

# Oregan Networks Sees Digital Lifestyle Flourishing With Wi-Fi

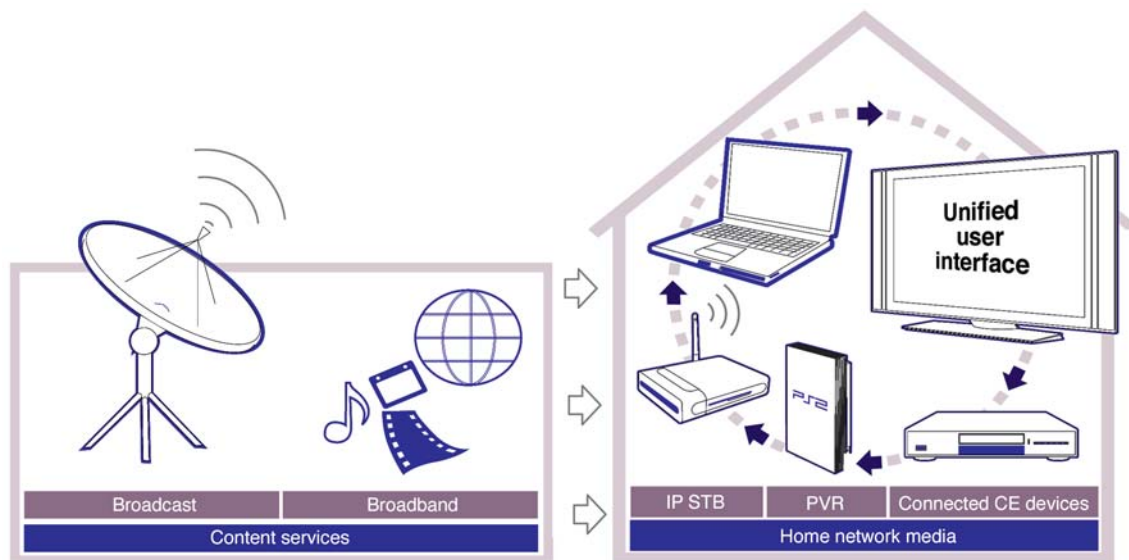
**W**ireless technologies are extending their reach into daily life, with products like mobile phones, wireless headsets, remote car keys and more now commonplace in many homes. Untethered digital technologies have taken less than a decade to achieve widespread adoption. When the Institute of Electrical and Electronics Engineers (IEEE) released the 802.11 wireless protocol in 1997, the technology was to serve as a data link layer for local area networks (LANs). Subsequently, the Wi-Fi Alliance adopted the protocol as a standard in 2000. Now it is set to power a host of commercial data, voice and media services over broadband Internet connections.

The original version used infrared signals on the Industrial, Scientific and Medical (ISM) frequency band. Soon, however, the more robust and commercially feasible 802.11b protocol superseded the original. IEEE802.11b is capable of streaming various media at a maximum throughput of 5.5Mbps and connecting Wi-Fi-enabled devices within 50m of the access point. However, the IEEE802.11g version paved the way for the reliable streaming of video and home entertainment, offering a 54Mbps peak throughput, or an average throughput of about 24.7Mbps. Combined with the range of the IEEE802.11b standard, IEEE802.11g accommodates streaming of up to four simultaneous streams of standard-definition movie. Theoretically, it can handle two high-definition streams encoded in highly compressed MPEG-4, Windows Media Video, or DivX formats.

Now technophiles can choose among IEEE802.11a, IEEE802.11b and IEEE802.11g of the standard. Alternatively, they may simply select a tri-mode device, with all-in-one wireless connectivity under one chassis. Additionally, to resolve the security issues relating to wireless connectivity, the Wi-Fi Alliance



**Fig. 2: Oregan Networks' technology links different devices, such as video recording equipment, home servers, game consoles and computers.**



Source: Oregan Networks Ltd.

**Fig. 1: Multiple-room entertainment delivery system**

is introducing the Wi-Fi Protected Access 2 (WPA2) technology, which uses the Advanced Encryption Standard (AES) scheme and dynamic key exchange mechanisms, including temporal key integrity protocol (TKIP).

Furthermore, the home wireless connectivity market gained additional momentum with the Intel Pentium M Centrino chip set. This product gave consumers instant built-in wireless connectivity for notebook computers as well as increased battery life of the device, owing to reduced CPU clock speeds. Perhaps even more importantly, the Centrino line helped consumers understand concretely the benefits of the so-called unwired lifestyle. As a result, the notion of digital entertainment moved beyond the personal computer and into the living room.

