Evaluating the performance of Mesh network protocols for disaster scenarios

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Introduction

To revisit the project aim, the aim is to evaluate Mesh routing protocols for voice such as:

- **AODV** (ad hoc on demand vector)**,**
- **DSR** (demand source routing)**,**
- **OLSR** (optimized link-state routing),

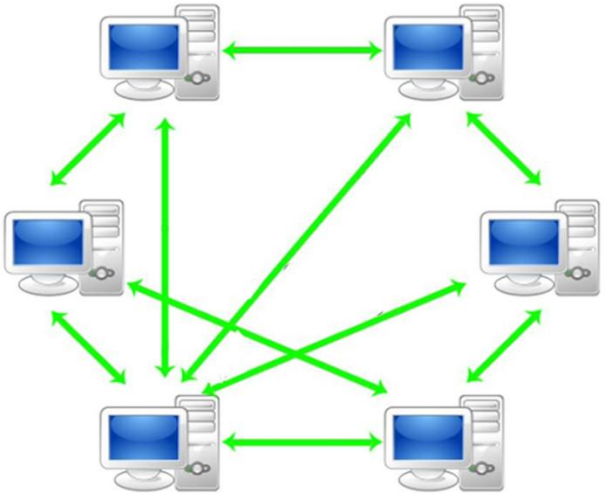
using **UDP** (user datagram protocol) in disaster scenarios.

Introduction (2)

The aim is to simulate some scenarios with different numbers of nodes, permutations of nodes, and different radii of the disaster area.

The network topology being used is a peer-to-peer topology, since:

- It is easy to deploy.
- it offers promising solution to the challenges of information-sharing in disaster events.



Introduction (3)

And then finally the aim is to test the performance metrics:

- **throughput,**
- **delay,** and
- **network load**

on these simulated networks using a simulation tool used is **OPNET** (optimized network evaluation tool)

Simulation Approach

Keep every variable static except the aspects being tested.

Static variables:

- Protocols (AODV, DSR, OLSR, UDP)
- Throughput, Delay, Network load
- Mobility rate
- Simulation time
- Application

Simulation Approach (2)

Dynamic variables

- Number of nodes
- Radius size
- Permutations of the nodes

E.g. 4 node permutations could be:

3 cellphones & 1 laptop, or

2 cellphones & 2 laptops, or

1 cellphone & 1 laptop, etc.

Methodology

Scn.	Parameters							
	No. of nodes	Routing protocols	Other protocols	Performance metrics	Simulation radius	Mobility rate	Simulation time	Application
1	4	AODV, DSR & OLSR	UDP	Throughput, delay, network load	500m x 500m	5 meters/sec	10 min	Voice
2	7	AODV, DSR & OLSR	UDP	Throughput, delay, network load	1000m x 1000m	5 meters/sec	10 min	Voice
3	10	AODV, DSR, & OLSR	UDP	Throughput, delay, network load	2000m x 2000m	5 meters/sec	10 min	Voice

Methodology (2)

Scenario	Number of nodes	Permutation
1	4	2 cellphones & 2 laptops
2	7	3 cellphones, 2 radios, & 2 laptops
3	10	4 cellphones, 2 radios, & 2 laptops

Challenges

Routing protocol	Problem	Occurrence	Solution
DSR	Failed to simulate under video application.	Number of nodes is greater than 4	Settled with implementing with voice application only

Timeline

	Term 3							Term 4						
	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Methodology														
Implementation														
Documentation														
Results Analysis														
Results Discussion														
Documentation														

