VN NIC
Internet for all

REPORT ON
VIET NAM INTERNET RESOURCES

INTERNET RESOURCES AND CRITICAL INTERNET INFRASTRUCTURE FOR DIGITAL TRANSFORMATION
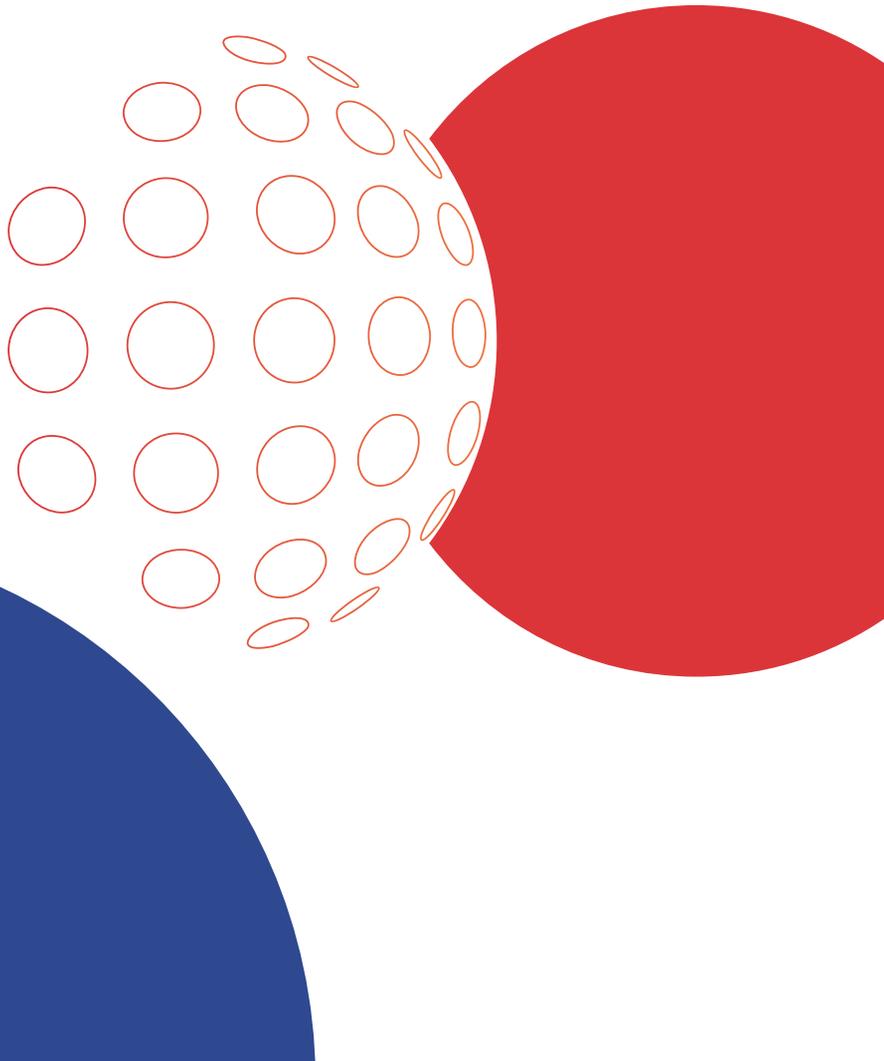
2020

REPORT ON
VIET NAM INTERNET RESOURCES

*INTERNET RESOURCES AND CRITICAL INTERNET INFRASTRUCTURE
FOR DIGITAL TRANSFORMATION*

2020

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PREFACE

D igital transformation is an inevitable trend and has driven every aspect of modern life, giving opportunities and also challenges for Viet Nam and other countries to dominate in the Forth Industrial Revolution. Viet Nam considers the digital transformation as a key prioritized motivation in the reform and development to become a powerful and prosperous digital nation in the coming decades. In order to achieve the set goal, the Prime Minister has signed Decision 749/QD-TTg on June 3rd, 2020 to approve the national program on digital transformation until 2025, with a vision towards 2030, aiming to make Vietnam amongst the world's top 50 countries in terms of the E-Government Development Index (EGDI).

During the process of transformation, Internet of Things (IoT), 5G, and Cloud has become a major technology trend and would continue to drive global digital development in the near future. Viet Nam Internet Network Information Center (VNNIC), the national Network Information Center of Viet Nam, shall adapt to undertake a new mission to become a pioneer in promoting the new generation of Internet with the spirit of **"Internet for all"**. The year 2020 would have been considered a pivotal year when VNNIC focused on building digital platforms and services, creating momentum for the coming period. Accordingly, VNNIC chose **"Internet resource and critical Internet infrastructure for digital transformation"** as the theme of the **Report on Viet Nam Internet Resources 2020**.

This bilingual report would illustrate the role and trend of the country's critical Internet resources and Internet infrastructure in the digital transformation process by providing data, statistics and the research results of Viet Nam's Internet resource development in 2020.

We hope that **Report on Viet Nam Internet Resources 2020** would continue to benefit regulators in the process of consulting and implementing policies; support businesses, organizations and individuals in their activities and research. The Editorial Board hopes to receive constructive comments so that the following publications would be more complete.

Thank you very much!

VIETNAM INTERNET NETWORK INFORMATION CENTER

PART I

VNNIC's MISSION TO PROMOTE THE DEVELOPMENT OF NEW GENERATION OF INTERNET

I. VNNIC'S MISSON AND VISION

2020 marked the 20th annivesary of VNNIC, during which period we have succeeded in fulfilling the role of the Network Internet Center (NIC), accompanying the development of Vietnam's Internet, with the spirit "Breakthrough - Creation - Following the success".

Internet has entered the next phase of development with the transition to IPv6 Internet and emerging IoT, 5G networks. Digital transformation is essential for sustainable development of all Internet players. VNNIC has taken initiatives to adapt with global development, striving for the innovation of Internet in Viet Nam.
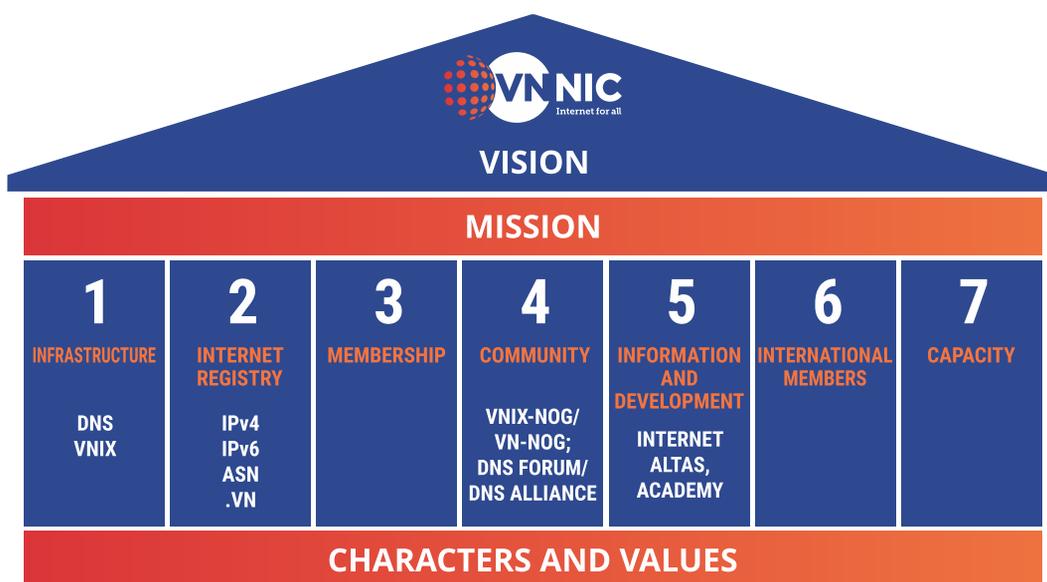
In the next chapter of development, we pursue the new vision **"Internet for All"**. Our work aligns with that goal for the Internet to be globally-connected, open, sustainable and secure for all. Through the new vision, we will thrive to be the pioneer in developing Viet Nam Internet connecting to global Internet.

Our mission is to continue to develop critical Internet infrastructures and essential Internet services, including ccTLD, NIR, DNS, Internet exchange, WHOIS and so on, to catch up with the development trends of new generation Internet; to orient Internet community towards safety information and advanced Internet resource-based services; to foster greater collaboration amongst Internet community and improve overall Internet safety and development in Viet Nam.

These missions are derived from our 7 strategic pillars which are Critical Internet Infrastructures (".vn" DNS, VNIX), Internet Registry (".vn" domain, IPv4, IPv6, ASN), Membership, Community, Information and development, International Member and Capacity.

II. VNNIC'S SERVICES AND RESEARCH

As part of the ongoing evolution of VNNIC, we have just launched the brand new corporate logo in November 2020. The new visual identity with great recognition helps to display much more what VNNIC stands for and pursue on the next journey: **Internet for all**.

VNNIC's new logo preserve the classic design and cherish our traditional values as "VN" is designed in a big blue dot stands for Viet Nam and a National Internet Center (NIC) in the era of digital transformation. It is also deduced by opening the gate connecting to global Internet ecosystem, reflecting our new vision and desire to be a pioneer, think first and do first towards community's benefits.

In the spirit of rebranding, we also present logo set of VNNIC's main services with the desire to ensure our brand credibility.

PART II

VNNIC's MAIN ACHIEVEMENTS AND ACTIVITIES IN 2020

I. HIGHLIGHTS OF INTERNET RESOURCES DEVELOPMENT IN VIET NAM IN 2020

514,632

Number of ".vn" domain names

- 1st place in ASEAN
- Top 10 ccTLD in Asia Pacific region
- 44th place in the world

15

".vn" Accredited Registrars

16,054,016

IPv4 addresses

- 2nd place in ASEAN
- 8th place in Asia
- 29th place in the world

9,032 billion billion billion

Number of IPv6 addresses

45%

IPv6 adoption rate

- 2nd place in ASEAN
- 4th place in Asia
- 8th in the world

34,000,000

IPv6 users

46

VNIX members

38.1%

Growth rate of VNIX members

II. VNNIC'S MAIN ACHIEVEMENTS AND ACITIVITIES IN 2020

1. VNNIC LAUNCHED BRAND NEW IDENTITY

On November 5th, 2020, VNNIC officially launched the brand new logo and new identity for VNNIC's main services (".vn" domain, IP address, VNIX, ".vn" DNS, VNNIC Internet Speed, VNNIC Atlas and VNNIC Internet Academy) as part of the ongoing evolution of the organization.

" VNNIC's mission is to promote Internet development to deserve community's trust over the past 20 years. "

Mr. Le Ngoc Duc
Director Management Board of VNNIC

" Slogan "Internet for all" represents VNNIC's efforts and commitments to bring great values of Internet into life and make life better. "

Mr. Nguyen Hong Thang
Director General of VNNIC

Launching event of VNNIC new logo

2. INTERNET RESOURCE AND INTERNET CORE INFRASTRUCTURE DEVELOPMENT ACTIVITIES

2.1. DEPLOYED THE FIRST DNS ROOT SERVER (F-ROOT) IN VIET NAM
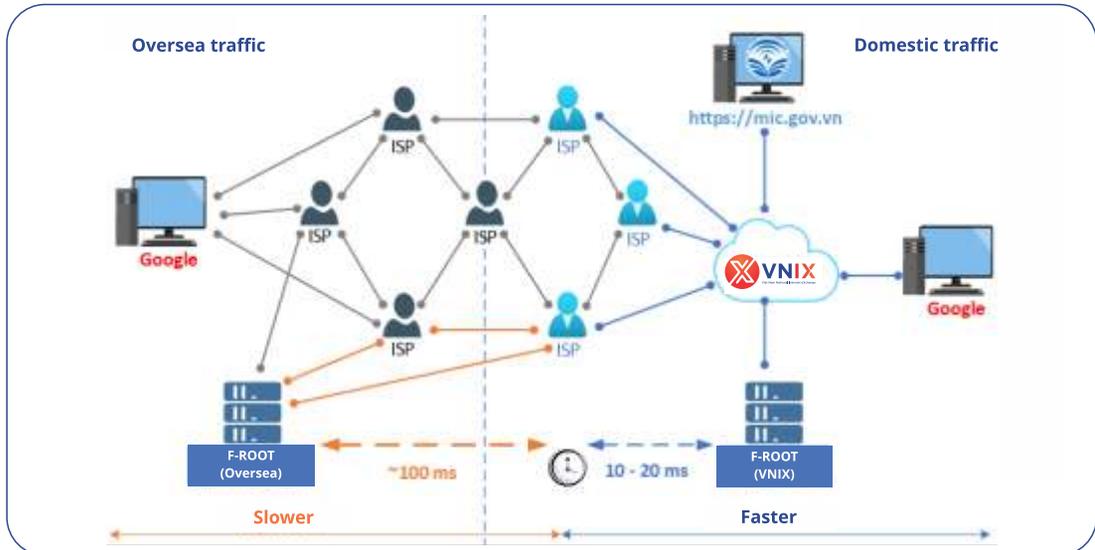
Deployed the first DNS root server (F-ROOT) at VNIX to speed up domain response time

In July, 2020, VNNIC cooperated with Internet Systems Consortium (ISC) to install succesfully the first DNS Root servers (F-Root) at VNIX in Ha Noi and Ho Chi Minh city. As a result, it helps to reduce the dependency on oversea Root servers since the DNS queries from Viet Nam go straight to local F-Root server now, instead of going overseas as before. We have seen a reduction in domain query response time by average from at least 5 times, improving access speed of Internet services over ".vn" domain in Viet Nam, accordingly.

Viet Nam was the 143th country in the world to deploy DNS Root and our servers were the 241th and 242th F-Root server in the world.

2.2. DEPLOYED MORE 24 TEST SERVERS AT VNNIC INTERNET SPEED FOR MORE COMPREHENSIVE INTERNET DATA IN VIET NAM

In 2020, VNNIC worked with ISPs, organization in Viet Nam to improve VNNIC Internet Speed system and deploy more 24 test servers at VNIX and ISPs' networks with the aim to provide more comprehensive Internet speed data to community, ensure better quality of Internet services and encourage transparent Internet market in Viet Nam.

