The Importance of Embedded Security in the Future of Conservation

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There is a move in our society to build things smaller and interconnected. This push for smaller and interconnected devices has led to many positive advancements, like devices that have made it easier to conserve resources. Some examples of this are wireless thermostats, wireless sprinkler controllers, wireless home controls, etc. These devices have not only made it possible to conserve easier, but they have increased the number of people who do conserve. However, this interconnection of things, or "internet of things" as it's commonly referred to, has caused a new problem. The connection of these small devices has exposed them to the to the dangers of being connected to the internet.

This move to smaller and interconnected devices has left these devices susceptible to attack. The reason is that these smaller devices have to naturally use smaller, lower power processors. These devices are lacking the resources necessary to use traditional security methods. As a result, most are forced to use weaker security methods or no methods at all. If we are to continue down this path of innovation and interconnection, then we have to address the topic of security.

While there are many currently working on this topic, it is far from being a forefront issue. This poster presents many different types of security methods and how they are traditionally implemented as well as reasons why they are or aren't good options for embedded security. It will also present possibilities in the future for embedded security.

The types of security that will be addressed in this poster will be cryptography, certificates, security by design, and the concept of an extra security modules. These will be addressed briefly with graphics showing the concepts in an easy to understand manner. The goal will be to make those in attendance aware of embedded security, to discuss current methods, and stimulate thought for new ideas.

As the next generation of engineers, it is our responsibility to continue the movement towards conservation and refine the methods that are currently being implemented. Making conservation easier will directly influence the number of people who participate. As these changes are made, it is important to do it methodically to assure that in the rush to find solutions corners aren't cut on security. After all, what's the point of having an automated thermostat if your neighbour can login and change your settings? What's the point of automating solar systems if they can be hacked and directed incorrectly? What's the point of using water monitoring systems if they can be spoofed? It's great to have these options but it's pointless if you can't insure that they are safe and secure.

Embedded security is a topic that needs to become more of a focus because sooner or later it will become critical. It's important to work toward new and more secure methods that can be managed with fewer system resources, so these devices will be prepared to integrate into these conservation tools making the advancements both life changing and secure.