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Comparative Study between Compression-Compression Less IPV6

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Abstract: ***IPv6 provides solutions to the problems of the growth of internet, specially to the lack of addresses, But the main point of IPv6 addressing is the 128 bits addresses, which give a wide addressing space, In this paper we shall worke on reducing the number of bits used in addresses to the simplest form, therefore we work on improving the performance of the network and work to increase the speed of sending and receiving data then we got high output of data.***

Keywords: IPV6 , OPNET ,Compression , anycast, Performance

1. Introduction

The main advantage of ipv6 over ipv4 is larger addresses space, the length of an ipv6 address is 128 bits, which give a wide addressing space, and provides solutions to the problems of the growth of internet, especially to the lack of addresses.

1.1 IPv6 Compression Types

There are 3 different types of IPv6 addresses:

Unicast: identifies a single interface. A packet with an address of this type in the destiny is delivered only to that interface.

Multicast: identifies a set of interfaces. A packet with this address as destiny is delivered to all the interfaces of the set.

Any cast: identifies also a set of interfaces, but in this case, a packet with this kind of address as destiny, is delivered only to one interface of the set. Usually the next interface, according to the routing protocol.

IPV6 Compression Rules IPv6 address consist of eight hexadecimal/parts and each hexadecimal/part consist of 4 digits and of 16bits, like this
2001:1265:0000:0000:0AE4:0000:005B:06B0

This is normally difficult to remember, we will explain and illustrate how the addresses work pressure and reduce the number of bits through a number of rules:

(I)IPv6 Zero Compression
In zero compression you can represent group of zeros by one double-colon (::) but you can perform this only once in your IPv6 address, means if you have two group of zeros in your IPv6 address you can use the double-colon only once. Review the example for better understanding.

Original IPv6 address:
2001:1265:0000:0000:0AE4:0000:005B:06B0
IPv6 address with zero compression:
2001:1265:: 0AE4:0000:005B:06B0

(II)Leading Zero Compression
In leading zero compression you can eliminate the starting zero(s) from any hexadecimal. If you have all zeros in hexadecimal you can represent this hexadecimal with one zero.

Original IPv6 address:
2001:1265:0000:0000:0AE4:0000:005B:06B0
IPv6 address with leading zero compression:
2002:1265:0:0:AE4:0:5B:6B0

(III)Both Zero and Leading Zero Compression:
You can use the both zero and leading zero compression together by following these compression techniques

Original Ipv6 address
2001:1265:0000:0000:0AE4:0000:005B:06BO
Both compressions
2001:1265::0AE4:0:5B:6B0

2. Methodology

OPNET Modeler Suite lets test and demonstrate technology designs before the production by allowing for communication between real devices or software and assimilated network then analyzes networks to compare the impact of different technology designs on end-to-end behavior.

In this simulation we designed a network consists of two servers linked across internet and clients in other site and all of this devices work by ipv6 addresses, and we gave the first server IP addresses without being compressed , while the other server with addresses compressed . The main objective of this simulation is to observe and control the speed of the flow of data from two servers as shown in figure(1) , then we carried out acomparison to the delay from end to end ,also we compared the time consumer in both IP traffic sent(packets/sec) ,and IP traffic received (packets/sec) .

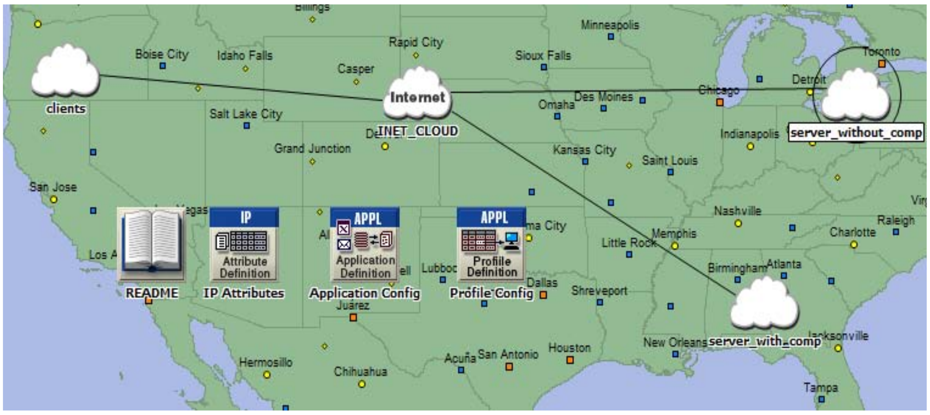

Figure 1: System Model

3. Results

(I) Time Average In IP End To End Delay:

We were sending data from the clients to each server and worked to run the simulation and follow-up delay in each of servers as shown in figure 2

