**Explanation of Our Simulation**

## Physical layer

The physical layer controls the node locations and their channel access. There were very few design decisions to be made here since the number of nodes was already fixed at 50 and the nodes were to be moved randomly. The method used to move nodes randomly was the random waypoint model which has two components: the first is that the node determines the point at which it will move to and moves there at a fixed rate, during the second component the node will pause at the destination location before choosing a new location and speed to move to. In this case there were three constant node speeds tested at: 1m/s, 10m/s and 20m/s. The time the nodes paused for was 0 seconds. The only other variable in terms of node location to be made was the initial position of each node. This positon of the nodes was determined to be random in the 1500x1500 metre area.

The channel access portion of design involved the selection of a physical layer protocol and an appropriate error. Because the design brief asked for a wireless adhoc network the 802.11 protocol was installed onto all nodes. It was assumed that the wireless network was designed in a wide open space and that the role of the intermediate nodes was simply to relay packets. Because of these assumptions a constant rate of propagation delay was used and the Friis Propagation Loss was used to model packet loss in the network.

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| --- | --- |
| Network Parameter | Value |
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Table - Physical Layer Parameters

## Data Link Layer

The data link layer only need to be modelled at the MAC layer. Within the MAC layer there is only one parameter that needs to be set. The Quality of Service type and the type of network that the MAC layer is implementing. The network type is stated in the design brief; it is an Ad-Hoc network. As per the assumption in the stated in the Physical Layer the intermediate nodes act as simple relays. As such there are no preferences within the traffic so there will be no QoS required in the model. For the Internet Layer the only features to configure are the protocol type; as stated in the design brief the protocol being used is the OSLR routing protocol.

|  |  |
| --- | --- |
| Network Parameter | Value |
|  |  |
|  |  |

Table - Data Link Layer Parameters

## Application Layer

IP Stack/Traffic

* 10/20/30 Source & Sink Nodes
* Install DSDV on all nodes
* Traffic is CBR which is on for 1 second and off for 0 seconds

**What we’re testing for**

IMPLEMENTED Throughput: The amount of data received by the network divided by the amount of time

NOT IMPLERMENTED Packet Delivery Ratio PDR: The number of packets received divided by the number of packets sent by the application.

NOT IMPLERMENTED Routing Overhead: The fraction of bytes used by the protocol for DSDV control messages

**Test Cases**

Part 1: Replace trigger updates with periodic updates in DSDV routing protocol

Part 2: Create a modified protocol with no trigger or periodic updates.

Install this protocol on the 5/10/15 nodes

Install normal DSDV on the rest

Part 3: Use RNG. If RNG is greater than 0.4/0.5/0.6 then delete a random column?

Each update? For an entire sim? Do you mean row?

Add the new function in add route.

Part 4: Applies to block of code in dsdv-routing-protocol.cc line 631:722.

Everything should fall under the first if block

**Results**