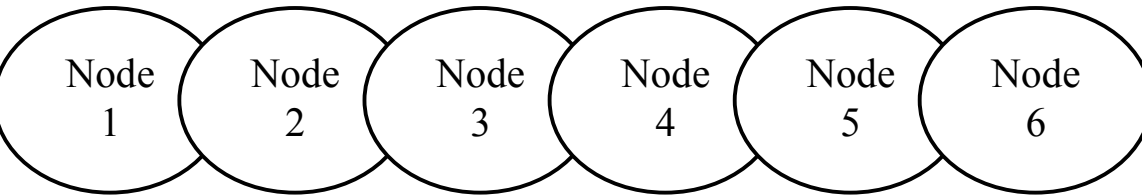


Experimental Performance Evaluation of AODV implementations in Static Environment

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Test-Bed Set Up



- Static Ad-hoc n/w
- Same Frequency CH
- MACKill Filter (at the n/w layer)

3 modes of configurations

1. UU - AODV implementation by Upsala University, Sweden
2. JAdhoc - AODV implementation by University of Bremen, Germany
3. Static - Set routes manually in ad-hoc network

Results taken

UDP (Actual load, Packet Delivery Fraction, Jitter, Out of order Packets)

TCP (Throughput, RTO, CWND, DupAcks)

UDP Results

Between 2 nodes in Static Configuration - 3.6 Mbps of UDP stream without any packet loss