References

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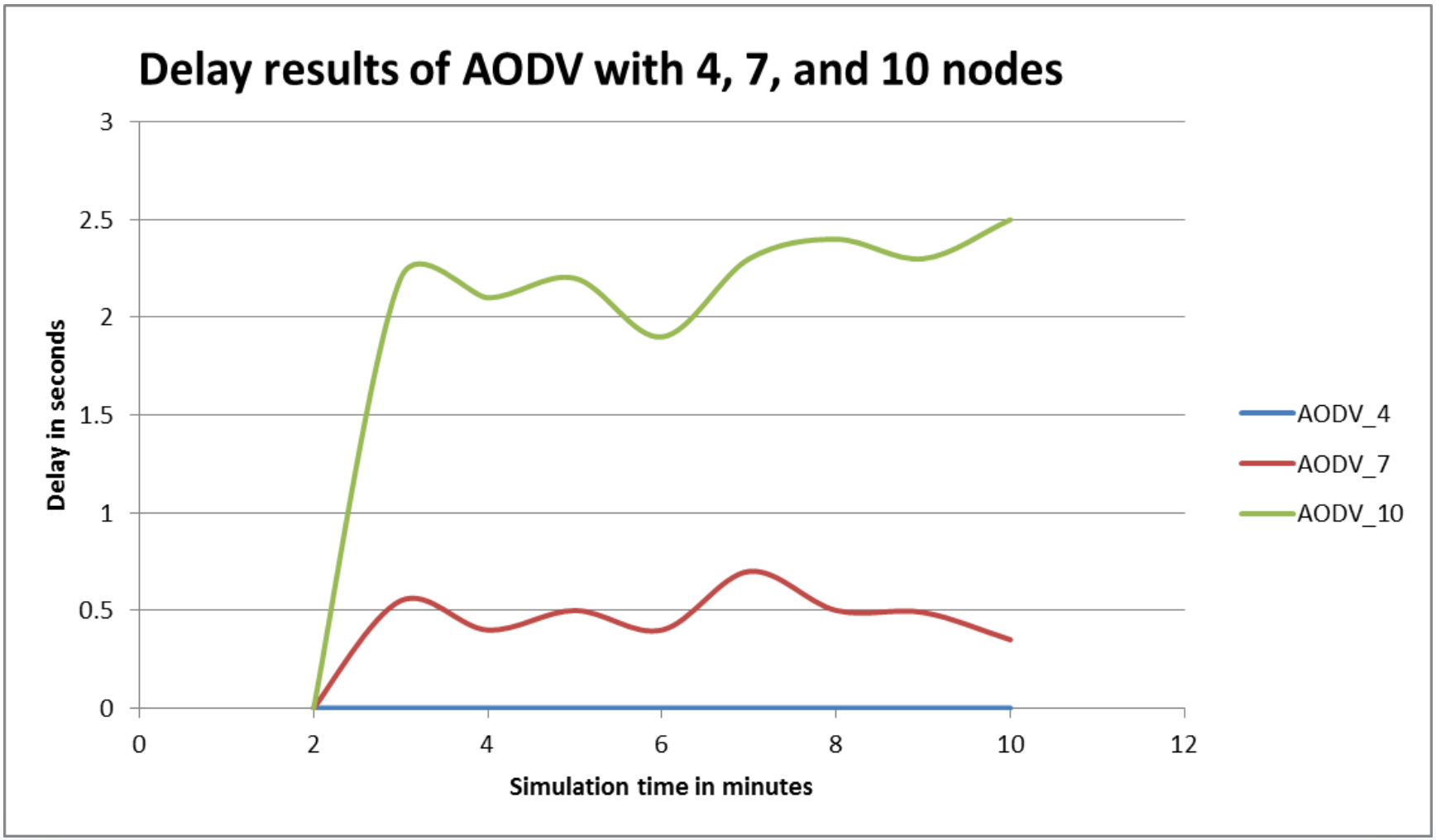
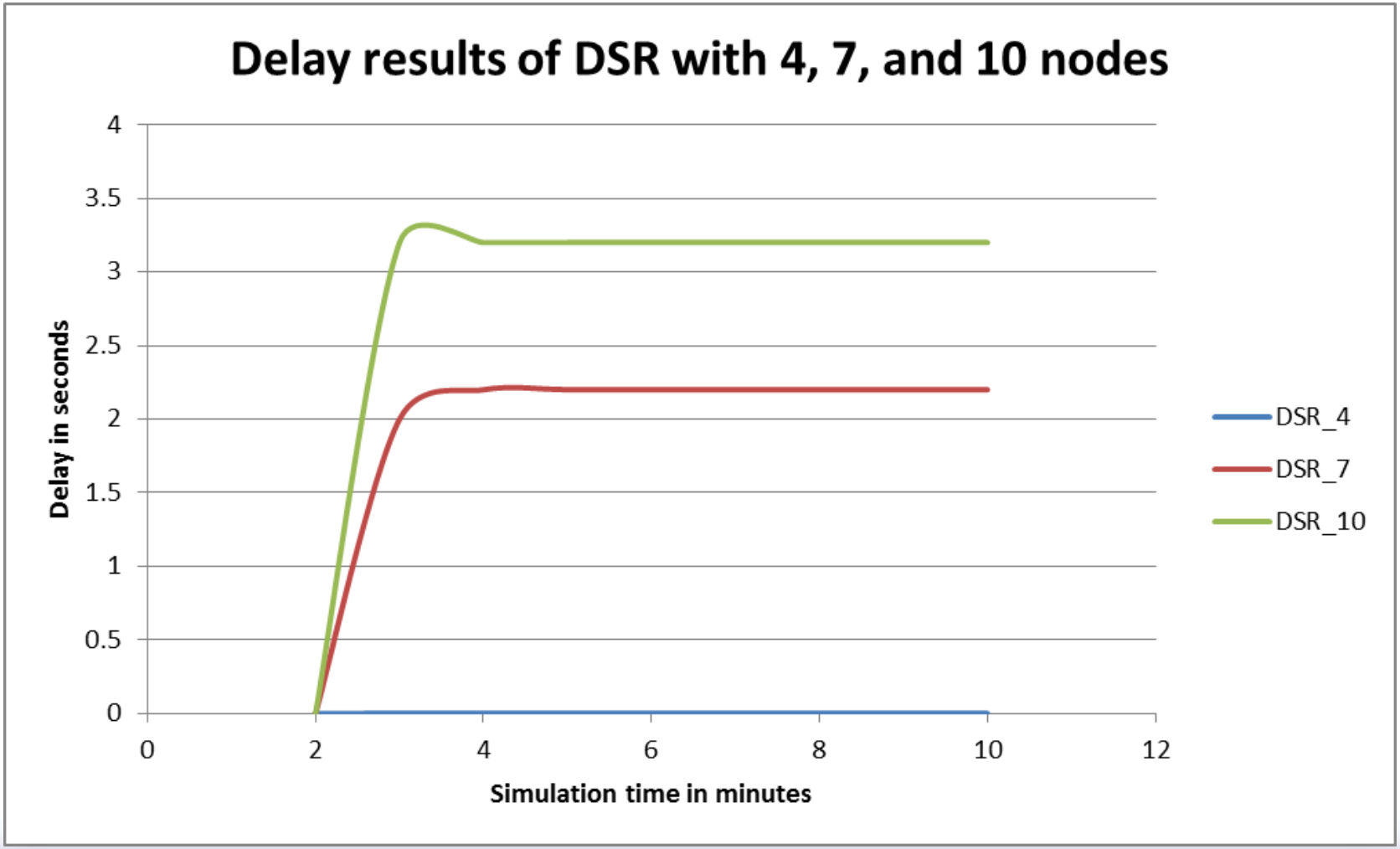
Demo

