

Internet in Thailand

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1. Internet Development in Thailand

The Internet is widely known as a worldwide communication network that supports various types of services including data, voice and video. It consists of networks of networks connected together with Internet Protocol (IP) over different media and data link protocols.

The internet development in Thailand began with a group of university professors who would like to keep contact with friends and researchers in other countries. In 1987, the Prince of Songkhla University (PSU) set up first dial-up connectivity to the University of Melbourne, Australia for exchanging emails. At the same time, the Asian Institute of Technology (AIT) tested UUCP (Unix to Unix Copy Protocol) connections to the University of Melbourne and the University of Tokyo via a X.25 service of the Communication Authority of Thailand (now become CAT Telecom Public Company Limited [1]). All those connections were initially based on dial-up links. In early 1988, the Thai Computer Science Network (TCSNet) was founded with support from the Australian government, through the Australian International Development Plan (IDP). Three Universities which are PSU, AIT and Chulalongkorn University (CU), initially joined the TCSNet. Later on in 1991, Thammasat University (TU) installed MHSNet software (developed by Message Handling Systems Pty Ltd) and a 14.4 kbps modem with support from the Australian Academic and Research Network (AARNet) and became a new gateway for Thailand's academic and research institutions to communicate with University of Melbourne. At that time, the electronic mail service via MHSNet and UUCP became an important tool for Thai academics.

Apart from the mentioned universities, the National Electronics and Computer Technology Center (NECTEC) [2] under the Ministry of Science and Technology was supporting another Inter-University Network over X.25. The Inter-University Network project was identified since 1987 as an academic and research network focusing on the key issues of telecommunication infrastructure and databases. In January 1992, an electronic mail committee called NEWGroup (NECTEC's Email Working Group) was set up to represent demanding users to interact with NECTEC. This resulted in the establishment of the Thai Social/Scientific, Academic and Research Network (ThaiSarn) [3]. ThaiSarn was initially funded by the national budget via NECTEC and was technically supported by NECTEC to look after the network operation and services. Since the world-wide Internet were mainly based on the Internet Protocol (IP) technology and had very high growth rate at the time, NECTEC decided that ThaiSarn should also migrate to full IP technology. Therefore, the early-day MHSNet and UUCP dial-up links as well as X.25 technology were replaced by IP technology with leased circuits. In 1992, the first international internet gateway for academics was connected with 9.6 kbps link between CU and UUNET, USA. Another 64 kbps international link was also launched between NECTEC, the hub of ThaiSarn, and UUNET. In 1995, ThaiSarn received funding from the Japanese National Center for Scientific Information Systems (NACSIS) for the first E1 international private leased circuit (IPLC) from Thailand to the Scientific Information Network (SINET) in Japan.

The Internet development on the nonacademic side began in 1995, Thailand's IT Year. After six months of feasibility study by a joint working group, the Communications Authority of Thailand (CAT) at that time and the Telephone Organization of Thailand (or TOT, now TOT Public Company Limited [4]) approved a joint venture proposal from NECTEC to commercialize the Internet service in Thailand. Internet Thailand Company, jointly invested by CAT, TOT and NECTEC's legal entity the National Science and Technology Development Agency (NSTDA) received the first operating license and launched its full-scale services with its first 512 kbps international link through UUNET, USA in March 1995. At the same time, KSC Comnet (now changed to KSC Commercial Internet Co., Ltd.) also received an operating license from CAT and became a commercial internet service provider (ISP). A few month later, CAT approved proposal from Loxley information (Loxinfo) and other companies for operating license. The internet usage and connectivity continue to grow since then. A number of ISPs were later established to provide Internet services nation wide for both corporate and individual subscribers. Figure 1 shows the internet connectivity diagram in Thailand for both academic and non-academic networks as of August 1995.

