

# Unleashing home wireless

by Bulent Celebi, CEO, AirTies

WiFi networks are widely used to connect IT and some entertainment devices in homes. Now we are starting to see the arrival of affordable wireless networks that can seamlessly connect all of a home's entertainment, communications and IT devices to easily access content and services throughout the home. Although much of the technology already exists, it is still quite a challenge to simplify its setup and use given the great variety of basically incompatible devices that need to be connected.



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## Where are we now?

The concept of a networked home is not new; many households already use Ethernet cabling to connect a number of traditional IT and consumer electronic devices, from computers and peripherals to games consoles and televisions. However, the vision of a home network, where content can be shared seamlessly among devices and printers, and storage can be accessed from any point on the network, is still some way off. What's more, few households will pull up floorboards to lay cables to connect their

homes and fewer still will install new cable whenever new devices are added. Wireless makes network connectivity simple; however, up until recently, robust, broadband, wireless deployments were too expensive, too costly to install and prone to quality of service (QoS) and performance issues.

However, new standards and innovations in wireless networking are making the networked home a reality. There are three essential ingredients to make the wireless networked home a truly compelling consumer experience: a network capable

of streaming video throughout the home; easy installation and network use; and, integration of compelling applications to ignite consumer interest.

## Video streaming and the home network

The ability to simultaneously stream multiple HD (*high definition*) content throughout the home - to TVs, PVRs, games consoles or PCs - is a fundamental for home media networks. Streaming video over wireless is commonly considered a major technical challenge; until recently the only available solutions

have carried high price tags. Speed alone is not enough to avoid pixelation on a TV screen. Good video quality requires each video packet to arrive in the right sequence and on time. The latest version of WiFi, 802.11n, provides the raw building blocks and speed, but current implementations are focused on raw speed and video packets are often dropped, arrive out of sequence or are late. Optimised WiFi link and control software, though, can deliver video packets reliably.

Interference is another issue that has hindered home WiFi deployment. The most commonly used WiFi technology uses the 2.4GHz frequency band, with three, non-overlapping channels in operation. In order to function at higher speed - 300mbps - two out of these three channels must be used. This can cause interference if other nearby devices - at home or at a neighbour- are also using WiFi. Microwave ovens or DECT and Bluetooth phones, for example, use the same radio band and can interrupt delivery of the wireless signals when used at the same time. At 5GHz there are 22 channels so, by constantly monitoring all channels for noise and traffic, software can dynamically shift to the best wireless channel available and maintain the signal without dropping video packets.

The third critical issue, the limited range of wireless coverage in concrete or stone buildings (the norm in Europe), is even more pronounced at 5GHz. However, by using a meshed network approach to overcome this problem, each device acts as a repeater; this significantly extends the coverage range.

### Making it simple

The realisation of the wireless home network vision involves creating a highly complex network with multiple TVs, PCs, disk drives, printers, video cameras etc. Installing and managing all of these devices is a major challenge; to make such a network profitable and viable for the service provider the network must be self-installed and easily managed by the customer.

Secure installation of the wireless network - at the touch of a button - is a prerequisite for success, as too is the need for the devices to be capable of automated self-discovery and configuration so the average person can carry out the installation

without expert supervision. This ease of use must include security settings for all the devices on the network as well as the ability to change or add users or devices; changes should be self-propagating and not require the user to change each individual networked device. The goal is to avoid the need to despatch costly support staff to handle these functions, which would significantly undermine the service provider's profitability.

### A rich user experience

The third key area relates to the user experience. The consumer electronics market is a complex and fast evolving market, with hundreds of different formats and incompatible devices. Dozens of different video, audio, music, codecs (digital coder/decoder) and file formats result in hundreds of technology combinations, which is why most electronics devices such as TVs, game consoles and cameras do not work together, even when they come from the same vendor. Marrying these different devices into a unified whole with the ability to access content and devices from any point on the network is an ambitious yet achievable goal.

Liberating content from individual devices on the network and making it available to all is becoming viable. The types of content which can be shared range from paid-for-content, such as movies, to user-generated content, such as photos or videos. Currently all of this media is scattered on the disk drives of multiple PCs or laptops, external USB drives, music players and disk drives build into STBs (*set-top boxes*) for PVR functionality. However by using standard file systems the content can be shared among all networked devices, allowing, for example, a movie stored on the STB to be streamed to any PC, TV or gaming devices attached to the network.

Other possibilities in the newly networked home will include sharing content on social networking sites like Twitter and Facebook on multiple home devices as well as smart phone and telephone integration, allowing caller information and IDs to be displayed on TV screens. Homes equipped with fibre/V DSL (*very-high-bitrate digital subscriber line*) service will be able to create their own home tele-presence environment by using HD video cameras combined with the HD

STBs and TVs. The possibilities are truly endless and - if all of the conditions above are met - eminently achievable.

### Expanding horizons

Apple has shown with the iPod and later the iPhone that what truly sets a killer product apart is not a single technical component, but a cohesive range of technologies packaged in a way that is attractive to consumers. The advent of the networked home opens up new vistas and possibilities for service providers with new content-rich applications. By moving to hybrid platforms and exploiting the possibilities opened up by OTT applications, operators can offer new bundles and services that significantly differentiate their offerings. Service providers can provide value-added services, like interactive viewing and video-on-demand (*VOD*) either as paid for or free services. VOD content, for example, can be pushed through to the subscribers' USB memory drive, to be stored for viewing at a later date, on any connected television in the home. This content can be personalised according to the individual's interests and past viewing preferences, improving the end-user experience and helping to reduce churn.

### Future developments

The concept of a completely wireless home has been discussed for the past 20 years, but it has yet to happen. The technology now exists to make the vision a reality, but how it is used will decide whether it can extend beyond its current capabilities. To succeed, the wireless solutions must be profitable, so they need to be affordable and cost little to deploy and own. The ingredients for success are finally coming together and the growth of video streaming, in the wake of the iPhone and services like BBC iPlayer, has awakened user demand for video-based content. The stage is now set to liberate home networking, content and devices from their shackles and pave the way for a true revolution in the home entertainment experience. ●