Choose 500Kbps UDP stream to measure

Actual Load

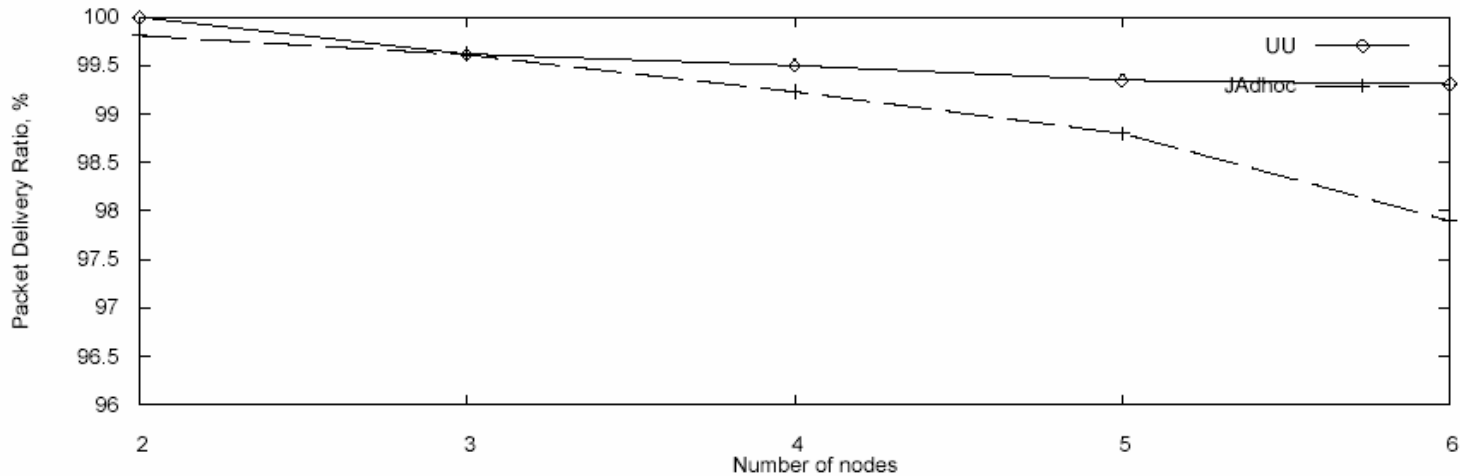
Packet Delivery Fraction

Out of order Packets

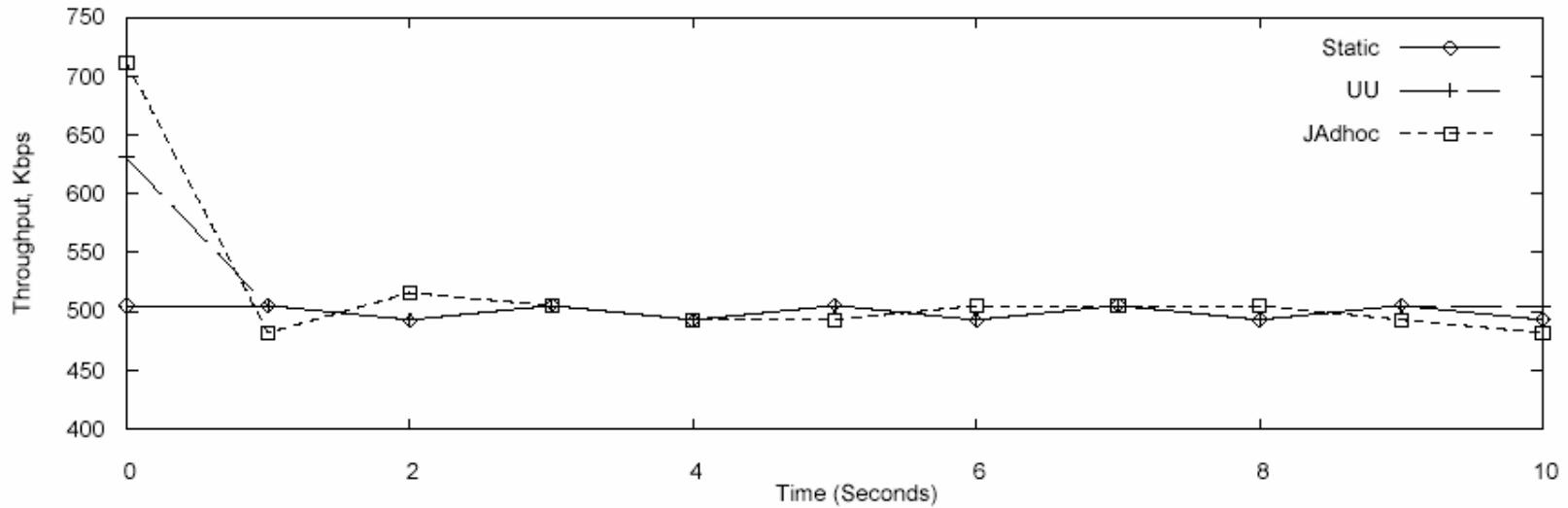
Jitter

UDP Results

Packet Delivery Ratio vs Number of nodes

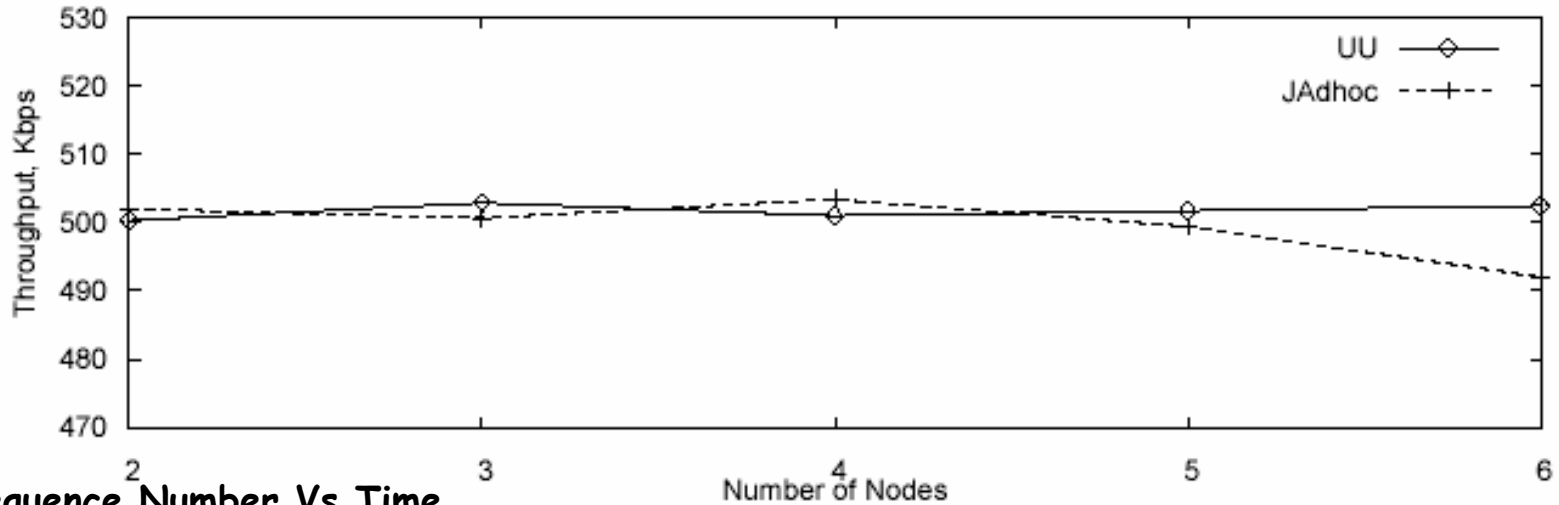


Throughput between 4 nodes

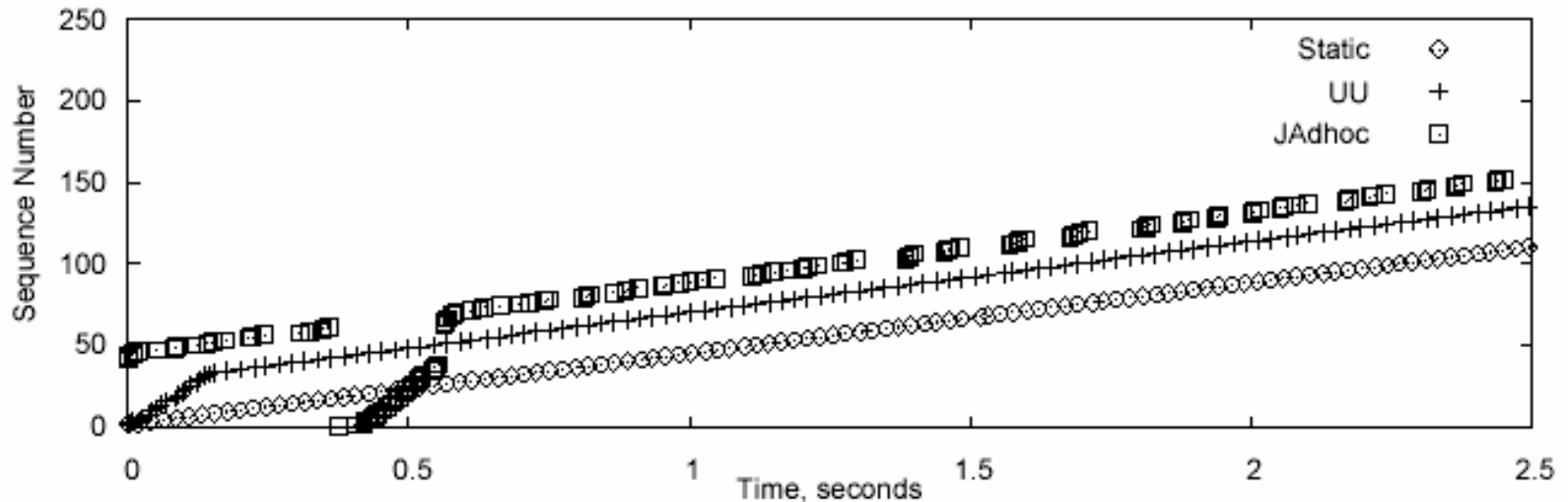


UDP Results

Actual Load for offered load of 500Kbps vs Number of nodes

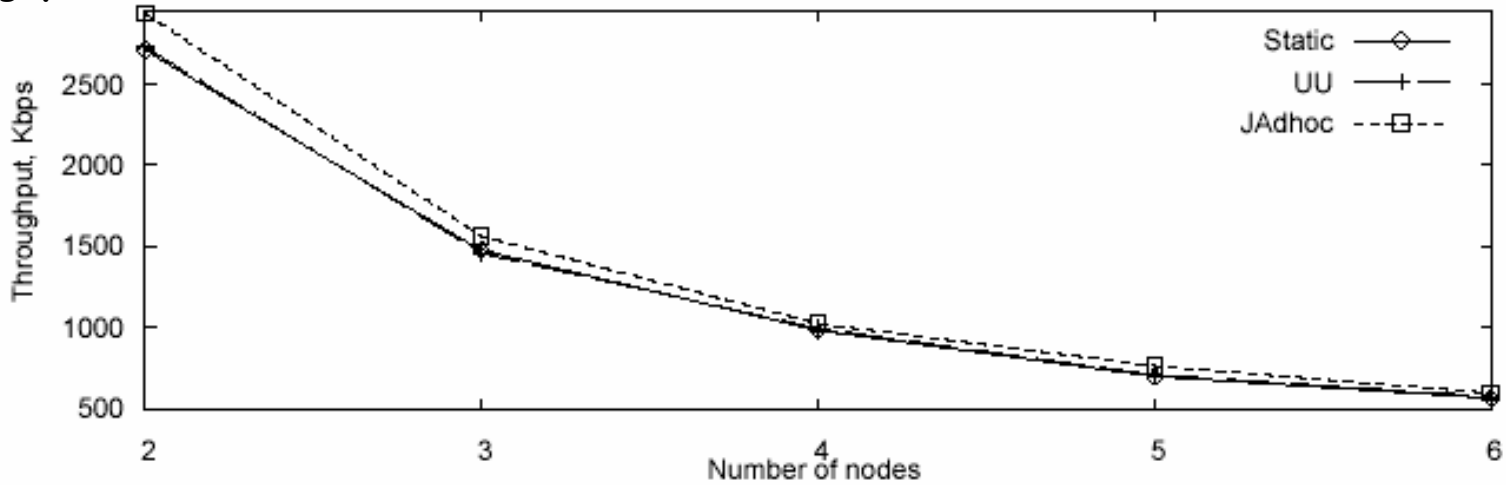


Packet Sequence Number Vs Time

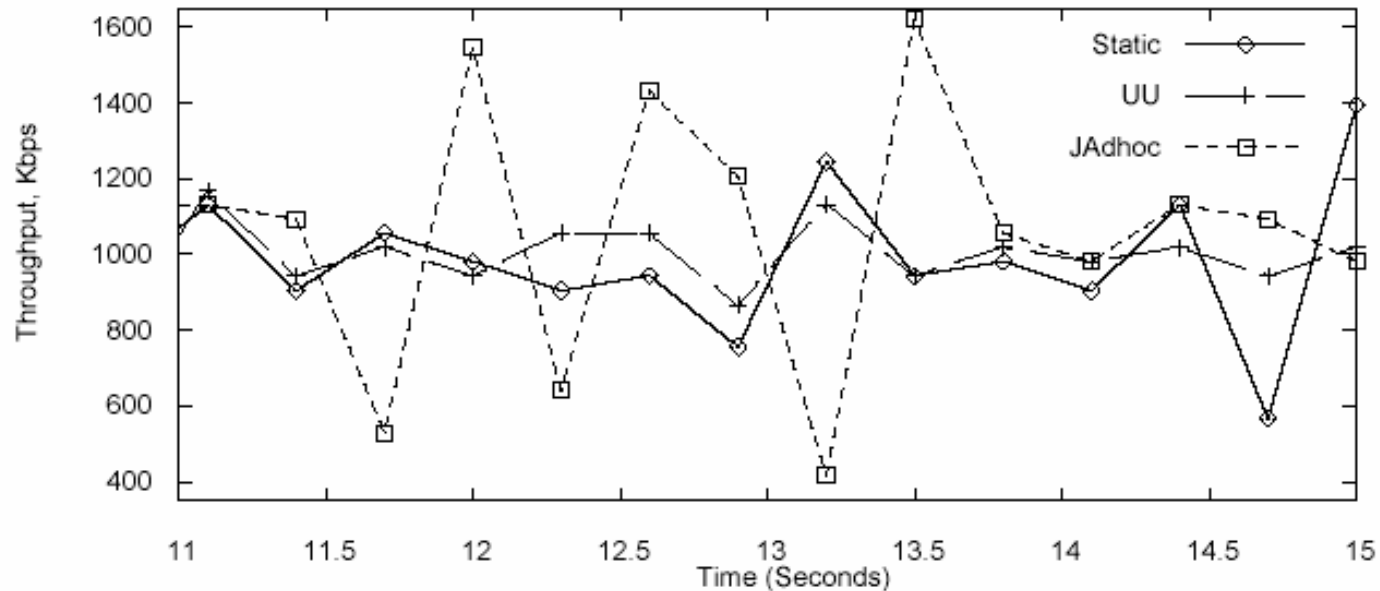