Test your Internet speed at: https://i-speed.vnix.vn

3. ENHANCING NATIONAL COOPERATION AND DEVELOPING INTERNET HUMAN RESOURCE

3.1. LAUNCHED VNNIC INTERNET ACADEMY
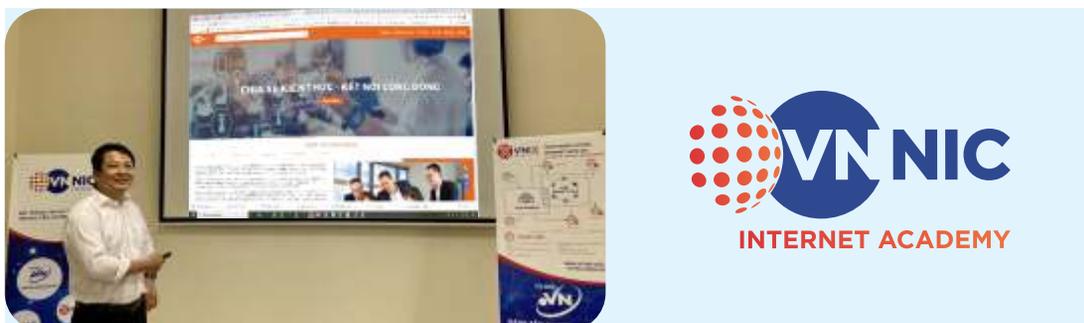
Launched VNNIC Internet Academy

VNNIC Internet Academy (https://academy.vnnic.vn) was the new platform initiated by VNNIC and offically launched in November 2020 with the aim to develop Internet human resource and foster the greater engagement amongst the Internet communities. It would provide trustworthy information and data in the field of Internet, including Internet resouces, critical Internet infrastructures, Routing security, emerging technologies and so on. During the first stage, VNNIC Internet Acadey starts with Webinar Courses, Video tutorials, online conference and blogs.

3.2. COLLABORATED WITH ITU/MUST TO DO TRAINING WORKSHOP ON IPv6 DEPLOYMENT OVER 5G NETWORK

Workshop on IPv6 deployment over 5G network (from 6th to 10th January, 2020)

VNNIC collaborated with MUST/ITU to conduct a training workshop on IPv6 deployment over 5G network, promoting the deployment of 5G telecommunications networks as global trend and requirements of new generation of Internet. The workshop was well-attended by engineers of 4 Mobile providers in Viet Nam.

3.3. IPv6, DNS WORKSHOPS FOR ICT GOVERNMENT AGENCIES

Workshop on IPv6, DNS for government agencies under Ministries and Branches

In 2020, VNNIC conducted 2 training workshops on IPv6, DNS on a large-scale for government agencies under Ministries and ICT Departments in the Northern region (in July, 2020) and in the Southern region (in November, 2020). These activities were under the scope of IPv6 for Gov Program towards the goal of Viet Nam Internet fully IPv6 enabled by 2025.

Workshop on IPv6, DNS for ICT Departments

IPv6 conference in Ba Ria – Vung Tau Province on May 22nd 2020

IPv6 workshop in Kon Tum Provice from 12th-13th November 2020

3.4. ONLINE WORKSHOPS ON INTERNET RESOURCES MANAGEMENT FOR DIRECTORS OF ICT DEPARTMENTS

The workshop was initiated by MIC to discuss and exchange management requirements and skills related to ICT, e-government, smart city, Internet security and public-utility telecommunciations, etc. The target audience was Directors of ICT Departments. Contributing to the workshops, Mr. Nguyen Hong Thang, Director General of VNNIC delivered topic on Internet resources management and network design improvement towards digital tranformation in Viet Nam.

3.5 ENHANCING COOPERATION WITH ICT DEPARTMENTS TO PROMOTE THE DEVELOPMENT OF INTERNET RESOURCES IN THE LOCAL AREA

MOU SIGNING WITH ICT DEPARTMENTS

15 ICT Departments

TRAINING ON INTERNET RESOURCE MANAGEMENT AND USE PROMOTION IN VIETNAM

60 courses

PROVIDING, SHARING DATA ON REGISTRANTS AND COLLABORATING ON THE INSPECTION, EXAMINATION AND EXECUTION OF VIOLATION OF MANAGEMENT AND USE OF INTERNET RESOURCE LOCALLY

400 Requests from **25** ICT Departments
(2020)

IPv6 FOR GOV

- Hosting training course on IPv6 and DNS for more than **1,000 officials** of **56 ICT Departments**

- Cooperating with Central Post and Telecommunication to host training course on OSI for **100% ICT Departments**

- Providing support and guidance to **36 ICT Department** in which there were **18 working visits**

4. INTERNATIONAL COOPERATION ACTIVITIES

Following Viet Nam's national strategy on digital transformation and the spirit of enhancing Viet Nam's position in global Internet, especially in ASEAN, VNNIC has proactively undertaken both multilateral and bilateral cooperation activities. These activities focused on improving Viet Nam's Internet quality, inculding continuously increasing IPv6 usage in Viet Nam, developing Internet Registry system, VNIX and ".vn" DNS as global high technonolgy standards.

Under impact of COVID-19 pandemic, VNNIC has managed to change physical meetings to online activities following the government instruction on COVID-19 safety measurement.

BILATERAL COOPERATION ACTIVITIES

Engagement meeting with APNIC in the development of Internet registry system in July 2020

Online workshop for LANIC from 17th-18th November, 2020

Under the scope of MoU between Ministry of Information and Communications in Viet Nam and Ministry of Post and Telecommincation in Laos, VNNIC conducted online workshop on IPv6, DNSSEC, NIX for LANIC from 17th-18th November 2020. The workshop was designed to support LANIC on focused issues and important tasks: to develop and issue IPv6 Master Plan in Laos in 2021; to deploy DNSSEC for .LA third level domain; to develop management policies on National Internet Exchange.

Engagement meeting with KISA on the management and development of Internet Resources in December 2020

OTHER ACTIVITIES AMONGST REGIONAL INTERNET FORUMS

VNNIC also has actively taken part in to many regional ICT conferences, workshops, meetings and ASEAN's projects by international Internet associations and forums, sharing our best practices and recommendations on Internet resource management and delopment. It helps to firm up the coordination and efficency of our bilateral partnership, strengthen our international role in APTLD, APNIC, APIX community and NOGs in the region.

VNNIC participated in APIX's annual meetings on 2020

*VNNIC participated in APRICOT 2020,
APNIC Meeting and NIR Workshop 2020*

APTLD Meeting 79

*VNNIC's virtual exibitor at
ITU Virtual Digital World 2020*

*VNNIC coordinated and led the ASEAN
project on smart city architecture*

6. COMMUNITY ENGAGEMENT ACTIVITIES

The highlight of VNNIC's community engagement activities was the VNIX-NOG 2020 meeting with the participation of almost 300 engineers and network operators in Viet Nam. The conference took place on September 30th, 2020 and was delivered by both onsite and online conference platform, bring in the widest possible range of local participants that could not attend in person due to COVID-19. The conference was also supported by experts from regional Internet organizations, including APNIC, APIX.

VNIX-NOG Conference 2020 (online and onsite)
https://vnix-nog.vn

PART III

THE ROLE OF INTERNET RESOURCES AND CRITICAL INTERNET INFRASTRUCTURE IN DIGITAL TRANSFORMATION IN VIET NAM

DNS

VNIX

.VN

IPv6

ASN

5G

IoT

VN NIC
Internet for all

On June 3rd, 2020, the Prime Minister issued Decision No. 749/QD-TTg approving the National Digital Transformation Program by 2025, with orientation towards 2030. This should be an important document which defines the vision, goals, tasks and solutions for Viet Nam's national digital transformation. The national digital transformation program aims to dual goals of forming a digital government, a digital economy and society, simultaneously establishing Vietnamese digital enterprises with global competitive capacity. Accordingly, one of solutions for shaping foundation for digital transformation in Viet Nam is to develop critical information infrastructures.

In Viet Nam, the Internet resources (".vn" domain name, IP address, ASN) and critical Internet infrastructures (national ".vn" DNS system and Viet Nam National Internet eXchange - VNIX) is important elements outlined in the National Digital Transformation Program by 2025, with orientations toward 2030: "Expanding Internet connectivity in the country via direct, peer-to-peer connection, connecting to Internet transit station (IXP), to VNIX" and "Transforming the entire Vietnamese Internet network into the new generation Internet protocol addressing (IPv6). Online services of state agencies, electronic newspapers, general websites, education, health care, and e-commerce of Viet Nam shall use the national ccTLD (".vn")".

I. DIGITAL RESOURCES FOR DIGITAL INFRASTRUCTURES DEVELOPMENT

Internet resources, including ".vn" domain and IP addresses (IPv4, IPv6) has been an integral part of the solution for digital infrastructure development. The concept of Digital Transformation, Internet of Things (IoT), 5G, Cloud has currently become a reality and also a development trend in the near future. Under this circumstance, VNNIC has developed Internet resources ready for 5G, IoT, smart city development, Internet-connected smart devices, towards the target goal of 100% IPv6 enabled Internet by 2025.

DOMAIN .VN

ELEVATING THE VIETNAMESE BRAND NAMES

IDENTIFICATION   TRUST   SAFETY

https://tenmien.vn

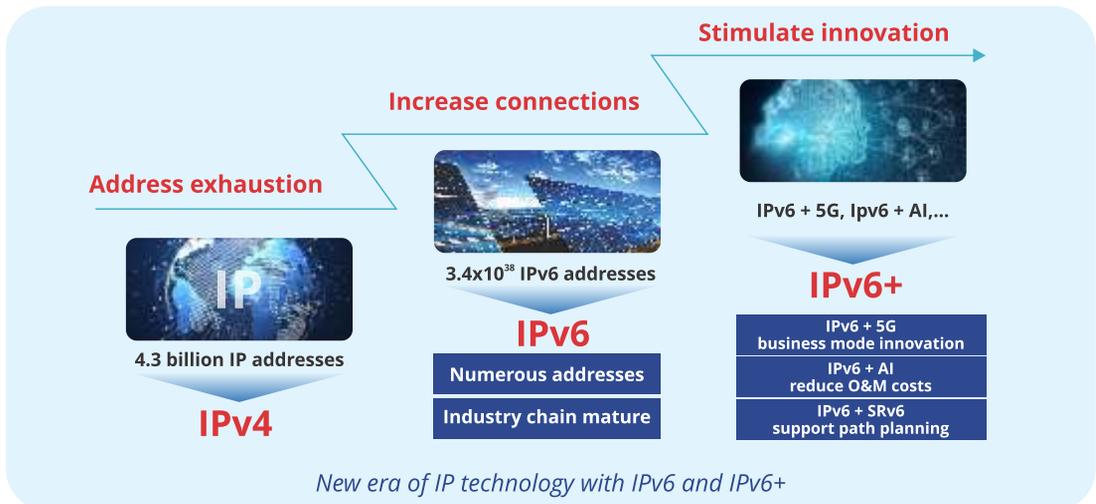**ESSENTIAL ELEMENTS CONNECTING PEOPLE WITH DIGITAL INFRASTRUCTURE IN DIGITAL TRANSFORMATION ERA**

Domain name, the identifier marking the address of any website, portal, online service portal, or e-mail, helps users to access the Internet easily and efficiently, instead of ranges of IP addresses which are hard to remember. With the boom in the digital startup ecosystem, ".vn" domain has transformed from information availability and access into an integral part of digital business models, identifying the trademark, products and services of Viet Nam.

The advantages of ".vn" domain would be represented in 3 values: identity, safety and reliability. Websites and portals with ".vn" domain which are identifiable, clearly expressing the Vietnam geographical and spiritual identity, has been considered as a formal way in the process of "connecting", ensuring the confidence from people themselves while collecting online information and using online services. For Vietnamese enterprises, to carry out silently the mission of "Elevating the Vietnamese brand names", ".vn" domain helps to shape a professional business presence in the marketplace, which would contribute to achieving the goal of forming Vietnamese digital enterprises with global competitive capacity.

IPv6 addresses - Digital resources for the development of digital infrastructures, digital services and e-government infrastructure

In the era of digital transformation with large scale of IoT, 5G networks, the number of devices connected to the Internet was estimated to exceed 100 billion. IPv6 has fundamentally solve the shortage of Internet addresses and contribute to the advancement of network infrastructure. In addition, emerging services such as autonomous driving, industrial automation, VR, smart healthcare, and IoT require huge quantity, high-quality, and smart connections. These services pose higher requirements on network automation, intelligence, and experience assurance. With the advancement of support of multi-layered secure networking, complexity reduce and performance improvements, IPv6 is an enabler of the scalability required by IoT and 5G vertical industries application. According to network architects, in the future, IPv6 is supposed to combine with AI such as network analysis, intelligent tuning, etc., to meet the requirements of path planning, quick service provisioning, SLA assurance, automatic O&M, quality visualization, and application awareness. From IPv6 to IPv6+, technological innovation will help to create new value for the industry, and to embrace the bright IP future in 5G and the cloud era.

Stimulate innovation

Increase connections

Address exhaustion

IP

4.3 billion IP addresses

IPv4

3.4×10^{38} **IPv6 addresses**

IPv6

| Numerous addresses |
| Industry chain mature |

IPv6 + 5G, Ipv6 + AI,...

IPv6+

| IPv6 + 5G business mode innovation |
| IPv6 + AI reduce O&M costs |
| IPv6 + SRv6 support path planning |

New era of IP technology with IPv6 and IPv6+

At this moment, the transition towards native IPv6 activities is increasingly shaped. Viet Nam's digital infrastructures is now basically ready for fully IPv6 enabled Internet, which should facilitate the digital government and digital transformation.

VIETNAM'S FULLY IPv6 ENABLED INTERNET 100% USERS ACCESS VIA IPv6 INTERNET BY 2025

IP
v4 v6
Internet Address

HTTPS://IPV6.VN

IPv6 transition for digital infrastructure towards digital government development

IPv6 - Internet resource for the development of digital services

II. DIGITAL INFRASTRUCTURE FOR DIGITAL CONNECTIVITY AND E-GOVERNMENT DEVELOPMENT

The national DNS system - the heart of the Internet

The Internet would be the critical infrastructure for the operation and development of organizations, enterprises and nations on the world. Until 2030, the Internet will continue to develop very strongly, the current technology trends become more reality and widely applied such as 5G, IoT, Bigdata, Cloud, AI, AR/VR, OTT, etc. Applications and requests are processed faster, even near real-time (<1ms ultra-low latency). As a vital infrastructure of the Internet, DNS system should be updated and changed to appropriate standards to ensure faster, safer, more reliable Internet services.

In Viet Nam, the national ".vn" DNS system together with Viet Nam National Internet eXchange (VNIX) and the national Internet resource management systems are developed and reinforced in compliance with international standards for high quality, secure connection and operational stability that helps to promote Internet development in Viet Nam and contribute to the development of e-commerce and e-government in Viet Nam.

VNIX - digital connection for digital infrastructure

Digital transformation is an indispensable process of development. VNIX defines its role as one of the critical information infrastructures of Viet Nam's Internet, contributing to the economic and social development of Viet Nam.

