

Wireless Sensor Networks

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Introduction

The purpose of the project is to utilise Wireless Sensor Technology to control the ambient temperature of a room. Wireless Sensor Networks, Figure 3, utilise wireless sensors to gather information, which is relayed to a hub device. Based on information received, various operations, such as lighting or temperature are altered [1]. Example if a room is above predetermined levels, steps will be taken to reduce this temperature via air conditioning or opening windows [1].

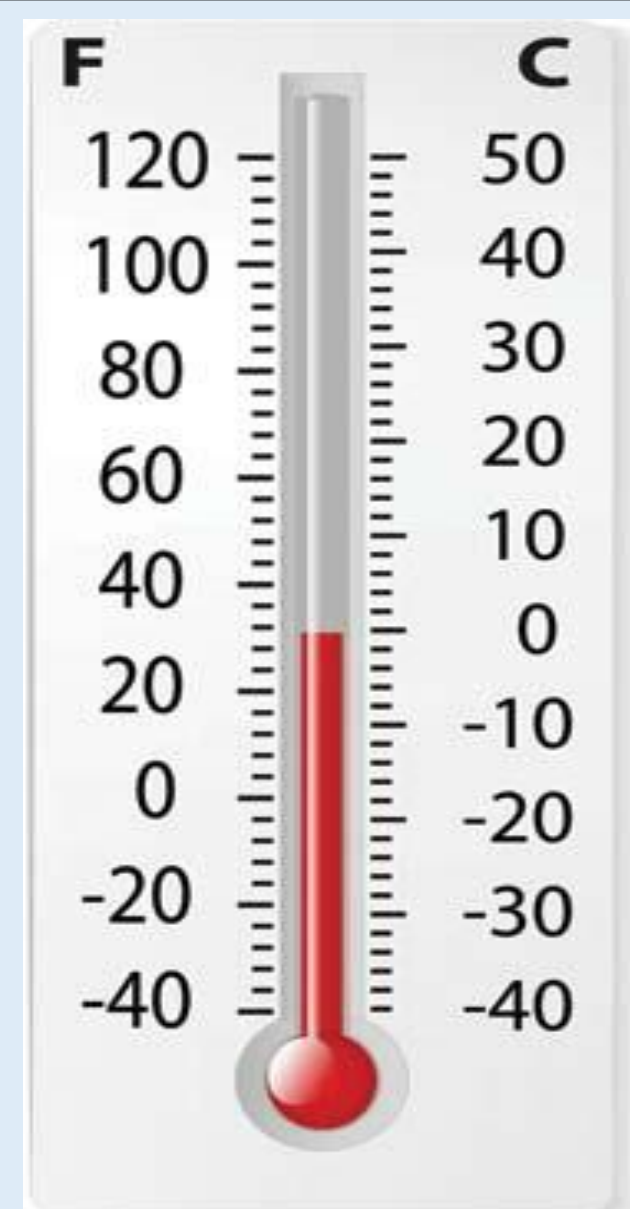


Figure 1
Thermometer [2]

Aims of the Project

The aim of this project is to create a Wireless Sensor Network which can detect the ambient temperature of a room. Using this information, steps will be taken to adjust the room temperature to predetermined levels. These steps include using heating a room if the temperature level is below the threshold, using air conditioning if the temperature is above the set threshold or utilising energy efficient methods such as opening a window to allow air flow to cool the room temperature.