TCP Results

Throughput vs Number of nodes

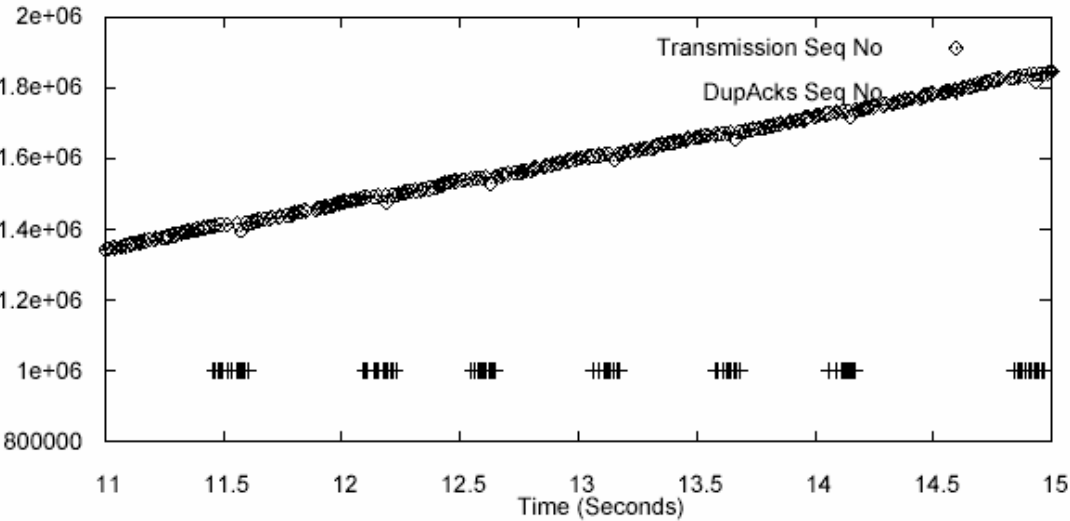


Throughput between four nodes



TCP Results

Static - Packet Trace



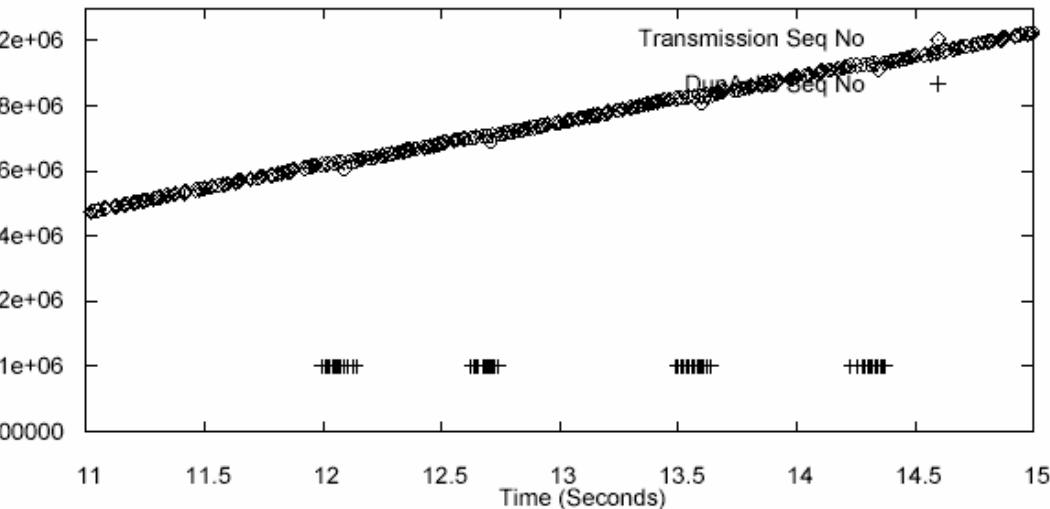
DUPACKS

- Higher in Static

CWND

- Higher Variation of CWND in Static
- Freq. of Throughput variation higher

Adhoc - Packet Trace



RTO

- Lower in Static
- Put more packets to the system
- Higher Pkt loss at Link layer

Additional Observations

1) Effect of "Hello Interval*Hello Loss"

HelloInterval*HelloLoss is Lower, the probability of Route Breaks are higher for higher data rate