The VNIX system connects independent networks, to ensure the secured activities of the entire Internet network in Viet Nam under the circumstance of incidents to the domestic and international Telecom networks, promote the IPv6 transformation, expand the connection, focusing on digital platform, digital services, governmental networks, e-gov, IDC and CDN to improve service quality. Enhancing the role of VNIX as a neutral platform would be a priority of the digital transformation process in Vietnam. This is also an opportunity for us to catch the trend, overcome other countries in the region; exploiting digital resources to motivate and facilitate our competitive capacity in the world.
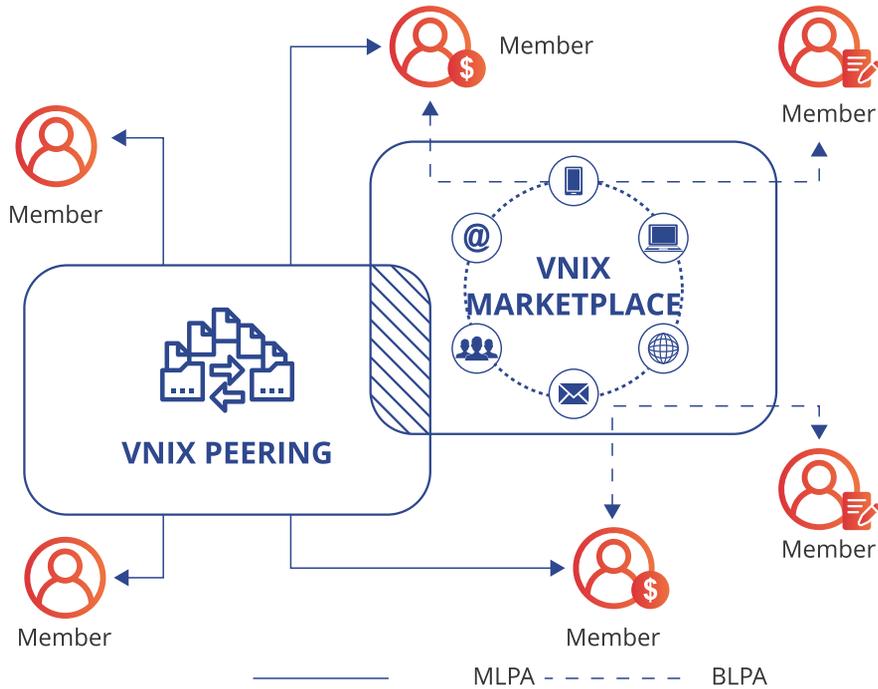
VNIX member:

Internet Service Provider (ISP)	Internet Data Center (IDC)
Internet Content Provider (ICP)	Education, Research and Development organization (EDU, RnD)
Content Delivery Network (CDN)	Government agency
	Internet Exchange Point
	...

To fulfill its role as digital infrastructure of Viet Nam, VNIX focuses on the following goals:

✓ Ensuring the secured activities of Internet network in Viet Nam under the circumstances of domestic and international telecommunication network breakdown.

✓ Promoting the IPv6 transformation and connection in Viet Nam.

✓ Expanding connection and establishing digital platform, improving service quality. Focusing on connecting digital platform, digital services, governmental network, e-government, IDC and CDN.

✓ Connecting to regional and international Internet Exchange points, promoting Viet Nam to be one of the regional Internet exchange.

Internet resource and critical national Internet infrastructure has been the core foundation for digital transformation, continuing to be the basic factor that supports the connection between users and digital infrastructure and contributes to the success of the national digital transformation.

PART IV

TRENDS AND GROWTH OF INTERNET RESOURCES AND INTERNET CORE INFRASTRUCUTRE IN VIET NAM 2020

Statistics updated by October 31ˢᵗ, 2020

I. TRENDS AND GROWTH

1. INTERNET RESOURCES GROWTH

For ".vn" domain, in 2020, due to the impact of the COVID-19 pandemic on the global economy, the domain name industry also faced many difficulties when most countries witnessed a high rate of deletions and declining demand for new registrations.

In Viet Nam, in the first 6 months of 2020, the economy was deeply affected by the COVID-19 pandemic and the growth rate dropped to the lowest level in the past 10 years. During the first 10 months of 2020, the whole country had 111,160 newly established enterprises, a decrease of 2.9% compared to the same period in 2019 (According to data published by the National Business Registration Portal). The most severely affected industries were arts, entertainment and recreation, tourism, transportation, accommodation, employment, and real estate activities. The above situation should have led to a decline in the demand for registration and use of domain names in general. However, according to experts, the pandemic would be also an opportunity to renovate business activities which have been carried out in the traditional way, to the online environment, which should be an opportunity for the domain industry in the long term.

2020 marked a significant shift in the Viet Nam's domain market, due to the fact that ".vn" domain for the first time passed gTLDs and other ccTLDs to lead the industry with 50.6% of total registrations. The results was achived due to the fact that ccTLD always holds the recognized values, which would serve enormously to economic and social activities: identity, safety and trust

Since 2011, ".vn" domain has continuously maintained its leading position in the number of country domain names maintained in Southeast Asia, reaching the top 10 ccTLDs and 44th place in the world in largest number of registration. By the end of October 2020, the total number of ".vn" cumulative domain names reached 514,632, an increase of 2.1% compared to the end of 2019. ".vn" accounted

for 49.5% of the domain name market in Vietnam. Although the growth rate was low compared to 2019 (approximately 8%), it illustrated the continuous and sustainable development of the domain name during the period from 2005-2020.

In 2020, while other countries faced country code domain names with negative growth or insignificant positive growth, ".vn" still recorded a positive growth rate, higher than the average number of the whole domain name industry in the Asia-Pacific region. That would further confirm the position of the .VN ccTLD on the world domain map, which positively contributed to the economic and social development of Viet Nam and represented a symbol of an integrated Viet Nam into global Internet, beside an important resource for Vietnam to be ready for the digital transformation of the country.

For IPv6 addresses deployment, Viet Nam continued fostering IPv6 application on networks and Internet services. With support and incentives by the Ministry of Information and Communications, Viet Nam made some remarkable achievements in the deployment of IPv6. By the end of October 2020, the number of IPv6 addresses in Viet Nam reached more than 9,000 billion billion billion addresses, developing capacity for digital transformation. Viet Nam's IPv6 adoption growth reached 45.6% now and the number of users using IPv6 services exceeded 34 million people. Many big ISPs, content providers and enterprises have conducted large-scale deployment of IPv6 for fixed broadband services, mobile broadband services and tested IPv6 over 5G and IoT networks.

As IPv6 is the next generation of Internet which is a sustainable solution for digital transformation, towards Viet Nam's fully IPv6 enabled Internet by 2025, VNNIC has supported government agencies to speed up their deployment of IPv6. There have been 03 Ministries, Branches and 32 Provinces/Cities to develop their IPv6 Deployment plan; amongst them 03 Ministries, branches and 07 Provinces/Cities has transited their internal and services networks to IPv6. In the next five years, Viet Nam will focus on IPv6 transformation amongst government agencies, content providers and high technology services such as 5G, IoT and smart city.

2. DEVELOPMENT OF NATIONAL CRITICAL INTERNET INFRASTRUCTURES

Regarding the national ".vn" DNS system, VNNIC has been maintaining and reinforcing national ".vn" DNS system for secure connection and operational stability towards the development of e-commerce and e-government in Viet Nam.

2020 marked the growth of domain name queries, especially IPv6 queries (as by October 31st, 2020, the number of queries increased 173% over the same period last year). The speed of ".vn" domain query response time improved dramatically, increasing at least 5 times than before, as the result of deploying DNS Root in Viet Nam in 2020. ".vn" DNS system has been deployed emerging technologies (Anycast, DNSSEC, IPv6 technology) with the aim to ensure ".vn" DNS services safer and more reliable, thereby enhancing trust and quality of Internet services in Viet Nam.

Regarding Vietnam Internet eXchange, **the Viet Nam National Internet eXchange (VNIX) witnessed** many important achievements in operation and an significant increase in the number of VNIX members:

- Setting up 02 F-Root servers at VNIX in Ha Noi and Ho Chi Minh City.
- Deploying more 24 test servers at VNIX and ISP's network.
- Organizing successfully the VNIX-NOG conference in both offline and online platform in the condition of COVID-19 pandemic.
- Reaching 46 members with the growth rate of 38.1%.

It is expected that there will be 48-51 members connecting to VNIX by the end of 2020, exceeding the growth rate of 61.9% in member increase.

In research and development, VNNIC collected surveys from more than 500 IP/ASN members in Viet Nam for the purpose of analyzing connection demand, status and conditions of community. In this year, VNNIC proposed to government new regulations on VNIX development policies towards providing new connection networks, standards for local Internet improvement and facilitating open environment for international connectivity

II. STATISTICS INFORMATION

1. ".VN" DOMAIN NAME

1.1. STATISTICS ON ".VN" DOMAIN NAME GROWTH OVER THE YEARS
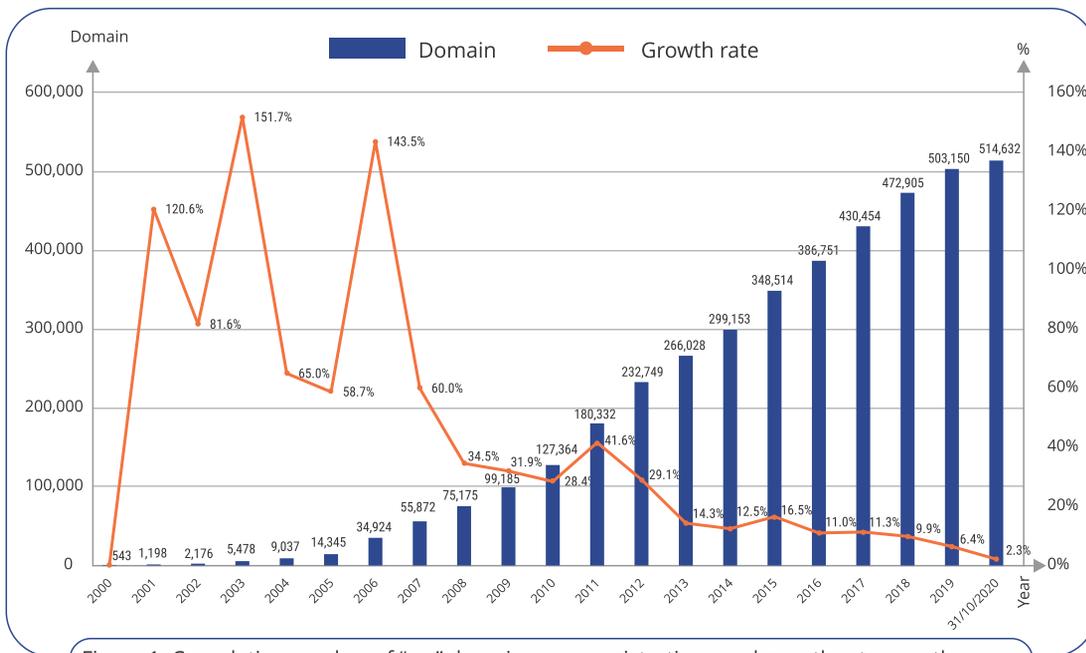

Figure 1: Cumulative number of ".vn" domain name registrations and growth rate over the years
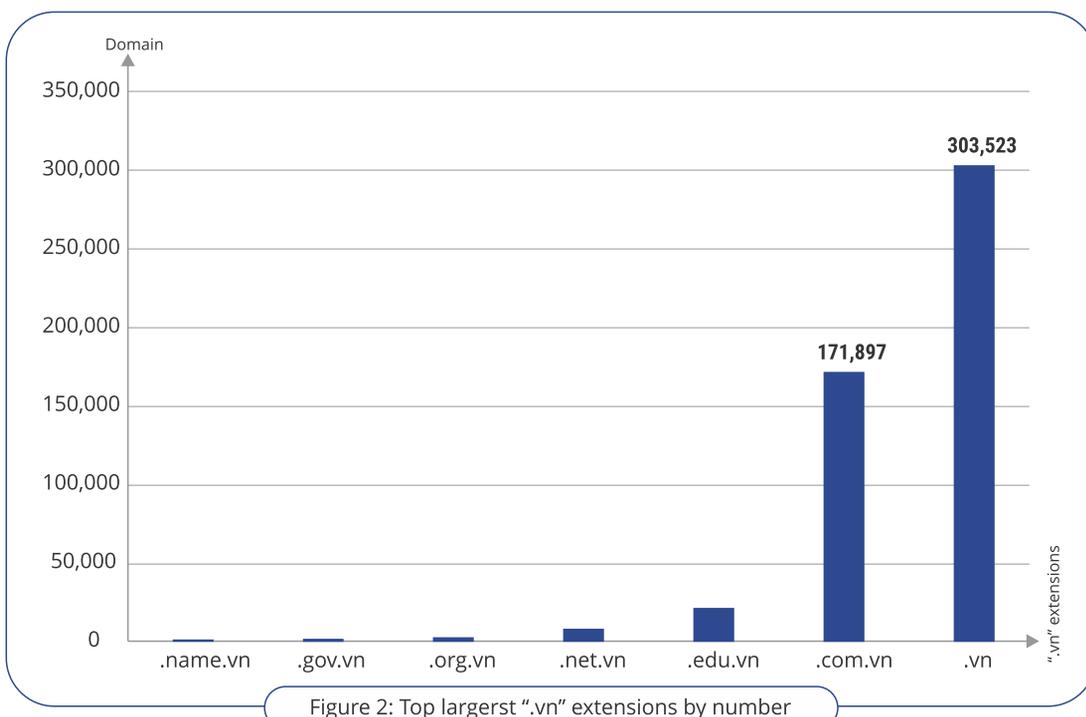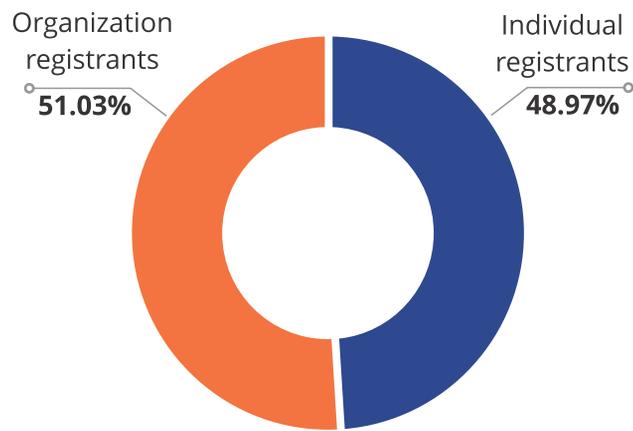

