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Data Communication and Networking Concepts in User Datagram Protocol (UDP)

T. Vedavathi, R. Karthick, R. Senthamil Selvan, P. Meenalochini

Abstract: ***In most popular standards, the UDP (User datagram protocol plays a vital role in Internet protocol. Normally, in the networking concepts are not required for set up communication between data paths and also the channels.it has used to addressing several different function and also provides data integrity at the source and destination. TCP and SCTP are designed for many applications in the network interface if error free network needed. So that, to improve the performance metrics of teaching learning process, the wireless technology based networking concepts involved major parts.***

Keywords: User Datagram, Internet Protocol, Internet of Things.

I. INTRODUCTION

The basic RFC 768 protocol was designed by David P. Reed in 1980.The error correction and checking are achieved by UDP protocol stack avoids the overhead of such processing. Due to transmit again and again, the dropping pockets are waiting for time-sensitive applications. RFC 768 was used more in simple message oriented transport layer protocol[1]. The message delivery for upper layer protocol and the UDP messages are sent once, there is no state for the UDP layer retains in it.for all users applications, it should be calculated by means of desired transmission reliability.

Application specific UDPs attributes are:

1. The network type protocol are simply suits for query and response protocol, also it is a transaction oriented protocol [2].
2. For modelling that is Internet protocol provides datagrams for remote cell and file systems in network.
3. For a full stock protocol, the trivial file transfer protocol used in bootstrapping.
4. IPTV has very much amount of clients are available in stateless.
5. Real time streaming protocol are used in online games which makes transmission delays.
6. The broadcast application is only suits in multicast precision time protocol.

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* Correspondence Author
T. Vedavathi*, Assistant Professor, Department of ECE, Chadalawada Ramanamma Engineering College, Andhra Pradesh, Tirupati, India.
R. Karthick, Assistant Professor, Department of ECE,Sethu Institute of Technology, Virudhunagar, Tamilnadu, India. karthickkiwi@gmail.com
R. Senthamil Selvan, Assistant Professor, Department of ECE, Chadalawada Ramanamma Engineering College, Andhra Pradesh, Tirupati, India. senthamilselvan87@gmail.com
P. Meenalochini, Assistant Professor, Department of EEE, Sethu Institute of Technology, Virudhunagar, Tamilnadu, India. meenalochinip@gmail.com

PORTS

To maintain point to point communication, we can use datagram for specific application and also use dta sockets for retransmission once packet lost. The multiplexing concepts evolved from software based structure applicable by means of port number. The acceptable port range varies between 0 to 65535 whereas the expected message can be reserved for Port 0[3]. There are three port numbers which was governed by IANA. First, UNIX based port number (0 to 1023. Second, (1024 to 49151) are used in particular registered services. Third, (49152 to 65535 are allotted for any application specific. For all communication based endpoints were running through software designs.

II. PACKET STRUCTURE

The User Data gram protocol holds 16 bits of data with the combination of source fields as well as checksum in IPv4. But the usage of IPV6 is kept reserved[4].

Source port number

If the state is idle, the port is zero initially [5]. The ephemeral port is used for the client which identifies the port number from sender. The best example for the user friendly port number is assigned the server as the source host.

Destination port number

If assumption made for destination port number, the server will act as superior port number which also be identifies the receiver's port. Now the client has the ephemeral port number.

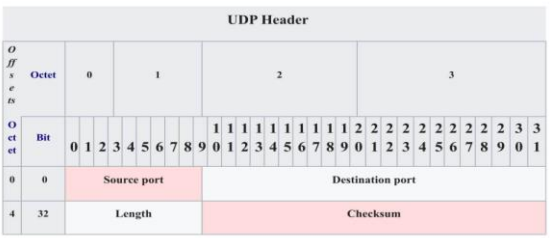

Figure 1. The basic functional packet structure of UDP.