Solutions

Better to use Link layer info to detect neighbour

Use Higher value for HelloLoss in static n/w that uses higher data rates

2) Lifetime of the reverse route

MinimalLifetime = (current time + 2*NET_TRAVERSAL_TIME -
2*HopCount*NODE_TRAVERSAL_TIME)

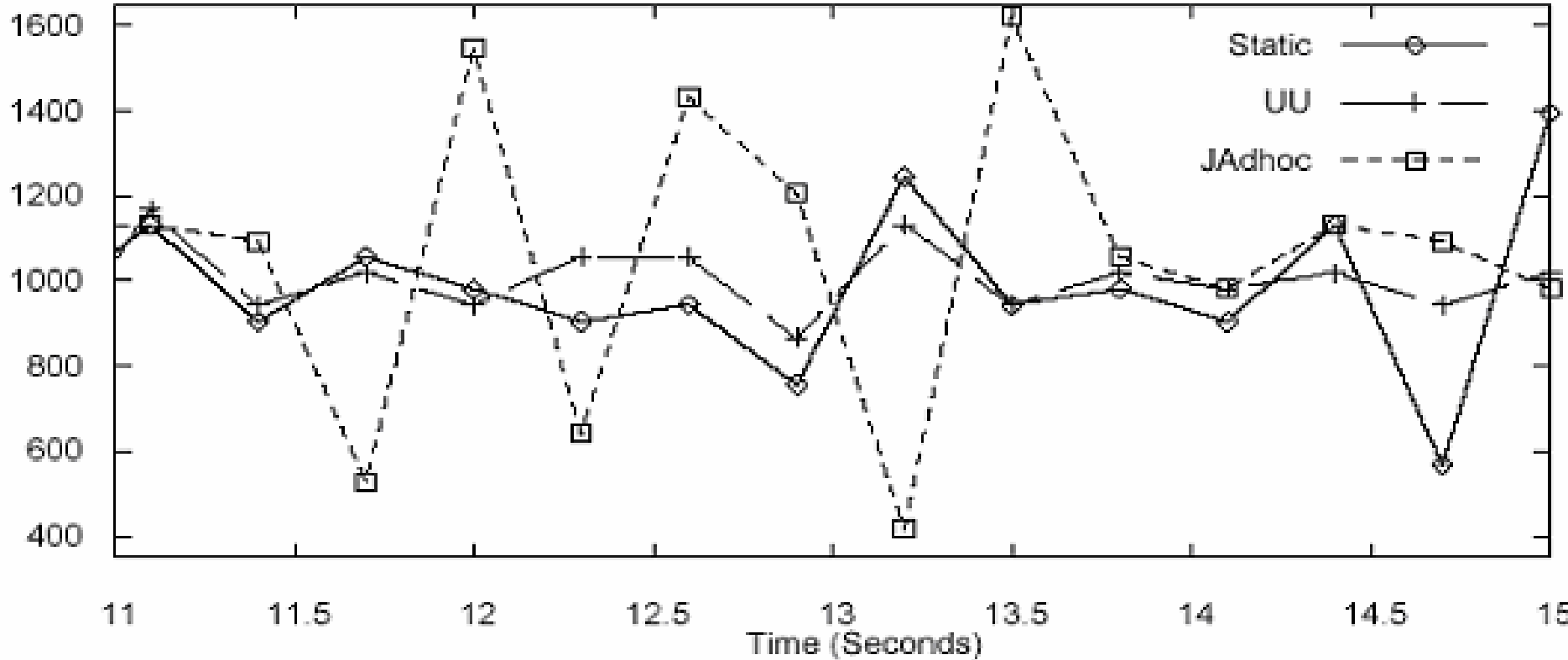
Route Lifetime = 140ms

(HopCount=3,NODE_TRAVERSAL_TIME=10), Net Diameter =10)

What are the implications of setting a default value (1-3 sec) for MinimalLifetime, irrespective of network topology ?