Figure 2: Top largerst ".vn" extensions by number

Organization registrants
51.03%

Individual registrants
48.97%

Figure 3: ".vn" domain name registrations by registrant types

Overseas
4.11%

Central
8.55%

Southern
44.89%

Northern
42.45%
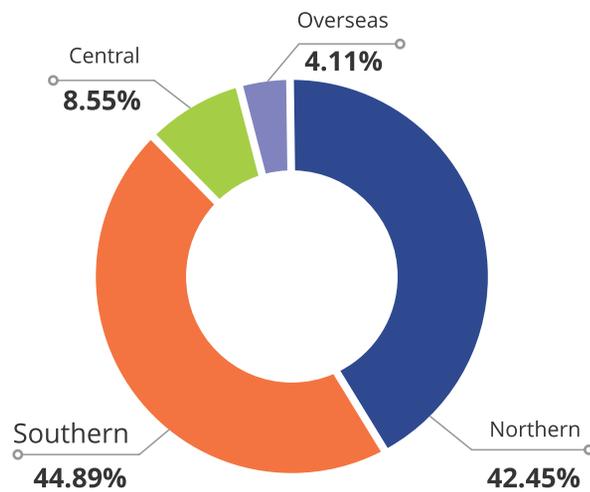
Figure 4: ".vn" domain registrations by geographical distribution

Picture 1: ".vn" domain registrations distributed by Provinces/Cities

Legend:
- < 200 domains
- 200 - 500 domains
- 500 - 1,000 domains
- 1,000 - 2,000 domains
- 2,000 - 5,000 domains
- 5,000 - 10,000 domains
- > = 10,000 domains

No.	Province/City	".vn" registrations	".gov.vn" registrations
1	Ho Chi Minh City	195,557	187
2	Ha Noi	175,897	699
3	Da Nang	9,852	32
4	Binh Duong	8,447	26
5	Hai Phong	7,823	40
6	Dong Nai	6,674	31
7	Thanh Hoa	4,810	56
8	Nghe An	4,525	63
9	Khanh Hoa	4,072	52
10	Nam Dinh	3,873	16

Table 01: ".vn" domain name registrations distributed by Provinces/Cities

No.	Province/City	Percentage of enterprises registering ".vn" domain	No.	Province/City	Percentage of enterprises registering ".vn" domain
1	TP Ho Chi Minh	17.46%	33	Binh Thuan	5.88%
2	Ha Noi	21.13%	34	Tien Giang	4.63%
3	Da Nang	10.16%	35	Ben Tre	4.63%
4	Binh Duong	7.60%	36	An Giang	3.53%
5	Hai Phong	7.62%	37	Quang Binh	2.57%
6	Dong Nai	6.82%	38	Binh Phuoc	3.00%
7	Thanh Hoa	3.83%	39	Tay Ninh	4.80%
8	Nghe An	4.18%	40	Gia Lai	3.72%
9	Khanh Hoa	8.06%	41	Hoa Binh	4.76%
10	Nam Dinh	4.21%	42	Phu Yen	3.75%
11	Ba Ria - Vung Tau	9.14%	43	Dong Thap	3.73%
12	Hai Duong	5.85%	44	Lao Cai	4.19%
13	Bac Ninh	6.16%	45	Ninh Thuan	4.87%
14	Can Tho	8.24%	46	Ca Mau	2.88%
15	Thai Binh	4.31%	47	Vinh Long	3.95%
16	Hung Yen	7.26%	48	Quang Tri	2.67%
17	Quang Nam	4.62%	49	Yen Bai	3.54%
18	Long An	7.59%	50	Tuyen Quang	2.63%
19	Quang Ninh	5.66%	51	Tra Vinh	2.60%
20	Binh Dinh	4.93%	52	Soc Trang	3.32%
21	Lam Dong	5.71%	53	Lang Son	2.57%
22	Bac Giang	3.77%	54	Bac Lieu	2.34%
23	Dak Lak	5.06%	55	Kon Tum	3.53%
24	Vinh Phuc	5.35%	56	Hau Giang	3.15%
25	Phu Tho	3.28%	57	Son La	3.66%
26	Thai Nguyen	4.99%	58	Dak Nong	2.10%
27	Ha Nam	5.41%	59	Ha Giang	2.23%
28	Ninh Binh	3.76%	60	Bac Kan	2.12%
29	Quang Ngai	3.91%	61	Dien Bien	2.21%
30	Thua Thien - Hue	6.38%	62	Cao Bang	2.53%
31	Kien Giang	3.77%	63	Lai Chau	2.25%
32	Ha Tinh	3.34%			

Table 02: The number of enterprises registering ".vn" domain name per the number of enterprise in Provinces/Cities (updated to August, 2020)
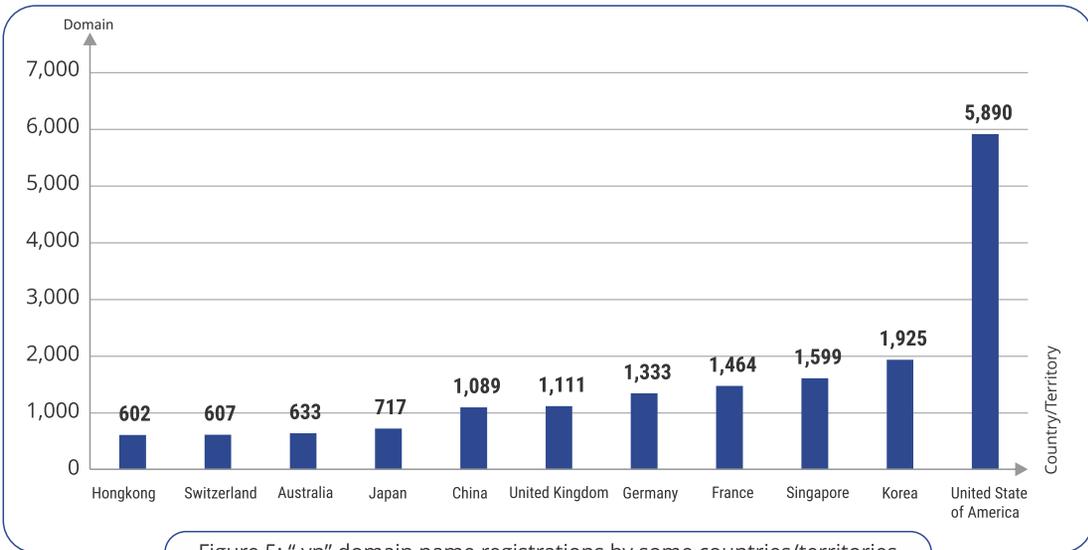
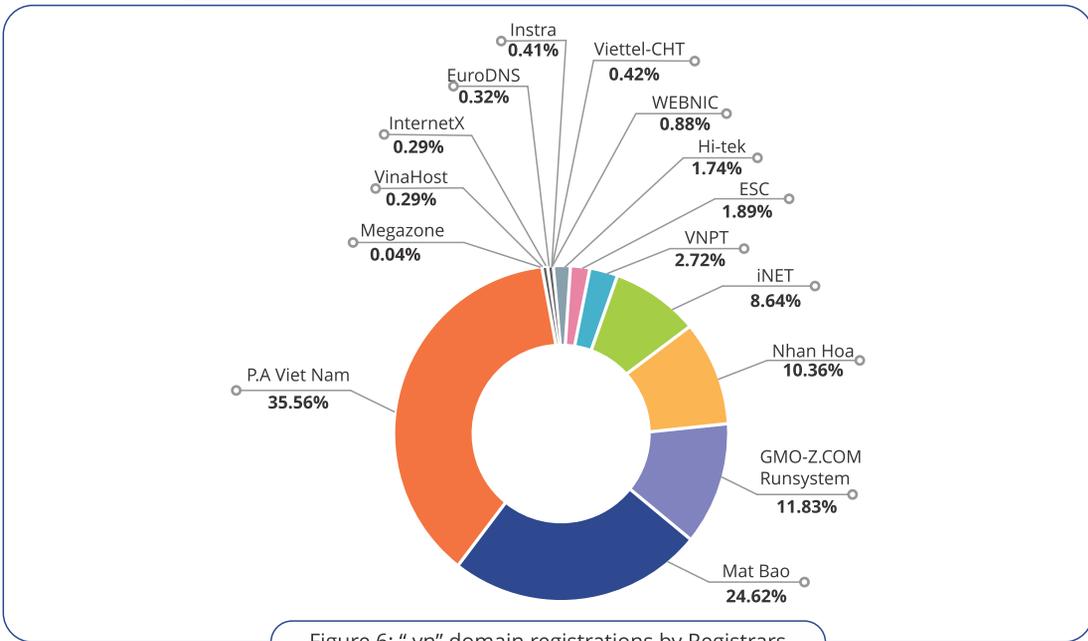Figure 5: ".vn" domain name registrations by some countries/territories

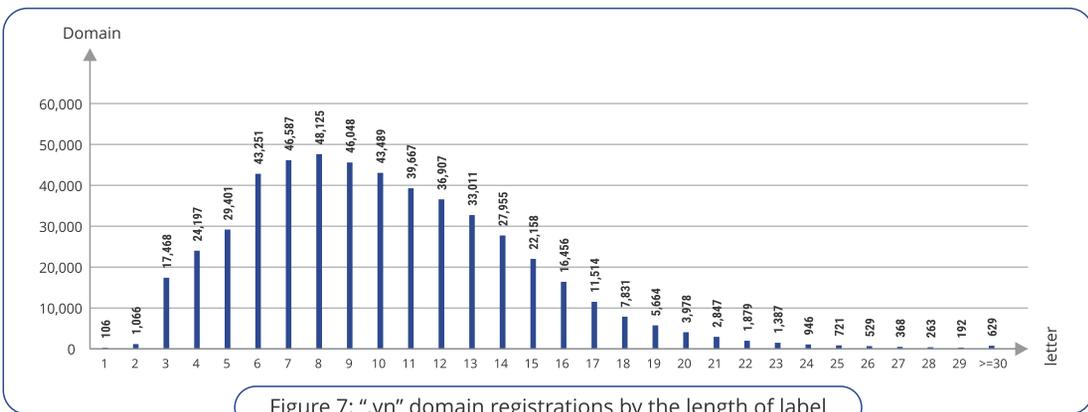Figure 6: ".vn" domain registrations by Registrars

Figure 7: ".vn" domain registrations by the length of label

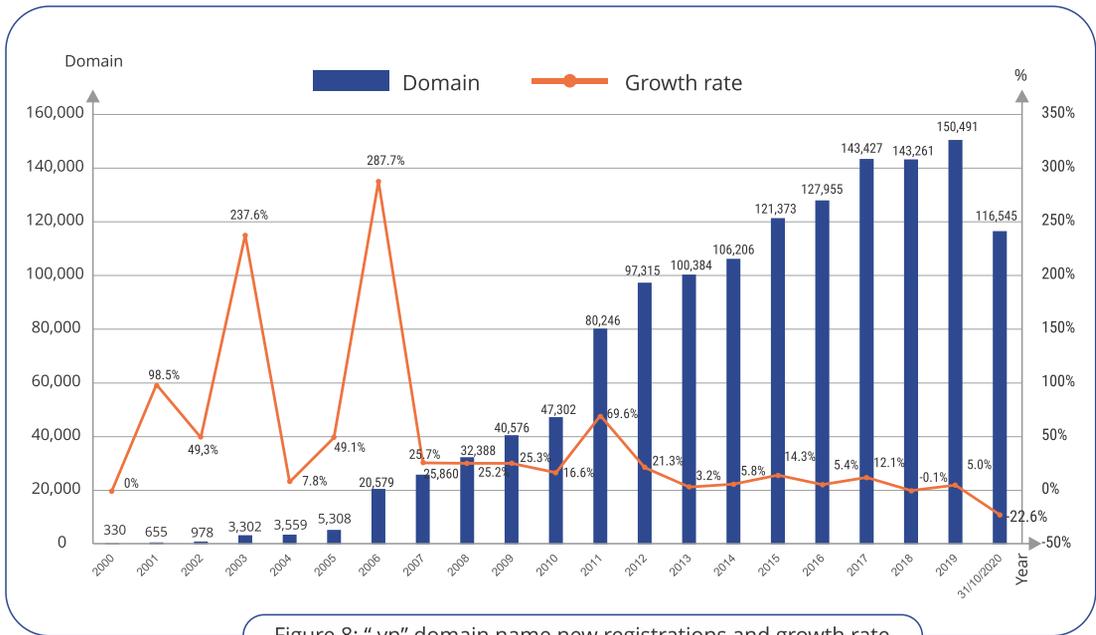## 1.2. STATISTICS ON ".VN" DOMAIN NAME NEW REGISTRATION IN 2020

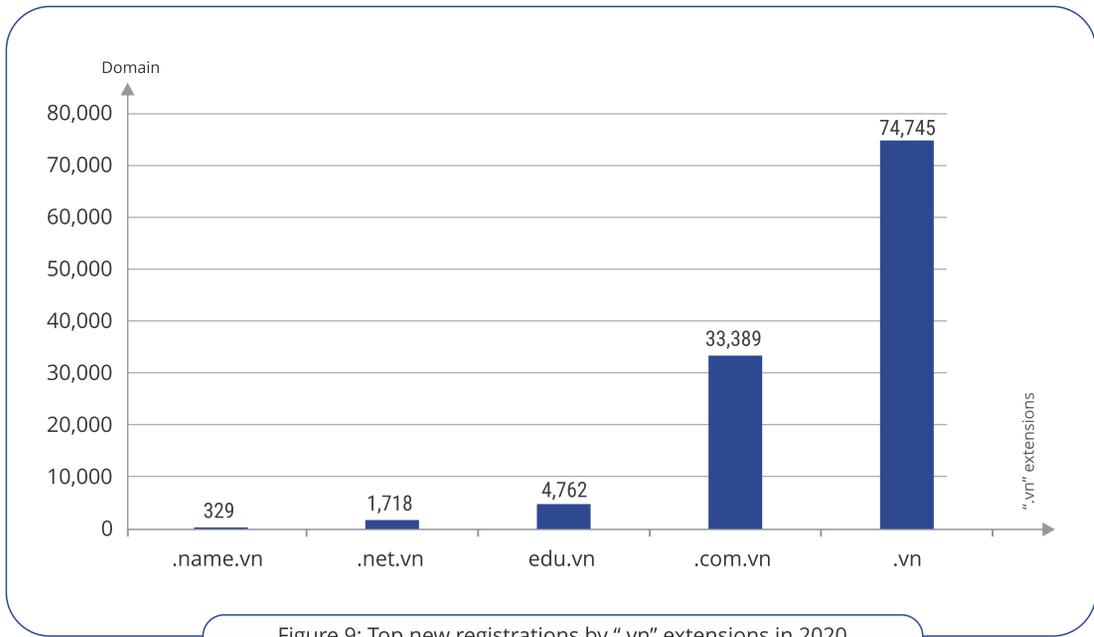Figure 8: ".vn" domain name new registrations and growth rate

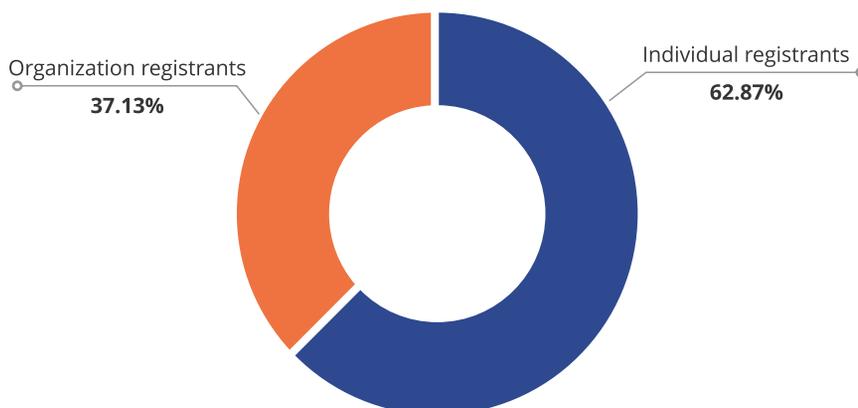Figure 9: Top new registrations by ".vn" extensions in 2020

Figure 10: ".vn" domain name new registration by registrant type

The noticeable difference domain market share in 2020 was the number of ".vn" new registrations by individual customers that accounted for a larger share (62.87%) while it was lower almost twice compared to the number of new registrations by organization registrants. This gap was narrowed constantly in the recent three years. By October, 2020, amongst total of 514,632 ".vn" registrations, the number of ".vn" number registered by individuals and organizations accounted for 51.03% and 48.97%, respectively.

