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Intel Labs Tunes Into a Wireless Future Where Everything That Computes is Connected

NEWS HIGHLIGHTS

- Intel Labs demonstrated the first all-digital WiFi radio integrated into the same chip with other digital building blocks that scales in size and energy efficiency to enable more things to connect to each other.

- Featuring a new biometric identification technique, Intel Labs demonstrated how to eliminate passwords while making access to cloud-based services more secure.

- WiGig, the newest WiFi standard, will dramatically reduce the number of wires and enable completely wireless docks and displays.

- New technologies and collaborations with Verizon, China Mobile and Cisco to improve system efficiency while improving the overall user experience.

SAN FRANCISCO--(BUSINESS WIRE)-- In his keynote today at the Intel Developer Forum, Intel Chief Technology Officer Justin Rattner said, "In the future, if it computes, it connects. From the simplest embedded sensors to the most advanced cloud datacenters, we're looking at techniques to allow all of them to connect without wires."

Rattner demonstrated for the first time a working, all-digital WiFi radio, dubbed a "Moore's Law Radio." The CTO explained that an all-digital radio follows Moore's Law by scaling in area and energy efficiency with such digital chip processes as Intel's latest 22nm tri-gate technology. System-on-chip designs for smartphones and tablet computers would be the most likely spot for the all digital radios to be integrated. The small size and lower cost of integrated digital radios will enable a host of new applications from wearable devices to "The Internet of Things" where devices such as home appliances with sensors can communicate with each other, exchange data and can be operated remotely.

Rattner went on to describe a next-generation wireless standard called WiGig that operates in the millimeter wavelengths of the radio spectrum and delivers bandwidths well over 5 gigabits per second. The WiGig standard is an industry-wide effort to consolidate a number of proprietary 60 GHz wireless technologies under the existing WiFi standard.

"WiGig is so fast it will let you wirelessly dock your enabled Ultrabook™, tablet or smartphone without wires," said Rattner. "Even multiple displays can be docked at one time."

Delivering Convenience and Increasing Battery Life for Cloud Connected Devices

Users love the ability to receive email and social media updates while their devices are

asleep. To bring this always on, always connected capability to the Ultrabook™ platform, Intel® Smart Connect technology currently wakes up the Ultrabook™ just long enough to receive the incoming packet traffic and then it goes back into standby mode to ensure long battery life.

Showing how the benefits of Smart Connect technology could be enhanced to include active operation for file transfer and video streaming, Rattner demonstrated "Spring Meadow," which manages communication between the cloud and the device more intelligently. By pre-processing incoming network traffic and proactively managing traffic flow, "Spring Meadow" makes more efficient use of the host processor, allowing it to remain in a low-power state longer without impacting system performance.

Eliminating Passwords, Increasing Security

Passwords remain the common, yet inconvenient way of protecting access to valuable or sensitive information. In an effort to eliminate the need for passwords, Intel Labs has developed a replacement scheme called Client Based Authentication Technology. Not only does it replace passwords, it dramatically simplifies and accelerates the process for accessing bank accounts, stock portfolios and other cloud-based personal information.

The technology allows the user to authenticate once to the physical device such as an Ultrabook™ or smartphone using a biometric sensor and then lets the device automatically authenticate itself with one or more cloud-based services. Reading a person's unique vein patterns in the palm of the hand, the user is then directly taken to his or her bank account, social network page or any kind of secure service. It also provides presence monitoring capability that locks the device and the secure service connection when the user puts his or her device down. A new biometric scan unlocks the platform and immediately restores the previous secure service connections. The whole process is virtually transparent, easy to use and more secure.

Cloud-Based Radio Access Networks, Future of Wireless Broadband

Rattner was joined onstage by Dr. Chih-Lin I, chief scientist at the China Mobile Research Institute in Beijing, to discuss the research collaboration between Intel Labs and China Mobile to design and prototype a full-scale Cloud Radio Access Network (C-RAN). C-Ran is an alternative to traditional RAN, which is the basis for modern cellular communications. Instead of simply moving the proprietary base station hardware to the data center, it is replaced by standard Intel-based servers running a software-defined radio application. Dr. I explained that C-RAN technology will dramatically reduce both capital and operational expenses for wireless service providers while providing superior levels of wireless services to users with fewer dropped connections during periods of peak demand.

Rattner described another research area, called a [Video Aware Wireless Network](#) (VAWN), where both service providers and end users will benefit from the latest wireless research. VAWN is the focus of a joint academic research program sponsored by Intel, Cisco and Verizon. With mobile video traffic expected to grow significantly over the next 5 years, according to Cisco Visual Networking Index, wireless networks could be constrained and video quality limited without new innovations. VAWN aims to increase the streaming video capacity of wireless networks while improving the viewing experience by optimizing network performance on an end-to-end basis.

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