WASP
Wireless Arduino Sensor Protocol

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Synopsis:

Synopsis her!

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Contents

1. Project introduction

This is an introduction.

Here is the initializing problem statement:

1.1 Initializing problem statement

How can a sensor network and a protocol be designed, so that data can be relayed throughout the network, enabling an endpoint device to receive the information without being within range of all sensors in the network?

It is a good question and we will analyze it.

Part I

Analysis

The analysis will discuss and look into the different aspects of the initializing problem formulation and the topics therein. The sections in this chapter blah-blablah..

2. Context

3. Use case

The purpose of this project is to create a protocol that allows multiple Arduinos to share data to a single endpoint, but a use case is needed to test the protocol.

The chosen use case for this report is soil moisture sensors for use on golf courses. A golf course is usually very large, and covering an entire golf course with cords would be a big task. Furthermore this would make the system hard to extend and almost impossible to make hot pluggable.

This makes this project a good use case for golf courses, as soil moisture is important in determining where it is necessary to water the course.

4. Technologies

We shall look at some existing technologies now.

4.1 Networks

This section will contain descriptions of networks and network theory, and connect to the established use case.

A computer network is a collection of computers and devices connected so that they can share information and services [1]. The way these devices are interconnected is called topology. The communication structure the devices use to exchange information over a medium is called protocol, which will be described in another section.

In this section the term node is used for a device connected to the network, to avoid binding to a specific device type.

There are different types of network topologies, and here are some examples:

- Ring
- Line
- Bus
- Tree
- Star
- Mesh
- Fully connected

These can be seen in figure xx, that will be put here somewhere.

The star network has one main node that the other nodes are directly connected to. An example of a star topology network is wifi, typically with a wireless router to which other devices connect to gain network access. The wireless router will handle all the network communication and redirect the information to the correct device. A limitation of the star network is that all network devices must have a connection to the main node, and therefore be clustered within the reach of the main node coverage.

A tree network also utilizes a main node, but the devices in the network do not necessarily connect directly to the main node, but rather connect to another node that relays to the main node. This can repeat over multiple levels, so that information is relayed through several nodes, before reaching the main node. The tree network has a fixed node structure, and the relay nodes will route the information towards the destination.

Another topology is the mesh network. There are two kinds of mesh networks, the full-mesh and the partial-mesh networks. A full-mesh describes a network where all the nodes are interconnected, similar to a fully connected graph. A partial mesh is also a mesh network, but does not require all nodes to be connected, so that it's similar to a tree network with cycles. The mesh networks have the same limitation as a tree network, regarding the information transmission delay because the information transmits through up to several nodes.

The best fitting network topology for the use case is a mesh network. It can transmit information through the network without limiting the connected devices to a certain distance from a main device, as with a star topology. It is also capable of multiple methods of distributing information. It does not rely on all nodes working at all times, as the network can reconfigure and find another path of information. This applies as long as there somehow exists another node that can relay the information towards the main node.

Move this paragraph? There are multiple methods of communicating through a mesh network. Routing and flooding are two alternatives. Routing will transfer the information towards a destination node, whereas the flooding method will ask all nodes within reach to spread the information forwards, and this will repeat until all nodes has transmitted the information, and hence the destination node also has received the information.

4.2 Wireless communication

4.3 Communication protocols

5. Problem Statement

Very good problem statement for you, my friend. Special prize.

Make a good sending data network for arduino.

5.1 Requirements

There are some requirements to the system and its software. These are split in two categories: functional and non-functional. This is based on some smart guys work [**keylist**].

5.1.1 Functional requirements

The list of functional requirements:

1. Actually run is an important part to passing the exam

5.1.2 Non-functional requirements

List of non-functional requirements:

1. Looking good is not a bad thing.

Part II

Implementation

6. Theory

7. Design

8. Implementation

9. Test

Part III

Conclusion

10. Reflection

oh..

10.1 What have we done!?

11. Summary

ok..

11.1 It ended like this

12. Future Work

Here's what's missing..

12.1 To be done

Bibliography

[1] K. Mansfield and J. Antonakos. *Computer Networking for LANS to WANS: Hardware, Software and Security*. Networking (Course Technology, Inc.) Cengage Learning, 2009. ISBN: 9781423903161. URL: https://books.google.no/books?id=VQvhAN9iBuMC.

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Part IV

Appendix