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A Predictive Analysis of Communication Protocols on Various Transmission Media using Ns2

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Abstract:
The tremendous increase in demands of the people has resulted in the advancement of technology day by day. A technology can be accepted and sustained only if it is proved to have the best performance. In this current era, any technology to be consider will have its main portion as communication. Wired and wireless networks are the efficient trend setting technologies in communication. This paper revolves around the predictive framework on the network survivability and its function with respect to spectral analysis of these transmission media using NS2. It also highlights on which medium is highly efficient comparatively.

Keywords: *wired and wireless network, Network function, Network survivability, NS2*

I. Introduction

Communication is the formation and making sense to transmit the message as a sequence of signals using a specific channel or medium. The interconnected transmission line may be of cable media, wireless radio wave, or through light pulse to have a communication between the nodes. The well-established and true working network has become vital for sharing the information in a secured way and provides proper maintenance to ensure Integrity, Timeliness. All the recent telecommunication technologies are aimed to improve the use of network resources effectively. If the network is an extended wired or wireless network then it is necessary to determine rapidity, accuracy, smoothness with the message flow in the organization. Both wired and wireless network communication will be suffered bya sort of communication barriers like Information overload, channel distortion and some of the extraneous barriers. So it is necessary to have the spectral analysis of various transmission media.

A discrete event driven Network Simulator version 2 (NS2) helps to statistically represent, describe, evaluate and interpret the data. The advantage of NS2 helps to identify and analyze the potential risks which are involved in the network further leads to examine the network efficiency in an appropriate manner.

Guided Media

The bounded transmission medium helps to direct and confine the transmitting signal in a narrow path using physical links. It shows the complexity in installation and maintenance. Also, the nature of it will be bulky and expensive too. A single cord failure may disrupt the entire network. The guided media may be coaxial cable, fiber-optic cable etc. In the wired network a single router is overloaded by its connections.

Unguided media

The wireless media may be radio waves, micro waves or infra-red waves. The cost-

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effective wireless network communication takes less time to configure the network but more immune to electromagnetic interference. Here the work is distributed and responsibility is taken by the access points irrespective of hub. Here the network extension by the addition of new nodes which do operate in the same frequency cannot be controlled and generates various noise like cross-talk, obstacle reflections etc.

The nodes in the network can be communicated and processed the information according to the set of defined rules which is called as protocol. There are two distinct perspective routing protocols they are proactive routing protocols which responds before the problem occurs and reactive that reacts after the occurrence of event.The routing protocol such as AODV (reactive routing protocol), DSDV and DVR has been investigated and determine which network is having the greater life time.

II. Related works

Several papers have addressed the performance of routing protocols with its various efficiency parameters.

Authors demonstrate a detailed model for network connectivity to evaluate performance metrics of neighbor discovery algorithms. In Ref. the authors compared two power consumption-based routing protocols DSDV and OWL indifferent routing phases.A.A.Chavanet al. studied the protocols of AODV and DSDVin view of overhead routing, PDR, throughput and end to end latency. It is proved that the routing overhead of DSDV is more as compared to AODV and concludes that AODV performance is better than DSDV performance. In the work proposed a method for incorporating wireless networks into wired networks while encouraging the interoperability of wired and wireless networks with multicast services. In Ref the author has implemented a flexible AODV which helps to support unpredictable constraints in theoretical simulation models for real time network connectivity. In the researchers analyzed AODV, DSR, Dynamic MANET and ZRP to examine frequently changing nodes in the ad-hocnetwork. They demonstrated that AODV is a successful routing protocol via data packet delay analysis from transmitter to receiver. Rajneesh et al. investigated various performance characteristics of routing protocols used in SONET-based networks such as one-way queuing delay, maximum transfer rate, use of links; etc. Yuhwa Suh et al. studied the effect of wired access networks on IP traffic forms with highlighting parameters like energy consumption, economy and environment by presenting the importance and reasonableness of this endeavor.

The existing works considered energy consumption, delay and routing overhead as the performance metrics for assessing different routing protocols but Network configuration is an important criterion for an accurate analysis of the availability of wired and wireless networks in order to select the correct working route using routing protocols.

