PROPOSAL FOR LCN DEMONSTARTION

Energy Measurement of RFID devices

Radio Frequency Identification (RFID) is a general term employed to explain an emerging technology that involves the transmission of information in form of radio waves from one object to another for the purpose of identification. RFID is swiftly evolving as a major technology for remotely tracking goods and assets throughout the globe. RFID is fundamentally an enabling technology that assists the employers to create applications which provide security and efficiency.

RFID technology is one of the most exciting and upcoming technologies. It has got various applications such as inventory control to keep a track of products and also used in a number of diverse applications like in medical sector to improve patient care, vehicular security and tracking of personnel. It is also used to curb piracy of certain products, security tags for access control, tracking of products during shipping, tracking of animals during emergencies like spread of communicable diseases besides a vast array of similar other applications.

The main components of the RFID system are a reader and tags. A reader reads and/or writes data to tags. The data transmitted by the tag will provide information on identity or location of the tagged object or specific information about the tagged product, such as cost, type, date of manufacture, etc. In an industry setting, the readers are usually wall mounted and connected to a power supply. The tags usually move past the readers to get identified. There are many other scenarios like scanning items in a super market, shop floor and more, where a user carries a hand held reader. Hand held readers are the best option for applications like asset tracking, field surveillance application and more, where it is more practical to bring the reader to the tags rather than moving the tagged object. These hand held devices are battery operated and the energy consumption of these devices should be minimized to prolong their life time, thereby increasing their portability.

Given the importance RFID in practical usage, there has been very little or no work been done to characterize the energy consumption of these devices. Most of the previous work in this field has been related to performance evaluation, improvement in security or development of an algorithm/protocol to increase the performance. The data sheets provided by vendors does not provide enough information in a form that can be used by researchers towards designing energy efficient RFID protocols. It is obvious that energy aware design requires a practical in depth knowledge of the power consumption behavior and the available information has to be presented to the researchers in a useful manner.

In this demonstration we practically measure the power consumption pattern of RFID devices working under EPC class 1 gen 2 standards and dissect the power plots in accordance to the protocol. Our work would provide a better understanding of the power pattern of the RFID devices thereby enabling researchers to design and evaluate energy efficient protocols.

METHODOLOGY

Energy consumption of a reader is calculated by measuring the voltage (constant - 3.3 Volts) and the current they draw from the source. The device under test was an M9 module from SKYETEK. The SkyeModule M9 is a tiny, embedded UHF RFID reader module. The reader supports various sets of protocols like ISO 6001 -6C, ISO 6001-6B and so on. Here we choose Class I gen 2 type and its supporting tags (passive tags) for testing. In order to measure the current to the card, a 1 ohm resistor is added in series to the Supply and the voltage drop across the resistor is measured using a Tektronix 350MHz digital oscilloscope1. Since a 1 ohm resistor is used in the setup, the voltage drop across the resistor equals the current drawn by the reader. All measurements are done at our lab environments and the subsequent plots shall be demonstrated.

SPACE REQUIRED: Table

SETUP TIME REQUIRED : 1 hour

Additional facilities needed : Power and WiFi