Length

The several bytes of UDP data and header specify its length. The total size of UDP is about 65535 bytes with the minimum length of 8 bytes. In IPV$ protocol is about 65507 to be imposed the actual data length. The important IPv6 protocol have larger amount of UDP header with bytes larger than 20 byte IP header [6].

Checksum

In checksum all the fields are '0' for unused IPv4 and the protocol IPv6 should have attempted the error-checking for the header and the data fields.

III. CHECKSUM COMPUTATIONS

To manipulate the checksum by using RFC 768.

The product of two octet consists of 16-bit number which derives the one's complement sum of pseudo, IP, UDP header with zero padding [7]. Actually 16-bit words are added using arithmetic's complement. After adding 17th bit and also add significant bit in total. The total sum of 1's complements which gives checksum field. The pseudo header shows the exact difference between the IPv4 and IPv6 is used to calculate checksum. The duplicate IPv4 contains pseudo header with the same message from original message. The fake IPv4 is only used to calculate the checksum value properly.

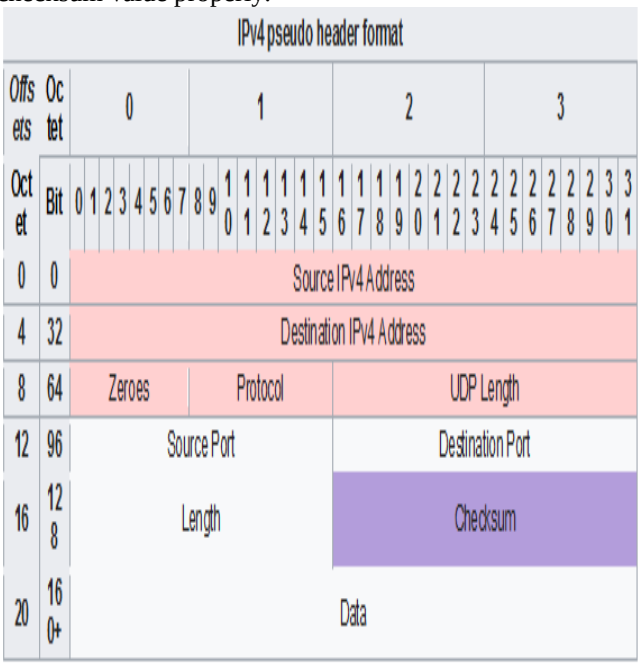

Figure 2. IPv4 Pseudo Header format

The user datagram protocol has length field contains UDP data and header in the protocol IPv4. Actual transmission data used to transmit the transmission data.

The checksum value is usually zero when not in use so the UDP calculation is optional. In IPV6 pseudo header the user datagram protocol is important to compute and also change as RFC 2460 [8],[9],[10],[11],[12].

To include 128-bit IPv6 addresses for any transport or high level protocol taken from the address in its checksum computation[13],[14],[15].. If we compared with the pseudo header the computation gives real header [16],[17],[18],[19],[20].

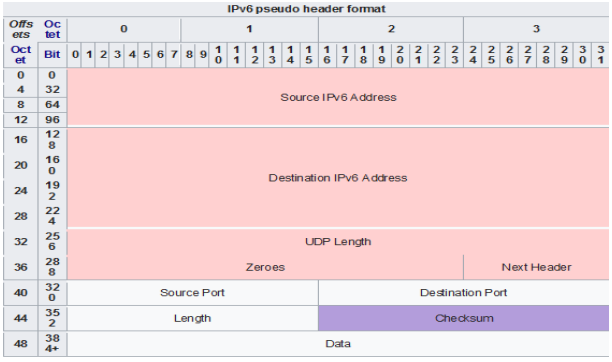

Figure 3. IPv6 pseudo header format.

The IPv6 header have only consists of IPv6 source address and destination address and there is no routing header [21], [22], [23],[24],[25],[26],[27],[28],[29],[30]. If it is starting node, the address is the very last routing header and if it is destination node, it shoes Ipv6 header. The overall length field is called as UDP header and data.