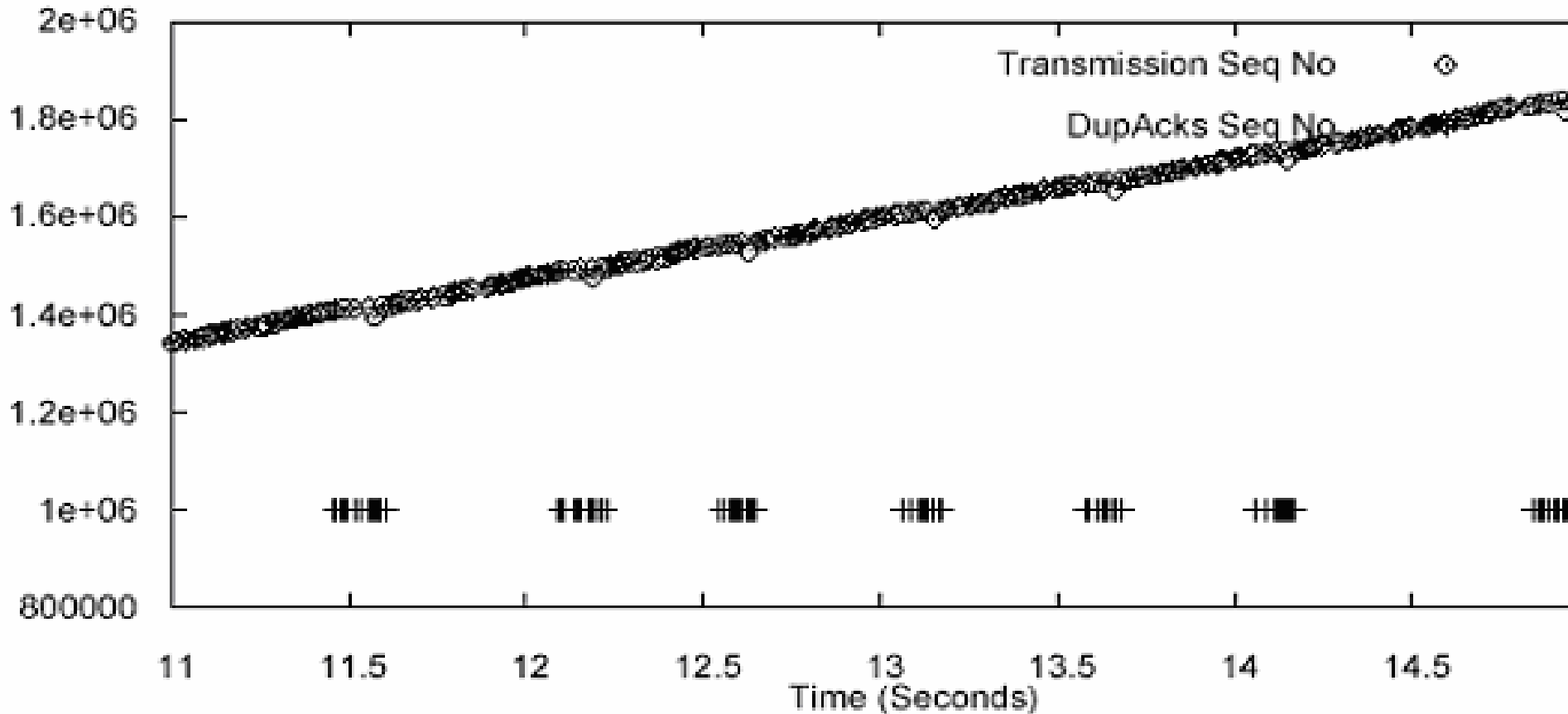
Rest of TCP Results

TCP Results



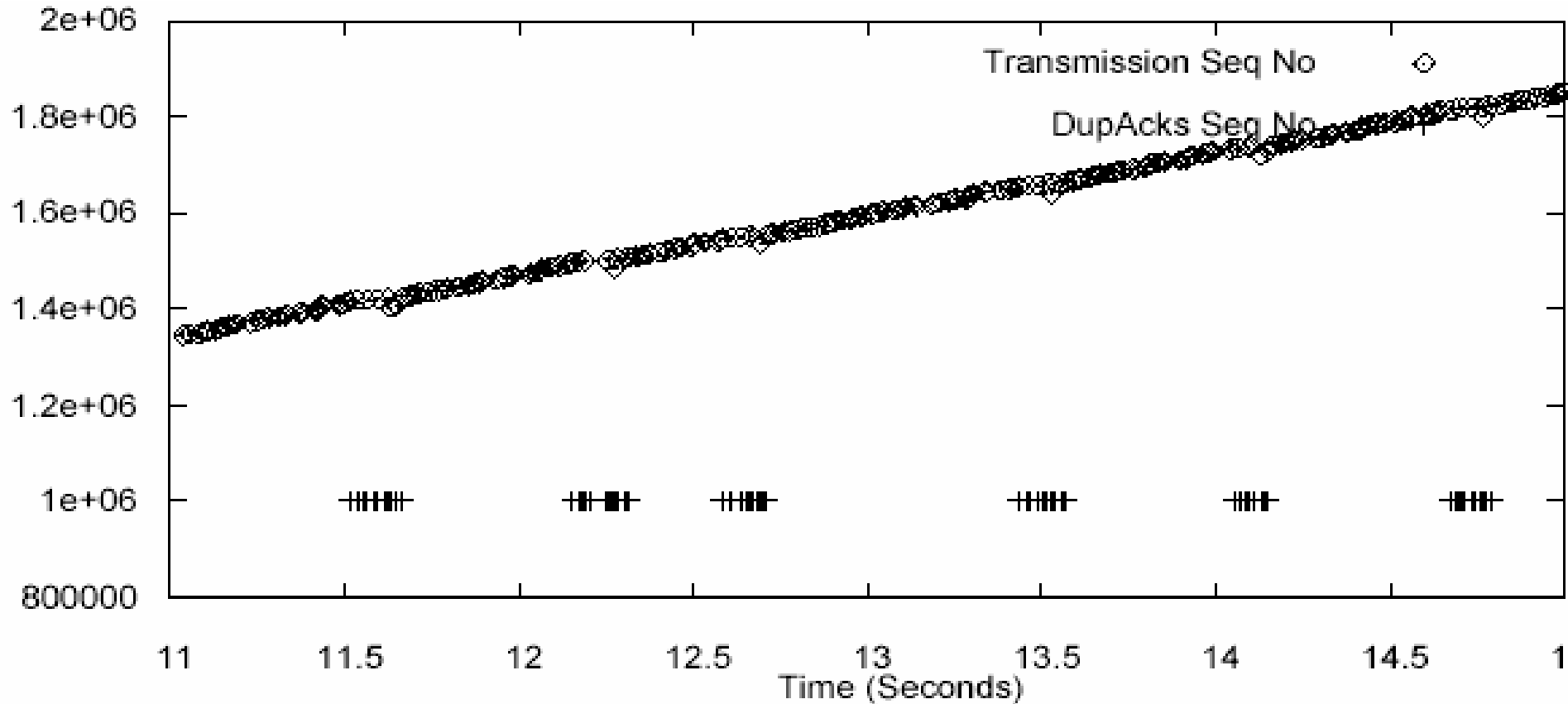
TCP throughput variations between 4 nodes

