

# The Wireless Internet and a WiFi Initiative in Estonia

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*Estonia is currently experiencing very rapid growth in one particular segment of the telecommunications market – the segment of the wireless Internet. This is happening in a country where a majority of residents already use mobile phones.*

The Internet became available for public use in Estonia in 1992, and, 10 years on, 50% of Estonia's residents say that they have used the Internet at least once. The popularity of the Net has created new needs. In many cases, conventional Internet use in the home or office is not longer compatible with a modern, speedy lifestyle. These days, people often find that they must send an urgent E-mail, make a bank transfer or search for certain information even when they are neither at home or at the office. It is also true that sometimes it is nice just to do some work on a park bench in the sunshine, instead of in an office. The wireless Internet network is probably the easiest and least expensive way to make these visions possible.

The creation of wireless networks has been a popular activity for the past

three or four years throughout the world. Most of these networks have been based on point-to-point links. In the center of the city of Rīga, for instance, telecommunications regulations forced the Internet to be mostly wireless. Other problems have included the excessive size of related equipment and the fact that vendors "spoke" in different radio languages.

The quantum leap in development was caused by three factors. First of all, radio Internet cards are being produced by the million, and they cost less than USD 100 these days. Secondly, the cards are small enough to be shaped into the PCMCIA size. Finally, living standards in Estonia have been on the rise, and a laptop or handheld computer is no longer a luxury for many people.

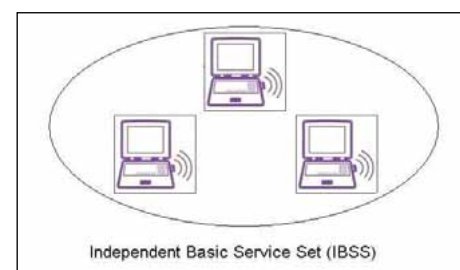


Figure 2. The wireless ad hoc mode

## WHAT IS WIFI?

Among all known wireless standards, the most popular is probably the IEEE 802.11b WLAN standard. Its application ensures connection speeds of up to 11 Mbit/sec, with operations that are possible at a distance of up to 300 meters from the transmitter. Normal radio rules apply, of course – the greater the distance, the lower the service speed. Wireless areas can overlap so as to allow for roaming support. Large areas can be developed in which one can move around without ever losing touch with the wireless Internet. All the end user needs is a WiFi card, and WiFi cards can be bought separately or as a part of new computers. A driver has to be installed unless a Linux operating system or any Microsoft operating system from Windows XP forward is used.

The WiFi (Wireless Fidelity) standard was agreed upon some three years ago, the aim being to standardize the R&D efforts of a number of companies. A manufacturer can use the WiFi logo on a new product only after strict product testing to demonstrate compatibility with standards and with previously manufactured units. Interoperability is thus ensured, so that Nokia and Cisco products can "talk" to Lucent and Dell network cards, and vice versa.

The 802.11 standard defines the infrastructure mode and the ad hoc mode. The infrastructure mode (Figure 1) involves at least one access point (AP) that is connected to the wired network infrastructure, along with a set of wireless end stations. This connection type is used in airports, cafes and other public places. The configuration is called a Basic Service Set (BSS). An Extended Service Set (ESS), by comparison, involves a set of two or more BSSs, thus forming a single sub-networks. Most sophisticated access point models can allow for roaming among numerous AP

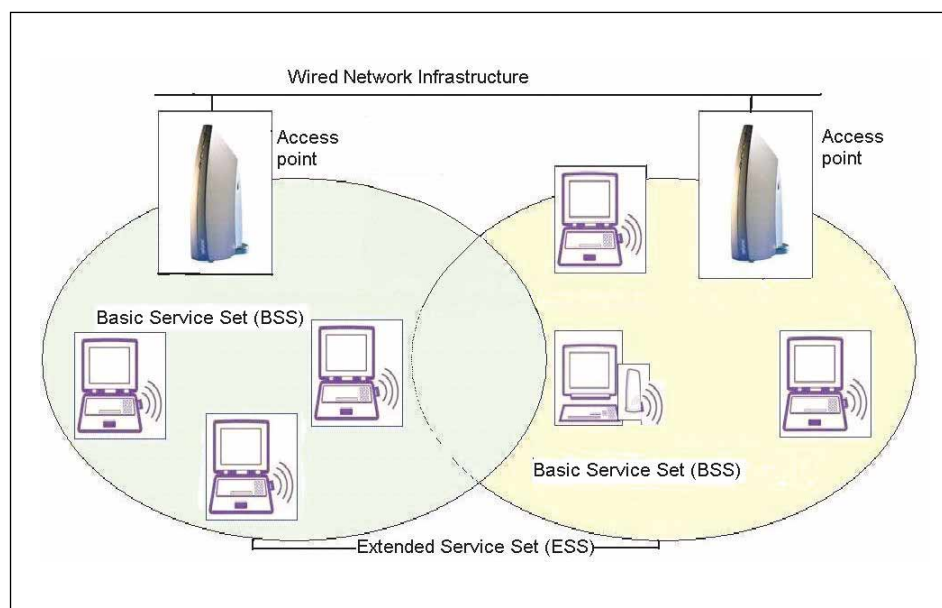


Figure 1. The wireless infrastructure mode



Figure 3. At a meeting of local WiFi community activists (from the left): Anto Veldre (IT manager at Tallinn Airport), Merlis Nõgene (chief editor, Radio KUKU), Priit Noorhani (WiFi Viljandi initiative group member), and Veljo Haamer (editor, WiFi.ee)

units. As is the case with GSM telephony, the user does not have to worry about radio waves and access points. The user can simply move from one access point to the next, doing so throughout the entire service area.