III. Design of Wired network and Wireless network using NS2 with different routing protocols

Routing governs the data packet transmission by establishing the specific routes between source and destination under the channel condition.

Distance vector routing protocol (DVR)

The base of DVR is Bellman Ford algorithm. It is one of the simple protocols and easily configured to any network. The routing packet generated by the routers hold the information about the distance vector to its neighbors and broadcasts it to all the routers to periodically update the routing table on its own to reflect the changes. This helps to identify the optimum path for data transmission over the network to reach the destination. The transportation is carried out by using the UDP protocol.

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IV. 4. Results and Discussions

In order to specify how routers communicate with each other, different routing protocols configure each network, distributing information that allows them to select routes between two network nodes. It is most important to study performance metrics such as throughput, PDR and data packet delay.

. Network metrics:-

Packet Delivery Ratio (PDR): Measurement of efficient packet transferfrom send er to receiver is referred asPDR. The organized network holds proper traffic management which pinpointsthe high delivery ratio of packets [12].

Average end-to-end delay: It is a time for unit data to travel from transmitter end to receiver end.

This sort of delay is induced by various sources of deed like transmission, processing etc. It is given by

$Ʈ = Ʈ_{pi} / T_{pd}$ where,

Ʈ=Data unit delay

$Ʈ_{pi}$=Sum of discrete data packetsdelay

T_{pd}=Total number of Packets reached the receiver

Average throughput: Throughput is a metric which measures the capacity of the channel in-terms of cycles of receiver's number of packets with respect to packet size.

The performance and study of routing protocols are revealed with the proof. SimulationsareperformedusingNS2on the same m obility models ontheLinux platform.The routing protocols DVR, DSDV and AODV are compared. The performances are assessed by Throughput and trace analysis file.

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Traffic scenario and tracing of wired network

A wire based network is configured using the vector range routing protocol shown in Figure1

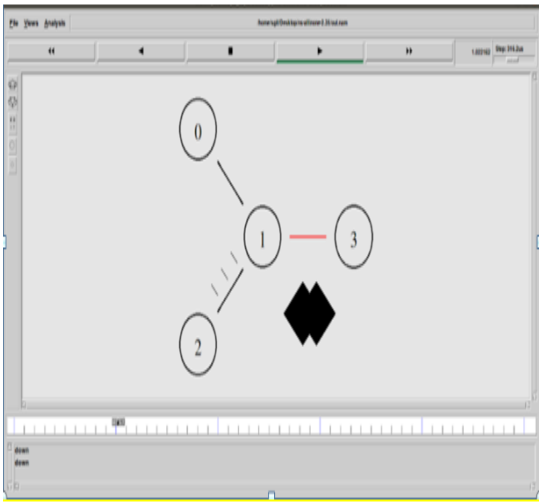
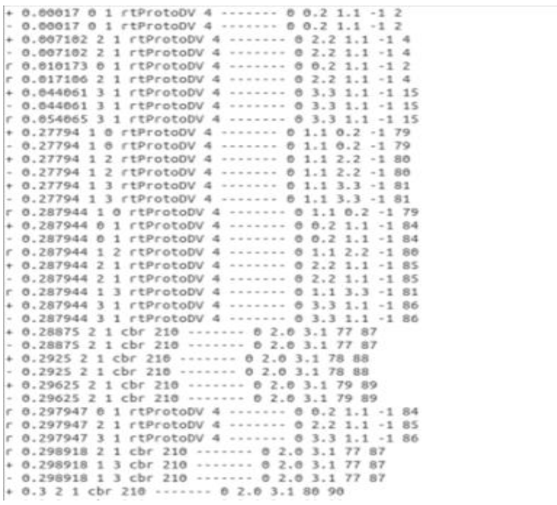