With such movement trends, it is forecasted that in 2021, the percentage of individual customers will be in balance with organization ones and drive market share of ".vn" registration in Viet Nam in the next 5 years. This trend would be consistent with the development of e-commerce and prospect for personalization on the Internet.
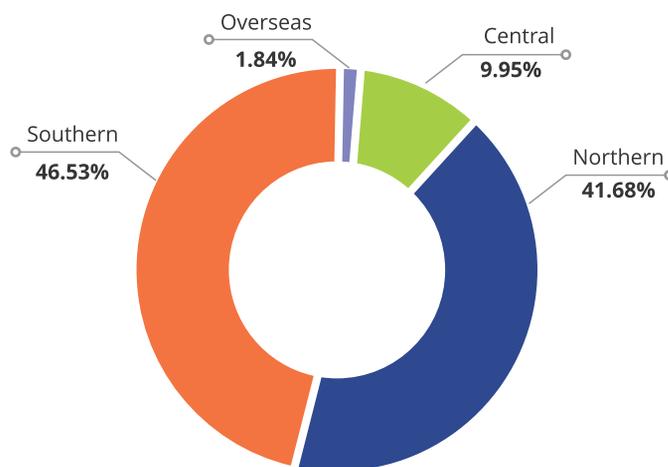
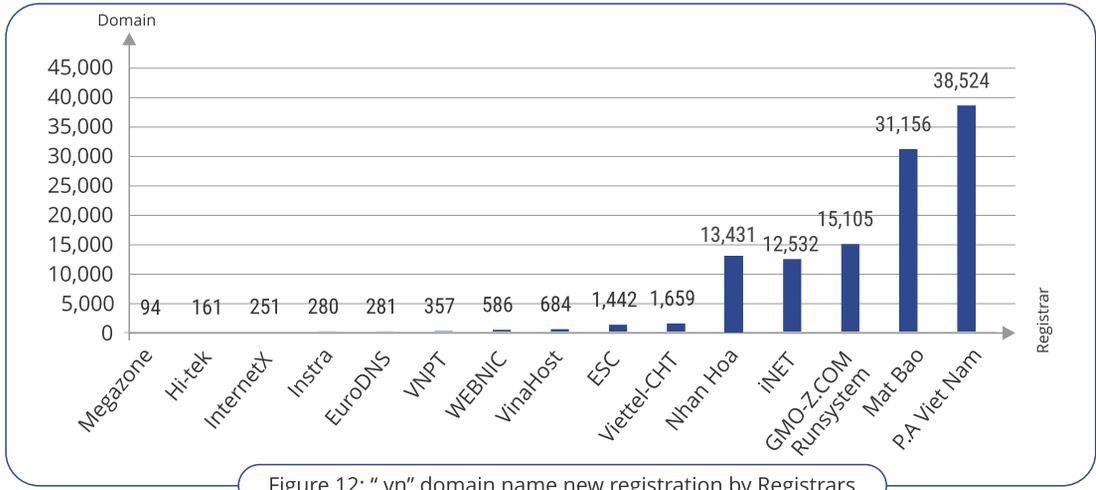Figure 11: ".vn" domain name new registration in 2020 by geographical distribution

Figure 12: ".vn" domain name new registration by Registrars

DOMESTIC REGISTRARS

| P.A Vietnam Company | Mat Bao Company | GMO Runsystem Company | Nhan Hoa Softwere Company Limited | iNET Software Co., Ltd | Vietnam Data Communication Company | Online Solution Company | Viettel-CHT Company Limited | Vinahost Company |

OVERSEA REGISTRARS

| Web Commerce Communications Ltd. | Instra Corporation | EuroDNS SA | InterNetX Company | HI-TEK INC., JSC | MEGAZONE Corp |

1.3. VALUE-ADDED SERVICES FOR ".VN" DOMAIN NAME

REGISTRY LOCK SERVICE

2,927 ".vn" domain names were protected with Registry Lock services
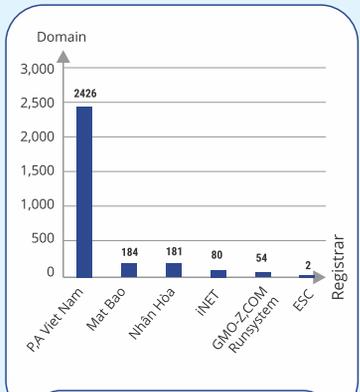
Figure 13: Registry Lock service by Registrar

DOMAIN NAME SYSTEM SECURITY EXTENSIONS

1,630 ".vn" domain names were signed DNSSEC in 2020
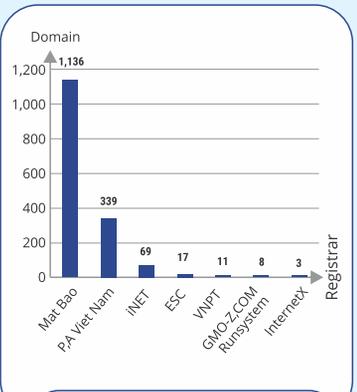
Figure 14: ".vn" domain signed DNSSEC by Registrars

TRANSFER THE RIGHT TO USE ".VN" DOMAIN REGISTERED WITHOUT AUCTION

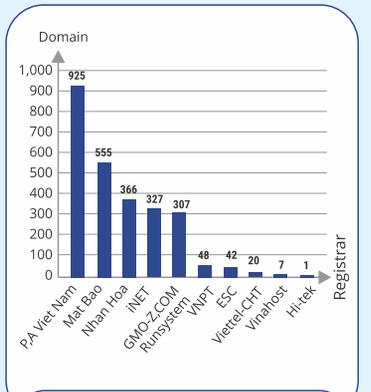**2,612** ".vn" domain names has been successfully transferred in 2020

Figure 15: ".vn" domain transferred by Registrars
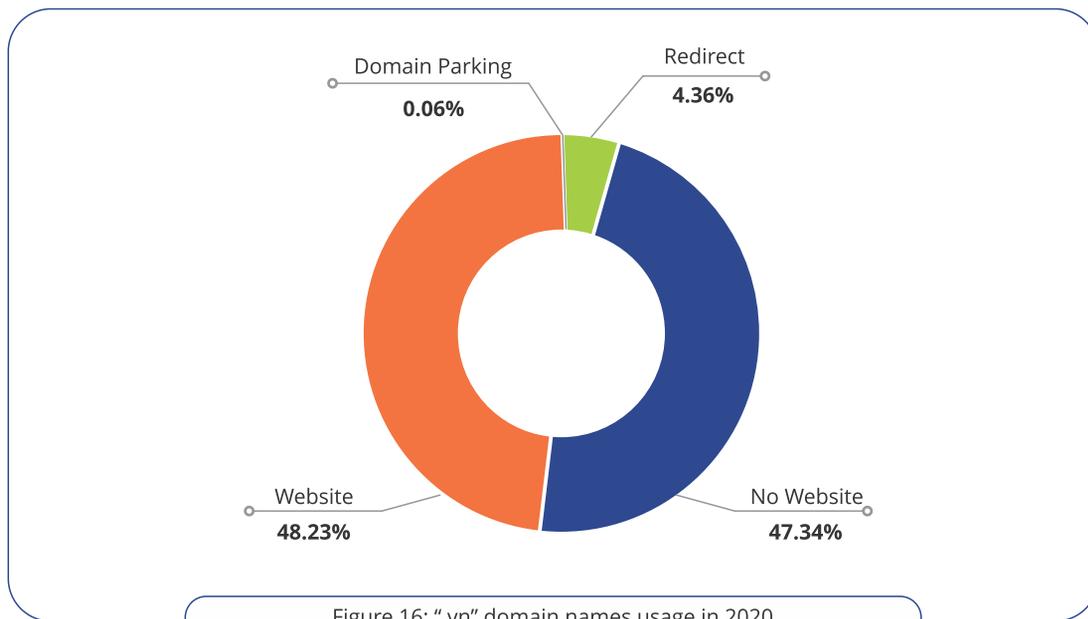
1.4. ".VN" DOMAIN NAME USAGE

Figure 16: ".vn" domain names usage in 2020

1.5. LIST OF ".VN" DOMAIN NAMES MOST QUERIED ON THE NATIONAL DNS

shopee.vn	01	11	vietinbank.vn
tiki.vn	02	12	vtv.vn
agribank.com.vn	03	13	rungrinh.vn
google.com.vn	04	14	speedtest.vn
thanhnien.com.vn	05	15	24h.com.vn
coccoc.vn	06	16	dantri.com.vn
soha.vn	07	17	zalopay.vn
vov.vn	08	18	techcombank.com.vn
zing.vn	09	19	lazada.vn
vnmedia.vn	10	20	tuoitre.vn

Table 3: List of ASCII ".vn" domain names most queried on the national ".vn" DNS system

cửahàngcamera.vn	01	11	bếpđiệntừhcm.vn
mỹphẩmsakura.vn	02	12	túichânkhông.vn
trắcnghiệm.vn	03	13	usbsáchnói.vn
bộtmỳkimngưu.vn	04	14	kháchsạnsầmsơn.vn
bánnhàhànội.vn	05	15	bổtúctayláihcm.vn
giànphơinhậpkhẩu.vn	06	16	phúcancity.vn
luậtvn.vn	07	17	mónngon.vn
máyincũtphcm.vn	08	18	kếtquảviệt.vn
mũikhoantừ.vn	09	19	tênmiềntiếngviệt.vn
hệthốngtrungchuyểnvnix.vn	10	20	chănlôngcừu.vn

Table 4: List of Vietnamese IDN most queried on the national ".vn" DNS system

2. IP ADDRESS AND AUTONOMOUS SYSTEM NUMBER
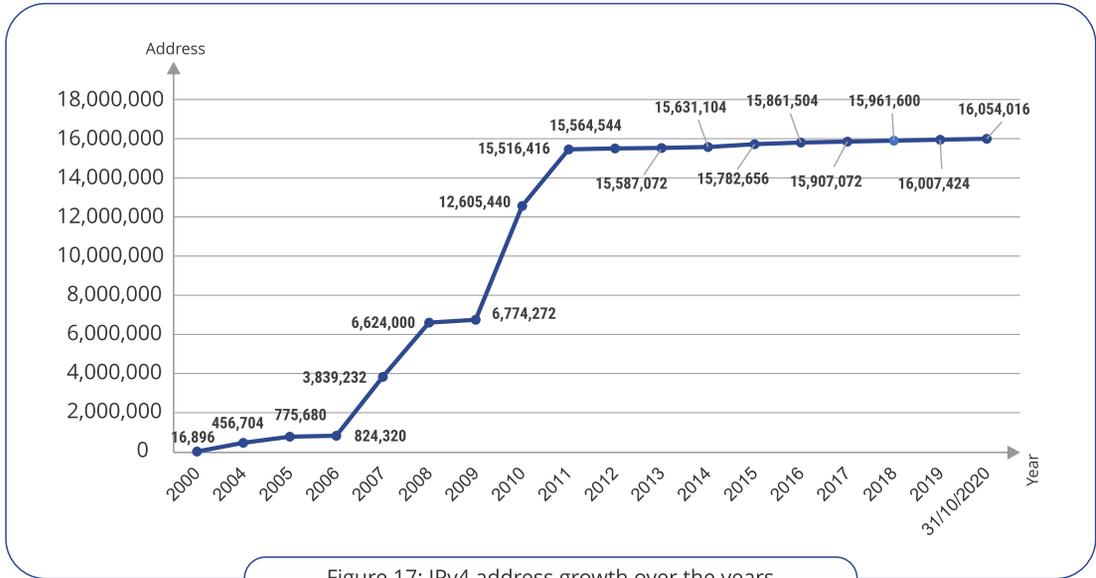
2.1. IP ADDRESS AND ASN GROWTH

Figure 17: IPv4 address growth over the years

As IPv4 has been exhausted since 2011 and is expected to entirely depleted by 2021, each entity is only eligible to get a small IPv4 block from the final APNIC /8 IPv4 address pool. Accordingly, the average annual growth rate of IPv4 addresses was just only 0.3% over the past 10 years.
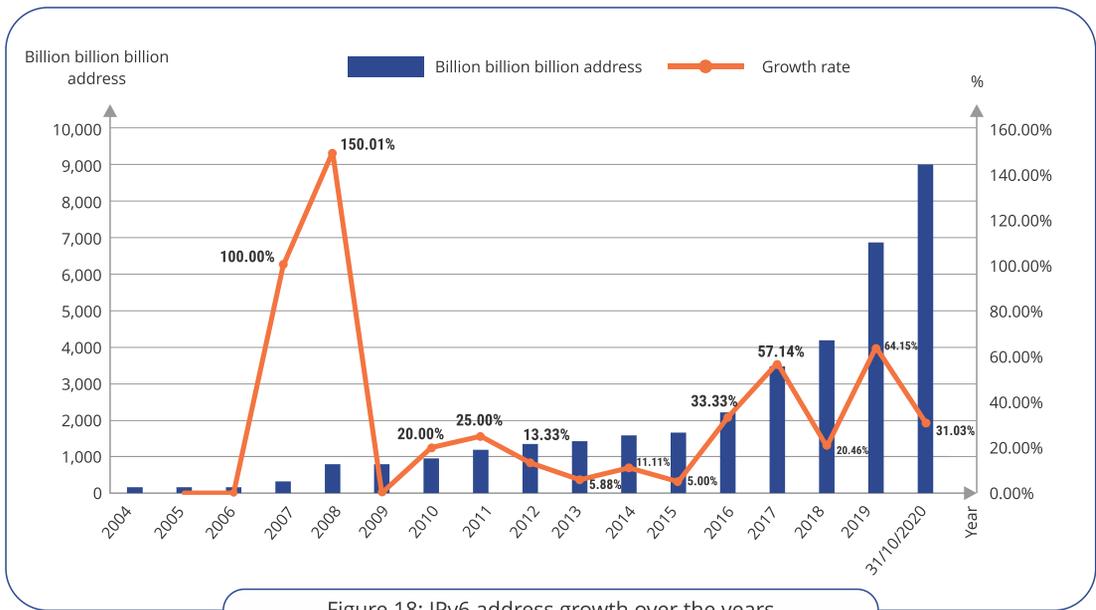

Figure 18: IPv6 address growth over the years

Viet Nam witnessed an remarkable increase of IPv6 adoption rate since 2008 as a result of the effect of Directive No. 03/2008/CT-BTTTT approved by The Minister of Information and Communications on promoting IPv6 deployment in Viet Nam.By October, 2020, the number of IPv6 addresses in Viet Nam reached 9,032 billion billion billon addresses.

