

Importance and Benefits of IPV6 over IPV4: A Study

Palukuru Venkata Praneeth Reddy, Kavali Mohammed Imran Ali, B. Sandeep, T.Ravi

Electronics & Communication Engineering, K L University, Vaddeswaram, India

Abstract- TCP/IP protocols are used to send and receive data, voice and video data grams or packets over the internet. Internet Protocol Version 4 (IPv4) is version four of the Internet Protocol, which is the basis of TCP/IP protocols. Internet Protocol Version 6 (IPv6) holds the future of ip addressing. It has many advantages compared to IPv4. The basic framework of IPv6 protocol was interchanged by the Internet Engineering Task Force. Present paper provides an introduction to IPv6 by giving the results that can be obtained by deploying the technology. It also explains some of the technical features and advantages of IPv6.

Index Terms - BENEFITS OF IPV6, IPv6 ADDRESSING, NEED FOR IPV6, INTERNET PROTOCOL

I. INTRODUCTION

The world has nearly outgrown the current internet and the latest internet devices will hasten the process. A whole new internet is required that too from the very basic level. The next generation requires a solid foundation which has an entirely rewritten protocol i.e. IPv6. It is designed giving main importance to scalability, which means we will never run out of IP addresses. Each and every individual on the planet can have billions of individual IP addresses. IPv6 also offers features such as security and automatic configuration. All these put together form a new and improved internet. The old network cannot be put aside for new. Both should coexist for an extended transitional period. Further, IPv6 is still untested .So, this new architecture must be validated before deploying in a large scale. IPv6 is not the entire solution to all internet problems. Hence, it must be able to support many high level protocols and applications. IPv6 is gaining momentum worldwide providing the increasing need for more IP addresses than those provided by IPv4. However, most of the countries almost exhausted their IPv4 addresses. Recently, UK has exhausted and declared it officially. It is more evident in Asia. Thus, IPv6 should resolve shortage of IP addresses forever.

II. NEED FOR IPV6

The growth of internet with its need for more addresses is a main factor driving the need for a new version of the Internet Protocol. Currently there are estimated to be more than 100 million computers connected to the Internet. Well, it's is not exactly known when the Internet run out of addresses. In the future, the number of devices connected to Internet is going to go up at a greater rate. Many of the devices such as phones, automobiles will require network connectivity. This rises the demand for more IP addresses. To overcome different problems

related to the Internet, it was suggested the necessity to move from version 4 to version 6 of the Internet Protocol. These are some limitations of IPv4 which force the need of IPv6,

- i) Insufficient IP address space
- ii) Address prefix allocation
- iii) Data security

III. BENEFITS OF IPV6

Following are the features and benefits of IPv6 over IPv4,

- i) Huge number of IP addresses
IPv6 has 128 bit addresses when compared to 32 bit addresses of IPv4 which results in a very large increase in the availability of IP addresses and creates a lot of advantages.
- ii) End to End Connectivity
IPv6 eliminates the need for NAT which results in better connectivity in peer-peer networks.
- iii) Built-in Security
IPv6 promotes interoperability between different IPv6 implementations.

IV. IPV6 ADDRESSING

IPv4 addresses are represented in dotted-decimal format. The 32-bit address is separated along 8-bit boundaries. For IPv6, the 128-bit address is separated along 16-bit boundaries. The resulting representation is called colon-hexadecimal.

TABLE I

IP version	Size of address
IPv6	128 bits which allow for 2128 or 340,282,366,920,938,463,463,374,607,431,768,211,456(3.4*10 ³⁸) possible addresses.
IPv4	32 bits which allow for 232 or 4,294,967,296 possible addresses.

V. IPV6 CAPABLE PRODUCTS

Due to necessity, IPv6 is coming to networks worldwide. Microsoft can help businesses ready for this by providing solutions that help for soft transition to the next generation Internet Protocol. The main organizations that implement the IPv6 transition mechanisms include Microsoft, Juniper Networks and Cisco Systems.

VI. IMPLEMENTATION CHALLENGES

IPv6 is the future of the Internet. It is not an option but it is an absolute necessity. Nevertheless, it is not going to be a simple or rapid transition. IPv6 implementation gives many challenges some of which are recognized and others are not known yet. Different manufacturers and service providers are testing the new IPv6 implementations. There are many unknown things related to IPv6 implementations. IPv6 will certainly benefit from these experiences, but still a long way to go before it is the feature rich. If IPv6 statistics are actually provided, it is still unlikely that they will take into account a transitional or mixed network.

VII. CONCLUSION

IPv6 is the critical backbone for the next generation technology. It holds tremendous promise; however, enterprises and businesses need to have a carefully planned evaluation and transition strategy for IPv6. Looking forward to the future, enterprises must plan their investment in networking equipment with great care to be certain the IPv6 is deployed in a sequential and organized manner, while also making sure the investments are justified. The potential business benefits resulting from IPv6 include lower network administration costs, protection of company assets via a unified security model, investment protection by phased transition, and deployment of new applications. Many of the IPv6 equipment manufacturers are trying to enlighten about the new technology and its significance when implemented. All of them have to give focus on the future of internet protocol. The increasing unanimity throughout the networking sector is that IPv6 is going to create sensations in the field of networks. There are also some disagreements related to the implementation of IPv6. For now, IPv6 is not yet proven. Everyone should take good care while migrating to IPv6. Each and every protocol should be tested cautiously. As one sees, the final result of the IPv6 network depends upon the extent to which testing is done.

REFERENCES

- [1] John J Amoss, Daniel Minoli 'Handbook of Ipv4 to Ipv6 transition' Auerbach Publications, Newyork,USA.
- [2] Ciprian Popoviciu, Eric Levy-Abegnoli, Patrick Grossetete 'Deploying IPv6 Networks' Cisco Press, Indianapolis USA, 2006
- [3] SOLVING IPV4 (32 BITS) ADDRESS SHORTAGE PROBLEM USING IPV6 (128 BITS), Er. Rakesh Gupta, Er. Sahil Verma, Er. Kavita.

B

BIOGRAPHY



PALUKURU VENKATA PRANEETH REDDY* was born in 1992 in Nellore District, Andhra Pradesh. He is currently pursuing IV/IV B.tech in K L University. He is interested in Communications and Wireless Networks.
Email: venkat.praneethreddy@gmail.com



Kavali Mohammed Imran Ali** was born in 1991 in Andhra Pradesh. He is currently pursuing IV/IV B.Tech in K L University. He is interested in Telecommunications.
Email: shaikimranali91@gmail.com



Sandeep Byrapuneni** was born in 1992 in Andhra Pradesh. He is currently pursuing IV/IV B.Tech in K L University. He is interested in Wireless communication.
Email: sandeep240193@gmail.com



Thumati Ravi*** is working as Associate Professor in K L University. He is interested in Image Processing.
Email: ravibind@kluniversity.in

Correspondence author: Palukuru Venkata Praneeth Reddy, venkat.praneethreddy@gmail.com, ph no: +91-9490246565