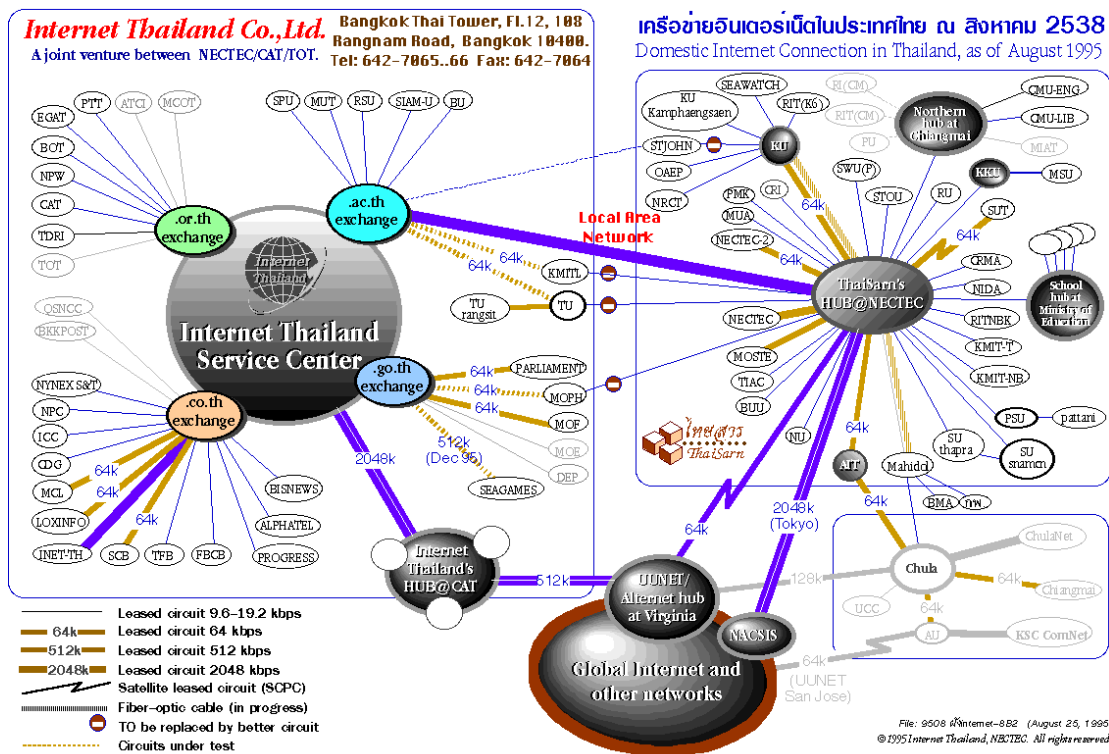


Figure 1: The diagram of the Internet Connectivity in Thailand, as of August 1995 [5]

2. Internet Service Liberalization

Telecommunications services in Thailand had been mostly controlled and exclusively provided by two state-owned telecommunications operators namely the Telephone Organization of Thailand (TOT) and the Communications Authority of Thailand (CAT) for a long time. TOT controlled the domestic telephone services while CAT regulated the international telecommunications services. The private sector could only work in conjunction with one of the state enterprises through collaborated partnership. Before the Internet Liberalization, all Internet Service Providers (ISPs) must be a joint venture with CAT which will get 35 percent of the total equity. Every ISP must buy international leased circuits to the Internet through CAT. In addition, CAT also set up guideline pricing for ISPs how much they could charge for internet services. There were totally 18 ISPs receiving CAT's operating licenses. The regulation had been changed after the establishment of National Telecommunications Commission (NTC) [6]. Telecommunications services were liberalized after the Broadcasting and Telecommunication Services B.E. 2543 (2000) and the Telecommunications Business Act B.E. 2544 (2001) entered into force with the objective to protect the public interests and to facilitate the free and fair competition environment for the Thai telecommunications industry. The Telecommunication Business Act defines the opening of the market with the new regulations for the industry and the ownership of the foreign investor to the telecommunications business. It also defines types of telecommunication services, network interconnection, tariff regulations, universal service obligations, etc. This Act is now implemented by the National Telecommunications Commission. A Royal proclamation formally established the National Telecommunication Commission (NTC) on October 1, 2004. The National Telecommunication Commission has announced the following rules and procedures for governing Telecommunications Business Licensing.

Pursuant to the Section 7 of Telecommunications Business Act B.E. 2544 (2001), it is prescribed that the Commission shall grant a license to any person wishing to operate a telecommunications business. The three types of license are imposed on operators in accordance with nature and categories of each service as follows:

- 1. Type One License** is granted to the telecommunications business operators not having their own network for operating in telecommunications services.
- 2. Type Two License** is granted to the telecommunications business operators having or not having their own network for operating in telecommunications services. The Type Two License is mainly intended for a limited group of people, or services with no significant impacts on free and fair competition or on public interest and consumers.
- 3. Type Three License** is granted to the telecommunications business operators having their own network for telecommunications services. It is intended for general public, or services which may cause a significant impact on free fair competition or on public interest, or a service which requires special consumer protection.