## Different Visions

Leading consumer electronics companies, without exception, are embarking on a new strategy that will reinvigorate their brand images, create new value for the consumer and drive demand in what so far has been a cyclical market: home entertainment devices. The vehicle for their strategy is the "digital home" theme (Fig. 1), which encompasses the idea of using any device at any time to gain access to personal and protected premium digital entertainment across LANs.

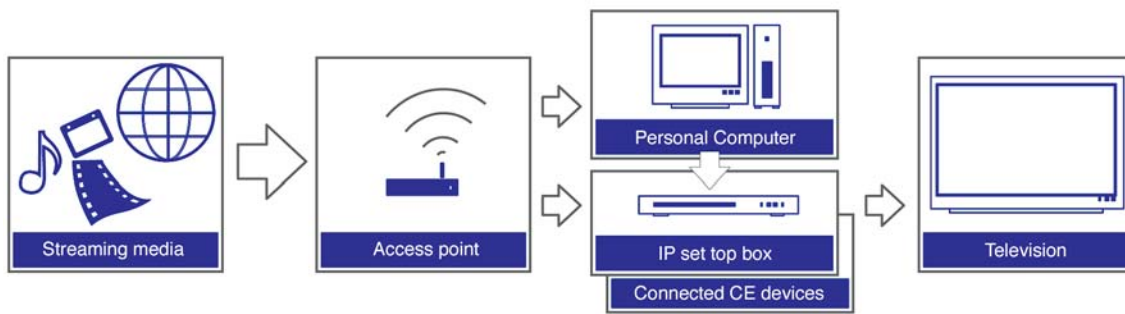
Oregan Networks Ltd., a provider of embedded software for convergent digital home entertainment devices (Fig. 2), creates solutions for Internet protocol TV (IPTV), video-on-demand, and home network

media distribution. As a developer of media client technologies, Oregan Networks strives for extensible, modular architectures, and comprehensive solutions specifically for interoperable digital home entertainment. Its unified user interface solution enables control of diverse interactive and multimedia services, home media, and home automation. The company frequently works with the top-tier consumer electronics companies and leading chip set manufacturers to build highly integrated media client solutions.

## Browsing Technology

For instance, Toshiba America Electronic Components Inc. (TAEC) has integrated the company's Oregan Media Browser into the AVM49R reference design, which runs the MontaVista Linux operating system. As part of hybrid Internet protocol (IP) set-top boxes or personal video recorders, the AVM49R, in conjunction with the Oregan Media Browser, allows streaming of high-definition content from broadband Internet sources and between interoperable home network equipment. The Oregan Media Browser comes with an extensive set of application programming interfaces (APIs), which lets manufacturers extend the functionalities of the target device to support multiple content services, conditional-access systems, and digital rights management technologies.

Tetsuro Wada, Director of Business Development and Technical Marketing for the RISC Microprocessor and Multimedia Business Unit at Toshiba America Electronic Components Inc., says, "The Oregan Media Browser enhances the AVM49R reference design, enabling delivery of source-independent video, audio, and gaming functions. The platform is optimal for enabling fast, cost-effective deployment of extremely reliable unicast and multicast-based services."



Source: Oregon Networks Ltd.

Fig. 3: Enabling connected home entertainment and online media services

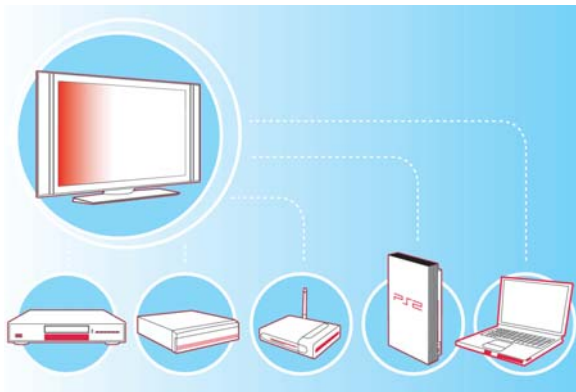


Fig. 4: Many machines, one wireless network

## Tailored Solutions

Oregon Networks is most widely known as the provider of Web browser technology for Sony Computer Entertainment Europe's (SCEE) PlayStation 2 console. For this on-going project, Oregon devised a custom version of its TV-centric, embedded browser technology, and ported it to Sony's Emotion Engine chip set, enabling the console to render rich animated graphics and sounds on a par with DVD quality. In 2001, Sony began to license the Oregon Media Browser commercially.

Today, the Oregon Networks solution powers user access to Central Station, Sony's online gaming community portal. To accommodate the international nature of Sony's brand, the browser also supports multiple languages and bi-directional text display.

Greatly enhancing the solution's portability and scalability, Oregon Networks developed the Oregon Abstraction Layer, a middleware layer that abstracts out all aspects of the software requiring customization, for compatibility with hardware-specific components like codecs, networking drivers and the operating system (OS).

