International Journal for Modern Trends in Science and Technology
Volume: 03, Special Issue No: 01, February 2017
ISSN: 2455-3778
http://www.ijmtst.com

NEXT GEN INTERNET PROTOCOL

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To Cite this Article
Panthagani Vijayababu, Jajjara Bhargav and Narne Srikanth, "NEXT GEN INTERNET PROTOCOL", International Journal for Modern Trends in Science and Technology, Vol. 03, Special Issue 01, 2017, pp. 164-167.

ABSTRACT

The next-generation Internet Protocol (IPNG) otherwise called IPv6, has been produced by the Internet Engineering Task Force (IETF) to supplant the present Internet Protocol rendition 4.After being used for very nearly three decades, the most convincing issue confronting the IP Internet today is IP address consumption. The IPv4 augmentations such as Sub mesh, NAT, CIDR and so on were transient counteract ant arrangements. Inspired by the apparent IP Address deficiency emergency and requirements of the present day web, the thought of IPv6 was considered in 1995 as a panacea to every one of the issues presently confronted by IPv4. IPv6, the next rendition of the convention, has given trillions of locations which are possibly boundless. The convention additionally builds up new components such as SLAAC, Neighbor Discovery and upgrades in QoS, Security, and Routing. To empower the combination of IPv6 into current operational systems, a few move instruments have been proposed by the IETF IPng Transition Working Group which incorporates Dual Stack, Tunneling, and Translation. The paper centers to think about and break down IPv4 and IPv6 systems, concentrate on their attributes and header positions. The paper addresses the issues that are common in IPv4 and clarifies the purposes behind consistent movement to IPv6.The paper additionally talks about built up relocation methods and highlights their disadvantages from security and execution perspective

KEYWORDS: *Next Generation Networks, Routing, IPV4, Ipv6*

I. INTRODUCTION

The Internet today had turned into a perpetually basic part of the world's correspondence base in this manner making Internet Service Providers (ISPs) to be under expanding weight to give great, unsurprising execution, high caliber of Service (QoS), adaptability, Traffic Engineering and speed to an extensive variety of more established and more current applications to its purchasers. A worldwide innovation mixture Internet Protocol and remote portability has exhibited extraordinary open doors for the administration conveyance of information, voice and video for correspondences furthermore registering continuously. The most recent eight years or more have seen an undeniably rapid coordination of PCs what's more, telephony both gear and arranges. The old open system administrators (PNOs) have seen a reduction in telephony activity on their open exchanged telecommunications systems (PSTNs) because of the inexorably fame of cell phones and the development of administrations from phone systems to people in general internet. A client of phone systems favors the unregulated however extensive substance of communications gave by their system supplier which has communication

potential outcomes; this is offered by people in general internet. Settled system administrators' reaction to take care of this demand was to convey broadband, while this arrangement fulfills the clients request it has done little to guarantee the proceeded with improvement of worldwide communications systems as the settled system administrator is left just giving access to people in general internet (or more regrettable access to an internet administration supplier, ISP) While content and administration are given with no relationship with systems administration costs. Clients don't purchase innovation yet they purchase administrations. So from the system administrator's perspective, it is the capacity to offer administrations that can take point of preference of broadband which is essential. This new idea of an incorporated broadband system has created in the course of the most recent couple of years also, has being named Next Generation Networks (NGN)— This term is utilized to portray some design advancements in telecommunication center and get to network, which meets the requirements of an innovation empowered society, all the more particularly it is a creative advancement of innovation and administration stages to meet another period of IP driven systems administration prerequisites what's more, clients opportunities. Next Generation Networks are generally fabricated around the internet protocol. It empowers various administrations, for example, Voice, Video, and Data to be coordinated what's more, effectively extended a solitary framework. The next generation arrange flawlessly mixes public switched telephone network(PSTN) and the public switched data network (PSDN), creating a single multiservicemaking a solitary multiservice system. Rather than extensive, concentrated, restrictive switch bases, this next generation structural planning pushes central office (CO) usefulness to the edge of the system. What results from this is a disseminated system base that impacts new, open innovations to lessen the expense of business sector passage significantly, build adaptability, and suit both circuit-exchanged voice and parcel exchanged information.