(Source: <http://www.ntc.or.th>)

As of 31 January 2008, there are totally 156 Telecommunications business licenses including internet service provider and network provider licenses issued by the National

Telecommunication Commission. Among these, there are over 70 Type-One Licenses for Internet Service Providers, 10 Type-Two Licenses for operating International Internet Gateway (IIG) and National Internet Exchange (IX), and 16 Type-Three Licenses for Network Providers. (Source: <http://www.ntc.or.th/license>)

3. Internet Growth and Current State in Thailand

The Internet has been growing rapidly in the past decade in terms of network size, bandwidth usage and Internet users. The growth of Internet and current status in Thailand can be observed in various aspects.

-Internet Service Providers

After the Internet liberalization, a significant number of licenses have been issued by the National Telecommunication Commission. At present, there are 6 providers operating International Internet Gateways (IIG) and National Internet Exchanges (NIX). The number of IIG and NIX is quite high compared with the number of connecting Internet Service Providers (ISP). There are currently 23 ISPs which have direct links to IIG and NIX. Table 1 lists the name of ISPs in Thailand.

Table 1: List of ISPs in Thailand

	Name of ISP	Web site
1	ADC (Advanced Datanetwork Communications Co., Ltd.)	http://www.adc.co.th
2	A-NET (ANET Co., Ltd.)	http://www.anet.net.th
3	BeeNet (BB-Broadband Co., Ltd.)	http://www.beenets.com
4	CAT-ISP (CAT Telecom Public Co., Ltd.)	http://www.cat.net.th
5	CS LoxInfo (CS LoxInfo, Plc.)	http://www.csloxinfo.com
6	CWN (Chomanan Worldnet Co., Ltd.)	http://www.cwn.net.th
7	E-Z Net	http://www.eznet.co.th
8	Far East Internet (Far East Internet Co., Ltd.)	http://www.fareast.net.th
9	FTTH (Fiber To The Home Co., Ltd.)	http://www.ftth.co.th
10	INET (Internet Thailand Public Company Limited)	http://www.inet.co.th
11	ISSP (Internet Solution & Service Provider)	http://www.isp-thailand.com
12	JI-NET (Jasmine Internet Company Limited)	http://www.ji-net.com
13	KIRZ Internet (KIRZ Co., Ltd.)	http://www.kirz.co.th
14	KSC (KSC Commercial Internet Co., Ltd.)	http://www.ksc.net
15	OTARO (Otaro Co., Ltd.)	http://www.otaro.co.th
16	PACIFIC INTERNET (Pacific Internet [Thailand] Limited)	http://www.pacific.net.th
17	PROEN Internet (Proimage Engineering and Communication Co., Ltd.)	http://www.proen.co.th
18	REACH	http://www.reach.net.th

19	SAMART (Samart Infonet Co., Ltd.)	http://www.samarts.com
20	TOT-ISP (TOT Public Company Limited)	http://www.tot.co.th
21	True Internet (True Internet Co., Ltd.)	http://www.trueinternet.co.th
22	TT & T (TT&T Public Company Limited)	http://www.ttt.co.th
23	World Web	http://www.cat.net.th

-Internet Connectivity

The Internet connectivity between Internet Service Providers, International Internet Gateways and National Internet Exchanges can be illustrated in Figure 2. The network diagram shows how each ISP connects to NIX, IIG and international network providers. The name of ISPs, their Autonomous System (AS) numbers, and capacity of each network link are also labeled in the diagram. Each ISP can connect to the Internet by purchasing International Internet Gateway (IIG) services or connecting to an international service provider using international private leased circuit (IPLC). Most ISPs connect to the global Internet through IIG and exchange domestic traffic at NIX. Some ISPs have extra international links to network providers abroad via IPLC provided by network operators.

