1. The structure of the program
   the codes of this project about core router is under the CoreRouter file
   the codes of this project about edge router is under the EdgeRouter file
   Makefile   the makefile of the project

   For CoreRouter file

   1) Router.h   the header file which include the data structure we use

   The Core -> Edge payload data structure was defined in this file, which is shown below
   typedef nx_struct CoreEdgeMsg {
     nx_int16_t From;
     nx_int16_t Bcast;
     nx_int16_t Msg;
   } CoreEdgeMsg_t;

   The Edge -> Core payload data structure was defined in this file, which is shown below
   typedef nx_struct EdgeCoreMsg {
     nx_int16_t From;
     nx_int16_t Bcast;
     CoreEdgeMsg_t Msg;
   } EdgeCoreMsg_t;

   For matching sender and receiver AM type
   enum {
     AM_RADIO = 8
   }

   2) CoreRouterAppc.nc
   The configuration of CoreRouter

   3) CoreRouterC.nc
   1. Receives message from edge router
   2. Prints messages
   3. Send ACK back to edge router

   For EdgeRouter file
   1) Router.h is as same as the Core router.h
   2) EdgeRouterAppc.nc
      The configuration of EdgeRouter

3) EdgeRouterC.nc
   1. Create host table filled with entries EdgeRouter (between 1 to 4, the number depends on edge router ID)
      Host (between 1 to host limit which randomly generate between 10 to 99)
   2. Create destination table filled with EdgeRouter and host
   3. Generate random timer for sends
   4. Pick random host from host table for From field of message, choose pre-defined CoreRouter ID for Bcast field of message
      For field:
      Bcast: Random Router/host pair from destination table
      From is same
      Msg: Random 16-bit number

      Toggle Led 1 after send
   5. Receive ACKs from core Router toggle Led 2 after receive

2. How to compile the code

To compile/ install core router:

Make sure to be in the CoreRouter Directory & a genomote is detected by the PC

Type:

Make genomote install.550 master

To compile/install edge router:

 Make sure to be in the EdgeRouter Directory & a genomote is detected by the PC

Type:

make genomote install.1 master (For 1st edge router)

make genomote install.2 master (For 2nd edge router)

make genomote install.3 master (For 3rd edge router)

make genomote install.4 master (For 4th edge router)

To test system:

Make sure all edge router are in the RUN position& the core router is in the PRO position and connected to the PC

To read messages

Type: java net.tinyos.tools.PrintfClient -comm serial@/dev/ttyUSBX:57600

For the USBX use port # associated with Core Router

An example of what will be displayed by PrintfClient:

Message received… E1H37 E5H50 E1H37+E3H52+9497

What is all means

E1H37 – the source (Edge router)

E5H50 – the destination (Core router)

E1H37+E3H52+9497 – the payload

      E1H37 – the source (Edge router)

      E3H52 – the true destination (Edge router)

      9497 – the true payload