tablets are used in testing

Even though it uses shelves from a hardware store, it's definitely a server rack

Since it uses so many Raspberry Pi boards, some decent power solutions are needed

Quick **FACTS**

> It only took a few hours to put the initial version together

> The software has been continually evolving over six years

> The server has been running for nearly five years continuously

> There are 24 Motorola G4s, the most popular phone in the setup

> Patrick uses a different PoE adapter from the official one

self-reboots automatically if anything goes catastrophically wrong.

"The software and community support are unmatched. I tried other (faster) SBCs, but they all had issues with missing packages or lack of community support."

> ❝ **WebPageTest has upwards of 80 Raspberry Pis driving the mobile testing for Android and iOS devices** ❞

Simple and sturdy

It's a very simple setup beyond the software as well, merely using a PoE HAT on a Pi 3B+ with 3D-printed cases. All the individual phones are hooked up to the Pi so they can perform their testing duties.

"They work *amazingly* well," Patrick says. "It has gotten to the point where the mobile device testing is as stable as the desktop testing (which runs in VMs [virtual machines]). These days the mobile devices are set-and-forget. The software deployment is now fully scripted and I have a base image that I can clone to new SD cards and have a new device up and running in a few minutes."

For the moment, Patrick's little Pi farm is holding up well, and is only occasionally maintained via the addition of more powerful models of Raspberry Pi when they become available. He hasn't even lost an SD card so far – a true testament to the Raspberry Pi, SD cards, and Patrick's smart coding. M
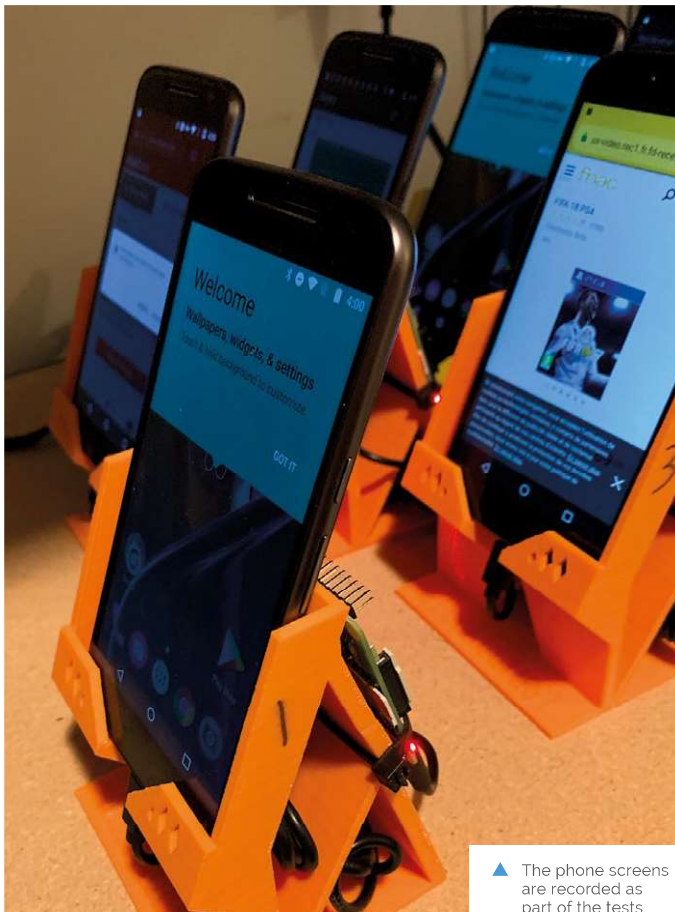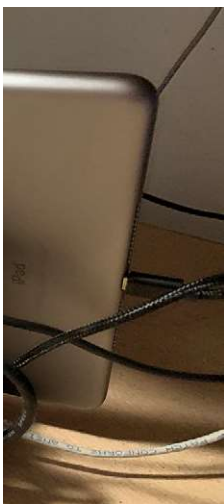