Reliability and Congestion Control

Actually, there is lot of reliability lacking with packet loss and duplication. Redundancy reliability will be increased by means of TFTP mechanism to which application layer is needed. To improve high degree of reliability, we can use transmission control protocol[31],[32],[33],[34].

IV. RESULTS AND DISCUSSION

Most of the UDP application have themselves to achieve self-employable reliability mechanism which provides real-time multiplayer streaming with examples for voice over IP{(VoIP). In case of VoIP , the packet loss is not at all a problem. But in case of VoIP the primary concern is a latency as well as jitter. The transmission control protocol used to resending the original data.

Version	Offset	Octets
IPv4	16	128
IPv6	44	352

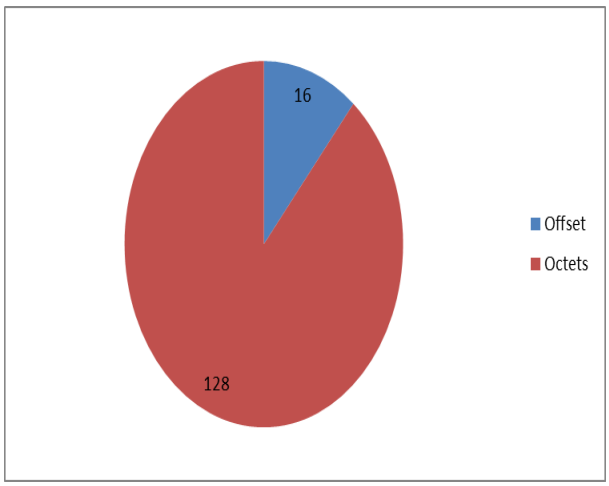

Fig 4a and 4b. Comparison of IPv4 and IPv6.

V. CONCLUSION

This paper concludes that many wireless users may be preferred to increase. Initially, the work gives and overview and then defined the basic networking concepts as well as discuss various technology relevant to networking. Many people trusted to use wireless networking based solutions recently and also good affordability. This work also gives detailed information about wireless networking with flexibility and scalability. To improve latency and loss-tolerance, the UDP (User Datagram Protocol) is an alternative communications protocol to Transmission Control Protocol (TCP) between applications on the internet.