The ad hoc mode is more crucial in that it does not require any AP or central infrastructure. The user's laptop can communicate directly with the computers of business partners or office colleagues (Figure 2). Here, again, we can look to the world of GSM for an example. It is no longer surprising to have two friends exchange their telephone lists via infrared, is it? Similarly, you can create an ad hoc network when and where you need it, transferring anything that you have on your disk to the disks of your partners.

This is a quick and easy way to set up a wireless network without having to have a wireless infrastructure. Existing or expensive services at places like hotel rooms, convention centers and airports can be bypassed.

More detailed information about WiFi can be found at <http://www.wi-fi.org>.

### THE FIRST STEPS IN ESTONIA

The first wireless connection areas in Estonia were launched in the spring

of 2001. By the summer of 2002, there were 40 such areas. Approximately two-thirds of them are commercial and provided by major ISPs such as Eesti Telefon and Uninet. The remaining third are controlled by non-profit activities involving local WiFi activists or private companies. All of the non-profit areas are using standardized WiFi equipment so as to ensure equal availability.

There have been several reasons for the rapid development of the WiFi idea. Two major factors have been the very broad use of the Internet in Estonia, as well as the country's well established infrastructure in this area. There are other factors, too, which have influenced the process to a greater or lesser degree:

- Affordability of properly certified hardware (using WiFi, not proprietary standard);
- Easy installation (WiFi is the only mainstream mobile data transmission technology which is so simple to use);
- WiFi connections are up to 200 times faster than GPRS connections from GSM services;
- One can share Internet connection costs with a friend or neighbor;
- Windows, MacOS and Linux have all integrated WiFi into their software, which means that the user is not chained to a specific vendor or "flavor of

the month";

- Most new notebook computers and PDAs have installed WiFi, so no card is needed, and the antenna is hidden inside of the unit;

- There is easy access to WiFi information in Estonian (<http://www.wifi.ee>);

- Signs denoting WiFi areas are unified and easily recognized throughout Estonia – a great deal of work went into achieving agreement among ISPs and freelancers on this matter;

- There has been greater competition among Internet service providers since the Estonian telecommunications market opened up for competition in January 2001.

### THE ROLE OF WIFI.EE

A key factor in any major project is coordination and synchronization. WiFi.ee is a non-profit service organization which promotes the idea of WiFi wireless Internet throughout Estonia. Ours is a small group of NGO enthusiasts seeking to spread the use of the wireless Internet as widely as possible, as inexpensively as possible and as easily as possible.

The very first thing that the group did was to reach agreement on signs that are used to denote WiFi areas (Figure 4). We worked to convince major service providers of the need for this. American experience tells us that a network alone is not enough. Truly widespread use of the wireless Internet requires usage areas that are easy to find and to identify. Information about available areas and conditions must be easily found by local residents and by tourists. For tourists, the biggest challenge in the United States is precisely this lack of information. There has been no unified source of information about all categories of providers.

WiFi.ee aims to be the Internet place where one can find all WiFi-related information. All open WiFi areas in Estonia, moreover, are marked with the WiFi.ee sign, irrespective of whether they provide free access or not. Bars and shopping centers have stickers similar to those from credit card companies. Open areas are marked with a WiFi.ee traffic sign.



Figure 4. A marked WiFi area at the Tallinn Airport

### CURRENT APPLICATIONS

Once Eesti Telefon and Uninet opened their first major WiFi areas in places such as the Old Market Square in Tallinn, it became possible to convince local bars and shopping centers of the wisdom of a small investment in the wireless Internet. Businesses which provide free WiFi services to their cus-

tomers develop the reputation of innovation, and this brings in new customers. This segment, along with the segment of home offices, is now the most rapidly growing one in Estonia. The idea is also warmly welcomed by municipalities, many of which have already financed or co-financed the installation of WiFi areas. This is very important, because commercial areas either do or will at some point have user fees. This means that free Internet access can be provided to all comers at places like public beaches, major tourist attractions or logistical centers. The site of someone with an open laptop, sitting on a park bench – that is no longer anything rare.

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Some of the WiFi areas in the southern Estonian town of Viljandi have been created so as to promote the town and its cultural events. It is expected that the technological misbalance that exists between Tallinn and the rest of Estonia will be evened out as a result of these technologies.

### FUTURE FORECASTS

We expect the number of wireless Internet areas in Estonia to increase to 50 by the end of this year and for the number to double in each succeeding year. Segments in which we can expect WiFi to be implemented in the next two years include the education system, the health care system, border facilities, street advertising, online publishing and local online “know-how” services.

The existing WiFi networks can hope for great success, because they are supported by the ISPs and by the local community. The result is an increased use of the Internet and a rapid improvement in the quality of online services. □