▼ The PoE HAT hadn't been released when he started, so the system uses a different solution
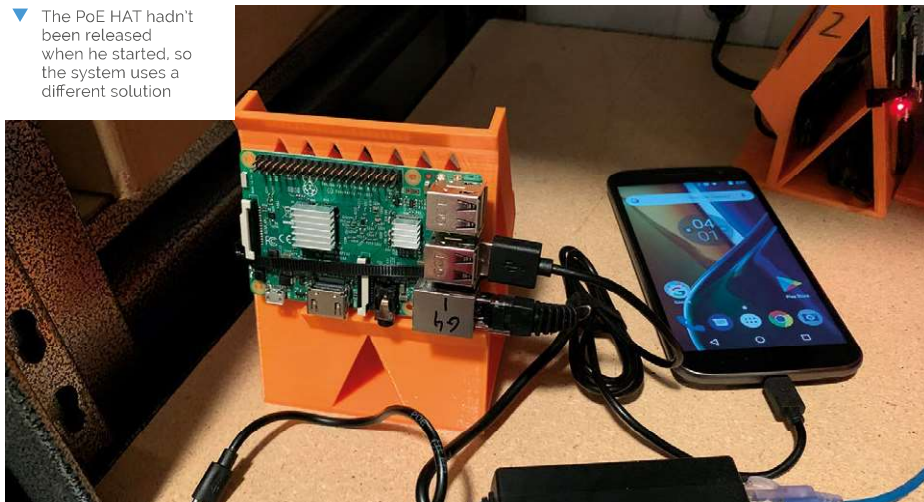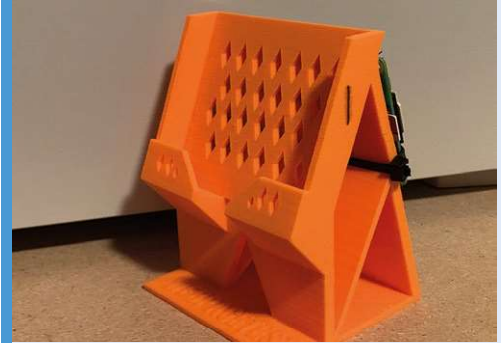

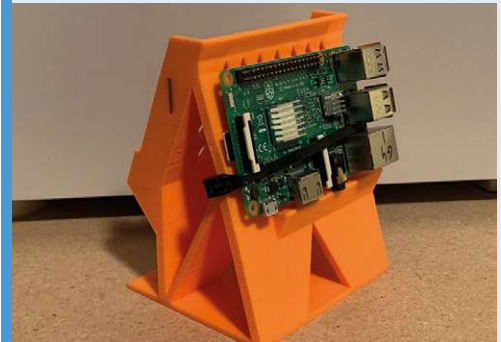▲ Tablets don't quite fit as well in the cases

The phone screens are recorded as part of the tests

Build a tester

01 Not many cases you can buy are designed for connecting a Pi and a phone together – in fact, we'd venture a guess there are none. Patrick 3D-prints his own custom cases that make organising his server a bit easier.

02 Patrick always uses the most powerful version of the Pi, as a lot of screen recording occurs in the process and a more powerful CPU is better for that. Here's a Raspberry Pi 3 strapped to the back of the custom case for just that purpose.
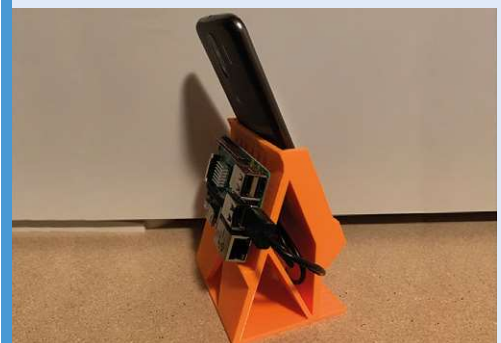
03 The selected phone is powered and controlled by the Pi. The PoE HAT then powers the entire thing, and allows the Pi to connect to the network and do all the testing it needs to do.