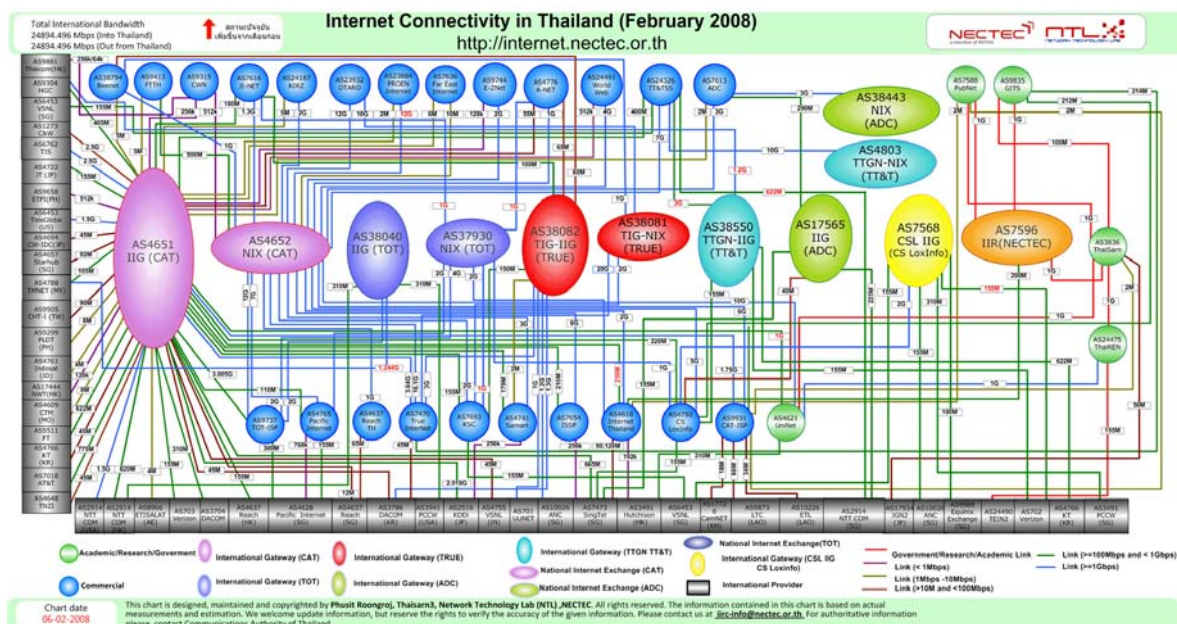


Figure 2: Internet Connectivity in Thailand, as of February 7, 2008 [5]

-International Internet Bandwidth

The International Telecommunication Union (ITU) defines the International Internet Bandwidth as an indicator which could be used to measure the growth of Internet usage.

The definition of International Internet Bandwidth herein is “Total capacity of international Internet bandwidth in Mega Bits Per Second (Mbps). If the capacity is asymmetric (i.e., more incoming than outgoing), provide larger capacity.” Basically, the total capacity of International Internet Bandwidth in Thailand is the sum of Internet bandwidth from all ISPs, Telecom Operators, Research and Education Networks that connect to international network providers. The current international bandwidth for Internet usage from/to Thailand is 24894.496 Mbps. Figure 3 also shows the growth of international Internet bandwidth since 1991.

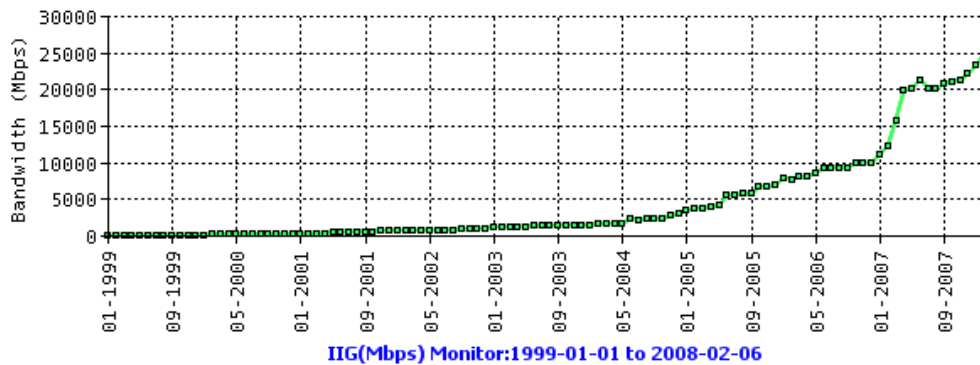


Figure 3: International Internet Bandwidth of Thailand [5]

-Domestic Internet Bandwidth

Beside international Internet bandwidth, domestic bandwidth between ISPs and Internet Exchanges is also observed as an indicator for Internet growth in Thailand. For domestically exchange of data traffic, ISPs connect to National Internet Exchange (NIX) with high bandwidth links. The current domestic bandwidth between ISPs and Internet Exchanges in Thailand is 162,910 Mbps. Figure 4 also shows the growth of domestic bandwidth since 1999.

