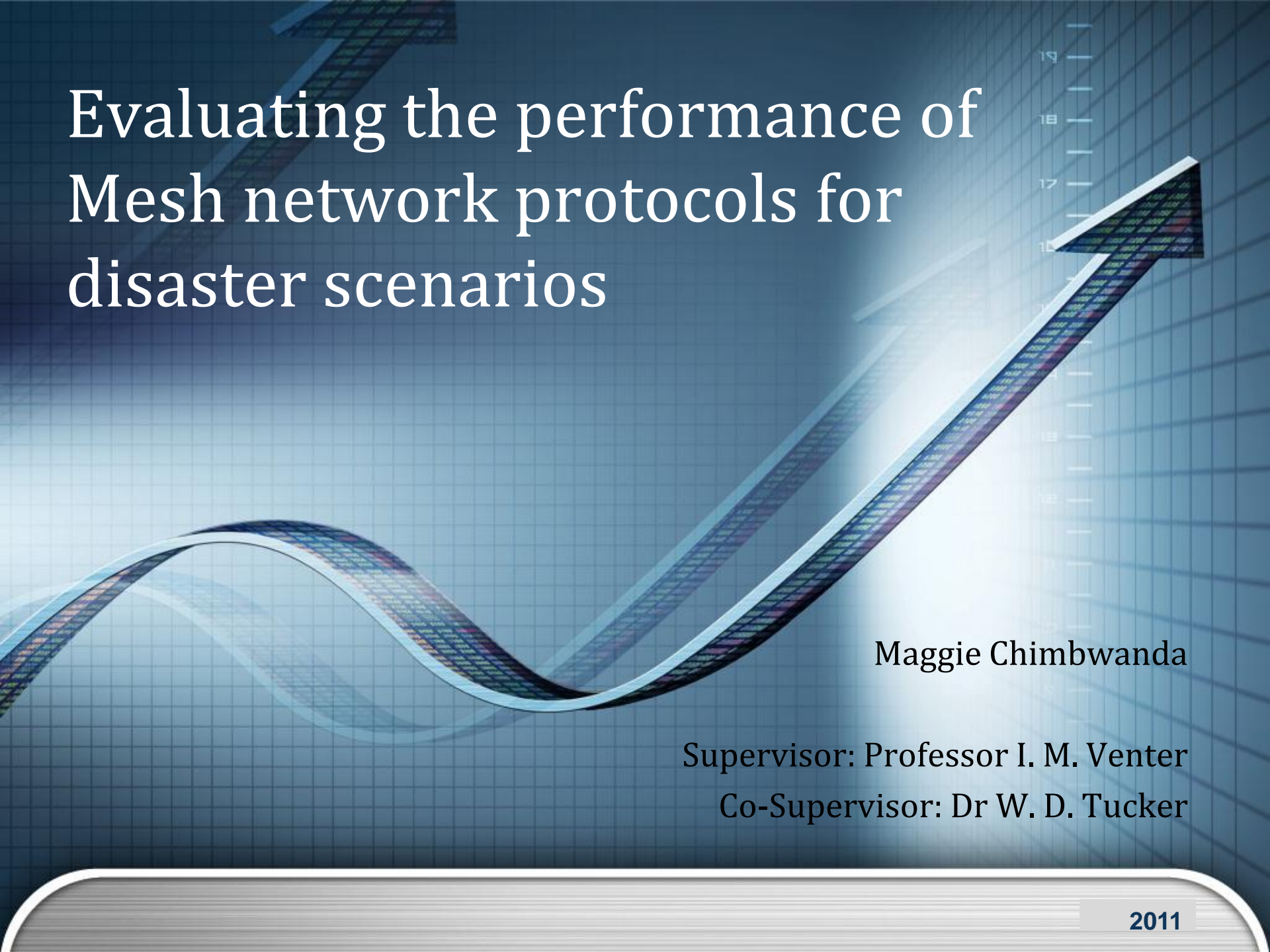# Evaluating the performance of Mesh network protocols for disaster scenarios

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Introduction

❖ Project Aim
- ❏ Evaluate the routing protocols **AODV, DSR, OLSR**, using **UDP**.
- ❏ Test which is the best routing protocol for these applications under the performance metrics **throughput, delay,** and **network load**.

❖ Performance Metrics
- ❏ **Throughput** - tests the amount of data that reaches the receiver from the source to the time taken by the receiver to receive the last packet.
- ❏ **Delay** - tests the number of time taken by packets to pass through the network.
- ❏ **Network Load** - test the amount of data traffic carried by the network.

❖ Simulation Tool
- ❏ **OPNET** (optimized network evaluation tool)

