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TROLLEYPONDER/ECOTAG/RADAR RFID Newsletter #97

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Your latest copy of our regular newsletter keeping you up to date with developments.

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1. Tracking nuclear storage containers

Many countries store their spent nuclear fuel from their nuclear power stations in metal and concrete drums which are then buried underground.

Trolley Scan were sent a few months ago a request by a nuclear plant operator to propose equipment for a system to track these containers using RFID. The tracking relates to empty containers before filling, filled containers on site and filled containers that are being transported to the storage area. The RFID transponders need to survive the burial process for many decades to provide positive identification of each container if they are excavated.

The intention is to attach special transponders to the outside of the metal drums, and in the case of concrete drums to embed transponders in the concrete case.

There are two interesting challenges to this proposal, namely the design of transponders to be buried in concrete, and protecting the transponders from the effects of close nuclear radiation.

A properly designed antenna for an RF device resonates at its operating frequency giving effective magnification of the RF performance, in the same way that a tuning fork resonates at its design frequency to sound waves at its resonant frequency.

When radio waves travel through dense materials, they no longer travel at the speed of light but travel slower which is a function of the relative dielectric constant of the material through which the wave is passing. This means that an antenna system that works in air will not work effectively when the antennas are encased in concrete and a new design is needed.

Trolley Scan have experience in designing for concrete, having done a design to tag the large concrete road crash barriers used in road construction on motorways. The purpose was to provide positive identity for each concrete block and be able to read that identity while passing at speed for inventory purposes. A new antenna system was developed for the transponders which are encased in the concrete during casting and allow good reading ranges.

Semiconductors have a problem operating in a zone of high radiation. Back in the 1960/70s before the age of microprocessors, digital systems were made primarily from a technology called TTL. This technology implemented gates, latches, counters and shift registers and from these modules computer systems were built. There were three ranges of the technology, namely commercial which could handle 0 to 70 degC, military which could handle -40 to 125 degC, and radiation hardened to be used in space applications where they might be bombarded by radiation. The problem with the radiation seems to be that it alters memory states of the modules and hence the values being stored.

Whether this would be a problem with certain RFID systems is uncertain as there are limited facilities that can test the devices due to the radiation requirements. However there are certain RFID design issues that should minimise the impact of the radiation, such as having hard coded data in the RFID device rather than memory structures.

Testing in-situ will have to be done before final answers can be given.

2. Server attacks - hitting the beehive

This section relates to some observations that would be of interest to readers who operate internet servers and please skip if not of interest.

In our past newsletter we described how we had discovered a continual low level of security probing of our site on an organised basis from a very large number of slave computers worldwide. We identified 3000 of these machines and blocked them, and then the fun really started. We started a webpage and published lists of the attack sites and the number of attacks from each site, which really annoyed some people who organise the probes.

Having had about 1100 attacks per day when we started the tempo was upped to 11000 per day three weeks later. It then dropped off back to 1000 per day and on the 7th April we had an instantaneous 40 fold increase to 40000 attacks for just one day. The bullet proof properties of our site withstood the onslaught. We then received emails saying that our site had been taken over, a fact we knew was false as we could inspect all activity in the log files. For the past two weeks the attack tempo has dropped to less than 500 per day, very few of which even make it past the first level of filtering.

We now weekly publish details of the attackers and graph the attack tempo at

<http://rapidttp.co.za/attacks.html>

Many site owners globally have requested copies of our statistics and the identities that we have resolved.

We are now in the process of constructing a huge WHOIS database that allows us to reverse lookup from where the attacks are coming. This is showing up patterns of links between certain ISPs. We have about 250000 data points at present and look for situations where there seems to be a high level of coordination, especially in time and message content.

For those interested in this subject, you want to research the story behind "dellpc.com".

In short Dell Security division noted that a site had been registered called "dellpc.com". They approached the regulators in the USA claiming this name was close to their company identity and applied to have it transferred to their name. The registrant was not clearly identified except by a yahoo email address and did not oppose the transfer legally. When Dell started operating the domain, they found it receiving large emails that contained confidential corporate information from many important companies. It seems that this was a control node that had been designated in specially created viruses that had been inserted into the target companies computer systems, gathered data over a long period and sent the packed information to the control node.

Dell went further and found the same registrant email address had been used on a number of similar sites which are also likely to be control nodes. The email address was unmanned and so it was not possible to find out who was the registrant. However they managed to find out that it was a specific lecturer in China as he gave the same email address when pressed for a current email address when registering for a conference. They now have published his biography together with photos of the person creating this network.

We currently are trying to find the patterns from our data that might lead to the identities of control nodes.

We have written some very clever programs for processing the large number of datapoints very quickly looking for patterns. From this experience, one can foresee a large demand for people with Mathematical degrees for developing search programs and finding patterns in data.

Want more info such as a list of attacking servers?

[mailto:info@trolleyscan.com?subject=Server_attack_send_more_info\(2\)](mailto:info@trolleyscan.com?subject=Server_attack_send_more_info(2))

3. Product range

Trolley Scan are a manufacturer of UHF RFID systems. Trolley Scan manufacture fixed readers, portable readers and RFID-radar systems (Real Time Locating systems that give accurate position information) as well as a variety of transponders for different applications. Transponders come in the form of passive transponders with operating ranges up to 20 metres and battery assisted transponders with an operating range up to 40 metres. Trolley Scan also combine some of these components into packages for end users which are supplied with the appropriate software. Typical applications are asset management, notebook tracking, equipment barriers, store control, sheep and cattle tracking, event logging and sports timing systems.

Trolley Scan have been delivering their RFID solutions for the past 15 years and offer full support for all their equipment.

4. Getting your own complete RFID/radar system

You can order RFID systems or RFID-radar systems from TrolleyScan.com

Trolley Scan provide small RFID reader systems which give new users the ability to evaluate UHF RFID and their applications without needing specialised skills.

Trolley Scan provide a variety of easy starter systems for first time users who have an application that needs a solution. Typical packages are :

? Standard UHF long range readers with antennas and 100 transponders

- ? RFID-radar system comprising long range reader, antennas and a variety of different transponders.
- ? RFID-asset tracking systems comprising portable reader, antenna and a variety of transponders with software.
- ? RFID-notebook/laptop tracking system comprising reader, antennas, transponders and software

In addition components such as readers and transponders are available

These systems are already operating in 52 countries.

To find out details of the systems and to order see <http://trolleyScan.com/>