

A Comparison of Wireless Speed in the United States and South Korea

Jennifer Cheang

IT 103-002

George Mason University

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## Introduction

Imagine a world where information could be accessed in less than the blink of an eye, faster than a mouse's heartbeat. In the United States, the average middle class household accesses the World Wide Web at 5.1 megabits per second (mbps). If someone in the U.S. searches a keyword on Google, that search takes around 0.24 seconds. Is it even possible to get even faster? South Korea thinks so. In the past few weeks, research has been collected to compare the difference in efficiency of the South Korean internet to the America's penetration power. These facts and figures have provided a basis for comparison and analysis of the different components of each country's wireless network. The central idea of the paper is that South Korea's "wired culture" is made possible by the government's priority to put its civilians first to improve the quality of life using efficient internet services. The United States could adopt this model and prevent faulty connections with better bandwidth. This paper will explore the technology behind the world's most wired nation and the legal aspects, ethical implications, and security concerns of faster internet. To understand South Korea's wired culture, one must understand the technical details of the World Wide Web and what constitutes "fast internet."

## Background

**The mechanics of internet access.** To start with, one must understand that the internet is not a single device or being. According to Merriam-Webster, the **internet** is defined as "an electronic communications network that connects computer networks and organizational computer facilities around the world." In short, it is a network of networks. Explaining the entire concept of the internet and how it works would be a tedious task for the purpose of this paper, so

this paper will only explain how one *accesses* the internet and how different factors affect that penetration speed between the United States and South Korea.

When a person accesses a webpage, their computer (known as a **client**) sends a request in a virtual envelope, called a **packet**, of information asking for a copy of the webpage. This request is sent through large copper wires underground (if one is using landlines like **DSL**, digital subscriber lines) across **LANs** (Local Area Networks). The information continues through these connected cables and networks until it reaches a **hub** (a connection point for devices in a network) where the **hub** will redirect the packet to another **router** at the speed of light through **fiber optic cables**. The packet will arrive at an even larger hub that covers a **WAN** (Wide Area Network) and that hub will send the packet through a series of regional LANs until the packet reaches its target server. The **server** is a piece of hardware that serves information to other clients. The server will open the packet, read the request, and send the webpage back to the original client by breaking down the webpage into thousands of smaller packets of data which will travel through different routes but ultimately reconstruct itself at the same time on the requesting user's computer.

All of these actions happen within a second or so depending on one's **bandwidth**. Bandwidth, used in computer science, is the volume of information per unit of time that a transmission medium can handle. One can think of bandwidth like a water pipe; if the pipe is small, then large amounts of water (information) will take a longer time to get through. However, if the pipe is large, the same amount of water will flow much faster to its destination.

**Why the internet in South Korea is faster.** There are several factors that explain why the U.S. has both slower and more expensive internet than South Korea: the use of bandwidth by the U.S. military, Korean competition, politics, and population density.

*The use of bandwidth by the U.S. military.* The military takes priority in the United States, so its bandwidth, used for GPS and information transmission, is the highest and most efficient in the country. “[The Department of Defense thinks] like land barons in a feudalistic society. Rather than give up control over their bandwidth, so that a central authority can divvy it out to everyone, the services hoard their resources.” (McKenna, 2005, p. 27). The military does not effectively use its resources and wastes bandwidth that could be allocated to the general public.

*Korean competition.* The average Korean citizen has several outlets to choose from, so internet providers compete to have the fastest and cheapest services to attract consumers to subscribe to their plans. In the U.S., however, people usually choose between a cable company and a telephone company. Broadband providers are few and far between and are not required to share cable lines. In Korea, the government requires broadband providers to share cable lines to create open networks, therefore increasing competition between these companies since they use the same cables to send signals. This means companies can enter the broadband market without having to pay for infrastructure. In the U.S., companies lay down their own sets of cables. Competition would reduce costs for broadband consumers.

*Politics and culture.* Korea’s government promotes IT education and merging it with everyday life. With its cultural emphasis on its education system, access to massive amounts of information is essential. “The government [even] subsidizes the price of connections for low-income and traditionally unconnected people to encourage its citizens to get connected to the

internet” (Stutter, 2010, pg. 2). According to the State of the Internet report from Akamai for Q4 2011, 98.5% of Korean households have internet access (compared to 65% of Americans).

