

WHITE PAPER

Code Red Systems Ltd.
21 HaVaad HaLeumi
POB 16120, Jerusalem, Israel
T +972-2-642-3401, F +972-2-678-3403
Email: info@code-red.biz
Web: <http://www.code-red.biz>

April 20, 2005

Remote Management of Complex Home Networks

By,
Drew Tick, Code Red Systems & Dr. Joseph Gilor, Olive Bay Ltd.

(Jerusalem, Israel) According to In-Stat/MDR, networked entertainment elements such as Wi-Fi routers and media servers that link TVs and stereos directly into the home network will propel the overall market to over \$5.3 billion in 2007. A key factor in this growth is remote management of the home network, both from the perspective of service providers looking for sources of substantial revenue, as well as from end-users who will rely on their service providers to manage the ever increasing complexity of their home network.

Overview

For years companies have touted the home networking market which never really seemed to reach its potential. Over the last five years, however, significant growth in broadband internet connections to the home and wireless networks within the home, have vendors, carriers, and end-users poised for the realization of home networking functionality which has been anticipated for the past decade.

Home Networking is a very general term which has come to include connecting some or all of the following systems:

- Computing equipment
- Entertainment equipment
- Safety equipment
- Security equipment
- Climate control
- Household appliances

Remote management of these disparate types of equipment is the key to success in this market.

The Problem

In his book The Invisible Computer, Professor of Computer Science and Psychology at Northwestern University and former Vice President of Apple Computer's Advanced Technology Group, Dr. Donald Norman lists three critical design principles for the viability of home networks:

- Simplicity
- Versatility
- Pleasurability

Therefore the system of information built for the home must be suitable for the non-technical user, who does not have the training or desire to manage and maintain complex networks. The ultimate success of home networks means that they must not even appear to be complex, must be compatible with a large array of devices and must have immediate benefit without a deep understanding of the technology.

In parallel, telecommunications companies and Internet service providers have seen continuous price erosion and decreasing profitability in the providing of core services. Therefore many companies, are looking to advanced home networking services for increased revenues and expansion of their customer base. According to Randy Kinkaid, BellSouth's Senior Director of consumer Internet services: "If home networking is going to reach the mainstream, it's got to be pushed out from the PCs to where customers normally use it, which is their TV or stereo. That's when you start to hit the mother lode."

In order to realize this vision, service providers must take on the daunting task of managing the network and the devices which are connected to it. In its current format, the network itself will probably be an IP based network using a wireless infrastructure such as WiFi. Going forwards, there will also be a need to support secondary wireless protocols such as Zigbee, which is used to control security related apparatus such as burglar alarms and smoke detectors.

The devices themselves will come from multiple vendors which may, or may not follow current standards. In the home networking arena, this may include the Digital Living Network Alliance (DLNA) which has 140 member organizations representing 14 countries and is currently the world's leading industry standard for home networking.

In short the major problem will be providing the service providers with an application to manage remote networks made of equipment from multiple vendors and the devices attached to those networks. This solution is critical for service providers to realize additional revenues for advanced networking services, as well as being crucial for consumers who require a simple and positive home networking experience to assure market acceptance.

The Solution

Centralized monitoring and management of devices from multiple vendors, using multiple protocols over multiple operating systems is required to meet this challenge.

The service provider should be able to see a visual image of the user's home network, including all network side and device side equipment. Monitoring, configuration, and maintenance of the devices should be done from a consistent user interface, which will have a single "look and feel" regardless of the device being configured.

On the back end, the system should use the most generic approach possible for remote device management. For example, support for SNMP, HTTP and Telnet protocols provides a management interface to 90% of the network side devices currently used in home networks. On the device side, support for leading client side operating systems and possible inclusion of driver level software in the device, should enable management capabilities for most mainstream devices.

The solution should be software only and support the major wireless and wired protocols. For example, the WiFi 802.11 wireless standard will probably be the initial infrastructure for most home networks. In the future, however, other wireless protocols such as Bluetooth, WiMax and wireless USB must also be supported.

The large amount of devices coupled with support for multiple protocols makes management a daunting task. The various standards bodies make this task a bit more palatable by publishing industry wide protocols for management of related devices. Unfortunately, not all vendors adapt these standards, and even those who do, usually use a number of proprietary calls in addition to the standard interface.

Therefore a leading solution should not be evaluated on the number of devices or protocols currently supported, but rather on how quickly new devices and protocols can be recognized and supported. For example, if a new product comes to market, it would be expected that management support could be provided in a matter of days.

The Implementation

One might expect the solution described above to come from a leading networking company. The problem is that most networking companies are interested in managing their own equipment and not the equipment of their competitors. The second issue is while these companies may be experts in the management of network side equipment, they have little, if any, experience managing client side devices.

Enter Code Red Systems, a software development company specializing in management and security solutions for 802.11 WiFi networks. Due to market demand, the company has developed patent-pending technology for both network-side and client-side wireless equipment. The company is also committed to software-only multi-vendor solutions.

In the early days, it took three weeks for the company's engineers to write the code in order to support a particular wireless router. That time was eventually cut to three days and currently stands on one day of a technician's time to support new equipment. The goal is now to improve the algorithm and increase automation to a point where it will take less than an hour to recognize and manage a new piece of equipment.

Building on its experience in WiFi, the Code Red team is confident that it understands the advantages of being in synch with the latest emerging standards, while maintaining a realistic view how when and how these standards will be implemented in real world scenarios.

While strong in technology, the company is open to partnerships with leading players for prioritizing protocol support, access to specifications of leading standards committees, and market channels to key service providers.

Conclusion

Service providers firmly believe that advanced home networking services represent a significant revenue opportunity going forwards. Likewise, it is agreed that home networking will succeed only if consumers are presented with a simple, versatile and pleasurable networking experience.

The major obstacle standing between consumer demand and the ability to supply an appropriate solution, is the technical challenge of monitoring, managing and maintaining network-side and client-side devices from multiple vendors, using multiple protocols over multiple operating systems.

Code Red Systems has already implemented both network-side and client-side management modules for 802.11 WiFi wireless networks. This experience has led to the development of a software engine which can support new equipment within 24 hours. The company is open to partnerships with leading industry players which enable the leveraging of its technology into market driven solutions for remote management of complex home networks.

About Code Red Systems:

Code Red is a software developer specializing in management and security solution for the 802.11 wireless networks. The company is headquartered in Jerusalem, Israel, and has a staff of software engineers with hands-on military and civilian data management and security experience. The company has a number of products which cover a wide range of applications and support equipment from multiple vendors. For more information please visit the company web site at: <http://www.code-red.biz>

About Olive Bay Ltd.:

Olive Bay's strengths are its technological background and unique market-oriented visionary planning approach. The company has a proven technological track-record with world-class expertise in scientific research, product design and product implementation. Moreover, the combination of deep technical roots and unique market-oriented approach, allows Olive Bay to offer a comprehensive distinguished competitive analysis and innovative strategic planning. For more information please visit: <http://www.olivebay.com>