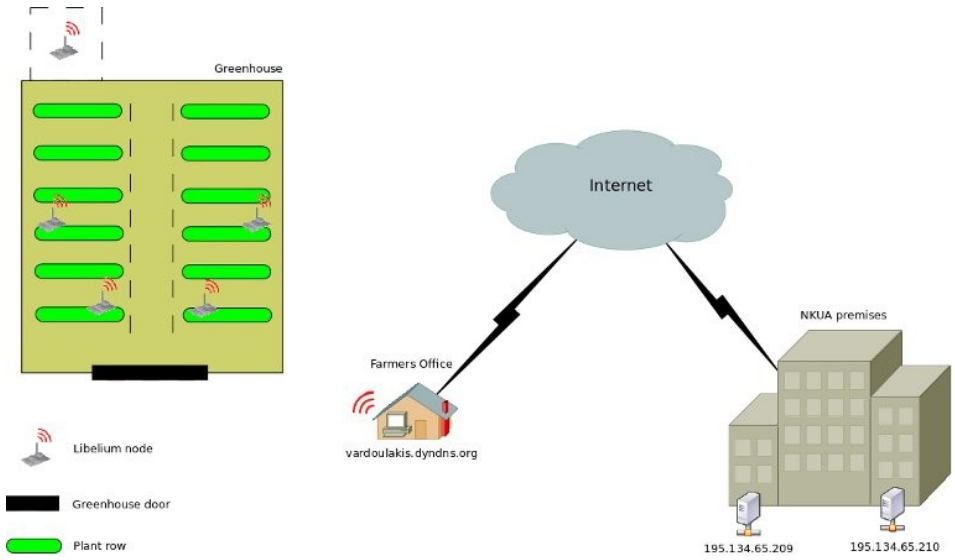
Demonstration Application – Greenhouse Management

High Level Description

The Greenhouse pilot consists of the "Greenhouse part" and the "Cloud Part". Inside the greenhouse, the deployed wireless nodes send their measurements periodically to the gateway which is deployed on a commodity PC located at the farmer's office, not far from the greenhouse itself.

The greenhouse is approximately 10000m^2, having an almost rectangular shape. The deployed nodes are equipped with 3 soil moisture, 3 temperature, 3 relative humidity, 1 CO2 and 1 PH sensors. There is also a node outside the greenhouse equipped with a temperature sensor. The end use application is a simple Web frontend, the Greenhouse Management Web application. Thus, the user is confronted with a friendly web application and can easily interact with the system without getting involved with the underlying complexity.

From there, the information is propagated to NKUA premises and specifically to the FMS controller which is deployed in a server with public internet IP. The processed information and the extracted knowledge are subsequently presented to the farmer via a web based portal, deployed on another server. The topology is presented below:



Supported Functionalities:

The operational version of the application supports the following features:

- Automatic identification of user location
- Manual definition of farm location
- Constant monitoring of crops and presentation to the user via numerous visualization options (charts, tables)

- Constant advisory of the farmer regarding the status of his crops using a built in expert system
- Alert of the farmer in case erroneous values a reported from the sensors
- Support for over-the-air firmware update. Sensor boards' firmware is upgraded on the fly with no user intervention
- Service providers can offer their services provisioning through a dedicated portal
- The farmer can consume a service through a dedicated page on his portal
- Constant monitoring of billing information
- Constant monitoring of networking environment (internet connectivity, bandwidth)
- Self management and Self-healing capabilities, transparent to the user (autonomous decision making and implementation of remedy actions in case internet connection is down)

Demonstration Video:

The short version of the demonstration video contains only user related information and demonstrates how the average person would exploit the functionalities of the portal. The longer version contains additional information related to the cognitive and self-management capabilities of the system, presented by means of real-life experimentation.

Short version: http://www.youtube.com/watch?v=oCWKk3GaTx8

Longer version: http://www.youtube.com/watch?v=dDq4RQYNiNs