- Simulate a scenario
- Apply variables to nodes
- Comparison of results

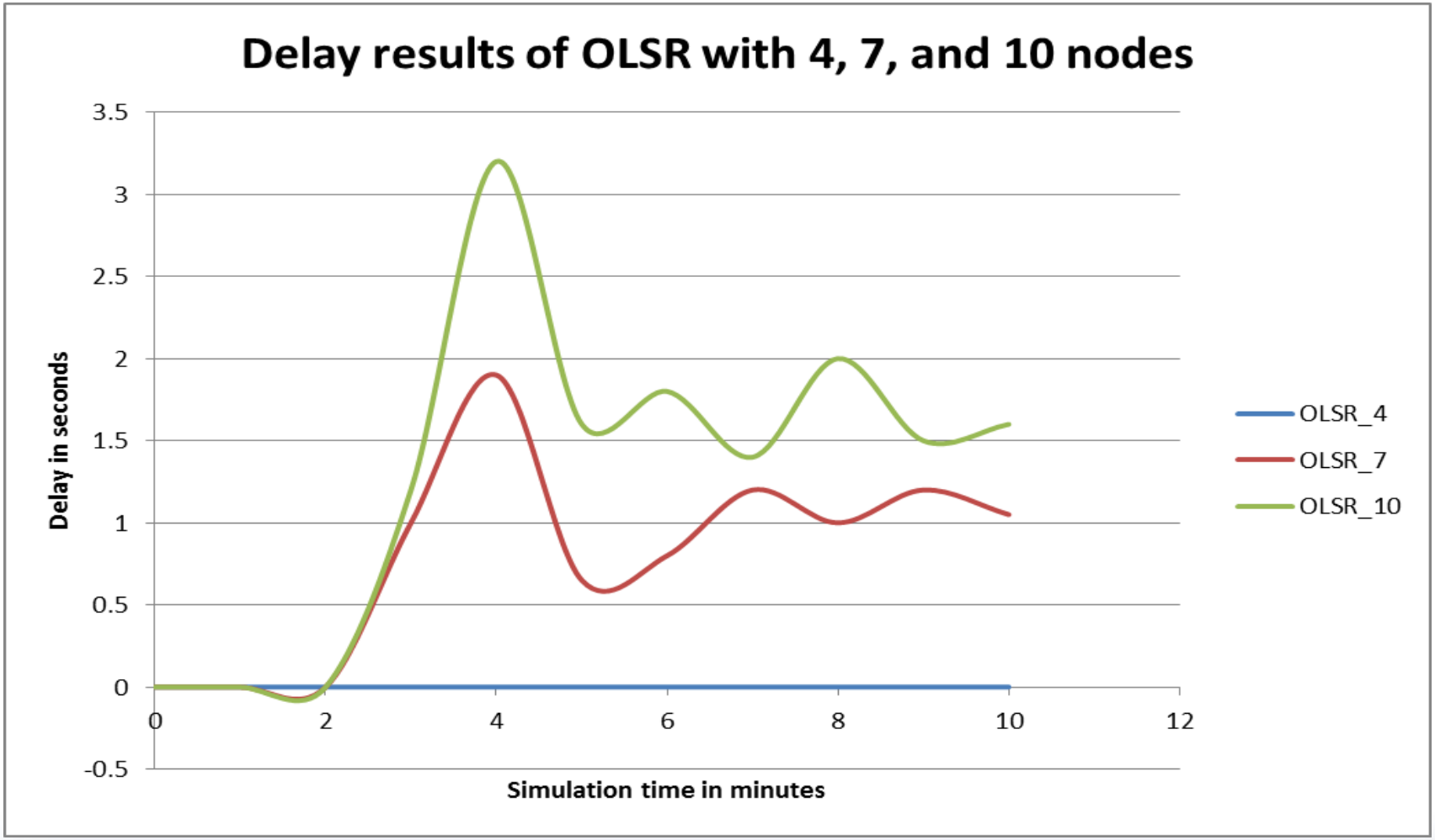
Example of delay results



Example of delay results (2)



Example of delay results (3)



Example of delay results (4)