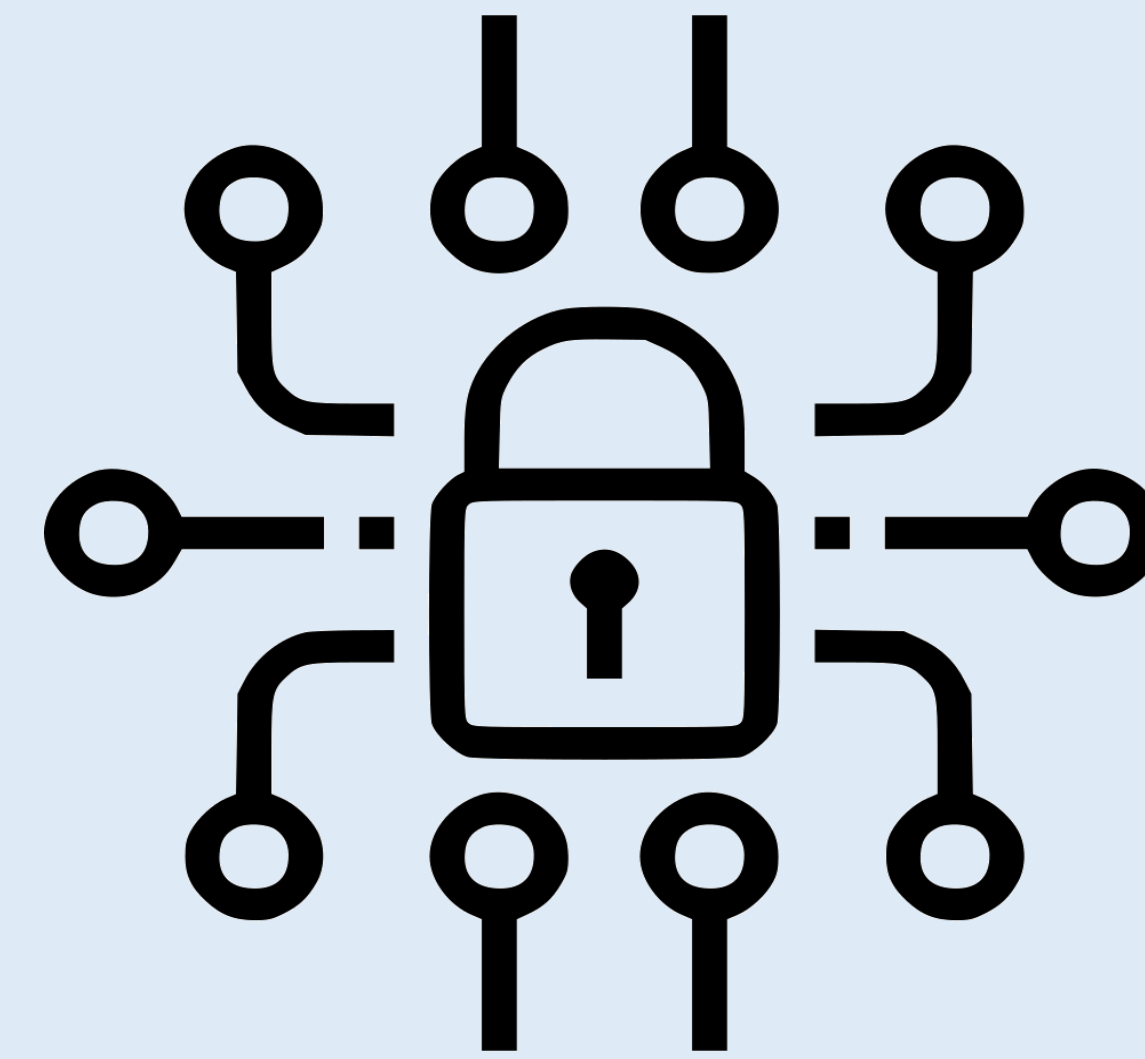


Figure 2 Cyber Security Icon [3]

Objectives

To accomplish this task, a simulation of the wireless network will be created to determine the location of various sensor devices. This simulation will be based on the layout of a predetermined test room, which will give a greater understanding of where devices should be located.

A Wireless Network will then be set up within a test room. This network will then collect data on various aspects, such as temperature and weather. This data will then be used to determine temperature changes and the most efficient method to utilise.