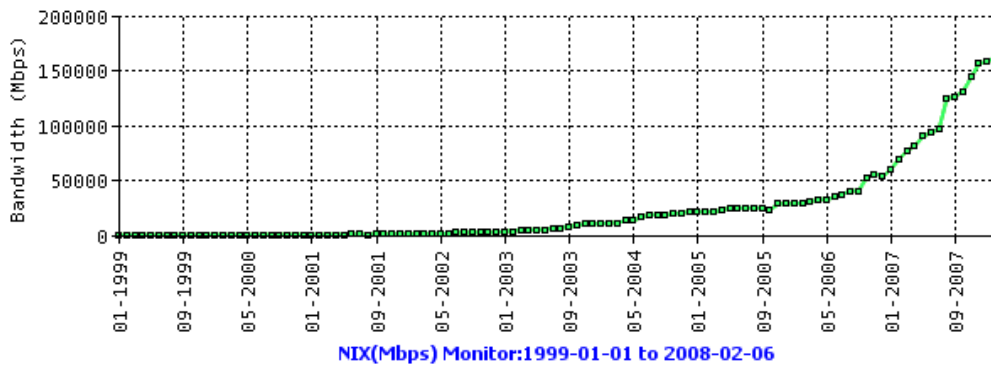


Figure 4: Total Domestic Internet Bandwidth between ISPs and Internet Exchanges [5]

-Internet Protocol (IP) Address/Number

An Internet Protocol (IP) Address is a unique address assigned to electronic devices on the Internet in order to identify and communicate with each other. The amount of IP address number allocated to ISPs or organizations has also been observed to monitor the growth of the Internet in Thailand. Although the number of public IP address can not exactly represents the number of connected Internet devices due to the widely use of private IP address, it could be used to compare the network size and its growth. There are currently 15489 Class-C address blocks allocated to Thailand which is ranked tenth in Asia as listed in Table 2. Leading countries/economies are: India, China, South Korea, Australia, Hong Kong, Japan, Taiwan, Singapore, and New Zealand. Thailand are still ahead of Malaysia, Philippines, Indonesia and Vietnam. Figure 5 displays the growth of IP address/number allocation for Thailand compared with some countries in the region. Figure 6 shows the proportion of IP address/number allocation requested from APNIC [7].

Table 2: IP Address Allocation in APNIC, as of February 7, 2008

Rank	Country/Economy	Number of Class-C Network Address	Number of Usable IP Numbers
1	India	16,826,882.004	4274028029
2	China	342,377.125	86963789
3	South Korea	139,681.937	35479212
4	Australia	125,737.519	31937329
5	Hong Kong	89,761.086	22799315
6	Japan	69,966.125	17771395
7	Netherlands (registered in APNIC)	68,153.000	17310862
8	Taiwan	62,309.000	15826486
9	Singapore	23,342.535	5929003
10	New Zealand	18,815.625	4779168
11	Thailand	15,489.000	3934206
12	Malaysia	13,396.000	3402584
13	Philippines	9,736.281	2473015
14	Indonesia	9,345.000	2373630
15	Vietnam	8,863.000	2251202