*Population density.* South Korea is more densely populated than the U.S. This means that cable networks are shorter and less copper wire is used to connect a larger population, making it cheaper for companies to lay down broadband connections. Broadband signals carried by fiber optics and copper wires travel faster if the distance is shorter. “In South Korea, that's usually just from the base of an apartment building to a particular unit. In the U.S., copper wire may have to link a home with a fiber optic cable that's a mile away” (Stutter, 2010, pg. 3). This causes data to slow down and make it more expensive for companies to maintain, raising prices for consumers.

### **Potential Benefits of High-speed Internet Access**

High-speed Internet is reliable and constant. In fact, in many cases, it can be more secure because there is a smaller time frame in which packets of data are available on a network. A reliable connection prevents important processes, such as business transactions, from losing signals. For business owners, it would be beneficial to easily connect to clients both at home and overseas with fluent video and audio streams. For students, fast internet access allows for a larger allocation of information, and therefore a higher literacy rate (which can be seen in Korea’s extraordinarily high testing results). Korean students know how to set up websites with large databases and can even block IP address from certain countries. Recreational use of the internet would improve as well: web pages would load faster and there would be a lesser chance of them freezing, downloading of audio and visual files, programs, and software updates would take a less amount of time, and larger video and audio files (as well as higher quality) can be uploaded quickly.

## **Legal and Ethical Issues**

There are hundreds of ethical and legal concerns regarding high-speed internet, and internet in general, but for the purpose of this paper only one will be discussed.

One of the biggest concerns with expanding bandwidth use in the U.S. would be the massive role that government would play in it. Much of South Korea's internet is regulated by the government because of its policies and supplemental role in providing the population with cheaper and faster broadband. U.S. citizens would oppose regulation policies and cry out against actions against the private sector, criticizing the government for trying to control businesses.

## **Security Concerns**

High-speed internet is considered more secure and reliable; however, it also allows even more of one's personal information to be distributed across the web and can be accessed at any time by hackers. For example, in South Korea, the music industry is booming and has some of the largest fan bases on Earth. However, this industry has also fostered a type of fans called *sasaengs* (or "privates"). These fans have been known to tap into CCTV networks and surveillance celebrities in their homes as well as produce identical copies of cellphones that they can intercept and answer incoming calls from. These *sasaengs*, mostly young female students, can find the most intimate details of someone's life including the addresses of their family or even their financial information. They can even use GPS to track down a celebrity's movements through taxi cab workers across social networking sites in real time. This frightening abuse of internet access in Korea highlights the dangers of high-speed internet access for civilians and even criminals.

### **Socio-economic Problems**

The divide among rich and poor – those who can access and work internet and those who cannot—is called the Digital Divide. “Distribution of Internet access... is heavily skewed toward the younger generation, white-collar workers and students, college graduates, and households with high income” (Kim & Jeong, 2010, p. 50). This raises concern over the continued polarization of the upper and lower classes. It is feared that lower classes will be left behind (by the economy and also the education system) in the information age.

However, in South Korea, “the digital divide is narrowing: the access to the Internet had been highly uneven at first, but is becoming much more egalitarian” (Kim & Jeong, 2010, p. 51). This is because of government regulations that provide low-income families and rural areas to cheaper internet services and ITC4D projects aiming to give access to nearly all of Korea’s population.

### **Further Required Research**

South Korea is already five years ahead of the U.S. in terms of information technology, but its government intends to continue its lead as “the world’s bandwidth capital” by investing in hundreds of projects meant to increase wireless efficiency and distribution of bandwidth. One of their biggest projects is switching the population from cable DSL to WiBro. WiBro is a WiMax technology developed by South Korea that uses broadband signals and boosts bandwidth from about 5Mbps (already the fastest in the world) to 10 Mbps. WiBro would provide consumers with wireless broadband that is as efficient, secure, and reliable as copper wires and fiber optics. The government intends to provide internet using WiBro in public areas such as subways. Many

businesses have already switched to WiBro and provide free internet access for customers during business hours.

## **Conclusion**

The central idea of the paper is that South Korea's "wired culture" is made possible by the government's priority to put its civilians first to improve the quality of life using efficient internet services. The United States could adopt this model and prevent faulty connections with better bandwidth. High-speed internet access has provided Korean citizens with more efficient lifestyles, increased literacy, and expanded businesses. This achievement was possible with the help of the government to increase competition among broadband providers, provide low-income families with internet access, and integrate internet literacy into the everyday lives of its citizens. Korea's "wired culture" has fostered one of the world's fastest growing economies and is slowly making the country into a world power. The U.S. needs to consider adopting this digital model so it can retain its status as a superpower and prevent itself from falling behind other nations.



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