TCP Results



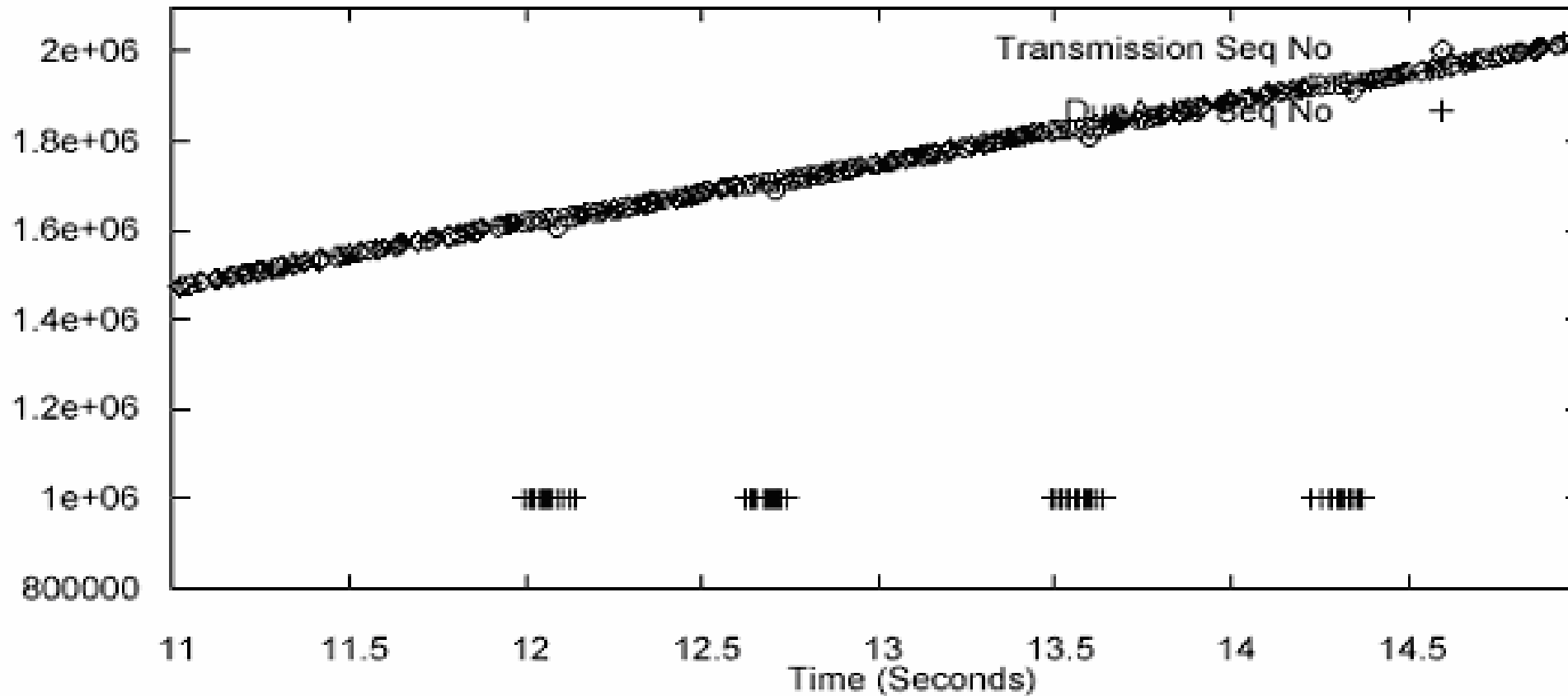
TCP Flow packet trace, with dupacks for Static mode

TCP Results



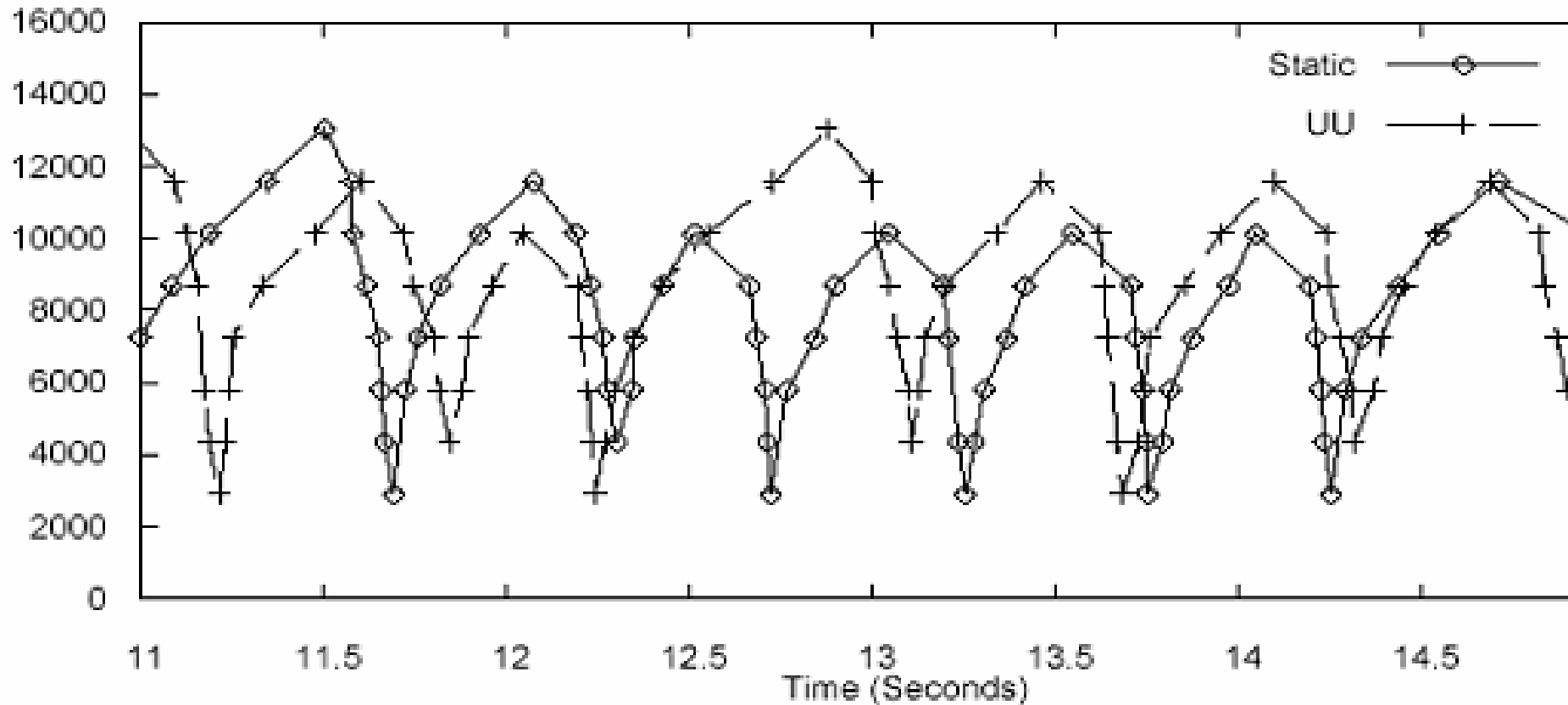
TCP Flow packet trace, with dupacks for UU mode