Fig.1. Traffic scenario of DVR



```
+ 0.00017 0 1 rtProtoDV 4 ------- 0 0.2 1.1 -1 2
- 0.00017 0 1 rtProtoDV 4 ------- 0 0.2 1.1 -1 2
+ 0.007102 2 1 rtProtoDV 4 ------- 0 2.2 1.1 -1 4
- 0.007102 2 1 rtProtoDV 4 ------- 0 2.2 1.1 -1 4
r 0.010173 0 1 rtProtoDV 4 ------- 0 0.2 1.1 -1 2
r 0.017106 2 1 rtProtoDV 4 ------- 0 2.2 1.1 -1 4
+ 0.044061 3 1 rtProtoDV 4 ------- 0 3.3 1.1 -1 15
- 0.044061 3 1 rtProtoDV 4 ------- 0 3.3 1.1 -1 15
r 0.054065 3 1 rtProtoDV 4 ------- 0 3.3 1.1 -1 15
+ 0.27794 1 0 rtProtoDV 4 ------- 0 1.1 0.2 -1 79
- 0.27794 1 0 rtProtoDV 4 ------- 0 1.1 0.2 -1 79
+ 0.27794 1 2 rtProtoDV 4 ------- 0 1.1 2.2 -1 80
- 0.27794 1 2 rtProtoDV 4 ------- 0 1.1 2.2 -1 80
+ 0.27794 1 3 rtProtoDV 4 ------- 0 1.1 3.3 -1 81
- 0.27794 1 3 rtProtoDV 4 ------- 0 1.1 3.3 -1 81
r 0.287944 1 0 rtProtoDV 4 ------- 0 1.1 0.2 -1 79
+ 0.287944 0 1 rtProtoDV 4 ------- 0 0.2 1.1 -1 84
- 0.287944 0 1 rtProtoDV 4 ------- 0 0.2 1.1 -1 84
r 0.287944 1 2 rtProtoDV 4 ------- 0 1.1 2.2 -1 80
+ 0.287944 2 1 rtProtoDV 4 ------- 0 2.2 1.1 -1 85
- 0.287944 2 1 rtProtoDV 4 ------- 0 2.2 1.1 -1 85
r 0.287944 1 3 rtProtoDV 4 ------- 0 1.1 3.3 -1 81
+ 0.287944 3 1 rtProtoDV 4 ------- 0 3.3 1.1 -1 86
- 0.287944 3 1 rtProtoDV 4 ------- 0 3.3 1.1 -1 86
+ 0.28875 2 1 cbr 210 ------- 0 2.0 3.1 77 87
- 0.28875 2 1 cbr 210 ------- 0 2.0 3.1 77 87
+ 0.2925 2 1 cbr 210 ------- 0 2.0 3.1 78 88
- 0.2925 2 1 cbr 210 ------- 0 2.0 3.1 78 88
+ 0.29625 2 1 cbr 210 ------- 0 2.0 3.1 79 89
- 0.29625 2 1 cbr 210 ------- 0 2.0 3.1 79 89
r 0.297947 0 1 rtProtoDV 4 ------- 0 0.2 1.1 -1 84
r 0.297947 2 1 rtProtoDV 4 ------- 0 2.2 1.1 -1 85
r 0.297947 3 1 rtProtoDV 4 ------- 0 3.3 1.1 -1 86
r 0.298918 2 1 cbr 210 ------- 0 2.0 3.1 77 87
+ 0.298918 1 3 cbr 210 ------- 0 2.0 3.1 77 87
- 0.298918 1 3 cbr 210 ------- 0 2.0 3.1 77 87
+ 0.3 2 1 cbr 210 ------- 0 2.0 3.1 80 90
```

Fig.2. Trace file of DVR

In general, tracing is a record of the actual script that gets processed in a programming environment. Network simulation in NS2 produces traces of all events in a trace archive. So the trace file of DVR is as shown in Figure 2.

4.3Traffic scenario and tracing of wireless network

A wireless network was traced and depicted using the Destination Sequence Vector Routing Protocol and shown that it introduces large amounts of overhead into the network due to the need for regular updates. The Figure 3 shows a node configuration for a mobile wireless noderunning DSDVas its protocol for Ad-hocRouting.