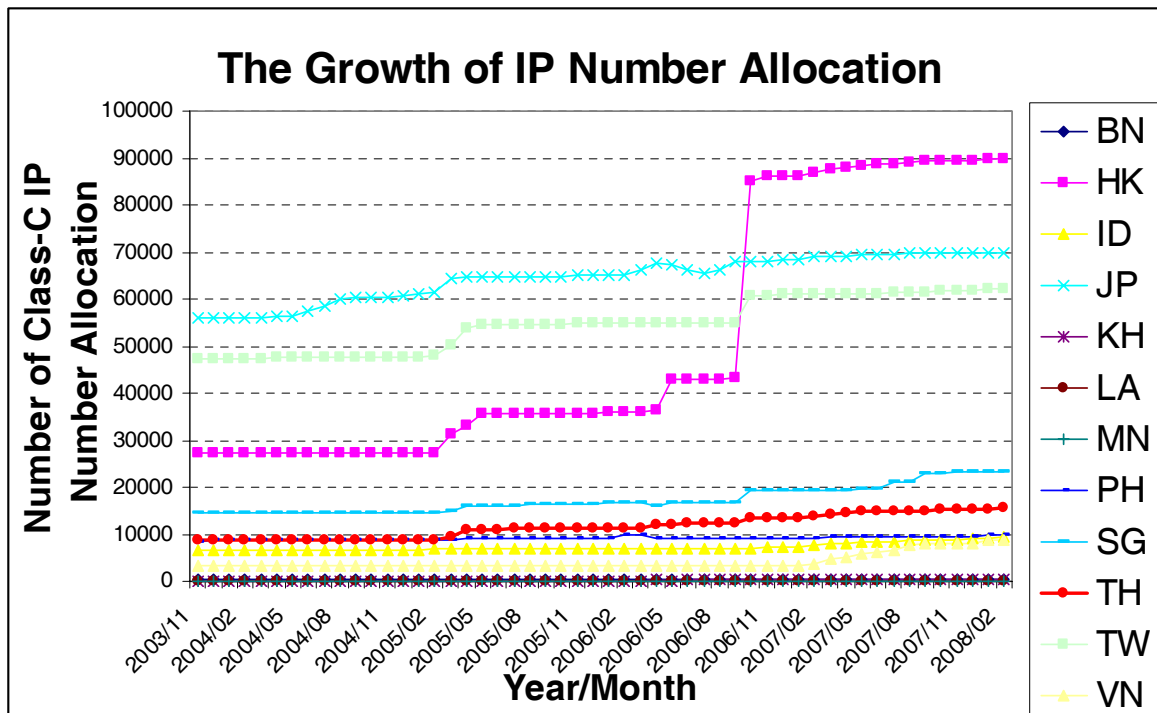


Figure 5: The Growth of IP Number Allocation

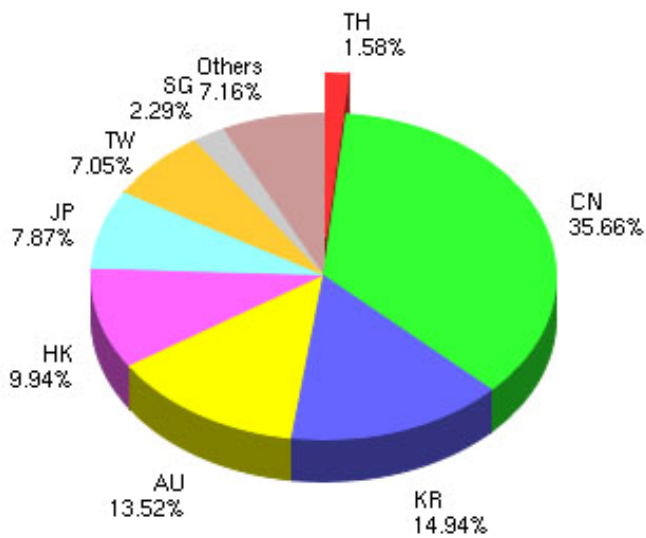


Figure 6: Proportion of IP number allocation by APNIC as of February 2008 [5]

-Number of Domain Name

The term domain name has multiple meanings. The domain name can be referred to a name that identifies a computer or computers on the Internet such as web site's URL. It

can also be used for other purposes in the Domain Name System (DNS), for example the special name used in an email address, or SIP (Session Initiation Protocol) address in VoIP. The number of domain name registered under the Top-level domain name “.TH” is also observed as an indicator for the Internet usage or growth. As of January 2008, there are 27,436 domain names registered under “.TH” and among those, there are 6,662 domain names registered in Thai under “ภาษาไทย.TH”. Figure 7 displays the growth of domain names registered under “.TH” and “ภาษาไทย.TH” since 1997. Figure 8 presents the current state of registered domain names under each sub-domain of “.TH”. (Source: <http://www.thnic.net.th>)

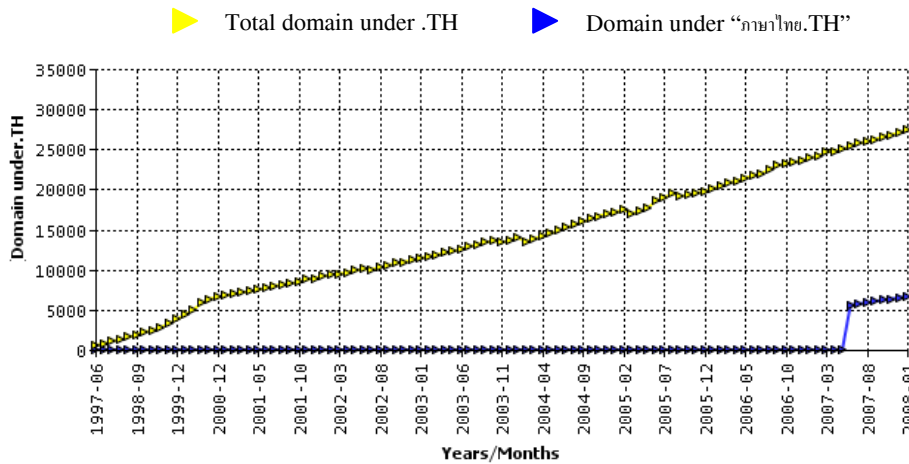


Figure 7: The growth of registered domain names under “.TH” and “ภาษาไทย.TH” [5]