TCP Results



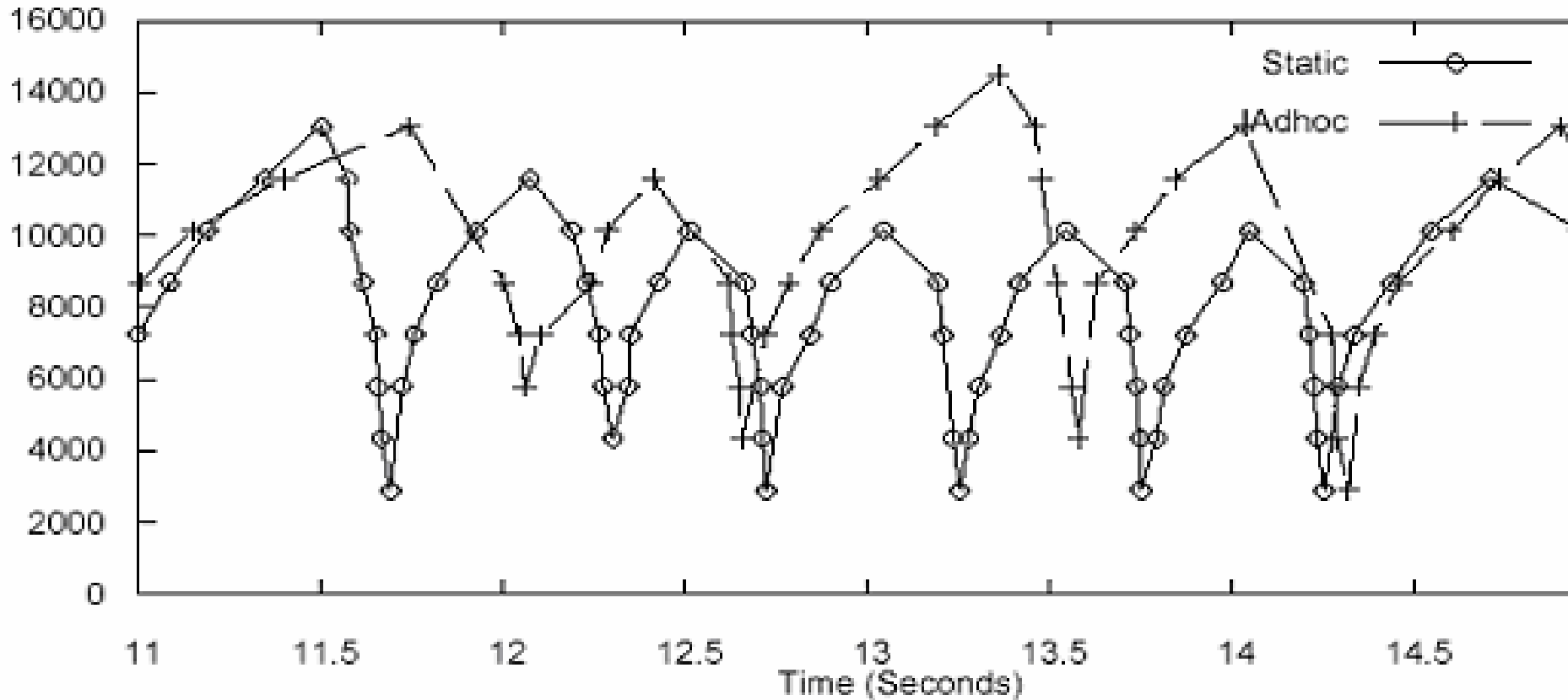
TCP Flow packet trace, with dupacks for JAdhoc mode