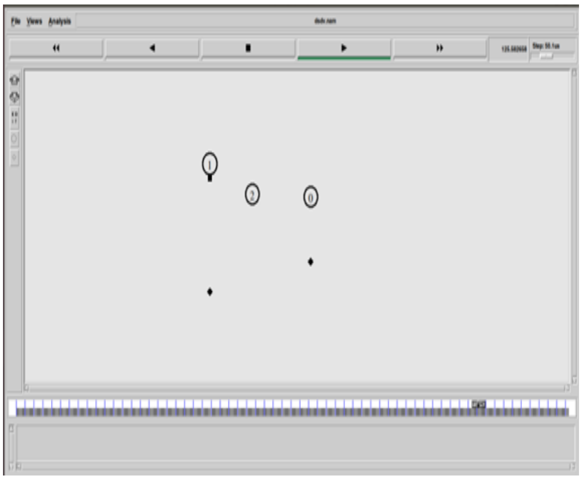
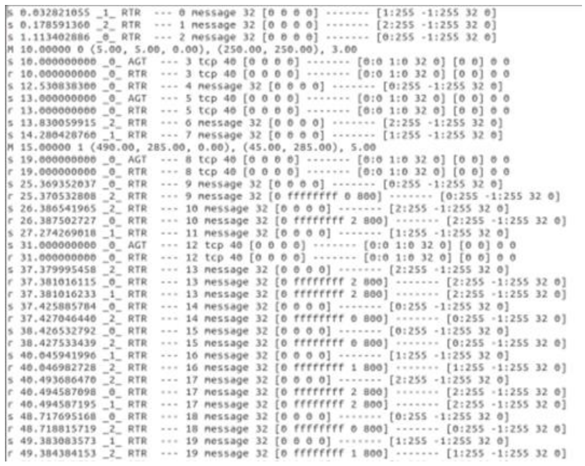


Fig.3. Traffic scenario of DSDV



```
s 0.032821055 _1_ RTR --- 0 message 32 [0 0 0 0] ------- [1:255 -1:255 32 0]
s 0.178591360 _2_ RTR --- 1 message 32 [0 0 0 0] ------- [2:255 -1:255 32 0]
s 1.113402886 _0_ RTR --- 2 message 32 [0 0 0 0] ------- [0:255 -1:255 32 0]
M 10.00000 0 (5.00, 5.00, 0.00), (250.00, 250.00), 3.00
s 10.000000000 _0_ AGT --- 3 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
r 10.000000000 _0_ RTR --- 3 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
s 12.530838300 _0_ RTR --- 4 message 32 [0 0 0 0] ------- [0:255 -1:255 32 0]
s 13.000000000 _0_ AGT --- 5 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
r 13.000000000 _0_ RTR --- 5 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
s 13.830059915 _2_ RTR --- 6 message 32 [0 0 0 0] ------- [2:255 -1:255 32 0]
s 14.280428760 _1_ RTR --- 7 message 32 [0 0 0 0] ------- [1:255 -1:255 32 0]
M 15.00000 1 (490.00, 285.00, 0.00), (45.00, 285.00), 5.00
s 19.000000000 _0_ AGT --- 8 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
r 19.000000000 _0_ RTR --- 8 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
s 25.369352037 _0_ RTR --- 9 message 32 [0 0 0 0] ------- [0:255 -1:255 32 0]
r 25.370532808 _2_ RTR --- 9 message 32 [0 ffffffff 0 800] ------- [0:255 -1:255 32 0]
s 26.386541965 _2_ RTR --- 10 message 32 [0 0 0 0] ------- [2:255 -1:255 32 0]
r 26.387502727 _0_ RTR --- 10 message 32 [0 ffffffff 2 800] ------- [2:255 -1:255 32 0]
s 27.274269018 _1_ RTR --- 11 message 32 [0 0 0 0] ------- [1:255 -1:255 32 0]
s 31.000000000 _0_ AGT --- 12 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
r 31.000000000 _0_ RTR --- 12 tcp 40 [0 0 0 0] ------- [0:0 1:0 32 0] [0 0] 0 0
s 37.379995458 _2_ RTR --- 13 message 32 [0 0 0 0] ------- [2:255 -1:255 32 0]
r 37.381016115 _0_ RTR --- 13 message 32 [0 ffffffff 2 800] ------- [2:255 -1:255 32 0]
r 37.381016233 _1_ RTR --- 13 message 32 [0 ffffffff 2 800] ------- [2:255 -1:255 32 0]
s 37.425885784 _0_ RTR --- 14 message 32 [0 0 0 0] ------- [0:255 -1:255 32 0]
r 37.427046440 _2_ RTR --- 14 message 32 [0 ffffffff 0 800] ------- [0:255 -1:255 32 0]
s 38.426532792 _0_ RTR --- 15 message 32 [0 0 0 0] ------- [0:255 -1:255 32 0]
r 38.427533439 _2_ RTR --- 15 message 32 [0 ffffffff 0 800] ------- [0:255 -1:255 32 0]
s 40.045941996 _1_ RTR --- 16 message 32 [0 0 0 0] ------- [1:255 -1:255 32 0]
r 40.046982728 _2_ RTR --- 16 message 32 [0 ffffffff 1 800] ------- [1:255 -1:255 32 0]
s 40.493686470 _2_ RTR --- 17 message 32 [0 0 0 0] ------- [2:255 -1:255 32 0]
r 40.494587098 _0_ RTR --- 17 message 32 [0 ffffffff 2 800] ------- [2:255 -1:255 32 0]
r 40.494587195 _1_ RTR --- 17 message 32 [0 ffffffff 2 800] ------- [2:255 -1:255 32 0]
s 48.717695168 _0_ RTR --- 18 message 32 [0 0 0 0] ------- [0:255 -1:255 32 0]
r 48.718815719 _2_ RTR --- 18 message 32 [0 ffffffff 0 800] ------- [0:255 -1:255 32 0]
s 49.383083573 _1_ RTR --- 19 message 32 [0 0 0 0] ------- [1:255 -1:255 32 0]
r 49.384384153 _2_ RTR --- 19 message 32 [0 ffffffff 1 800] ------- [1:255 -1:255 32 0]
```