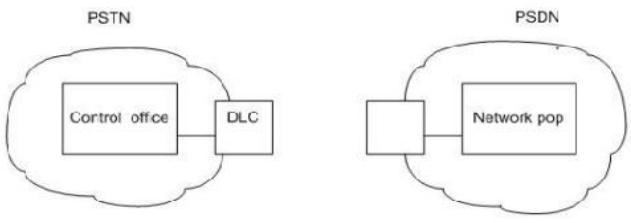


Fig1: PSTN, PSDN Network

Today's network is partitioned into two components: the PSTN and the PSDN (fig 1). Thepublic switched telephone networkcomprises of substantial, incorporated, respectability class-5 switches with remote exchanging modules and digital circle transporters. While interestingly the considerably littler public switched data network comprising of network purposes of vicinity (POPs) and remote access devise-is developing at an emotional rate. The development of the PSDN is driven by the internet, intranets, virtual private networks (VPNs) and the remote access. On the other hand, the PSTN keeps on being the primary method for conveying data services.

II. BACKGROUND

For a hub to be all around and interestingly identifiable, it requires an IP address [1]. Consumption of location space and security vulnerabilities was the fundamental inspiration driving the arrangement of IPv6. The Internet Protocol form 4 is the conveyance component utilized by the TCP/IP protocols. It is an inconsistent, best-exertion, and connectionless bundle conveyance protocol. Best-exertion implies that datagram's might be lost, touch base out of request, and indeed, even be copied. IP accept that higher layer protocols (e.g., TCP) will address these oddities. There are two predominant documentations to speak to an IPv4 address-the twofold documentation and specked decimal documentation. IP locations are spoken to by a 32-bit unsigned paired worth, which is generally communicated in a spotted decimal design (e.g., 193.205.80.1) on the grounds that the numeric structure (e.g., 193205801) is difficult to peruse. A less demanding approach to keep in mind IP locations is by doling out to them a name (e.g., www.google.com), which is determined through the Area Name System (DNS).IPv4 utilizes 32 bit numbers which implies that the location space is made out of 232 on the other hand 4,294,967,296(more than 4 billion) addresses. This implies hypothetically if there were no confinements more than 4 billion gadgets would associate with the internet [3]. However these locations have been depleted as of presently without any location space left at this point. The principle explanations behind such an expansive interest for locations have been because of:

- Growth of huge scale Mobile gadgets.
- Always-on associations such as portal gadgets (switches, broadband modems) which are infrequently killed.

- Growth of Users: In 1990, just a little part of families around the globe had Internet network. Just after 15 years, half of them had relentless broadband associations' despite everything it developing.
- Inefficient address use: Organizations that acquired IP addresses in the 1980s were regularly assigned significantly more addresses than they really required, in light of the fact that the beginning class full network assignment technique was lacking to reflect sensible use. For instance, vast organizations or colleges were alloted class A location obstructs with more than 16 million IPv4 addresses each, in light of the fact that the next littler allotment unit, a class B hinder with 65536 locations, was too little for their expected deployments

The primary distinction in the parcel format in the middle of IPv4 and IPv6 is that IPv4 has a 20 byte header while IPv6 has a 40 byte header [3]. Despite the fact that the location space in IPv6 is four times the extent of its partner, IPv6 has decreased the quantity of required fields and made them discretionary as augmentation headers. Subsequent to the Ethernet MTU size is 1514 bytes, the extra 20 bytes of header data just bring about an extra 1.3% overhead; an extra 20 bytes of header data when an IPv6 bundle is exemplified in an IPv4 parcel raises the general overhead to 2.6%. In principle, this execution overhead between these two protocols is minimal.IPv4Datagram as appeared in figure 1 is essentially made out of two sections header and data. Header contains data vital to steering of bundle where as data part contains the genuine payload.