TCP Results



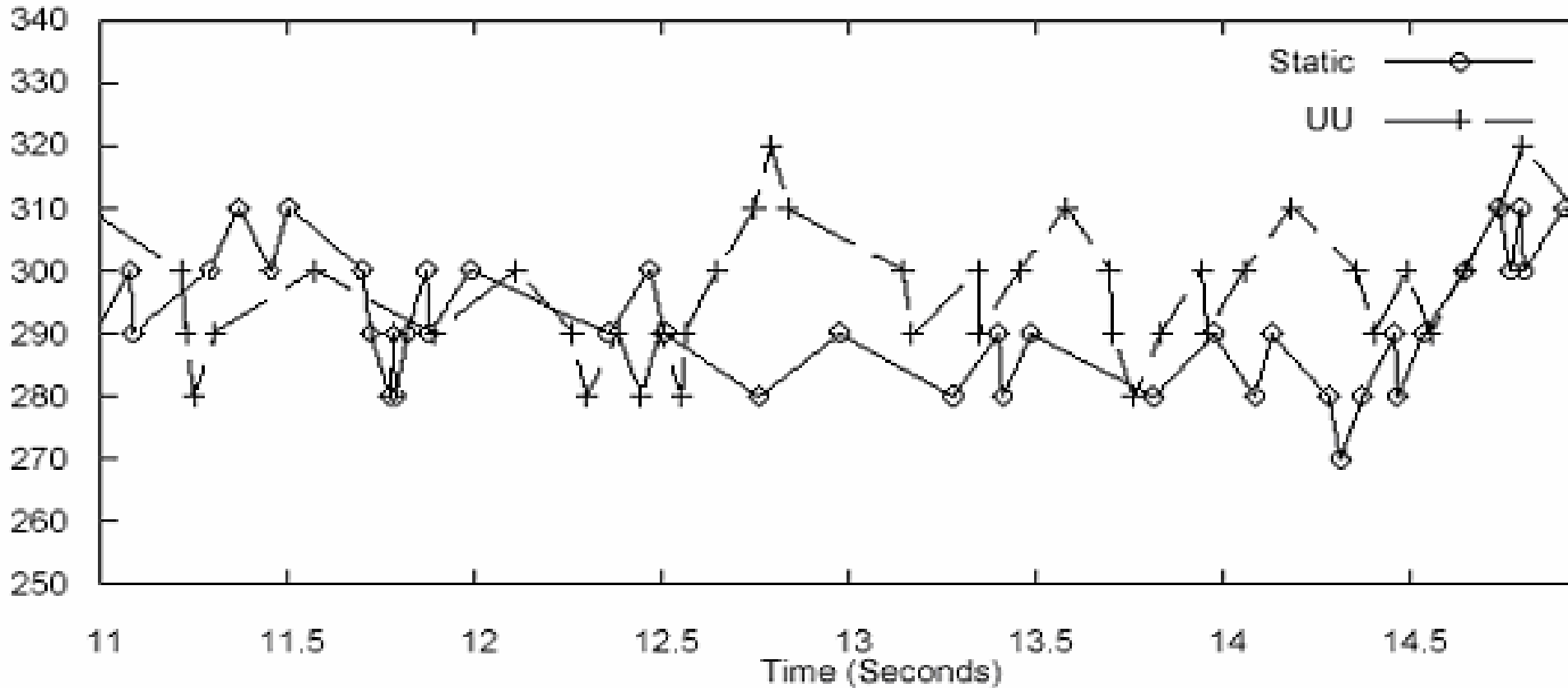
Variation of cwnd for Static & UU modes

TCP Results



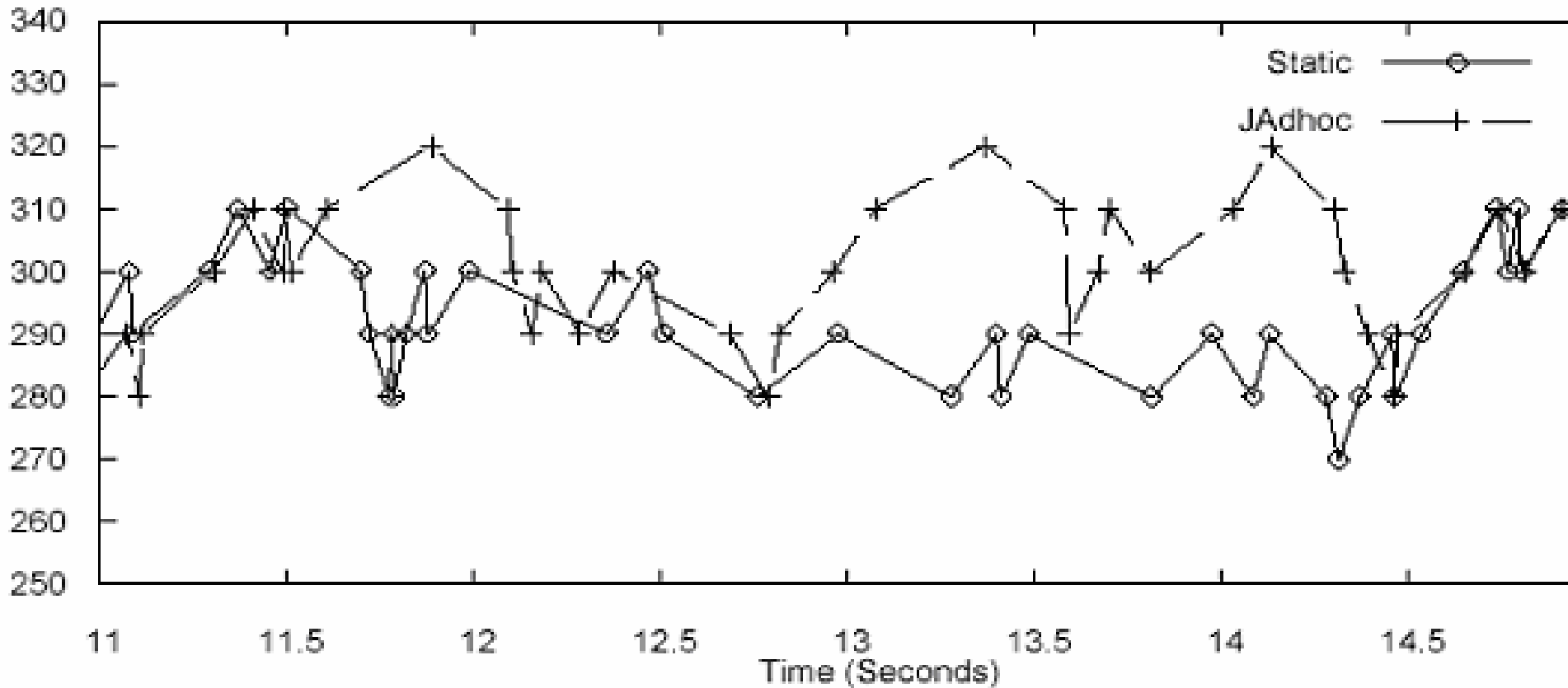
Variation of cwnd for Static & JAdhoc modes

TCP Results



RTO Variations for Static & UU modes

TCP Results



RTO Variations for Static & JAdhoc modes