Fig.4. Trace file of DSDV

The traces are used to measure the different performance metrics and to map the data on graphs for further analysis and comparison.

Traffic scenario and tracing of optical network:-

An optical network was planned and modeled using improvised AODV routing protocol. The optical traffic network scenario is generated using a tcl script consisting of multiple nodes, duplex connections, delay in ms and also agents used in origin and destination nodes.

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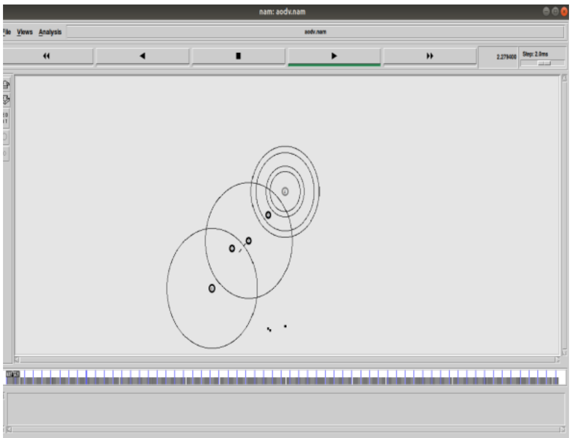

Fig.5. Animation shows the packet flow, coverage area and Traffic scenario of AODV

