The Web Bluetooth Series

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Introduction

Some time ago, I wrote an article for the Bluetooth blog about a technology known as Web Bluetooth. In a new series of articles, I'm going to shine a light on that technology, explore its significance and potential once again and then illustrate and explain exactly how developers can use it to create a new breed of platform agnostic Internet of Things (IoT) applications.

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Web Bluetooth is important and developers should know about it. Let me explain why I think this to be the case.

The humble browser

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The web browser. It's come a long way since my first encounter with Netscape Communicator in the 1990s. Back then it was a tool for rendering text and images downloaded from a remote web server, very, very slowly over a modem connection. Now it's a fully-fledged applications platform and some people would say it's the most important platform of all.

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Now, I realise I am at terrible risk of incurring the wrath of native application developers everywhere, but before you Flame On, let me defend my position in the first instance by pointing out that I'm a native application developer too. But not always. The right tool for the job is a fairly reliable guiding principle, I would venture.

It's all in the standards

解释

The Bluetooth SIG is a standards body so you're probably quite used to hearing us expound the benefit of standards. "Just works" interoperability between a multitude of devices from a plethora of manufacturers doesn't happen by magic. It's carefully constructed technology standards that make this possible.

The web browser is the success that it is because of standards. The same content works as expected on Windows, Mac OS, Linux, Android, iOS, BlackBerry 10 and so on, because the W3C adopted a series of standards and the various browsers implemented their features in compliance with those standards. The whole thing is a triumph of engineering, organisation and cooperation.

Fans of the browser

End users like web browsers. They might not proclaim this with the degree of evangelical passion it warrants and in fact they might not mention it at all, because they simply take it for granted that Facebook, Gmail, YouTube and all their other favourite web applications work wherever they are

and on whatever device they happen to be using. Many don't even appreciate quite how wondrous and convenient this is. And, why should they? It just works and that's all anyone needs to know.

But there's another group of browser fans and that's the enterprise IT department. For years now, cloud computing has been gathering momentum, with modern browser technology joining forces with other apects of "the cloud" such as its use of virtualisation, web services and new database technologies, to allow the creation of sophisticated enterprise applications which scale on demand, cost relatively little to support and are platform agnostic. It doesn't matter in the way that it used to, that some of the company's 100,000 employees are running a version of Windows whilst there are some departments who prefer using Macs and others still who have staff who are mobile and so have been issued with iOS tablets for their work.

This is because in cloud computing, the browser is the platform.

Indeed, cloud computing, fronted by our no longer humble friend, the web browser, has created a whole new approach to enterprise software. I'm talking about software as a service (SaaS) of course and there are numerous enormously successful SaaS products today which owe their existence to the browser and the cloud. How many of us now use Google apps, Office 365 or Salesforce.com at work?

Enterprise IoT

Internet of Things is largely a concern for enterprises. Yes, there are consumer applications of IoT but I believe that most true IoT systems will be run by and for enterprises. Consider industrial IoT (IIot) in general.

IoT systems use a mixture of technical ingredients and Bluetooth is one of them. Bluetooth Low Energy (LE) and Bluetooth mesh networking each possess qualities and capabilities that make them perfect for many of the "edge tier" communication requirements of IoT systems.

Communication at the edge tier of IoT systems is generally concerned with two broad use cases, the first of which I call "monitoring" and the second, "control". Often these two generic use cases are linked, with data acquired by the monitoring system being piped back into the control system in a feedback loop. We can also break edge tier communication into two categories in terms of the parties involved. Data may be communicated between machines or systems, such as when sensor data is acquired at the edge tier and communicated via a series of intermediate architectural tiers to the cloud. Or communication may take place between devices and people. People may be involved in monitoring and controlling machines, systems, processes or whole environments using data acquired from sensors. They'll use sophisticated graphical dash boards and control panels to observe the state of systems and interact with them. People are part of the IoT too.

Connecting the browser to IoT devices

Web Bluetooth allows web applications to communicate directly with IoT devices using Bluetooth LE. Since Bluetooth mesh supports Bluetooth LE devices communicating securely with the nodes in a mesh network, Web Bluetooth could be used to create monitoring and control applications for Bluetooth mesh networks as well. When creating new IoT systems, the requirements and policies of the enterprise IT department can thus be met, without straying from the cloud computing 走失
architectural principals which govern most of the other IT systems in use and therefore without eroding the business benefits that cloud computing delivers.
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Standardisation

Web Bluetooth is not yet a W3C standard. I think it needs to be. Web Bluetooth is not yet implemented in all browsers either[1]. And it really needs to be in my humble opinion. Right now, you'll find Web Bluetooth in Chrome on most platforms. The "caniuse" URL in the footnote will give you full information.

脚注

请求

If, you feel the same as I do, then I invite and encourage you to petition browser implementers to get behind Web Bluetooth and progress it through the W3C standards process. IoT needs this. You need this.

支持

Mozilla Firefox	https://bugzilla.mozilla.org/show_bug.cgi?id=674737	
Microsoft Edge	https://developer.microsoft.com/en-us/microsoft-edge/platform/status/webbluetooth/ https://wpdev.uservoice.com/forums/257854-microsoft-edge-developer/suggestions/9775308-implement-the-web-bluetooth-gatt-client-api	
WebKit (Safari)	https://bugs.webkit.org/show_bug.cgi?id=101034	

The W3C also host a public email list for Web Bluetooth: https://lists.w3.org/Archives/Public/public-web-bluetooth/

Summary

In this first part of my series on Web Bluetooth, I've shared my thinking about the subject and gone some way to convey the significance and potential of the technology. In the next parts, I'll change tack and start to explore Web Bluetooth in more of a tutorial style. If you think Web Bluetooth is something worth learning more about, and I hope you do feel that way, then the remainder of this series will help you get started.

In the next part, I'll examine some of the foundation knowledge needed to start working with Web Bluetooth.

[1] See https://caniuse.com/#search=web%20bluetooth