Below is the main difference between ipv4 & ipv6

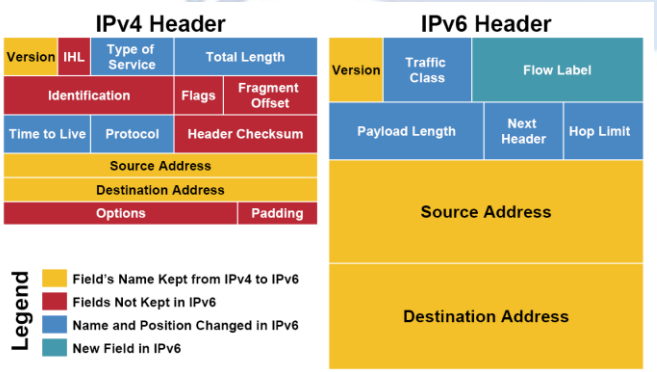


Fig2: IPV4, IPV6 Headers

III. MIGRATION FROM IPV4 TO IPV6

The Transition from IPv4 to IPv6 is inescapable as a result of absence of IPv4 location space and inspiration for new protocol i.e. IPv6 [2]. As a result of the tremendous number of frameworks on the Internet, the move from IPv4 to IPv6 can't happen all of a sudden. It requires a lot of investment before each framework in the Internet can move from IPv4 to IPv6. The move must be smooth to keep any issues in the middle of IPv4 and IPv6 frameworks. Move systems might be analyzed into three classifications. Dual Stack, Tunneling, Translation

Relocating from IPv4 to IPv6 is an overwhelming task on the grounds that the clients can't endure downtime of the internet for the reason for relocation and afterward restart the frameworks once more. Subsequent to IPv4 and IPv6 are contrary, both the protocols need to exist together for some timeframe, till entire relocation process happens. The relocation period it-self won't be secure and there are execution issues

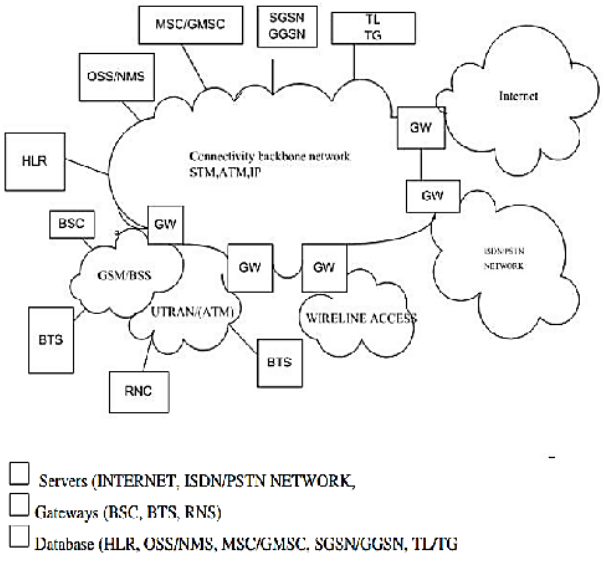
- Encapsulation or DE capsulation Delays in Tunneling
- Computational Power in Dual Stack and Cost
- Loss of Information in Translation or Security Leak

IV. NEXT GENERATION NETWORK ARCHITECTURE

There is a pace of progress in the Telecommunication commercial center that was incomprehensible a few years back. Liberalization has lead to an expansion in rivalry and different new business open doors for various players. Societal changes and work propensities forced on individuals, the necessity to be essentially "constantly associated". New advances offer more limit and adaptability for speedier and less expensive executions of new elements. The presentation and sending of different new services in the network must be done at the rate required by the business sector. It is along these lines evident that the new network structural planning must be an advancement of today's networks with stepwise way to deal with presenting the new advances

The new Next Generation Network structural planning comprises of

- An Access layer
- A transport and switching layer
- An application and service layer



V. Conclusion

As compressed in this paper, IPv6 has both points of interest and additionally disadvantages when contrasted with IPv4 from the execution and security perspective. The paper completed a broad review over IPv4 and IPv6 header structure and presented the issues and inspiration for grasping the next rendition of the Internet Protocol IPv6. The paper likewise talked about current movement procedures and attempted to highlight their shortcomings. These strategies request improvement in equipment and programming like upgrading switch programming, working frameworks and so forth. The similitudes in two protocols help in executing solid security approaches to secure IPv6 and movement networks. It is normal that IPv4 and IPv6 hosts should coincide for a generous time amid the unfaltering relocation from IPv4 to IPv6, and the advancement of move techniques, instruments, and components has been part of the fundamental IPv6 plan from the begin

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