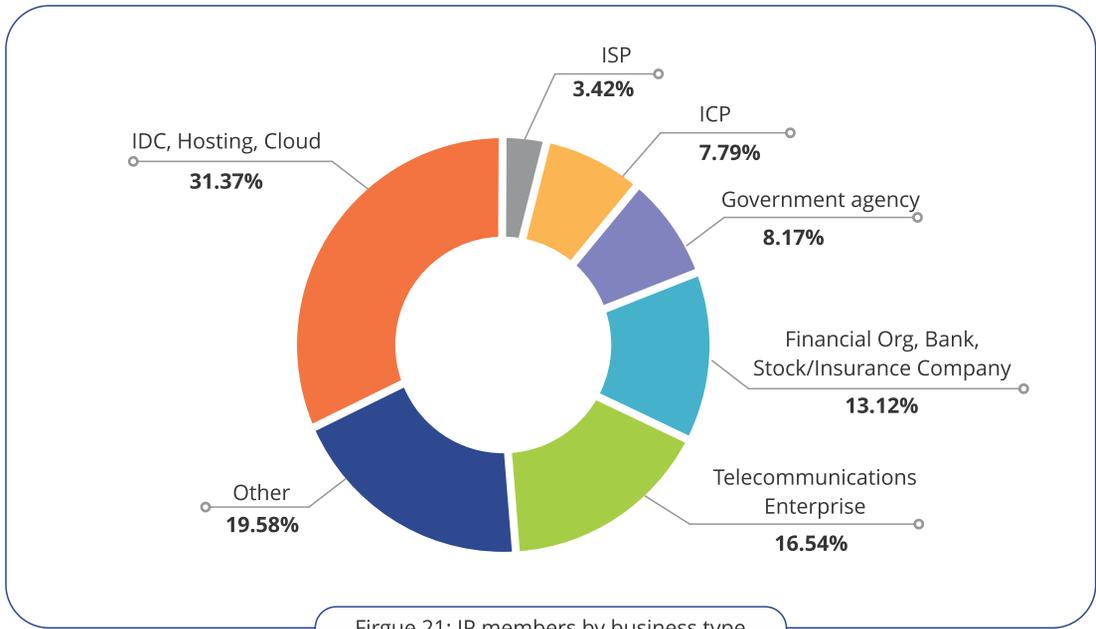Figure 19: ASN growth over the years

Figure 20: IP Members growth over the years

Firgue 21: IP members by business type

In the past five years, the number of new IP members in Viet Nam has increased by 48 members (in average) each year. There were 89 new members in only 10 months in 2020. It is expected that the number of new IP members would reach 100 members at the end of 2020, increasing twice times than the new number in the past five years. Most of them would be government agencies, ISP, cloud, IDC.
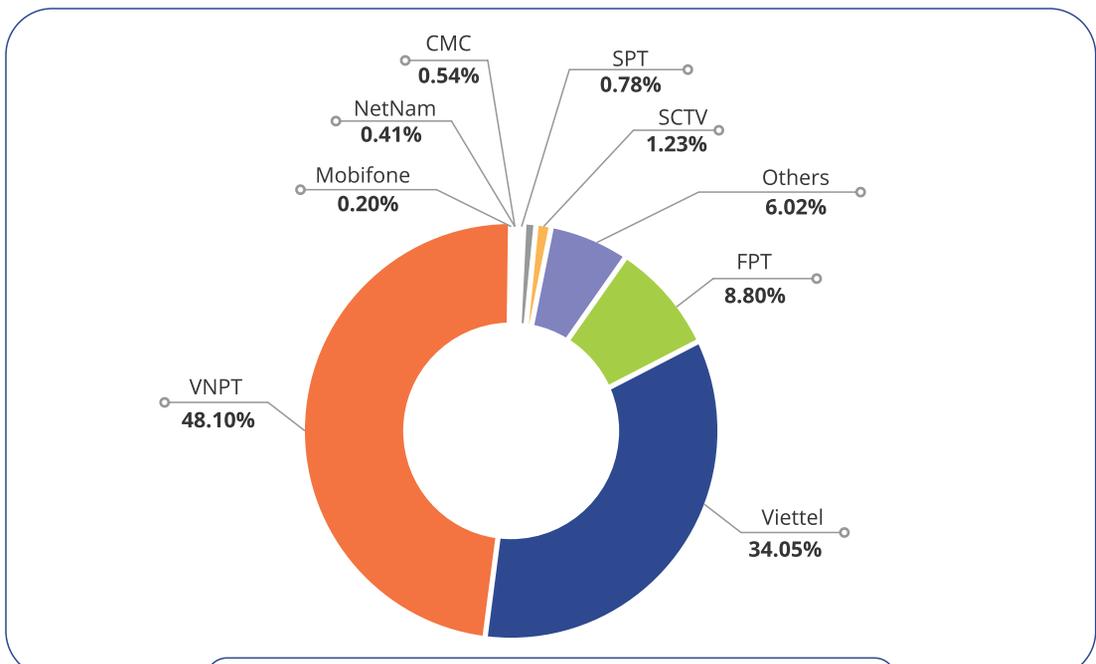

Figure 22: IPv4 addresses by the biggest members in Viet Nam

2.2. THE NEXT GENERATION OF IP PROTOCOL, IPV6 DEPLOYMENT IN VIET NAM

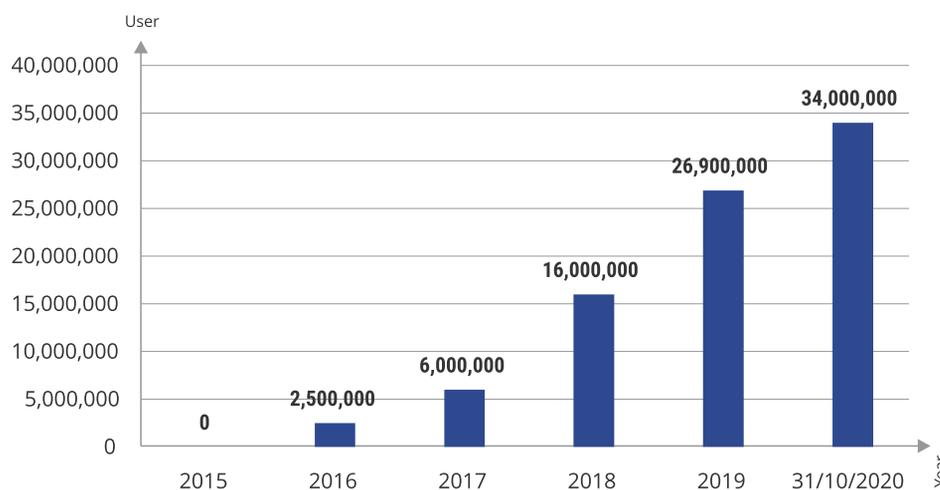Figure 23: The use of IPv6 for Viet Nam (Source: APNIC Lab)

Figure 24: IPv6 user growth over the years

No.	Country/Territory	IPv6 adoption rate
1	Saint Barthelemy	76.29%
2	India	70.09%
3	Belgium	60.24%
4	Mayotte	58.69%
5	Malaysia	53.40%
6	United States	51.30%
7	Taiwan	49.46%
8	Germany	48.96%
9	Greece	48.51%
10	**Viet Nam**	**45.60%**
11	Switzerland	45.37%
12	France	44.12%
13	Guiana	41.10%
14	Japan	40.98%
15	Puerto Rico	40.56%

Table 05: Top 15 countries in the world with highest IPv6 adoption rate

No.	Country/Territory	IPv6 adoption rate
1	Malaysia	53.04%
2	**Viet Nam**	**45.60%**
3	Thailand	35.54%
4	Singapore	19.26%
5	Myanmar	17.73%
6	Philippines	11.00%
7	Indonesia	0.62%
8	Campuchia	0.00%
9	Timor Leste	0.00%
10	Brunei	0.00%
11	Laos	0.00%

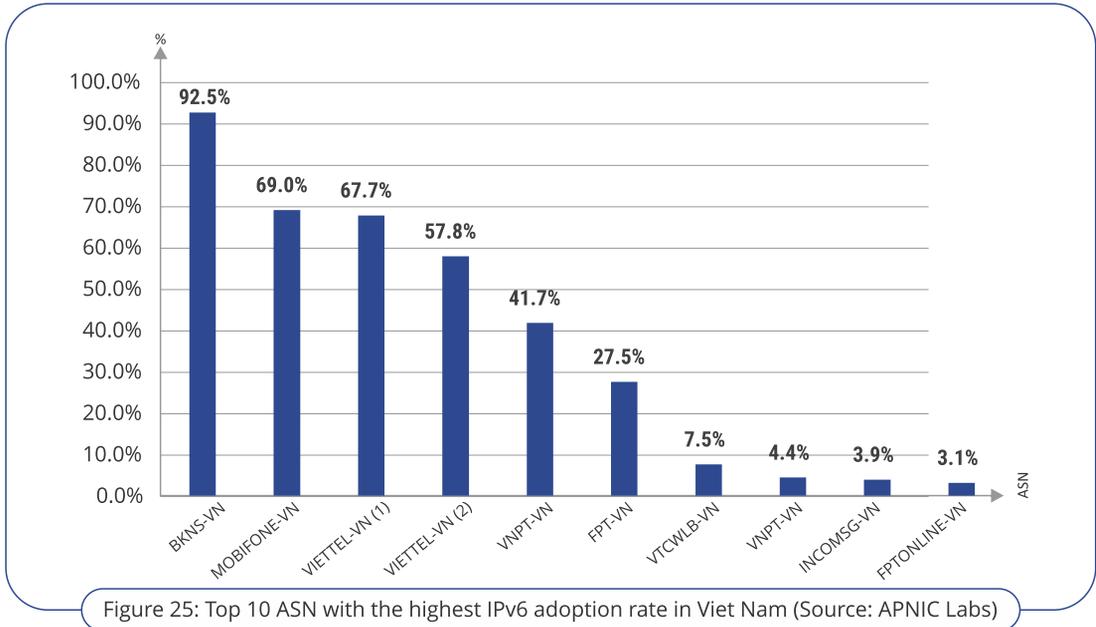Table 06: Top countries in Asia with highest IPv6 adoption rate

Figure 25: Top 10 ASN with the highest IPv6 adoption rate in Viet Nam (Source: APNIC Labs)

2.3. IPv6 FOR GOV PROGRAM

IPv6 for Gov Program is developed by VNNIC with the aim to promote and support IPv6 deployment amongst government agencies towards the goal of upgrading Internet in Viet Nam to be fully IPv6 enabled. To help achieve this goal, VNNIC will support ICT government agencies of Ministries and Branches and ICT Departments in Provinces/Cities in developing IPv6 deployment plan, developing IPv6 human resources and enabling IPv6 in their services and networks.

10 steps for IPv6 deployment in government agencies

https://www.vnnic.vn/ipv6/
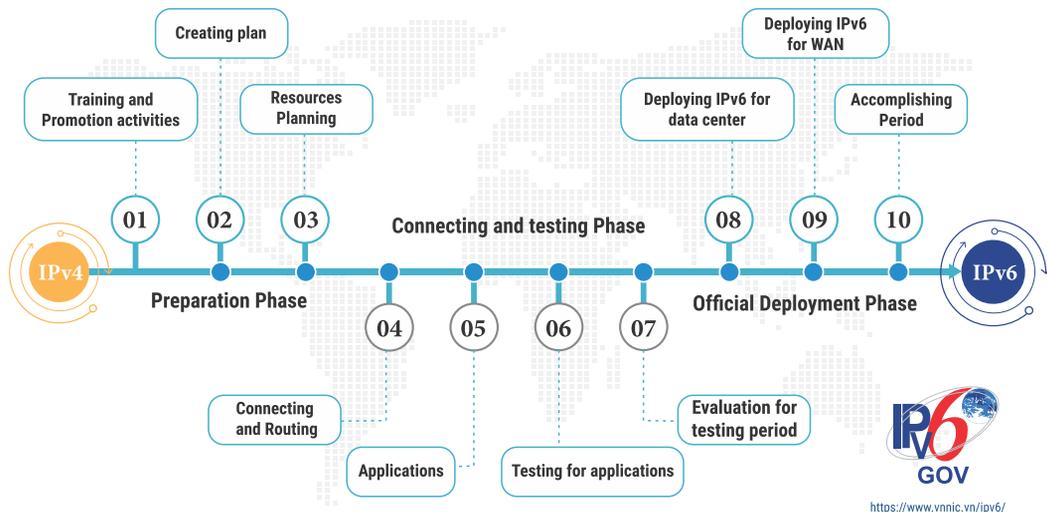
HIGHLIGHTS OF IPv6 FOR GOV PROGRAM IN 2020

DEVELOPING IPv6 HUMAN RESOURCE AMONGST GOVERNMENT AGENCIES

2,131

Vietnamese engineers

1,296

Engineers amongst ICT government agencies

20

Ministries, Branches

56

Provinces/Cities

SUPPORTING GOVERNMENT AGENCIES IN IPv6 DEPLOYMENT PLAN AND IPV6 TRANSITION IN THEIR NETWORKS

05

Ministries with IPv6 enabled Portal

36

Provinces/cities with IPv6 enabled Portal.

DEVELOPING AN ONLINE IPV6 TRAINING PROGRAM AT VNNIC ACADEMY

Network Advancement

DNS operatoon

IPv6 deployment

IPv6 For Gov

32 Provinces/cities

Having their own IPv6 deployment plan.

11 Ministries, Branches 19 Provinces/Cities

with both IPv4 and IPv6 blocks.

