IRT Client and Server Sketch Notes:

**SETUP**

* Before starting, you’ll need a list of the plot/rep numbers for each setup, and you must assign a unique radio ID to each client and server (I’d recommend leaving either 1-6 or 250-255 reserved for the server radio IDs)

Client:

* Enter the corresponding server’s radio ID
* Enter the authentication key (**25595**): This is used to verify the client communicating with it so that rogue clients/microcontrollers cannot communicate with the server and mess with the data
* Enter the client’s plot number, rep number, and radio ID
* You’ll probably want to test the sensors before you start too

Server:

* Enter the server’s radio ID
* Make sure the time and date are correct
* Make sure the client list is empty

* + Either enter “i” then “-1” or type “r” (completely erases flash memory)
* **Easy Sync:**
  + Enter ‘a’ on the server
  + Enter ‘a’ on one of the clients (\*\*MUST BE DONE AFTER SERVER\*\*)
  + The client’s information should be automatically added to the list of Current Clients
  + The client’s clock should be synced with the server’s clock
  + Repeat for each client for that server
* **Manual Sync:**
  + Enter ‘i’ on the server
  + Enter the plot number, rep number, and radio for every corresponding client
  + Enter -1 for the plot number when you are finished
  + Make sure all the client clocks have the correct time

**EXECUTION**

(Note: some of these specific time intervals and time-outs are being adjusted as we adjust the sketch. Currently the clients are sending data every half hour instead of every hour.)

* Clients will take measurements every 10 minutes. If you want to change this, you’ll have to go into the code. You can only use intervals longer than 10 minutes that are factors of 60
* On the top of the hour, the clients will stay awake after taking a measurement rather than going back to sleep
* Servers will communicate with their synced clients every hour. It runs through the list of clients one by one and sends them a request with a timestamp in the metadata. If it does not receive an acknowledgement with data within 5 seconds, it moves on to the next client.
* Upon receiving the request, the client updates its clock and sends all the data it has stored since its last transmission, ending with a message containing “XXX\_Y#”, signaling the end of the transmission.
* The server saves each data transmission to the section of Flash memory allocated for that client. Upon receiving the final transmission from the client, it will move onto the next client in its list.
* Clients will stay awake for at most 2 minutes before going back to sleep. If they have not received a request within this time, they will go back to sleep after the 2 minutes. However, if the 2-minute mark occurs while it is communicating with the server, it will wait until it is done communicating to go back to sleep.
  + Note: In the case that a client loses connection with the server for an extended period (not to exceed ~6 days, or else the allocated Flash memory on the server will not be able to contain all the data), all data will be sent in the first transmission back connected. In all likelihood, this will cause some, if not all, of the rest of the clients to miss their transmissions. This is fine, because it will just catch up on the following transmissions.
* The Server will save all its unsaved data from Flash onto the SD card into unique files for each of the clients at the end of the day (7pm). It will erase all Flash memory (besides the first block where all the critical client information is saved) at this time.
* You can also manually download all unsaved data at any point using the menu
* Servers and Clients only run from 7am to 7pm (inclusive)