

Strategies for Giga-Internet Stimulation

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Abstract— Recent explosion of new network-based services such as mobile apps, cloud services, and N-screen services requires more wired and wireless traffic to provide the services stably. It is inevitable to construct Giga-Internet network and to provide fast Internet connection. Giga-Internet means a next generation Internet of 1Gbps, whose speed is 10 times faster than the current BcN network. The Korea government has built the policies of enhancing network infrastructure, including broadband network plans and BcN plans. To compete with other countries which are already preparing for introducing Giga-Internet services, Korea will establish Giga-Internet and start commercial services in 2012. In this paper, we analyze the necessity of stimulating Giga-Internet and propose the future plan of Giga-Internet.

Keywords— Giga-Internet, NGN, BcN, Broadband, IT Policy

I. INTRODUCTION

Recent explosion of new network-based services such as mobile apps, cloud services, and N-screen services requires more wired and wireless traffic to provide the services stably. It is inevitable to construct Giga-Internet network and to provide fast Internet connection. Giga-Internet means a next generation Internet of 1Gbps, whose speed is 10 times faster than the current BcN network. Korea has become a leading country with the world's top class information infrastructure through continuous projects to establish the high-speed information and communications network (1.5 ~ 2Mbps), and broadband convergence Network (50Mbps or above) since 1995 [1, 2, 3]. As the result of preemptive policies, Korea has possessed the most advanced IT infrastructure in the world, and created a new market in the related areas [4]. The need for high-speed network has been accelerated by digital convergence, that is, the convergence of broadcasting, communications and the Internet [5].

The Korea government has built the policies of enhancing network infrastructure, including broadband network plans and BcN plans [6, 7, 8]. To compete with other countries which are already preparing for introducing Giga-Internet services, Korea will establish Giga-Internet and start commercial services in 2012 [9].

However, the investment to the network infrastructure in the private sectors is still passive. It is due to the saturation of

subscribers who use fixed monthly rate programs, which had been the source of income for the private sector. It is also caused by the stagnation in the communication market due to fixed Internet service charges. The subscribers paid around 20,000 ~ 30,000 won for a few Mbps Internet service at the end of 1990s, but they still pay almost the same amount of money for 100Mbps Internet service. Consequently it is difficult to expect active investment to future network infrastructure by the private sectors. Domestic telecommunication companies are seeking ways to diversify the business areas such as the service platform, but it is not clear whether such ways are settled as new growth engines.

Therefore, Giga-Internet commercialization strategies are required in order to strengthen the broadcast and communication competitiveness, to induce private investment to network infrastructure and to proliferate high quality smart services.

Under the circumstances like these, it is very important to find a way to create profit in the private sector and uplift the satisfaction level of nationwide. The way should be searched by considering various elements directly connected with the successful commercialization beyond the level of pilot project. These elements include consumer demand, killer service models, smart use of network, and market ecosystem.

In this paper, we analyze the necessity of stimulating Giga-Internet and propose the future plan of Giga-Internet. The current status of Giga-Internet of Korea and other countries will be given in Section 2. In Section 3, we propose the objectives and goals of Giga-Internet plans of Korea. The implications of Giga-Internet plans will be analyzed in Section 4, and we will draw a conclusion in Section 5.

II. CURRENT STATUS OF GIGA-INTERNET

As the user's demand of fast network bandwidth has increased recently, the Korea government has established plans and conducted action projects continuously. In February 2008, the Korea government made a plan of commercializing Giga-Internet as of the end of 2012, and announced the Detailed Action Plan of 100 issues. The 'Giga Internet Service Introduction Promotion Plan' was established in April 2009,

Table 1. Giga-Internet subscribers through the pilot projects

Division	KT Consortium				CJHV Consortium			
	Area	2009	2010	Total	Area	2009	2010	Total
Pilot Households by Region	Yonin	182	54	236	Yangcheon	220	83	303
	Gwangju	199	-	199	Busan	130	0	130
	Daejeon	-	23	23	Eunpyeong	-	253	253
	Apgujeong	-	305	305	Bucheon	-	40	40
	Pyeongchang	-	132	132				
Total		381	514	895		350	376	726

and pilot projects have been conducted by the consortium of major telecommunication companies from 2009 till now.

