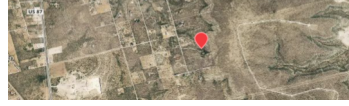


## VULNERABLE DEVICES EASILY DISCOVERED

Q 66.76.137.191 66-76-137-191.bigcmtd5.com.sta.suddenlink.net

**Web Information Control System**

City	Big Spring
Country	United States
Organization	Suddenlink Communications
ISP	Suddenlink Communications
Last Update	2017-10-21T10:28:51.809075
Hostnames	66-76-137-191.bigcmtd5.com.sta.suddenlink.net
ASN	AS19108



IN-TANK INVENTORY	TANK	PRODUCT	VOLUME	TC	VOLUME	ILLAGE	HEIGHT	WATER	TEMP
	1	WASTE OIL	385	8	3895	15.12			86.13

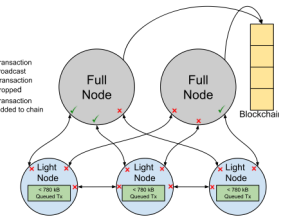
- Protocol & port # available
- Exact address
- DB info & timestamps
- Vulnerable to attack

## RESEARCH VISION

Develop software that helps secure industrial control systems by leveraging our Ethereum light client to address industrial IoT security challenges.

## ETHEREUM LIGHT CLIENT ARCHITECTURE

- Standard Ethereum stores entire blockchain of data
- Light Client does not store any chain data



## SOLUTION OVERVIEW

### Lightweight Architecture

- Software enforces security policies on IoT device
- Prevent unauthorized applications from running

### Blockchain Technology

- Foundation for command and control
- Send/receive security updates

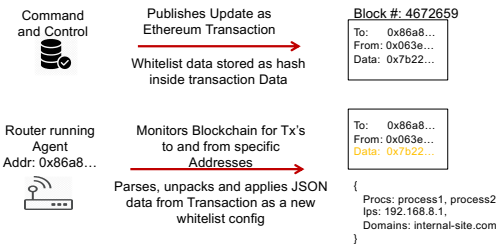
### Machine Learning

- Intelligently whitelist/blacklist processes
- Learn from connections to whitelist IP ranges

## BLOCKCHAIN AS A SOLUTION

- Blockchain is a distributed ledger of transactions
- The blockchain is decentralized, no one central power exists which prevents corruption/failure
- The blockchain is immutable
- Used to distribute application whitelists
- Whitelist controls what is run on the IoT device

### Ethereum Whitelist Transaction



## GOING BEYOND WHITELISTS

The team has built several other proof of concepts on top of the underlying technology

### Firmware & Device Updates

```
0xa70c5e53024f4f415d567a97b90d685648d22a7633815b3e5681c87c42d3b63d7
```

### Device Provisioning

```
0x39471ed242cc69da9556d71966d76b83f05b4f0a3baff5947795a45d6f0fca09
```

Ropsten Ethereum Test Network transaction Hashes.

Public Ethereum transaction used to update and provision a device with a public key

## COLLABORATION OPPORTUNITIES

Cooperation, support and involvement from industry partners would benefit this research:

- Visibility into plant hardware configurations
- Network topologies of hardware
- **Contact:** [maloney@m.mit.edu](mailto:maloney@m.mit.edu)  
[msiegel@mit.edu](mailto:msiegel@mit.edu)

## LIGHTWEIGHT AGENT PROCESS MONITORING