Portals of 03 Ministries
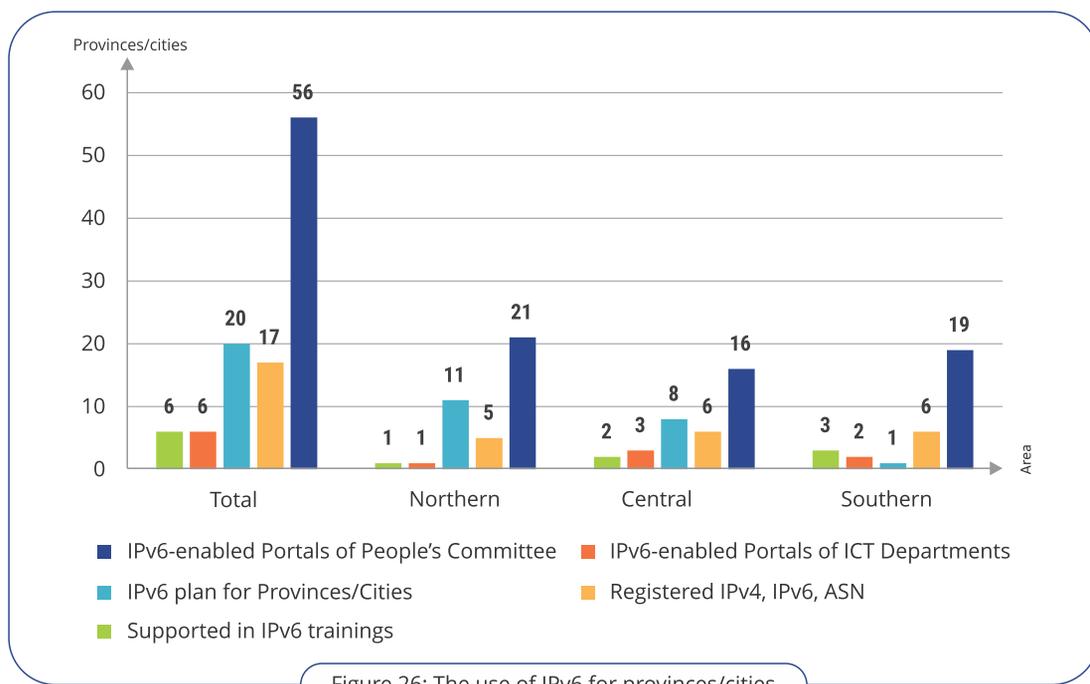
Enabled IPv6

Portals of 07 Provinces/Cities

Enabled IPv6

Figure 26: The use of IPv6 for provinces/cities

No.	Organization	Portal
1	Ministry of Information and Communications	mic.gov.vn
2	Minitry of Natural Resources and Environment	monre.gov.vn
3	The State Bank of Vietnam	sbv.gov.vn
4	Da Nang People's Committee	danang.gov.vn
5	Ho Chi Minh City People's Committee	hochiminhcity.gov.vn
6	Lam Dong People's Committee	lamdong.gov.vn
7	Long An People's Committee	longan.gov.vn
8	Dong Nai People's Committee	dongnai.gov.vn
9	Hoa Binh People's Committee	hoabinh.gov.vn
10	Bac Kan People's Committee	backan.gov.vn
11	Da Nang Department of Information and Communications	tttt.danang.gov.vn
12	Ho Chi Minh city Department of Information and Communications	ict-hcm.gov.vn
13	Lam Dong Department of Information and Communications	stttt.Lamdong.gov.vn
14	Long An Department of Information and Communications	stttt.longan.gov.vn
15	Hoa Binh Department of Information and Communications	sothongtin.hoabinh.gov.vn
16	Thua Thien Hue Department of Information and Communications	stttt.thuathienhue.gov.vn
17	Vinh Long Department of Information and Communications	stttt.vinhlong.gov.vn

Table 07: The list of Ministries, Provinces/Cities, the Department of Information
and Communications enabled IPv6 Portal
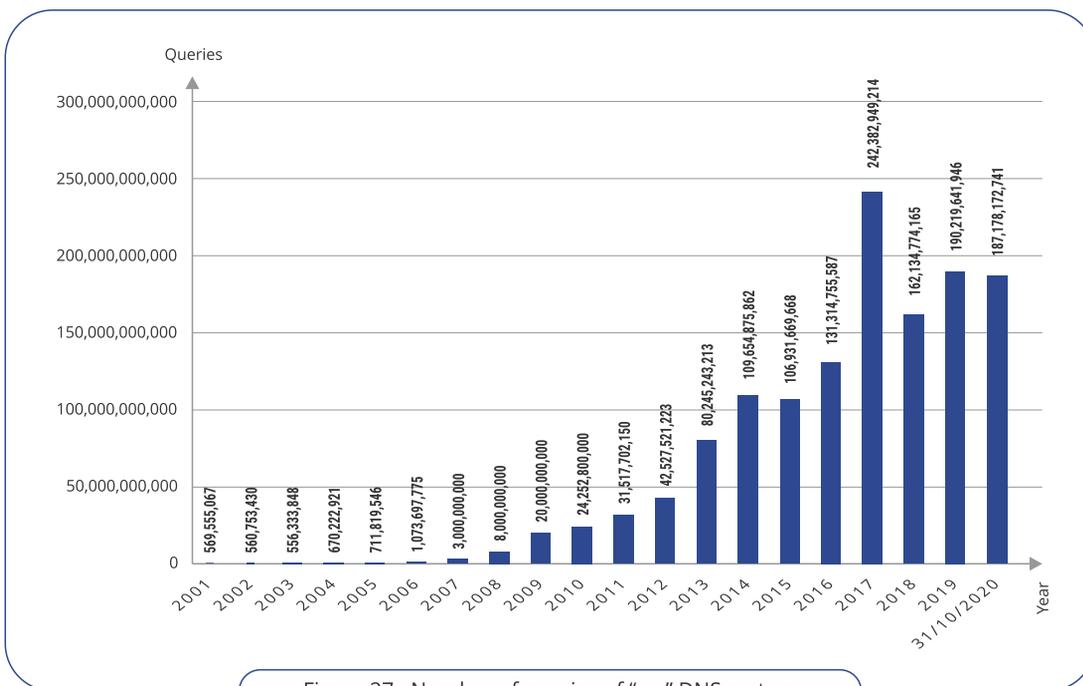
3. NATIONAL ".VN" DNS SYSTEM

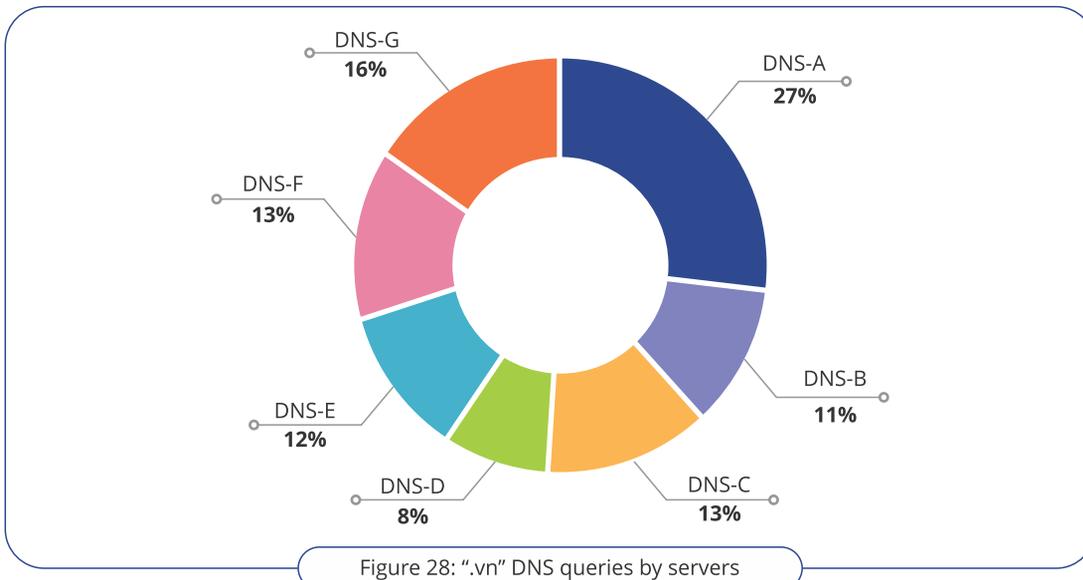Figure 27 : Number of queries of ".vn" DNS system

Figure 28: ".vn" DNS queries by servers

DNS requests are distributed and load balanced across ".vn" DNS servers, amongst them DNS-A server and DNS-G received the largest requests. All of ".vn" DNS servers supports IPv4// IPv6 and are deployed with Anycast which helps to respond and routing ".vn" requests to more than 100 different locations in biggest cities all over the world, ensuring the fastest DNS response for Internet activities over ".vn" domain.
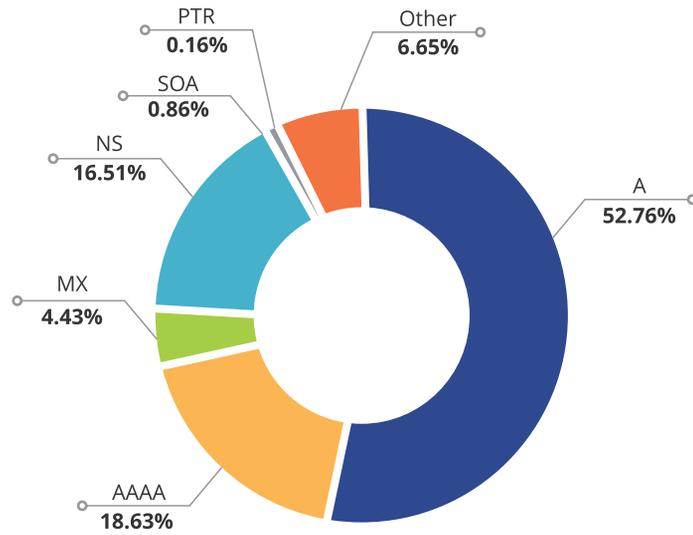
PTR
0.16%

Other
6.65%

SOA
0.86%

NS
16.51%

A
52.76%

MX
4.43%

AAAA
18.63%

Figure 29: The average response time of ".vn" DNS system
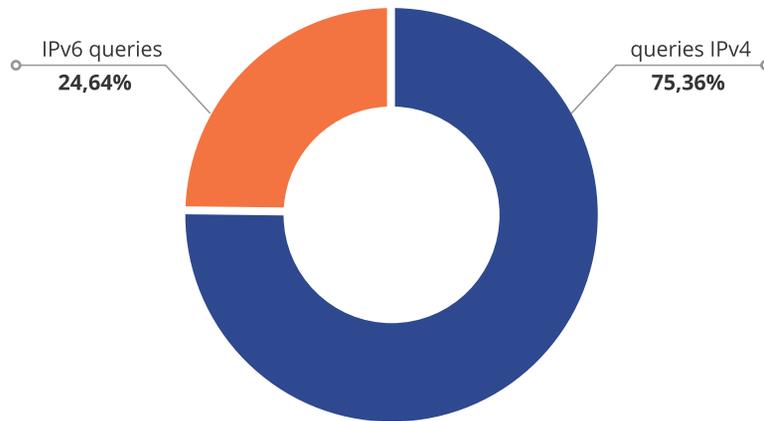
IPv6 queries
24,64%

queries IPv4
75,36%

Figure 30: ".vn" DNS queries by IPv4 and IPv6 address in 2020

4. VIET NAM INTERNET EXCHANGE (VNIX)

TRAFFIC VIA VNIX

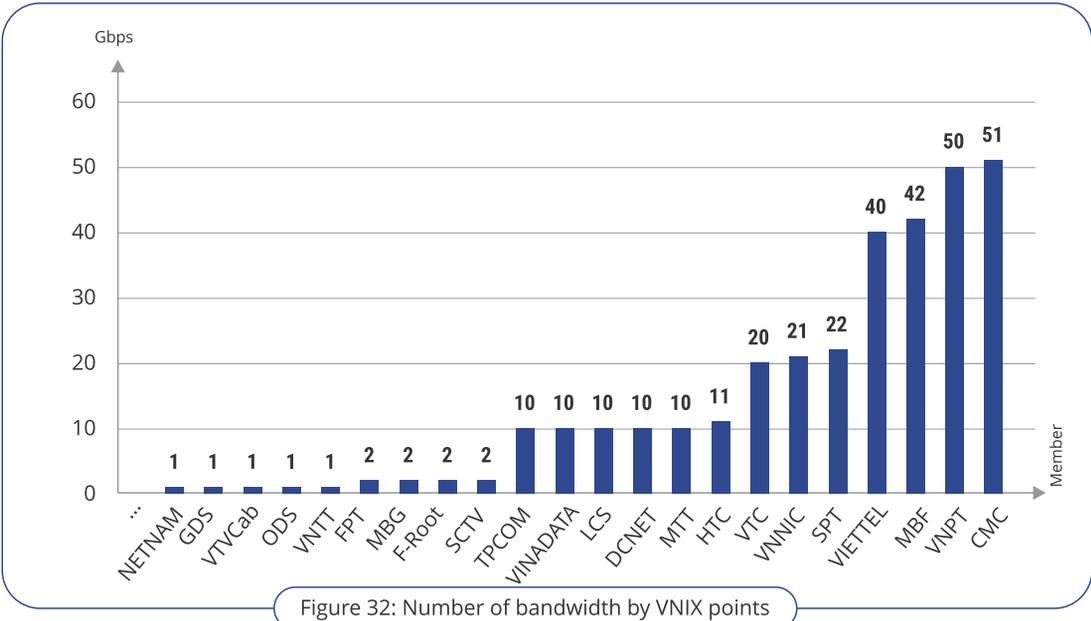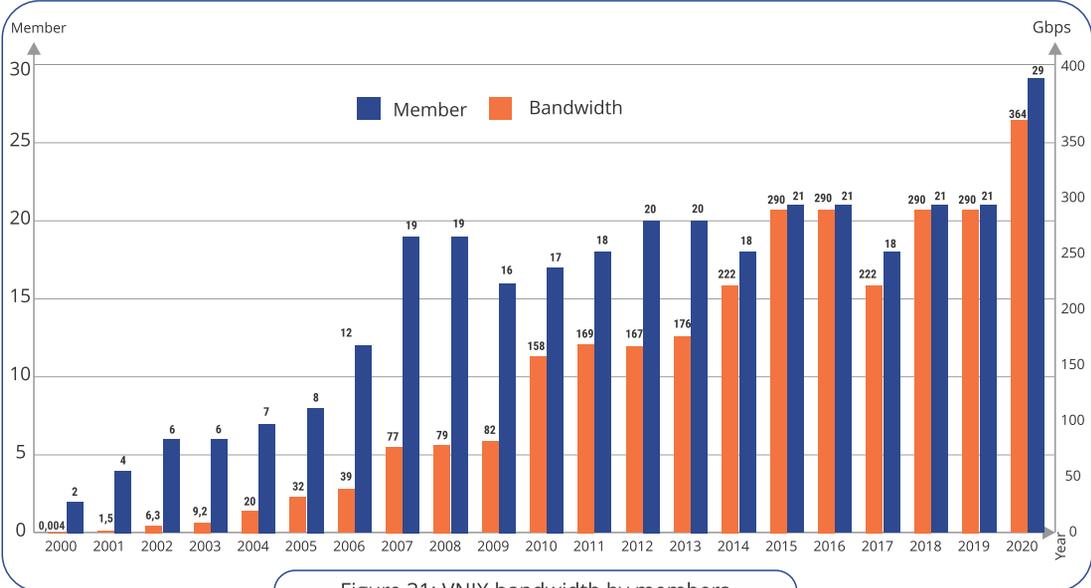| Locations	Members	Max peak of traffic via VNIX	IPv4 prefix	IPv6 prefix
3	46	60,9Gbps	12,223	2,760

