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Course: Secure Sensor Network Systems

Project: Arduino-based test beds

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SSNS Project Work: Introduction

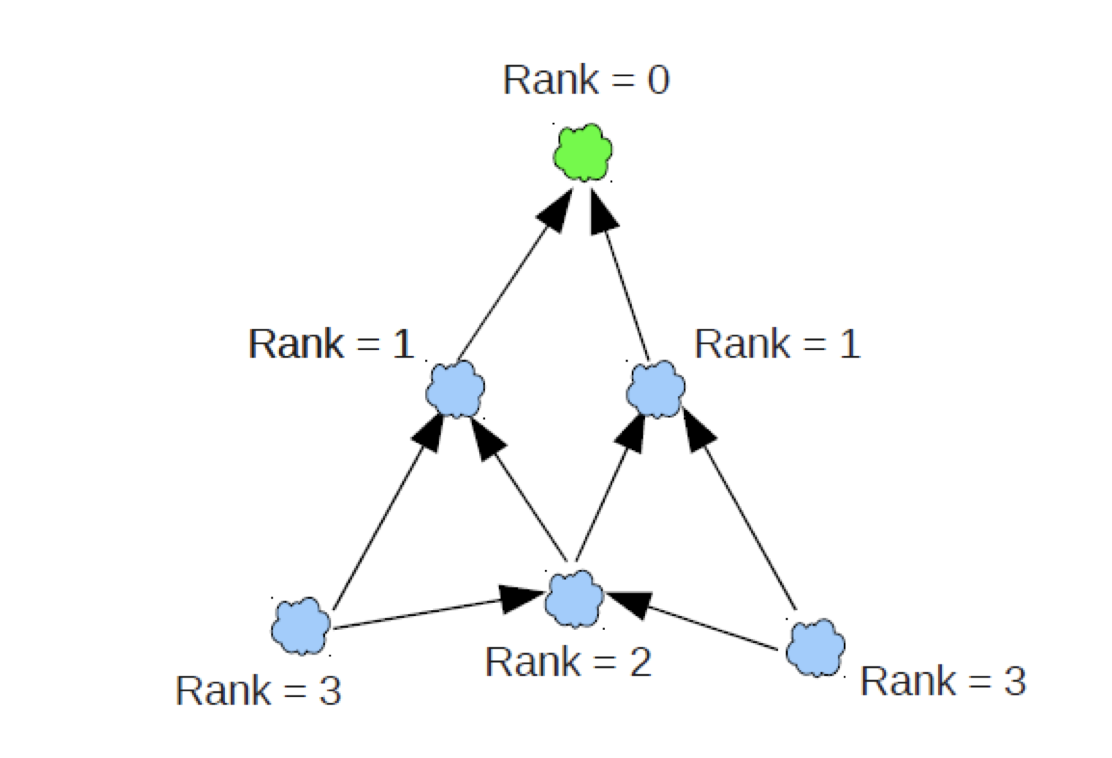
This project has the intention for us to learn about networking technologies right on low level. The project uses DIGI XBee S2D shields for communication. We have five sets of: Arduino, XBee shield, XBee transmitter, Sensor (either proximity or humidity+temperature).

Since the original documentation for the project requirements were ambiguous, we decided to make an implementation as close as possible.

One of the five devices will be solely a **base station**. This base station will receive the data from other devices and forward it to (TODO) USB serial for remote monitoring. We consider USB Serial is remote enough for this project, since we don’t have Bluetooth or WiFi shields to send data to cloud. The purpose of the project also is not to build something in the cloud but wireless secure networking on ground.

The other four devices will have one of two sensors: temperature & humidity or proximity. Each device will read and process the data from the respective sensors. The processed data will then be sent to the base station for remote monitoring. The base station itself does not make use of a sensor since we have decided that its sole purpose is to gather the data and forward it in good telemetry. If we were to mix the base station with sensor logic there could be problems in future with scalability.

The telemetry from the sensor devices is transferred to the base station with RPL IPv6 via mesh network. In this kind of scenario, we can have the devices more far away from the base station. See the illustration below.



The difference with the illustration and our system is that we have only 5 devices from which one is Rank 0 device, the receiver. Other devices than Rank 0 device are defined to be transmitters. Transmitters ranks are dynamic with RPL stack so they can hop on each other based on signal strength.

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