A Review on IPv4 and IPv6 in Networking

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Abstract
IPv4 addresses are earlier reduced in Internet Assigned Numbers Authority (IANA) and have disabled in Regional Internet Registries (RIRs) while more clients are constantly adding into the Internet. IPv6, as the only relevantnext generation Internet protocol,is still not comically successful approved because a scheme that could solve the transfer of IPv4 resources to IPv6 network, as well ascollective communication between the two inconsistent protocols, has not been fully developed and deployed. Internet Protocol version 4 (IPv4) addresses have been recorded to be nearing collapse and the next generation Internet Protocol version 6 (IPv6) is regularly being classified in the Internet. IPv6 arranges a much larger address space, better address design and greater security, among other profits. IPv6 distribution requires thorough and careful establishment to minimize network disruption and ensure that the profits of IPv6 are accessed. Due to the issues of IPv4,now these days IPv6 is extremely popular in organizations, companies and Internet Service Providers (ISP).

Keywords
IPv4, IPv6

I. Introduction

A Network in the world of computers is said to be a collection of interdepended hosts, via some shared media which can be wired or wireless. A computer network enables its hosts to share and swap the data and information over the media. Network can be a Local Area Network (LAN) connected across an office or Metro Area Network (MAN) spanned across a city or Wide Area Network (WAN) which can be connected across cities and colonies [5]. Internet Protocol is a set of technical rules that conclude how computers relates over a network. There are currently two versions:Internet Protocol version 4 (IPv4)and Internet Protocol version 6 (IPv6) [6].

A. Challenges of Networking

The important principle of Internet Protocol is to provide logical participation in establishing support for routing of Internet Protocol nodes using either protocol IPv4 or protocol IPv6. Multiple surveys and researches have been done and still going on in this field as a recent search has been revealed on IETF website. Researchers are also working to initiate platform form obilenet working with support from Mobile IPv6 between entire subnets. In previous method when there was not any implementation of this approach then route devices could not able to connect after 255 routers because there is a behavior of internet protocol address (IPV4) address they could ping up to 255 routers only and secondly ipv4 address are 4.3 billion and when these all address will used in future then it cannot use IPv4 because of limited numbers so there is a solution of ipv6 but this technique can't change the whole world network from ipv4 into IPv6 because billions of people are using IPv4 address and if they purchased IPv6 then they need to pay again for network.In IPv4 there is a Problem of Intra-Domain Movement, The frequent intra-domain movement of the MH within a short area will lead to constant handoff. Consequently, a great amount of registered messages are developed in the network and the network performance is largelyaltered.

B. Architecture of Networking

In networking different autonomous computers are connected to each other over a communication network, amount all the hosts, one host act as a master or server node which performs task allotment to the sub nodes that are applicable or able of performing the task.

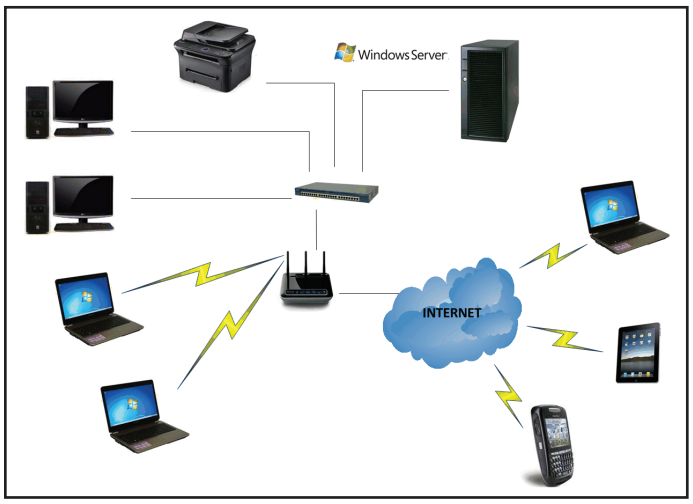

Fig. 1: Architecture of Network

II. IPv4

IPv4 is the first version of Internet Protocol to be widely used, and accounts for most of today's Internet traffic. There are just over 4 billion IPv4 addresses. In Mobile IPv4, a node that receives the data packets resides on the specific network nominated to it by its corresponding IP address. IPv4 is the most demand addressing protocol used on the Internet and most individual networks today. With the advent of wide variety of devices and upcoming technologies, the limited addresses of IPv4 are not capable to handle with the current internet. IPv6 was mainly developed to resolve the addressing issues as well the security concerns which are lacked by IPv4. One of the major challenges in the internet is to deploy IPv6 [1].