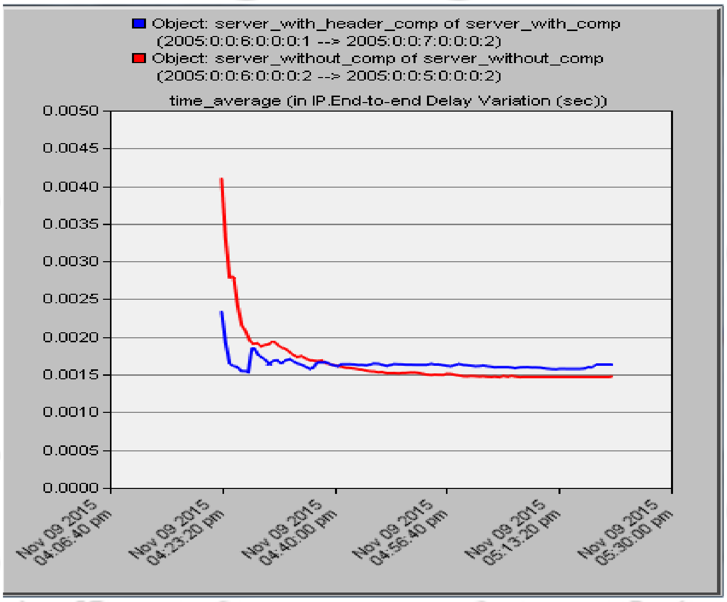

Figure 2: End to end delay

The result of this simulation are clear , The delay in the server is without compressed 0.0040 while the delay did not exceed 0.0023 for server with compressed and thus very great improvement was achieved in the performance of the network and increase the speed of the flow of data and get the highest output data per second.

(II) Time Average In IP Traffic Sent (Packets/Sec):

In this simulation we compared time consumer to traffic sent (packets /sec) in each server and worked to run the simulation as shown in figure (3).

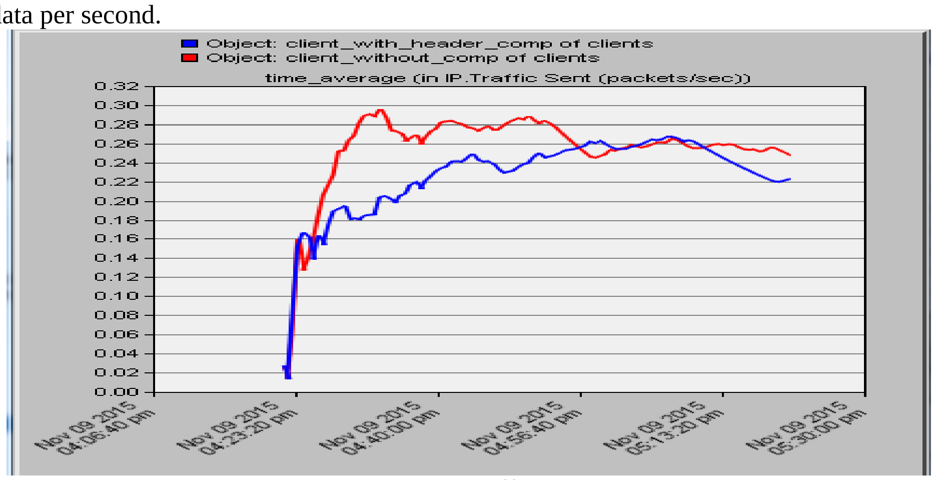

Figure 3: Traffic sent

The result of this simulation is the average time for sending packets from the source to destination in the server is without compressed between (0.014 to 0.29), while the average time between (0.01 to 0.26) for server with compressed. The less time consumer in the transmitter means it grows the number of packets sent and improve network efficiency.

(III) Time Average in IP Traffic Received (Packets/Sec):
In this simulation we compare time consumer to traffic received (packets /sec) in each server and work to run the simulation as shown in figure 4

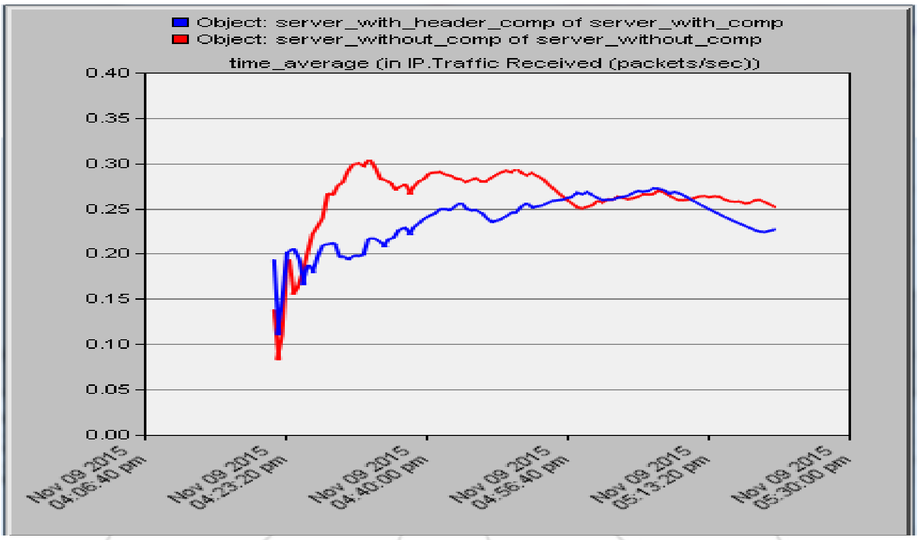

Figure 4: traffic received

The result of this simulation is the average time for sending packets from source to destination in the server are without compressed (0. 30), while the average time (0.26) for server with compressed.

4. Conclusion

The main goal is always improvement of the performance of the network, we have worked in this paper to improves the performance by reducing the length number of bits used in the ipv6 addresses by using three basic rules of pressure, the result is to reduce the delay from end to end and reduce the average time consuming in sent and received packets and get the highest output data per second. And we have achieved improving the performance of the network, and is to provide a good service for the clients over network and get a high efficiency network.

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