The foundation of communication model is by TCL script. The Trace file gets generated by the execution of the script. Using the awk script the packet delay can be calculated. The trace file of AODV is shown in Figure 6.

```
M 0.00000 0 (100.00, 200.00, 0.00), (150.00, 300.00), 5.00
M 0.00000 1 (200.00, 300.00, 0.00), (250.00, 700.00), 31.00
s 0.000000000 _0_ AGT --- 0 tcp 40 [0 0 0 0] ------- [0:0 4:0 32 0] [0 0] 0 0
r 0.000000000 _0_ RTR --- 0 tcp 40 [0 0 0 0] ------- [0:0 4:0 32 0] [0 0] 0 0
s 0.000000000 _0_ RTR --- 0 AODV 48 [0 0 0 0] ------- [0:255 -1:255 30 0] [0x2 1 1 [4 0] [0 4]] (REQUEST)
s 0.000115000 _0_ MAC --- 0 AODV 106 [0 ffffffff 0 800] ------- [0:255 -1:255 30 0] [0x2 1 1 [4 0] [0 4]] (REQUEST)
r 0.000963471 _1_ MAC --- 0 AODV 48 [0 ffffffff 0 800] ------- [0:255 -1:255 30 0] [0x2 1 1 [4 0] [0 4]] (REQUEST)
r 0.000988471 _1_ RTR --- 0 AODV 48 [0 ffffffff 0 800] ------- [0:255 -1:255 30 0] [0x2 1 1 [4 0] [0 4]] (REQUEST)
s 0.001869698 _1_ RTR --- 0 AODV 48 [0 ffffffff 0 800] ------- [1:255 -1:255 29 0] [0x2 2 1 [4 0] [0 4]] (REQUEST)
s 0.002264698 _1_ MAC --- 0 AODV 106 [0 ffffffff 1 800] ------- [1:255 -1:255 29 0] [0x2 2 1 [4 0] [0 4]] (REQUEST)
r 0.003113169 _2_ MAC --- 0 AODV 48 [0 ffffffff 1 800] ------- [1:255 -1:255 29 0] [0x2 2 1 [4 0] [0 4]] (REQUEST)
r 0.003113170 _0_ MAC --- 0 AODV 48 [0 ffffffff 1 800] ------- [1:255 -1:255 29 0] [0x2 2 1 [4 0] [0 4]] (REQUEST)
r 0.003138169 _2_ RTR --- 0 AODV 48 [0 ffffffff 1 800] ------- [1:255 -1:255 29 0] [0x2 2 1 [4 0] [0 4]] (REQUEST)
r 0.003138170 _0_ RTR --- 0 AODV 48 [0 ffffffff 1 800] ------- [1:255 -1:255 29 0] [0x2 2 1 [4 0] [0 4]] (REQUEST)
s 0.006267787 _2_ RTR --- 0 AODV 48 [0 ffffffff 1 800] ------- [2:255 -1:255 28 0] [0x2 3 1 [4 0] [0 4]] (REQUEST)
s 0.006542787 _2_ MAC --- 0 AODV 106 [0 ffffffff 2 800] ------- [2:255 -1:255 28 0] [0x2 3 1 [4 0] [0 4]] (REQUEST)
r 0.007391258 _1_ MAC --- 0 AODV 48 [0 ffffffff 2 800] ------- [2:255 -1:255 28 0] [0x2 3 1 [4 0] [0 4]] (REQUEST)
r 0.007391258 _3_ MAC --- 0 AODV 48 [0 ffffffff 2 800] ------- [2:255 -1:255 28 0] [0x2 3 1 [4 0] [0 4]] (REQUEST)
r 0.007416258 _1_ RTR --- 0 AODV 48 [0 ffffffff 2 800] ------- [2:255 -1:255 28 0] [0x2 3 1 [4 0] [0 4]] (REQUEST)
r 0.007416258 _3_ RTR --- 0 AODV 48 [0 ffffffff 2 800] ------- [2:255 -1:255 28 0] [0x2 3 1 [4 0] [0 4]] (REQUEST)
s 0.013864910 _3_ RTR --- 0 AODV 48 [0 ffffffff 2 800] ------- [3:255 -1:255 27 0] [0x2 4 1 [4 0] [0 4]] (REQUEST)
s 0.014139910 _3_ MAC --- 0 AODV 106 [0 ffffffff 3 800] ------- [3:255 -1:255 27 0] [0x2 4 1 [4 0] [0 4]] (REQUEST)
r 0.014988381 _2_ MAC --- 0 AODV 48 [0 ffffffff 3 800] ------- [3:255 -1:255 27 0] [0x2 4 1 [4 0] [0 4]] (REQUEST)
r 0.014988381 _4_ MAC --- 0 AODV 48 [0 ffffffff 3 800] ------- [3:255 -1:255 27 0] [0x2 4 1 [4 0] [0 4]] (REQUEST)
r 0.015013381 _2_ RTR --- 0 AODV 48 [0 ffffffff 3 800] ------- [3:255 -1:255 27 0] [0x2 4 1 [4 0] [0 4]] (REQUEST)
r 0.015013381 _4_ RTR --- 0 AODV 48 [0 ffffffff 3 800] ------- [3:255 -1:255 27 0] [0x2 4 1 [4 0] [0 4]] (REQUEST)
s 0.015013381 _4_ RTR --- 0 AODV 44 [0 0 0 0] ------- [4:255 0:255 30 3] [0x4 1 [4 4] 10.000000] (REPLY)
s 0.015108381 _4_ MAC --- 0 ARP 86 [0 ffffffff 4 806] ------- [REQUEST 4/4 0/3]
r 0.015796853 _3_ MAC --- 0 ARP 28 [0 ffffffff 4 806] ------- [REQUEST 4/4 0/3]
s 0.016026853 _3_ MAC --- 0 RTS 44 [52e 4 3 0]
r 0.016379324 _4_ MAC --- 0 RTS 44 [52e 4 3 0]
s 0.016389324 _4_ MAC --- 0 CTS 38 [3f4 3 0 0]
r 0.016693796 _3_ MAC --- 0 CTS 38 [3f4 3 0 0]
s 0.016703796 _3_ MAC --- 0 ARP 86 [13a 4 3 806] ------- [REPLY 3/3 4/4]
r 0.017392267 _4_ MAC --- 0 ARP 28 [13a 4 3 806] ------- [REPLY 3/3 4/4]
s 0.017402267 _4_ MAC --- 0 ACK 38 [0 3 0 0]
```