In September 2009, Presidential Council for Future and Vision chose 'Five Future Strategies for IT Korea' and the Giga-Internet services are included in the 5 major IT strategies of Korea.

The Giga-Internet based services such as 3D multi-angle TV and customer premise smart network were demonstrated at G20 Communications Exhibition in Korea in November 2010, showing to the world that the premium services are not impractical to implement at all. Table 1 shows the number of Giga-Internet subscribers through the pilot projects.

The top countries over the world are also preparing for Giga-Internet infrastructure and services. The U. S. Government established "National Broadband Plan" in March 2010, planning to provide 1Gbps service to school, hospital, and government until 2020 and at least 100Mbps service to 100 million households. The plan also considered system improvement such as the joint development for reducing the cost of network development.

Japan established "I-Japan 2015" in July 2009, planning to enable 1Gbps wired network and 100Mbps wireless network in all places inside Japan as of 2015. The plan has changed the goal year of "I-Japan 2015" from 2015 to 2020 on December 2009, but the plan itself is still effective. The Japanese Government will invest 30 billion yen until 2015 into the development of NWGN (NeW Generation Network), expanding Giga-Internet coverage and utilization rate through digital contents development.

Singapore established "iN2015" in June 2006, planning to provide 1Gbps service in all places including home, school, and company as of 2015. Under the name of NGNBN (Next Generation Nationwide Broadband Network), the Singapore Government is investing approximately 1 billion dollars of budget into private sector.

Sweden established "Broadband Strategy for Sweden" in November 2009, planning to expand minimum 100M broadband service distribution rate up to 40% in 2015 and 90% in 2020. The Swedish Government plans for developing optical cables, supporting subscriber tax system and developing common lines. The plan will be implemented with the connection of regional development programs and infrastructure development.

The commercial services of the top IT countries are also very active. 100Mbps or faster Giga-Internet services have been commercialized in major IT countries, such as Japan (2005), Hong Kong (2005), Netherlands (2007), and Singapore (2010).

Combined commodity services (i. e., TPS, QPS types) are provided at the Internet access speeds of 200Mbps and 1Gbps. For example, NTT Japan has a service titled "Flet's Hikari Next" which combines Hikari telephone (the VoIP service), and Hikari TV (the IPTV service). UPC Netherlands released the 120M Internet service combined with TV service.

Compared with 100Mbps, 200Mbps services cost approximately 12~68% more and 1Gbps services cost 41~398% more [9]. Table 2 shows the Giga-Internet service rates of the top IT countries.

The current trend of the top IT countries implies a few points other late-starting countries should bear in mind. Government can provide policy and institutional support to lessen the burden of private sector due to the sophistication of network and promote market revitalization through the service expansion to other industries.

It is difficult to induce the investment made by telecommunication companies and also difficult to vitalize the Giga-Internet market solely depending on the increase of rates based on the increase of subscriber network speed. More sophisticated strategies to uplift the profit of telecommunication companies are required. Examples of the strategies would be a customized Internet speed based on the characteristics of service, various rate systems of Giga-Internet services, and less user burden.

III. OBJECTIVES & STRATEGIES

The Giga-Internet plan of Korea has three goals to achieve "Smart Broadcast and Communication through Giga-Internet." The first goal is to increase Giga-Internet service subscribers. The number of Giga-Internet service subscribers in 2012 is around 200,000, which is only 1% of the population. According to the plan, the number of Giga-Internet service subscribers will be increased to 3.40 million, 20% of the population by 2015.

The second goal is to increase sales in Giga-Internet based application services. The size of the market is estimated to be

Table 2. Giga-Internet service rates of the top IT countries

Country	Japan			Singapore		
Company	NTT	KDDI	K-Opticom	Singtel	StarHub	M1
100Mbps	49,409 won	63,096 won	65,879 won	61,200 won	108,672 won	51,657 won
200Mbps (Increase Rate Compared with 100M)	63,660 won (29%)	77,212 won (22%)	73,945 won (12%)	83,964 won (37%)	138,651 won (28%)	86,678 won (68%)
1Gbps (Increase Rate Compared with 100M)	94,300 won (91%)	88,936 won (41%)	116,968 won (78%)	-	346,626 won (219%)	349,340 won (576%)

19 billion won in 2012, but it will be increased to 1.6 trillion won by 2015. The third goal is to increase local equipment ratio in Giga subscriber network from 65% in 2012 to 80% in 2015.