Overall project configuration

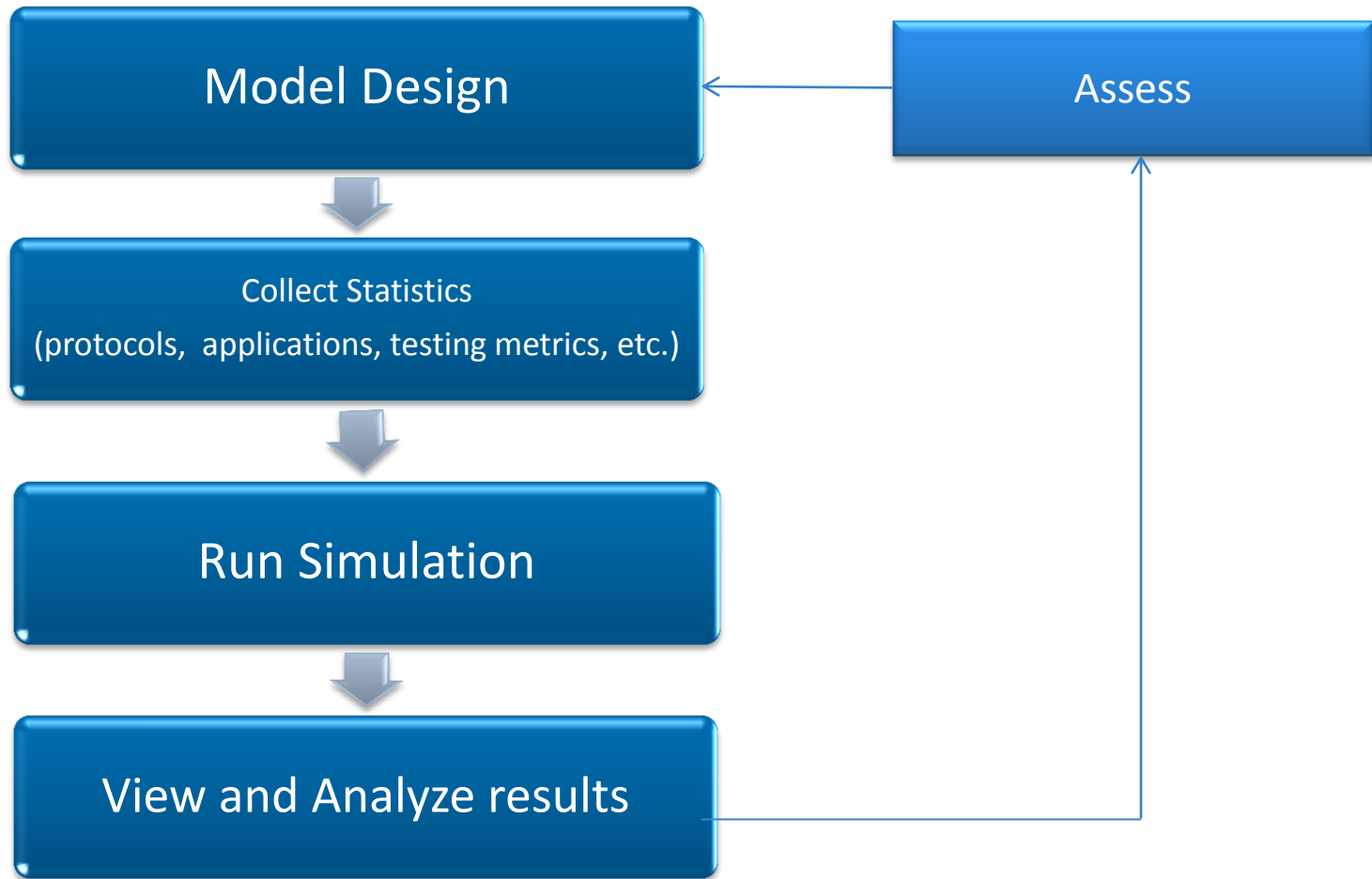| Scenario	Parameters						
	No. of nodes	Routing protocols	Other protocols	Performance metrics	Simulation radius	Mobility rate	Simulation time
1	4	AODV, DSR & OLSR	UDP	Throughput, delay, network load	1000m x 1000m	10 meters/sec	10 min
2	7	AODV, DSR & OLSR	UDP	Throughput, delay, network load	2000m x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

Prototype

❖ Pilot Study

❑ Also known as a pilot experiment

❑ A small scale preliminary study conducted before a large-scale quantitative project is implemented

❑ Checks the feasibility

❑ Improves the design of the whole project

Pilot configuration

Scenario	Parameters						
	No. of nodes	Routing protocols	Other protocols	Performance metrics	Simulation radius	Mobility rate	Simulation time
Pilot	4	AODV, DSR & OLSR	UDP	Throughput, delay, network load	100m x 100m	5 meters/sec	10 min

(OPNET) Simulation workflow

Model Design

Collect Statistics
(protocols, applications, testing metrics, etc.)

Run Simulation

View and Analyze results

Assess

Lower-level design

❖ Packet forwarding from one node to another

```
public void packetSending(){
if(nodeDes == available){
        if(routeDes == available){
                sendMessage();
        }
        else{
                broadcastMessage();
                waitReply();
        }
        forwardPackets;
        recieveAck();
}
```

Timeline

	Term 2							Term 3					
	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
Overview of protocols	█	█	█	█									
Simulation envroment analysis				█	█								
Pilot study						█	█						
Demo						█	█						
Documentation							█						
Construction								█	█	█			
Implementation										█	█	█	
Documtation												█	█

References

❑ Sajjad Ali, Asad Ali. "Performance Analysis of AODV, OLSR, and DSR in MANET." essay.se. 2009. http://www.essay.se (accessed 01 18, 2011).

❑ Yamsani Ravikumer, Sarath Kumar Chittamuru. "A Case Study on MANET Routing Protocols over HTTP and TCP." essay.se. 06 2010. http://www.essay.se (accessed 01 25, 2011).

❑ J.F.Kurose, K.W.Rose. "Computer Networking: User Datagram Protocol." Wikipedia. 2010. en.wikipedia.org/wiki/User_Datagram_Protocol (accessed 05 10, 2011).

❑ Haralambos, Holborn. "Sociology: Themes and Perspectives." Wikipedia. 2000. www.wikipedia.com (accessed 05 04, 2011).

Demo

❖ Configuration of pilot experiment

❖ Running simulation

❖ Acquiring results

❖ Comparison of results

Prototype results

❖ Global results

 – gathered from the entire network

❖ Object results

 – gathered from individual nodes

Pilot study conclusion

Protocol	Throughput	Delay	Network load
AODV	Low	High	Low
DSR	High	Low	High
OLSR	High	High	High

- ❑ DSR outperforms ADOV and OLSR in throughput and delay
- ❑ ADOV outperforms OLSR and DSR in network load