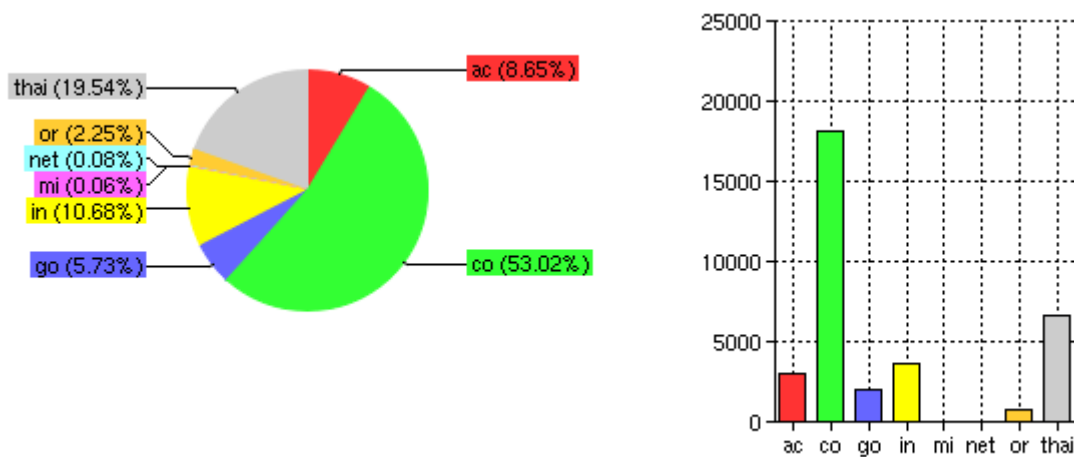


Figure8: The proportion and number of registered domain names under “.TH” [5]

-Internet Users

According to the National Statistical Office (NSO) [8], the number of Internet users in Thailand was about 3.5 million based on a household survey in the year 2001. The growth rate was conservatively estimated with less than 2% for the year 2003-2005. There is no recent estimation or survey on the number of Internet users from NSO. However, from the estimation of NECTEC with a less conservative approach based on the growth of international bandwidth described in [9], the growth of Internet users is illustrated in Figure 9. The estimated number of Internet users in Thailand in 2007 is 13.15 million people.

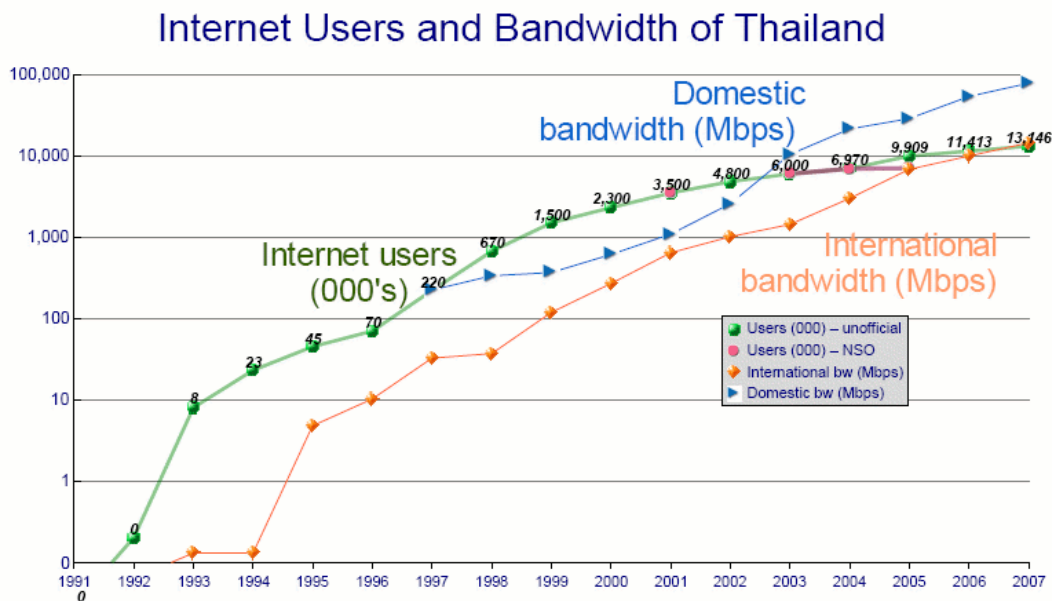


Figure 9: The growth and number of Internet users in Thailand [9]

4. Internet Services in Thailand

Internet access services in Thailand were traditionally classified into two main types: corporate (business) access and home access services. Corporate access services are typically provided to organizations or enterprise for business use while Home access services are provided to any individual for personal use. The access technology is varied from low-speed dial-up to high-speed dedicated connection. The service charges mostly depend on the access speed and usage time. At present, the cheapest Internet access charge is 4 baht per hour for low-speed connection and 295 baht per month for high-speed (broadband) connection [10].

