

# IoT Challenge #2

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## Introduction

The IoT Challenge #3 was part of the Internet of Things(IoT) Laboratory session. The topic of the Challenge was TinyOS and TOSSIM.

The goal of the challenge included implementing the topology as shown in figure 1, developing a TinyOS application to be simulated with TOSSIM, implementation of a simple routing protocol based on broadcasting using a sample sketch provided.

The implementation of the topology can be found in the topology.txt file.

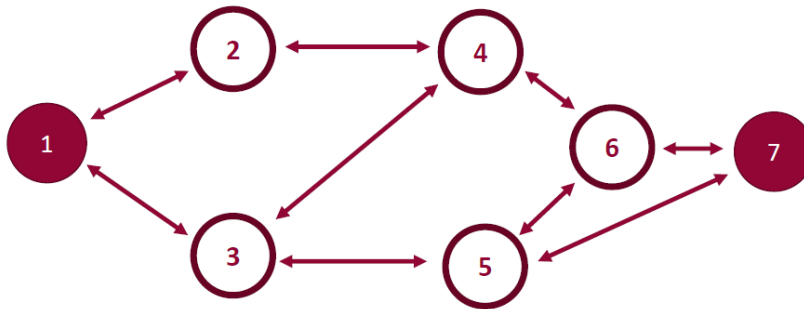


Figure 1: Topology that was to be implemented.

## Routing Protocol Specifications:

The routing protocol design should implement the specification given below,

- Before transmitting a message, each node checks its routing table to see if a route is present for the selected destination:
  - if the destination is present, the message is forwarded to the **next hop** indicated in the routing table.
  - Otherwise a ROUTE\_REQUEST message is sent in broadcast, containing the selected destination in the message.
- If I receive a ROUTE\_REQUEST I should:
  - Broadcast it if the ROUTE\_REQUEST is a new one.
  - If I am the node requested, I reply in broadcast with a ROUTE\_REPLY, setting the ROUTE\_REPLY cost to 1.
  - IF the node requested is in my routing table, I reply in a broadcast with a ROUTE\_REPLY, setting the ROUTE\_REPLY cost to the cost in my routing table + 1.
- If I receive a ROUTE\_REPLY, I should:
  - If I am the requested node in the reply, do nothing.

- If my table does not have entry or if the new cost is lower than my current cost, I update my routing table and then forward the ROUTE\_REPLY in broadcast the cost that is incremented by 1. Else I do nothing.

## Message Formats:

- Data Messages
- Route Request Messages
- Route Reply Messages

The algorithm used to implement the above specification is given in figure 2.

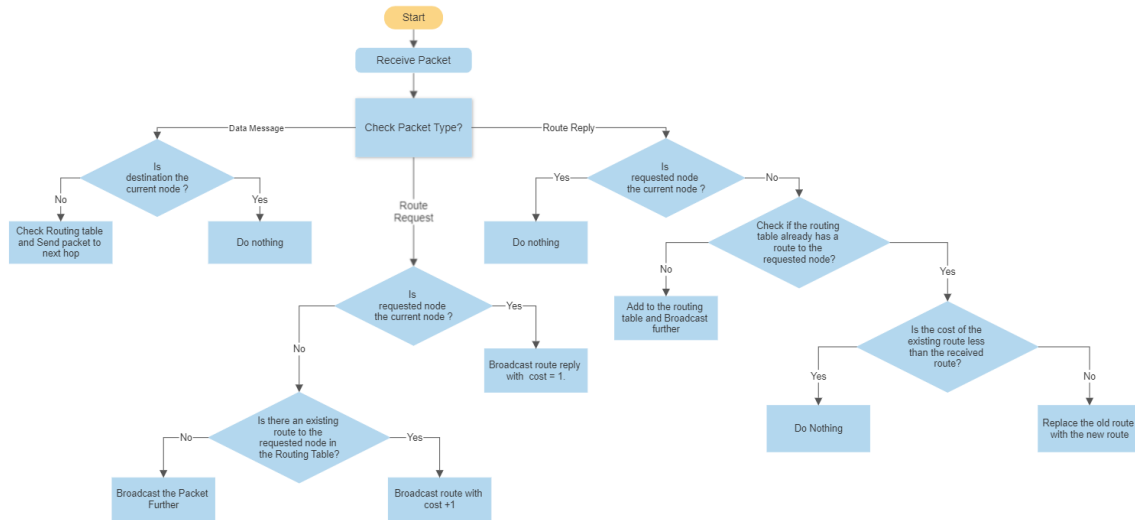


Figure 2: Routing protocol flowchart

## LED Control:

I should also toggle the LEDs of the node 6 based on the number of packets received and my person code. The algorithm used to implement this is given in figure 3.

## Files Attached

As supporting files to the above explained flowcharts the **TOSSIM compatible .nC** file and the **log.txt** file can be found in the **10881210.zip** file.

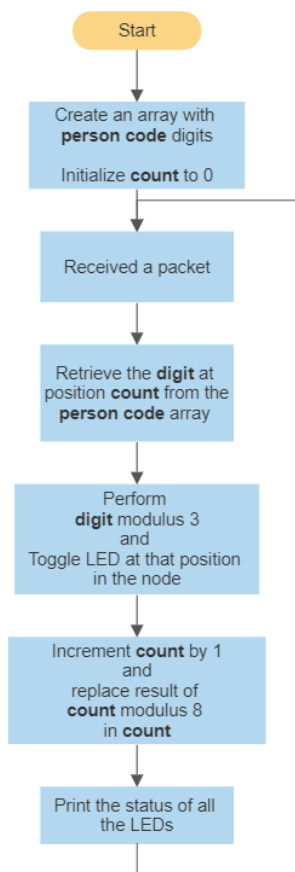


Figure 3: LED toggling flowchart