Fig.6. Trace files of AODV

4.5. Comparison of the Routing Protocols

Realizing the network performance metrics is extremely important. If no files are mentioned, the xgraph programs can plot a graph on an X display read from either data files or standard output. Use the xgraph to map the characteristics of the network parameter such as bandwidth, delay, jitter, latency, etc. Network simulation in NS2 generates xgraph after traces of all events in a trace file have been completed. The xgraph is shown in Figure7fortherouting protocols DVR, DSDV and AODV.

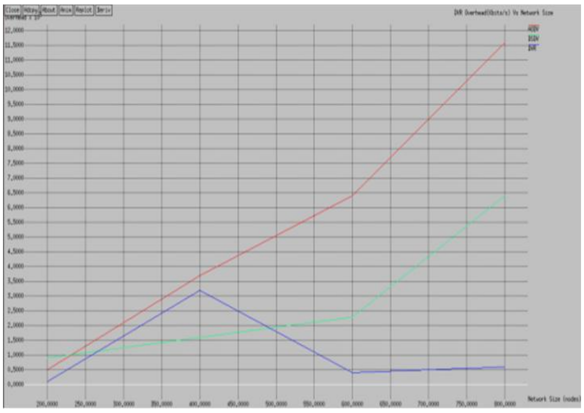

Fig.7. Comparison of the routing protocols

The Figure 7 indicates that the red curve is the optimum one that is AODV. By setting the pattern and action for sending time and receiving time for each packet these results has been achieved. It is observed that in a less congested path, the AODV protocol transmits the unicast or multicast packet to help avoid data traffic. It does not deliver any additional overhead on data packets.

V. 5. Conclusion and Future Scope

The feat of DSDV, AODV and DVR routing protocols on different transmission media is compared in this research work. The medium of transmission chosen are Radio frequency and optical fiber cable. The simulation results are acknowledged in a trace file and x-graph that depicted the performance of the protocols with their metrics. DVR protocol is simulated for wired network, DSDV protocol is simulated for wireless network and AODV protocol is simulated for Fiber optic network. The graph resembles that the traffic can be controlled in AODV protocol which is opted for optical network. Since AODV is good at providing Constant Bit Rate and Packet Delivery Ratio it is proved that the fiber optic network which uses AODV performs better against DVR and DSDV even-though it supports for a reasonable distance transmission. Transmission energy is the energy spent to

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transmit a message, and is dependent on the size of the packe Transmission energy is the energy spent to transmit a message, and is dependent on the size of the packe

The scope of transmission is a process parameter that influences the overall network energy consumption. So the network life time which purely depends on energy consumption of transmission nodes with its mobility features can be evaluated using the tool Qualnet. The digital traffic in-case of multimedia transmission is unpredictable with the enormous bandwidth and transmission range. By the efficient use of spectrum this can be a fitting platform leads to modernize the entire communication network.