III. IPv6

Internet Protocol version 6 (IPv6) is a new generation protocol of the basic internet protocol. Internet Protocol (IP) is a common language of the Internet, every device connected to the Internet must support it. The current version of Internet Protocol version 4 (IPv4) has several shortcomings which are unavoidable and complicate such exhausted address space, security issues, non availability of auto-configuration and in some cases present a barrier to, the further development of the Internet. While that is a lot of IP addresses, it is not enough to last forever. IPv6 is the sixth revision to the Internet Protocol and the successor to IPv4. It functions similarly to IPv4 in that it provides the unique, numerical IP addresses necessary for Internet-enabled devices to communicate. However, it does sport one major difference: it utilizes 128-bit addresses. We will explain why this is important

in a moment. The major difference between IPv4 and IPv6 is the number of IP addresses. There are 4,294,967,296 IPv4 addresses. In IPv6, 340,282,366,920,938,463,463,374,607,431,768,211,456 IPv6 addresses. The technical functioning of the Internet remains the same with both versions and it is likely that both versions will continue to operate simultaneously on networks well into the future. To date, most networks that use IPv6 support both IPv4 and IPv6 addresses in their networks [2].

IV. Literature Survey

The paper "A Survey on Next Generation Internet Protocol:IPv6" by Dipti Chauhan and Sanjay Sharma proposethe process of Internet evolution, the transition from Internet Protocol Version 4 to Internet Protocol version 6 has become inevitable and fairly immediate. Internet Assigned Numbers Authority (IANA) has finally exhausted the global IPv4 address space, which leaves the community no choice but pushes ahead the IPv6 transition process. Given that IANA has eventually run out IPv4 address space, the Internet is bound to enter the IPv6 era. Nevertheless, IPv4 networks will coexist with IPv6 networks for a long time during the transition. The IPv6 transition process should be steady and smooth. Therefore, the IPv4-IPv6 coexisting networks should sustain the availability of both IPv4 and IPv6, and support IPv4-IPv6 interconnection as well [1].

The paper"A Review on Implementation Issues in IPv6 Network Technology" By Ramesh Chand Meena, Mahesh Bundele advised theIPv4 addresses are already depleted in Internet Assigned Numbers Authority (IANA) and have exhausted in Regional Internet Registries (RIRs) while more clients are continuously adding into the Internet. IPv6, as the only available next peer group Internet protocol,is still not commercially successful accepted because a scheme that could solve the transfer of IPv4 resources to IPv6 network, as well asmutual communication between the two incompatible protocols, has not been fully developed and deployed. There were four basic issues faced in the technology such as Security issues, Addressing issues, Error detection issues and Wireless Sensor Network issues. The researchers have provided various solutions for the issues faced in implementation of IPv6 [2].

The paper "Tunnel based IPv6 Transition with automatic bandwidth management"by Srinidhi K S, Smt. R. Anitha, A.V.Srikantan proposed.The Internet will soon be sailing in very rough as it is about to run out of the current IPv4. Moving from IPv4to IPv6is not straight-forward because IPv4 and IPv6 are irreconcilable protocols. To enable the straightforward transition between IPv4 and IPv6, various transition mechanisms have been proposed by IETF. Since the exhaustion of IPV4 address, it has become imminent(fast) for all the internet service providers to migrate towards new technology of addressing i.e., IPv6 which can allot IP addresses to 2128 devices [3].

The paper "A Comparative Review of IPv4 and IPv6 for Research Test Bed" by Mohd.KhairilSailan, Rosilah Hassan, Ahmed Patel proposed IPv6 also known as Next Generation IP (IPng) is an evolution of IPv4. It was designed as an upgrade version of IPv4 and should support the entire world network devices.The limitation of IPv4 lies in the exhaustion of available public IPv4 addresses. The enlargement of such mobile and home services will lead to a more rapid consumption of IPv4addresses even if ISPs allocate only one static public IP address to each home network.The main advantage of IPv6 across IPv4 is address space. Itwas design to support +340 undecillion (2128) Internet Protocol addresses compared with 4.3 billion (232) IPv4 addresses. Ifthe estimationofeverybody in this world (6.77 billion) will require 3 IP addresses per person, thenapproximate the total required IP addresses for all the people around the world, which is 6.77billion x 3 = 20.31 billion IP addresses [4].

V. Conclusion

In IPv4 route devices could not able to connect after 255 routers because there is a behavior of internet protocol address (IPv4) address they could ping up to 255 routers only and secondly ipv4 address are 4.3 billion and when these all address will used in future then it cannot use IPv4 because of limited numbers.So to solve these above problems a new method is used instead of using IPv6 because it is difficult to change the whole world network from IPv4 to IPv6.

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