IPv6 prefix via VNIX increased by 31% compared to the same period of last year

Figure 31: VNIX bandwidth by members

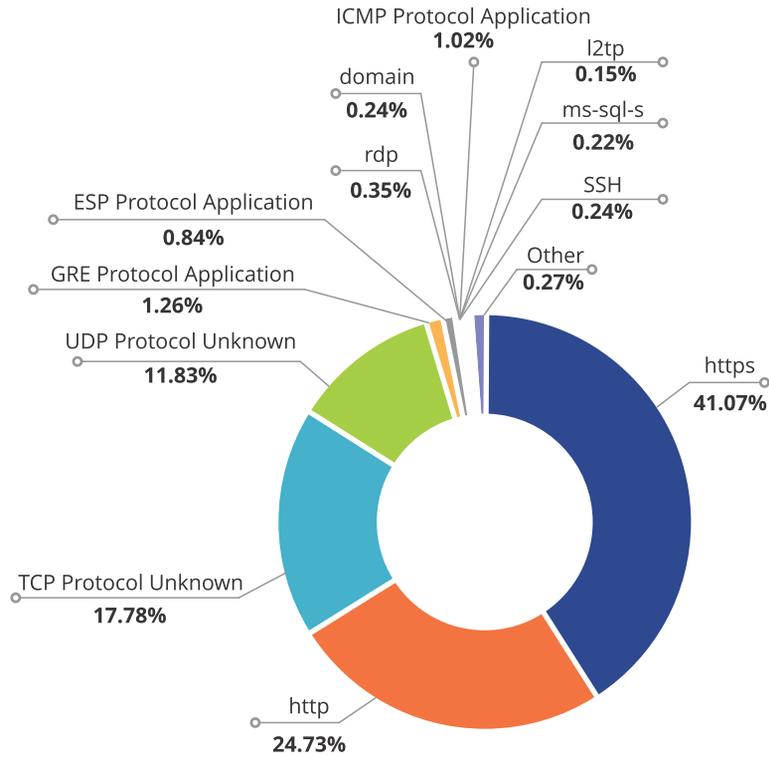Figure 32: Number of bandwidth by VNIX points
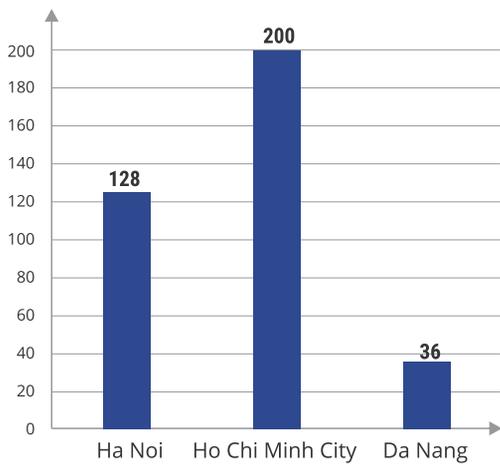
Figure 33: VNIX bandwidth by services

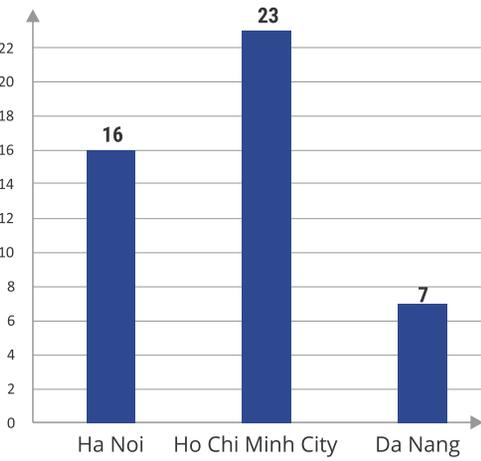
Figure 34: VNIX bandwidth by Provinces/Cities

Figure 35: VNIX members by connection locations

5. VIETNAMESE USERS' INTERNET SPEED MEASUREMENT BY VNNIC INTERNET SPEED

VNNIC Internet Speed – Free Service to measure Internet speed in Viet Nam

VNNIC Internet Speed is a free service developed by VNNIC in late 2019 at https://i-speed.vn, with the aim to measure Internet speed of users in Viet Nam. It is an independent and trustworthy system that Internet users can choose measurement points (servers), measure their connection speed by themselves and compare the results to Internet speed standard requirements and service packages provided by ISPs. VNNIC Internet Speed displays Internet access quality parameters including Download Speed, Upload Speed, average packet transmission time (Ping) and time delay between two consecutive packets (Jitter).

- **Download Speed** measures the download speed from test server to user device. This parameter affects the user's use of services such as downloading data, or watching television. For example, recommended download speed for watching Netflix's Ultra HD is 25Mbps.

- **Upload Speed** measures the upload speed from the user device to the test server. This parameter affects the performance of streaming services, uploading files in Internet. For example, live streaming a 720p HD video on Facebook recommends a max bitrate of 4Mbps for images, plus a max audio bitrate of 128 Kbps, while Youtube live recommends a range between 1.5Mbps to 4Mbps for videos and 128Kbps for the audio.

- **Ping** measures how fast that data package travels to the test server and back. It could affect Internet speed of voice and video applications such as Facebook Messenger, Skype, Viber, Zalo. The Ping time for voice call over the Internet should not go over 150ms.

- **Jitter** refers to the variation in the latency of packets over a network. It affects video and audio quality. Jitter should be targeted at less than 30 ms.

Ping and Jitter are both important for voice and video services on the Internet, if the quality is not guaranteed, it might cause poor VoIP call quality and image freeze.

By 2020, there have been 24 test servers deployed at VNIX and ISPs' networks in all Northern, Southern and Central region in Viet Nam.

24 Points

📍 **North, Central, South**
at VNIX locations in Ha Noi,
Da Nang City and Ho Chi Minh City

🏢 **10 test servers**
big ISPs' networks

No.	ISP/enterprise	Location/Server		
		Ha Noi	**HCM City**	**Da Nang City**
1	SCTV	1	1	1
2	FPT	1	1	
3	CMC	1	1	
4	Viettel	1	1	1
5	Mobifone	1	1	
6	VTC	1	1	
7	SPT	1	1	
8	HTC-ICT	1	1	
9	Netnam	1	1	
10	VNPT	1	1	1

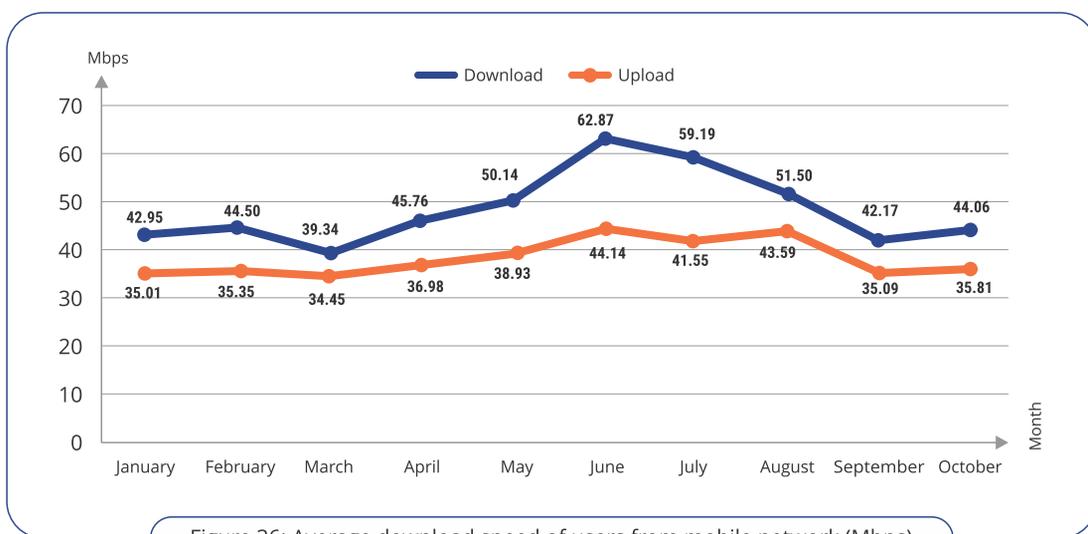Table 8: List of Speedtest servers amongst ISPs' network in Viet Nam

Figure 36: Average download speed of users from mobile network (Mbps)

The average upload speed of Viet Nam Internet is **48.25 Mbps**

The average download speed of Viet Nam Internet is **38.09 Mbps**
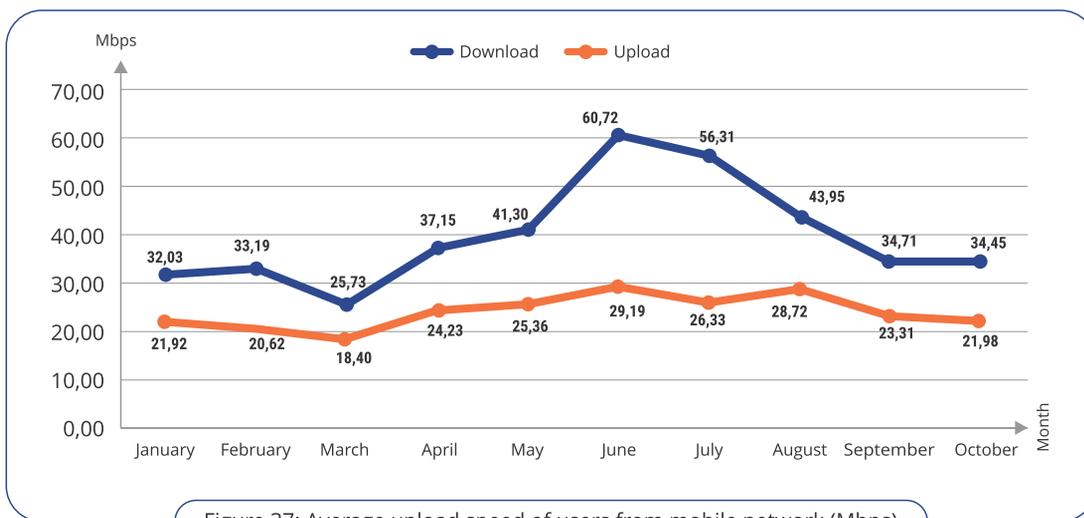
SPEED OF MOBILE NETWORKS

Figure 37: Average upload speed of users from mobile network (Mbps)

The average Download and Upload speed of Mobile network is **39.9 Mbps** and **24 Mbps**, respectively.
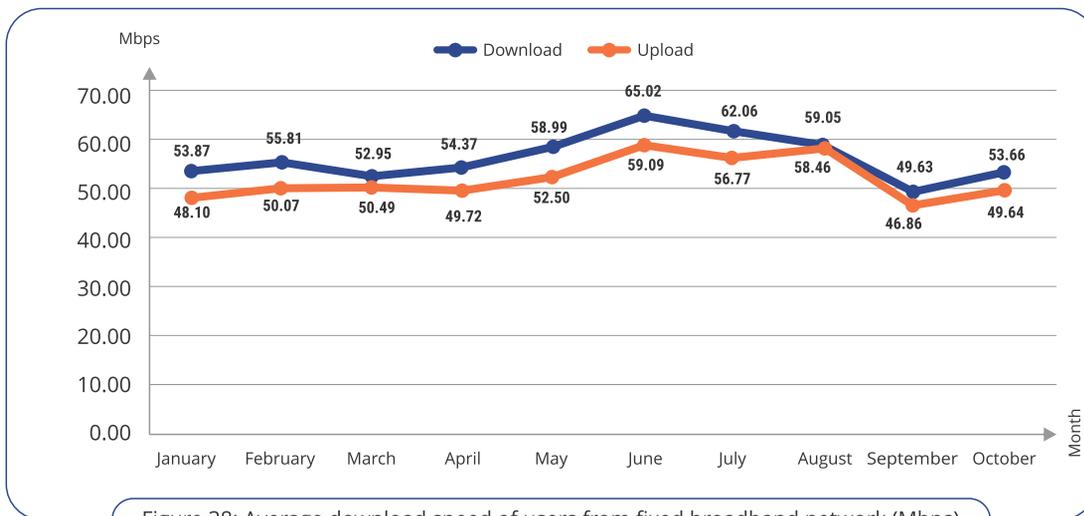
SPEED OF FIXED BROADBAND NETWORKS:

Figure 38: Average download speed of users from fixed broadband network (Mbps)

The average Download and Upload speed of fixed broadband network is **56.5 Mbps** and **52.17 bps**, respectively.

In 2020, there were 2 outbreaks of COVID-19 in Viet Nam from the end of March to the end of September. To meet the demand of working remotely, ISPs has taken efforts to double bandwidth, improving service quality for users.

O ver the past 20 years, the spectacular growth of Viet Nam's Internet resources, as well as the safe and stable operation of the critical national Internet infrastructure have accompanied and created the driving force for the robust development of Viet Nam's Internet. With these results, Viet Nam has deeply and broadly integrated into and contributed positively to the general development of the global Internet.

In light of the new development phase of the Internet with the global trend of digital transformation, we believe that both Vietnam's Internet resources and critical national Internet infrastructure will continue to strengthen their roles in the overall development of Viet Nam's Internet network and services and devote to the national digital transformation.

The Report on Viet Nam Internet Resources 2020, in addition to providing information for readers, would be also a sincere thanks from Vietnam Internet Network Information Center to domestic and international partners, beside the Internet community in Vietnam. Hopefully, VNNIC would continue to receive your trust, support and companionship for Viet Nam's Internet to develop and integrate with the world with the spirit of "Internet for all".

Best regards!

VIET NAM INTERNET NETWORK INFORMATION CENTER