REFERENCES

1. Kurose, J. F.; Ross, K. W. (2010). Computer Networking: A Top-Down Approach (5th ed.). Boston, MA: Pearson Education. ISBN 978-0-13-136548-3.
2. Clark, M.P. (2003). Data Networks IP and the Internet, 1st ed. West Sussex, England: John Wiley & Sons Ltd.
3. "UDP Protocol Overview". Ipv6.com. Retrieved 17 August 2011.
4. Forouzan, B.A. (2000). TCP/IP: Protocol Suite, 1st ed. New Delhi, India: Tata McGraw-Hill Publishing Company Limited.
5. Karthick, R and Sundararajan, M: "A Reconfigurable Method for Time Correlated MIMO Channels with a Decision Feedback Receiver," International Journal of Applied Engineering Research 12 (2017) 5234.
6. Karthick, R and Sundararajan, M: "PSO based out-of-order (OoO) execution scheme for HT-MPSOC", Journal of Advanced Research in Dynamical and Control Systems 9 (2017) 1969.
7. Karthick, R and Sundararajan, M: "Design and Implementation of Low Power Testing Using Advanced Razor Based Processor," International Journal of Applied Engineering Research 12 (2017) 6384.
8. Karthick, R and Sundararajan, M: "A novel 3-D-IC test architecture-a review," International Journal of Engineering and Technology (UAE)7 (2018) 582.
9. Deering S. & Hinden R. (December 1998). "Internet Protocol, Version 6 (IPv6) Specification". Internet Engineering Task Force. RFC 2460.
10. Postel, J. (August 1980). User Datagram Protocol. Internet Engineering Task Force. doi:10.17487/RFC0768. RFC 768.
11. "Compute 16-bit One's Complement Sum" (email). mathforum.org. John. 20 March 2002. Retrieved 5 November 2014.
12. Internet Protocol, Version 6 (IPv6) Specification. p. 27-28. doi:10.17487/RFC8200. RFC 8200.
13. "The impact of UDP on Data Applications". Networkperformancedaily.com. Archived from the original on 31 July 2007. Retrieved 17 August 2011.
14. Design and Analysis of Spawn Protocol for Secure Communication in VANET'' on International Journal of Engineering and Technology (UAE), Volume 7, Issue 4.19, 2018, 360-365, E-ISSN: 2227-524X
15. '' Collective Network Channel Decentralized Fountain Design Codes For Safe Communication In VANET Network'' on International Journal of Engineering and Technology (UAE), Volume 7, Issue 3.12, 2018, 779-783, E-ISSN:2227-524X
16. '' Analysis of Spawn Protocol and EDFC Algorithm for Secure Communication in VANET'' on International Journal of Pure and Applied Mathematics, Volume 118, Issue 20, 2018, 1961-1973, ISSN (O): 1314-3395, p-ISSN (P): 1311-8080.
17. '' Analysis Of EDFC And ADFC Algorithms For Secure Communication In VANET'' on Journal of Advanced Research in Dynamical and Control Systems, Volume 09, Issue 18, 2017,1171-1187 and ISSN :1943-023x
18. '' Enhancement of High Density Wireless Sensor Networks using VANET'' on International Journal of Pure and Applied Mathematics, Volume 117, Issue 17, 2017, 255-262 and ISSN (O): 1314-3395, p-ISSN (P): 1311-8080.
19. Karthick, R and Sundararajan, M: "A Reconfigurable Method for TimeCorrelatedMimo Channels with a Decision Feedback Receiver," International Journal of Applied Engineering Research 12 (2017) 5234.
20. Karthick, R and Sundararajan, M: "PSO based out-of-order (ooo) execution scheme for HT-MPSOC"Journal of Advanced Research in Dynamical and Control Systems 9 (2017) 1969.
21. Karthick, R and Sundararajan, M: "Design and Implementation of Low Power Testing Using Advanced Razor Based Processor," International Journal of Applied Engineering Research 12 (2017) 6384.
22. Karthick, R and Sundararajan, M: "A novel 3-D-IC test architecture-a review," International Journal of Engineering and Technology (UAE)7 (2018) 582.
23. R.Karthick, P Selvaprasanth, A ManojPrabaharan, "Integrated System For Regional Navigator And Seasons Management," Journal of Global Research in Computer Science 9(4),2018(11-15).
24. Karthick, R and Prabaharan, A.Manoj and Selvaprasanth, P. and Sathiyanathan, N. and Nagaraj, A., High Resolution Image Scaling Using Fuzzy Based FPGA Implementation (March 15, 2019). Asian Journal of Applied Science and Technology (AJAST), Volume 3, Issue 1, Pages 215-221, Jan-March 2019 . Available at SSRN: https://ssrn.com/abstract=3353627
25. Karthick, R and Sundararajan, M., Hardware Evaluation of Second Round SHA-3 Candidates Using FPGA (April 2, 2014). International Journal of Advanced Research in Computer Science & Technology (IJARCST 2014), Vol. 2, Issue 2, Ver. 3 (April - June 2014). Available at SSRN: https://ssrn.com/abstract=3345417.
26. Karthick, R and and Prabaharan, A.Manoj and Selvaprasanth, P.,Internet of Things based High Security Border Surveillance Strategy (May 24, 2019). Asian Journal of Applied Science and Technology (AJAST), Volume 3, Issue 2, Pages 94-100, Apr-June 2019. Available at SSRN: https://ssrn.com/abstract= 3394082.
27. Karthick, R and Sundararajan, M: "SPIDER based out-of-order (ooo) execution scheme for HT-MPSOC" International Journal of Advanced Intelligence paradigms, In Press.
28. Karthick, R and John Pragasam, D "Design of Low Power MPSoC Architecture using DR Method" Asian Journal of Applied Science and Technology (AJAST) Volume 3, Issue 2, Pages 101-104, April - June 2019.
29. Karthick, R and Sundararajan, M., Optimization of MIMO Channels Using an Adaptive LPC Method (February 2, 2018). International Journal of Pure and Applied Mathematics, Volume 118 No. 10 2018, 131-135. Available at SSRN: https://ssrn.com/abstract=3392104
30. Karthick, R and Rinoj, B. Micheal Vinoline and Kumar, T. Venish and Prabaharan, A.Manoj and Selvaprasanth, P., Automated Health Monitoring System for Premature Fetus (July 27, 2019). Asian Journal of Applied Science and Technology (AJAST) (Peer Reviewed Quarterly International Journal) Volume 3, Issue 3, Pages 17-23, July -September 2019. Available at SSRN: https://ssrn.com/abstract=3427756
31. Karthick, R., Deep Learning For Age Group Classification System, International Journal Of Advances In Signal And Image Sciences. Volume 4, Issue 2, Pages 16-22, 2018.
32. R. Karthick, N.Sathiyanathan, "Medical Image Compression Using View Compensated Wavelet Transform" Journal of Global Research in Computer Science 9(9), 2018(1-4).
33. P. Meenalochini and S. P. Umayal ,Comparison of Current Controllers on Photo Voltaic Inverters Operating as VAR Compensators, Journal of Electrical Engineering The Institution of Engineers, Bangladesh Vol. EE 38, No. I, June, 2012.
34. R. Karthick, P. Meenalochini, A. Manoj Prabaharan, P.Selvaprasanth, M.Sheik Dawood, "A Dumb-Bell Shaped Damper with Magnetic Absorber using Ferrofluids" International Journal of Recent Technology and Engineering 8(4S2), 2019(317-320).