In this section, we propose promotion strategies in order to achieve these 3 goals successfully. First of all, the strategies should be consumer-oriented and market-friendly. To achieve successful commercialization of Giga-Internet services, the following strategies must be considered. Early vitalizations should be promoted by providing realistic media, smart media, cloud, wired/wireless convergence service, coping with future convergence service demand. Business opportunities and opportunities to participate in smart economic activities should be expanded by discovering and diffusing various Giga-Internet core service models. Early commercialization can be supported by discovering the killer applications and by analyzing the utilization behavior of pilot projects.

Providing affordable and reasonable Giga-Internet rate systems will be a good basis for vitalizing Giga-Internet services. The rate system must consider reducing household burden for communication charges and uplifting the profitability of the industry. The basis of consumer protection should be developed by providing an SLA system which guarantees both quality and security.

To achieve the goals, a virtual circle of synergy must be created by inducing the participation of private sectors along with anticipatory policy support. The government must concentrate on providing the basis of the Giga-Internet services. The provision will include the basis for vitalizing pilot projects and ecosystem through the development of core technology, sophisticated tests and verification infrastructure. This will support the private sector to shift paradigms by securing investment efficiency and providing differentiated services. According to the plan, "Giga Internet Commercialization Promotion Committee (provisional title)" will be organized and operated for effective consultation and coordination between the IT private sector, the government, and academia. The operation of dedicated committee will

form the bond of sympathy and intensify cooperation between the participating entities.

For the successful achievement of the goals, it is important to enhance competitive strength through industry-friendly strategies and commercializing developed technologies. The basis for vitalizing network industry must be prepared through anticipatory verification and standardization of Giga-Internet core technologies. At the same time, early commercialization of the verified outcomes of pilot projects should be supported. Legal systems should be improved to eliminate causes that delay the development of Giga-Internet. This includes a system for improving the standards for communication facilities within a premise or a legal system for win-win cooperative system.

IV. IMPLICATIONS OF GIGA-INTERNET PLANS

The demand for the stable accommodation of the data traffic necessitates the introduction of Giga-Internet. However, the communication market could not afford due to the burden of network investment and the absence of business model. To cope with this problem, we demand that various rate systems must be developed in order to satisfy both consumers and companies. At the same time, services directly leading to profit should be developed, and the user environment must be improved. To make Giga service platform open will be a good option for developing various mash-up services.

The demand of wire and wireless traffic in the network is rapidly increasing, and satisfying the demand is a burden to telecommunication companies. At the same time, the degradation of quality of high quality services such as video streaming and cloud is anticipated. To address this problem properly, we propose to introduce real FTTH to subscriber network and sophisticate All-IP based backbone network continuously, and to promote network service strategies in connection with wireless network (such as N-Screen). Qualitative sophistication of the network is also necessary for efficiently handling large-sized contents which are the major cause for traffic increase. The security system over the network must be intensified.

Encroachment of Korean market by global companies such as Google, Apple, Nokia, and CISCO is getting wide and serious these days. It is due to the conflicted interests between telecommunication companies, contents providers (CP), and portal companies as well as the technological gap between domestic companies and global companies. To resolve this problem, the strategies of the government, we insist, must include the plan for developing organic cooperation system between broadcasting and communication players to secure competitiveness against global platform companies and promoting joint growth of domestic companies. The plans should promote the introduction of commercial network through sufficient technology and economic efficiency verifications of domestic equipment to activate Giga core technology industry.

Considering the impact of Giga-Internet on the network environment on top of the increased speed, we believe that it is necessary to review the regulatory system suitable for the smart network age. The regulatory system must cover the quality, communication environment, network sophistication, and profit distribution.

V. CONCLUSION

Recent explosion of new network-based services such as mobile apps, cloud services, and N-screen services requires more wired and wireless traffic to provide the services stably. It is inevitable to construct Giga-Internet network and to provide fast Internet connection. Giga-Internet means a next generation Internet of 1Gbps, whose speed is 10 times faster

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In this paper, we analyzed the necessity of stimulating Giga-Internet and proposed the future plan of Giga-Internet. We believe that Giga-Internet services will provide differentiated contents and user environment, and the services expedite future network-oriented social changes and proliferate realistic digital life.

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