Embedded System Provides Similar Performance to a Bluetooth Equipped PC

Hypertag, the company that uses Bluetooth technology to make poster advertising campaigns interactive, has developed a much smaller and more efficient generation of its content server technology. The new hardware allows the current PC server to be replaced with a small embedded system containing an array of Bluetooth subsystems &#151 each running in 'hostless' mode. The implementation was made possible by Cambridge Consultants' xIDE software development kit (SDK). This SDK gives users unrestricted access to the full native power of the XAP processor inside CSR's market-leading Bluetooth device, BlueCore, allowing Hypertag to create high-performance embedded Bluetooth subsystems complete with application software.

Hypertag's technology allows consumers to access information directly from poster adverts and signs, via their mobile phones. It works by allowing Bluetooth (or infrared) equipped devices to interact with an electronic content server or 'tag'. The consumer sets the Bluetooth channel to discoverable, and within a few seconds the information &#151 such as a wallpaper or ringtone, a reminder, or even a video or application &#151 is downloaded.

Up to now, Hypertag has been deploying a small Bluetooth-equipped PC content server. The goal of the design project was to create a physically smaller and lower cost system. Additionally, the team wanted a system that would consume much less power so that it could operate without a main supply, and also be easily wearable &#151 to extend the content delivery options available to marketers.

The company decided to investigate the feasibility of creating a hostless Bluetooth system that operates in the same kind of manner as a headset, with the application software running on the Bluetooth chip's own small microcontroller (conventionally, sophisticated Bluetooth products employ a Bluetooth chip operating under the control of a host processor). The key design issue for the development team was building a system that was capable of high throughput, as the content Hypertag is being asked to deliver to passers-by is getting larger, and often now includes messages incorporating video clips.

After investigating the development tools market, they settled on xIDE, as it gave them full access to the native power of the XAP processor core. Tests of the resulting design, which runs GAP, OBEX and Service Discovery Profile software, shows that each BlueCore chip typically delivers content to real-world phones at the same kind of speeds as other PC based solutions.

"xIDE made it possible to replace a more complex and expensive PC arrangement with a stripped-down solution that is smaller, more robust, and consumes far less power," says Hypertag's development engineer Graham Tricker. "It's helped us take a big step forward with our technology, giving us a system that will deal easily with many more usage environments, and scales well. It's also given us complete control of all the software on the content delivery platform - something we didn't have before."

The project to add Bluetooth capabilities to the existing embedded Hypertag system, which includes hardware for infrared content delivery, and a processor and Flash memory that manages the content, took around four months. xIDE's facilities, which include a means of building a Windows version of the application that could run on a Bluetooth dongle for debug purposes, made the Bluetooth phase of the design very quick.