VI. References:

1. Andres Medina, Stephan Bohacek, “Performance modeling of neighbor discovery in proactive routing protocols”, Journal of Advanced Research, Volume 2, Issue 3, July 2011, pp 227-239 https://doi.org/10.1016/j.jare.2011.04.007
2. Balram Swami, Ravindharsingh, “Simulation based comparison between OWL and DSDV”, International conference on Emerging Trends in Engineering, Science and Technology, 2015, pp 1575-1580
3. Bijan Paul, Md.Ibrahim, Md. Abu NaserBikas, “Experimental Analysis of AODV & DSR over TCP & CBR connections with varying speed and Node density in VANET” International Journal of Computer Applications (0975-8887) Volume 24, No.-4, June 2011
4. A.A.Chavan, Prof. D.S.Kurule, P.U.Dere, “Performance analysis of AODV and DSDV Routing protocol in MANET and modifications in AODV against Black Hole Attack”, 7th International conference on Communication, Computing and Visualization 2016
5. Ernesto I. Sandoval G, Carlos E.Galvan T, Jorge I. Galvan-Tejada, “Multicast Routing and interoperability between wired and wireless ad-hoc network”, International meeting of Electrical Engineering Research ,2012
6. Gabriel Mujica, Jorge Portilla, Teresa Riesgo, “Performance of an AODV-based routing protocol implementation by using a novel in-field WSN diagnosis tool” , Microprocessors and Microsystems, volume 39, Issue 8, Nov. 2015, PP 920-938 https://doi.org/10.1016/j.micpro.2015.10.007
7. Jair Jose Ferronato, Marco Antonio SadiniTrentin, “Analysis of Routing Protocols OLSR, AODV and ZRP in Real Urban Vehicular Scenario with Density Variation” IEEE Latin America Transactions, Volume 15, Issue: 9, 2017
8. JogendraKumar, AnnapurnaSingh, M.K.Panda, H.S.Bhadauria, “Study and Performance Analysis of Routing Protocol Based on CBR”, International conference on Computational modeling and security, proceeding pp. 23-30
9. S. Krco, M.Dupcinov, “Improved Neighbor Detection Algorithm for AODV routing protocol”, IEEE Communication Letters, Volume 7, Issue 12, 2003
10. LapasPradittasnee, SeyitCamtepe, Yu-Chu Tian, “Efficient Route Update and Maintenance for Reliable Routing in Large-Scale Sensor Networks” IEEE Transactions on Industrial Informatics, Volume 13, Issue 1, 2017
11. Llamas M., L.Anido, M.J.Fernandez, “Simulators over the network”, IEEE Transactions on Education, Vol.44, Issue 02, 2001
12. S.Mohapatra, P.Kanungo, “Performance analysis of AODV, DSR, OLSR and DSDV Routing Protocols using NS2 Simulator” International conference on Communication Technology and System design 2011, proceedings pp 69-76 https://doi.org/10.1016/j.proeng.2012.01.835
13. NadilmaCintraValencaNunes Pereira, Renato MarizdeMoraes, “Comparative Analysis of AODV Route Recovery Mechanisms in Wireless Ad-hoc Networks” IEEE Latin America Transactions, Volume: 8, Issue 4, 2010.
14. Payal, SudeshKr.Jakhar, “CBR Traffic Based Performance Investigations of DSDV, DSR and AODV Routing protocols using NS2” International Journal of Soft Computing and Engineering (IJSCE) ISSN:2231-2307, Volume-3, Issue 4, September 2013
15. RajneeshRandhawa, J.S.Sohal, “Comparison and performance of routing protocols in

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ISSN: 0193 - 4120 Page No. 5478 - 5484

SONET based networks", Optik, Dec 2008 https://doi.org/10.1016/j.ijleo.2008.12.015

16. Sheng Liu, Yang Yang, Weixing Wang, " Research of AODV Routing protocol for Ad hoc Networks", AASRI Conference on Parallel and Distributed Computing and systems, 2013
17. YuhwaSuh, KiyoungKim, AranKim, YongtaeShin ,"A study on impact of wired access networks for green Internet, Journal of Network and Computer Applications, volume 57,2015, pp 156-168 https://doi.org/10.1016/j.jnca.2015.07.016 http://www.isi.edu/nsnam/ns/