AUTHORS PROFILE

T.Vedavathi is currently working as an Assistant Professor in Department of Electronics and Communication Engineering at Chadalawada Ramanamma Engineering College, Tirupati. She received her engineering degree in S.V Engineering for Women, Tirupati in 2014.She received her Master degree in KMM Institute of Technology and Sciences, Tirupati in 2016.Her area of interests include Signals and Systems, Digital Circuits, Analog Electronics Circuits.

Karthick.R has currently working as an Assistant Professor in Sethu Institute of Technology. He has undergone his B.E (ECE) in PTR College of Engineering and Technology, Madurai and done his Post graduate M.E (Communication Systems) in Sri Sairam Engineering College, Chennai. He has obtained his Doctorate from Bharath University, Chennai. He has more than one decades of academic experience in the field of Biomedical engineering, CMOS VLSI and Testing.

Senthamil Selvan. R is currently submitted his Ph.D Thesis, Research Scholar at Wireless-Networks (VANET) in Department of Electronics and Communication Engineering at Bharath Institute of Higher Education and Research, Chennai. He is currently working as Assistant Professor in Department of Electronics and Communication Engineering at Chadalawada Ramanamma Engineering College, Tirupati. He received an engineering degree in Electronics and Communication Engineering, in April 2008 in Dr.Navalar Nedunchezhiyan College of Engineering, Anna University at Chennai and he received the Master Degree in May 2012, Communication Systems, at PRIST University Thanjavur. His research interests include Wireless Sensor Network, Satellite Communication and Wireless communication, Fundamental of Electronics, Digital Signal Processing.

Meenalochini.P has currently working as an Assistant Professor in Sethu Institute of Technology. She has undergone his B.E (ECE) in PTR College of Engineering and Technology, Madurai and done his Post graduate M.E (Power Electronics and Drives) in Sethu Institute of Technology. She has pursuing her Ph.D in Anna University. She has more than one decades of academic experience in the field of power electronics, power systems and communication engineering.