Internet Protocol (IP)-based services such as broadband Internet access, IP VPN, VOIP services are driving the growth of Internet usage in many countries including Thailand. Internet subscribers/users continue to migrate from narrowband to broadband Internet access. The number of broadband Internet subscribers in Thailand continues to rapidly increase in the last few years while the number of narrowband Internet subscribers starts decreasing. Based on the data of IDC Thailand [11], the number of broadband Internet

subscribers has increased 39.11% whereas the number of narrowband Internet users has decreased 14.68% from the year 2006 (B.E. 2549) as displayed in Figure 10 [10]. The market shares of Internet access services in Thailand are mainly taken by major ISPs which have business relationship closely with telecom/network operators. Leading ISPs for Internet services are True Internet, TOT, TT&T and CS Loxinfo. Figure 11 presents the market shares of major Internet service providers based on the number of subscribers between the second half of 2005 (B.E. 2548) and the first half of 2007 (B.E. 2550).

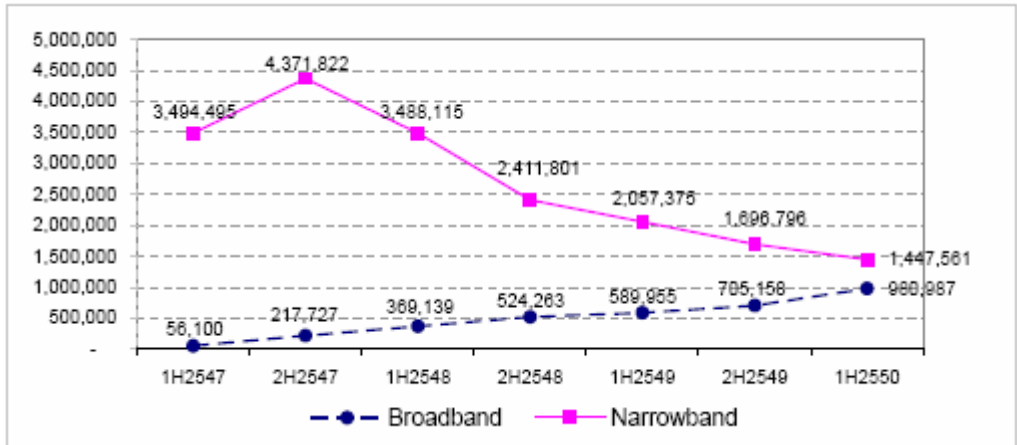


Figure 10: Number of Subscribers for Broadband and Narrowband Internet Services [10]

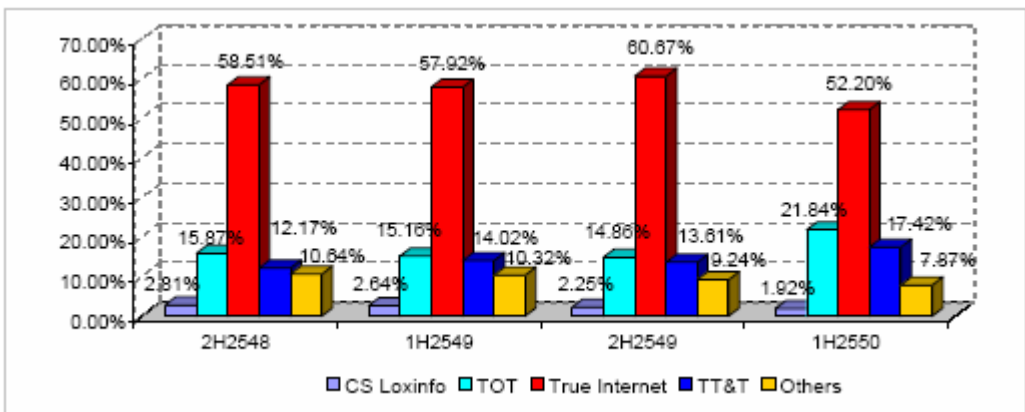


Figure 11: Market shares of Internet Services between Year 2005 -2007 [10]

Reference:

- [1] CAT Telecom Public Company Limited, web site <http://www.cat.net.th>
- [2] National Electronics and Computer Technology Center, web site <http://www.nectec.or.th>
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