## Architecturally Speaking

Oregon Networks developed its software suite specifically for device manufacturers and vertical service operators. This standards-based solution delivers media content across IP networks. The architecture integrates three modules for content delivery, including a TV browser and user-interface engine, an IPTV client, and a Digital Living Network Alliance (DLNA) player and server (Fig 3). The core of the solution, Oregon's TV browser module, complies with the core requirements of the World Wide Web Consortium's (W3C) recommendations. It enables the functionality of the user interface engine, making it possible to render dynamic

graphics and data feeds, essential for accessing Internet-based entertainment portals, news feeds and Web advertising on TV.

## Digital Home

As Oregon's work with Toshiba, Philips and Sony illustrates, digital home appliances today rank high in technological complexity. This adds to the challenges of consumer education, and ease of set up and use. Successful proliferation of this technology depends on seamless connectivity and on the cross-platform interoperability of devices using Wi-Fi and Universal Plug-n-Play (UPnP) technology standards.

Wi-Fi has become a critical technology building block allowing consumers to stream personal content and downloaded content including photo slide shows, music and movies to TVs (Fig. 4). For many, this leads to the ultimate home theater experience. Sharing hardware resources with media processing tasks, Wi-Fi operates in unison with embedded software solutions, Digital Transmission Copy Protection IP link protection, plug-and-play device interoperability and user interface solutions.

One user interface can enable the consumer to control the devices on the Wi-Fi network from the living room or from a personal computer. This involves a number of conditions, including password settings, parental control functions, quality of service (which relates to establishing the bandwidth usage priority of devices on the network), user interface settings and home surveillance systems.

## Market Trends

The so-called battle for the living room does not end with the juxtaposition of pricey entertainment computers and consumer electronics. Telecommunications providers and cable operators regard a rich multimedia experience as one of the value-added services they aim to offer. If they are successful, the value-added services will help them offset the erosion of traditional dual-play revenue streams.

The vertical model of device distribution for Wi-Fi-enabled devices offers the consumer a comfortable alternative to high-tech gadgetry. Instead of complex installations, Wi-Fi in set-top boxes and digital gateways offers a shortened learning curve, without the monetary investment usually necessary when acquiring a new technology. These advantages, along with the existing offerings from service operators, strengthen the position of the vertical camp. Those offering Wi-Fi en-

abled products can market the feature as "wireless multiple-room entertainment."

As those in the vertical and retail value chains recognize the potential of home networking, the consumer electronics industry sees the emergence of dual-purpose media silicon from companies like STMicroelectronics, Sigma Designs, and Texas Instruments, Inc., enabling functions that blend IPTV with digital media adapter capabilities. The mechanisms for media processing and network tasks are essentially identical regardless of the content source, as long as the media delivery relies on the IP scheme.

One issue that might inhibit the spread of wireless-enabled consumer premises equipment (CPE) is the associated cost delta. Adding this to the total hardware bill of materials adds an average of about US\$9 for an IEEE801.11g solution.

Chris Taylor, Director of the RF Components Division at Strategy Analytics, says standards drive the trend for significant price cuts in network-use chip sets. The trends gain strength from the innovations among silicon vendors like Marvell and Broadcom who have developed single-chip systems with pre-integrated CPUs and built-in wireless functions. These solutions target home gateways, mobile devices and CPE for delivery of voice, video and data.

## More Than Fun and Games

Interestingly, game consoles represent the first category of entertainment device to commit to wireless connectivity. Examples include PlayStation 3 and Xbox 360, PSP and Nintendo DS Multiplayer. Wi-Fi will enable multiple-player experiences and will allow access to Internet services on these devices.

Ubiquitous mobile Internet access zones, or hotspots, also will spur proliferation of wireless systems and services. Jwire, an online directory of global hotspots, says there are now 69,994 Wi-Fi hotspot locations in 102 countries. Service alliances between mobile phone manufacturers and voice over IP (VoIP) services, similar to this year's announcement of Motorola and Skype, ultimately may bolster the consumer demand for wireless technology.

Broadband adoption gathers momentum from new value-added services, including video-on-demand, VoIP, interactive TV, personal video recorders, and network gaming. Consumers acquiring these technologies and services need ways to link devices easily in a home network.

## Conclusion

According to the semiconductor research group at IDC Corp., in 2004 less than 1 percent of consumer electronics applications used wireless LAN technologies. However, consumer electronics devices will form more than 20 percent of the overall wireless market by 2009.

As an established, ubiquitous and constantly evolving standard, IEEE 802.11 today is the main method for seamless connectivity. The Digital Living Network Alliance specifies Wi-Fi as the default standard for wireless connectivity. Such endorsements help position Wi-Fi to power digital appliances of the future. **JEI**