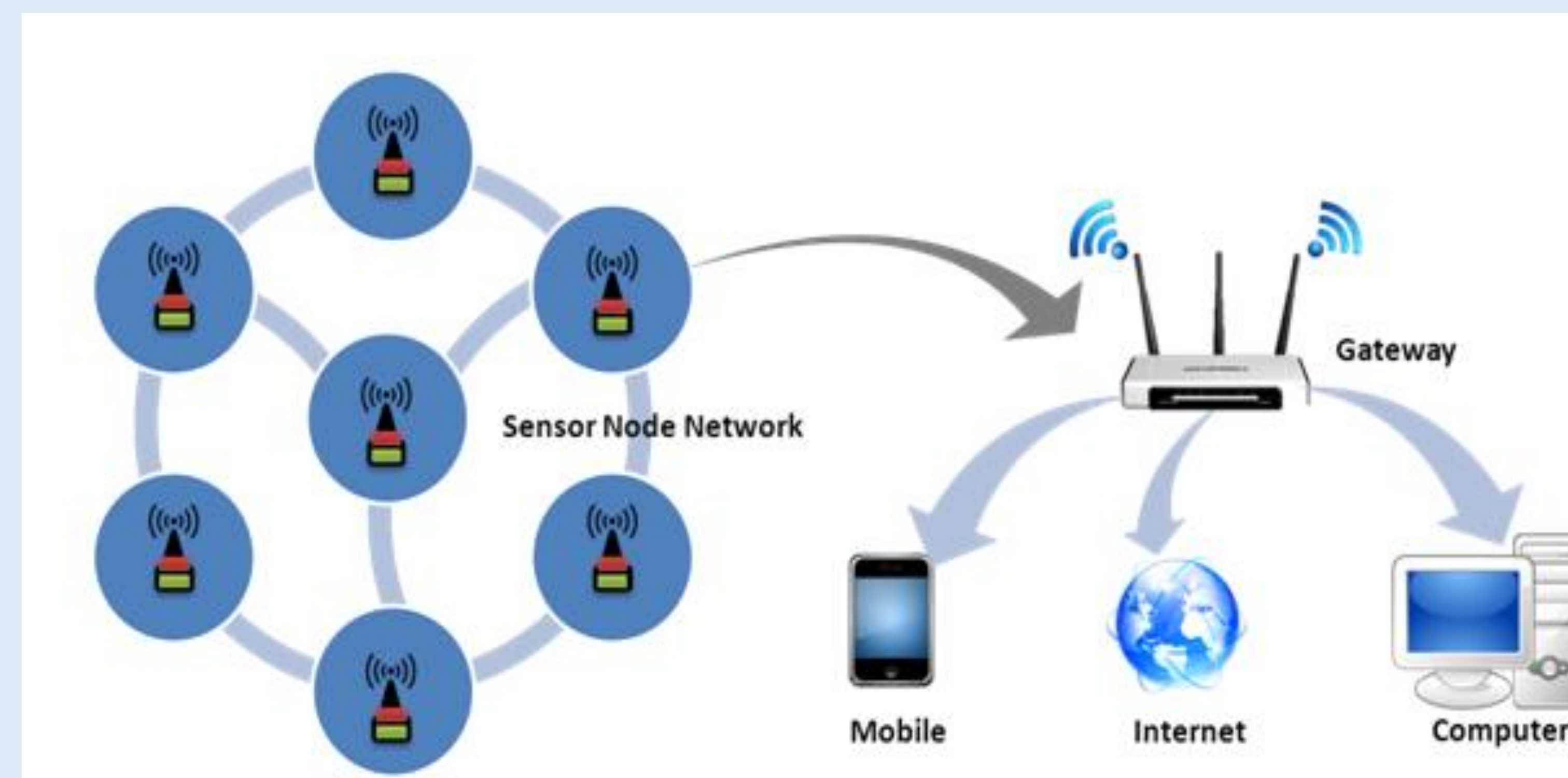


Figure 3 Wireless Sensor Network [4]

Risk

There are certain risks which require specific attention, such as:

Devices can be damaged or lost, therefore careful handling of devices, as well as some backups, will be used.

Devices can be hacked, so devices will have password security, as well as possible signal encryption, in order to minimize this security risk.

Resources

Resources required to accomplish this project include:

A computer device with the required simulation software, I.E. Netsim or Packet Tracer.

Sensor devices, ranging from temperature, lighting, motion and weather sensors.

A room which can be used to set up the Wireless Sensor Network in order to run the project and gather information

References

- [1] S. Chaturvedi, S. Parihar and V. Samarth, "Design of a Network for Detection of Environmental Condition Using Wireless Sensor Network Technology," in *2014 International Conference on Electronic Systems, Signal Processing and Computing Technologies*, 9-11 Jan. 2014, pp. 198-203.
- [2] Thermometer picture available at <http://kids.britannica.com/students/article/thermometer/277324>. Date Accessed 4 Oct. 2017.
- [3] Cyber Security Icon available at <https://www.onlinewebfonts.com/icon/551740>. Date Accessed 4 Oct. 2017.
- [4] Wireless Sensor Network available at <https://ns2projects.org/ns2-simulation-code-for-wireless-sensor-network/>. Date Accessed 4 Oct. 2017.