

Where's Waldo? Can you find the raspberry pi in the CDX?

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Outline

Why Pi?
Challenges in OT
Training
Exercises
Teaching
Demos (and demo?)
Obligatory Cat Meme
Challenge next door
Questions?



Why Pi?

Pie is delicious

Cheap

Easily available

Linux

Made in UK

Doesn't have to be a raspberry pi

Add ons



Training

Low or no budget

Simple, hands on exercises.

Portable.

Raspberry Pi Zeros

PLC ladder logic



Photo by Shane McFly



Exercises

Versatility

GPS Clock

Sync server - rsync data

Jump box -

Packet Sniffer

Situational Awareness

Malicious machine

PLC simulation

...



Teaching

CPS Security for Undergrads (and grads)

Labs
Lectures
Projects

```
#Python
#Libraries
import RPi.GPIO as GPIO
import time

#GPIO Mode (BOARD / BCM)
GPIO.setmode(GPIO.BCM)

#set GPIO Pins
GPIO_TRIGGER = 4
GPIO_ECHO = 17

#set GPIO direction (IN / OUT)
GPIO.setup(GPIO_TRIGGER, GPIO.OUT)
GPIO.setup(GPIO_ECHO, GPIO.IN)

def distance():
    # set Trigger to HIGH
    GPIO.output(GPIO_TRIGGER, True)
```

```
def dataReceived(self, data):
    # When a packet is recieved,
    log.info("Modbus packet received")
    self.process_modbus_packet(data)
```

```
def process_modbus_packet(self, data):
```

```
    # Decision making based on recieved value
    value = data[10] # extract a 0 or 1 from modbus packet
```

```
from pymodbus.server.sync import StartTcpServer
from pymodbus.device import ModbusDeviceIdentification
from pymodbus.datastore import ModbusSequentialDataBlock
from pymodbus.datastore import ModbusSlaveContext, ModbusServerContext
from pymodbus.transaction import ModbusRtuFramer, ModbusBinaryFramer
from twisted.internet import reactor
from twisted.internet.protocol import ServerFactory
import logging
import RPi.GPIO as GPIO
import signal
import sys
```

```
me - InitStartTime > 3:
-1
(0.00001)
```

Demos
(Demo?)

Conference table tops
Local High Schools
Proof of concept systems
Competitions

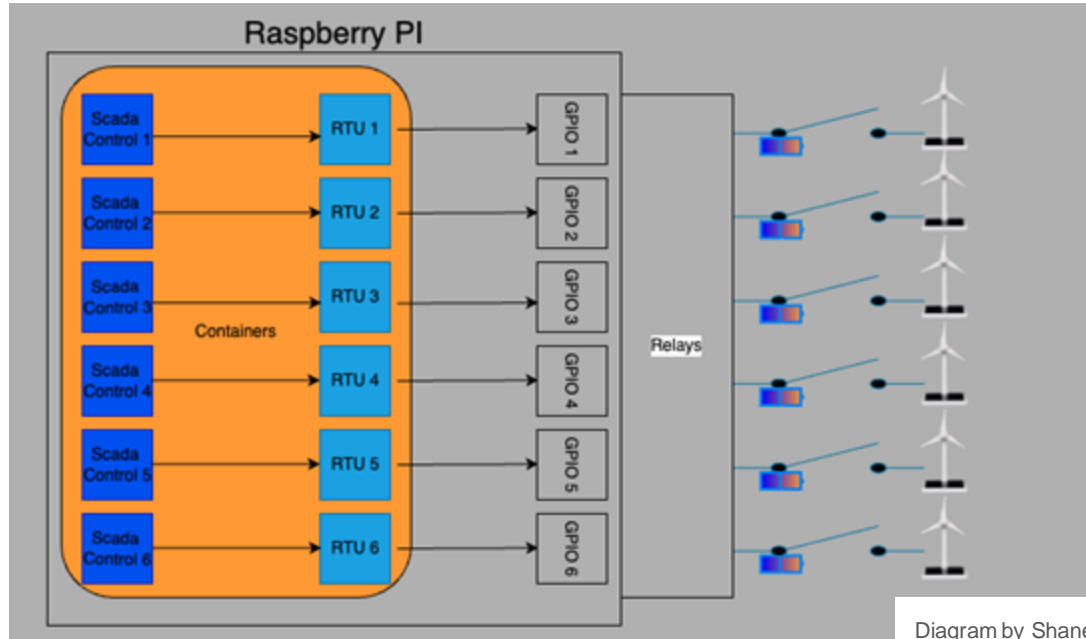
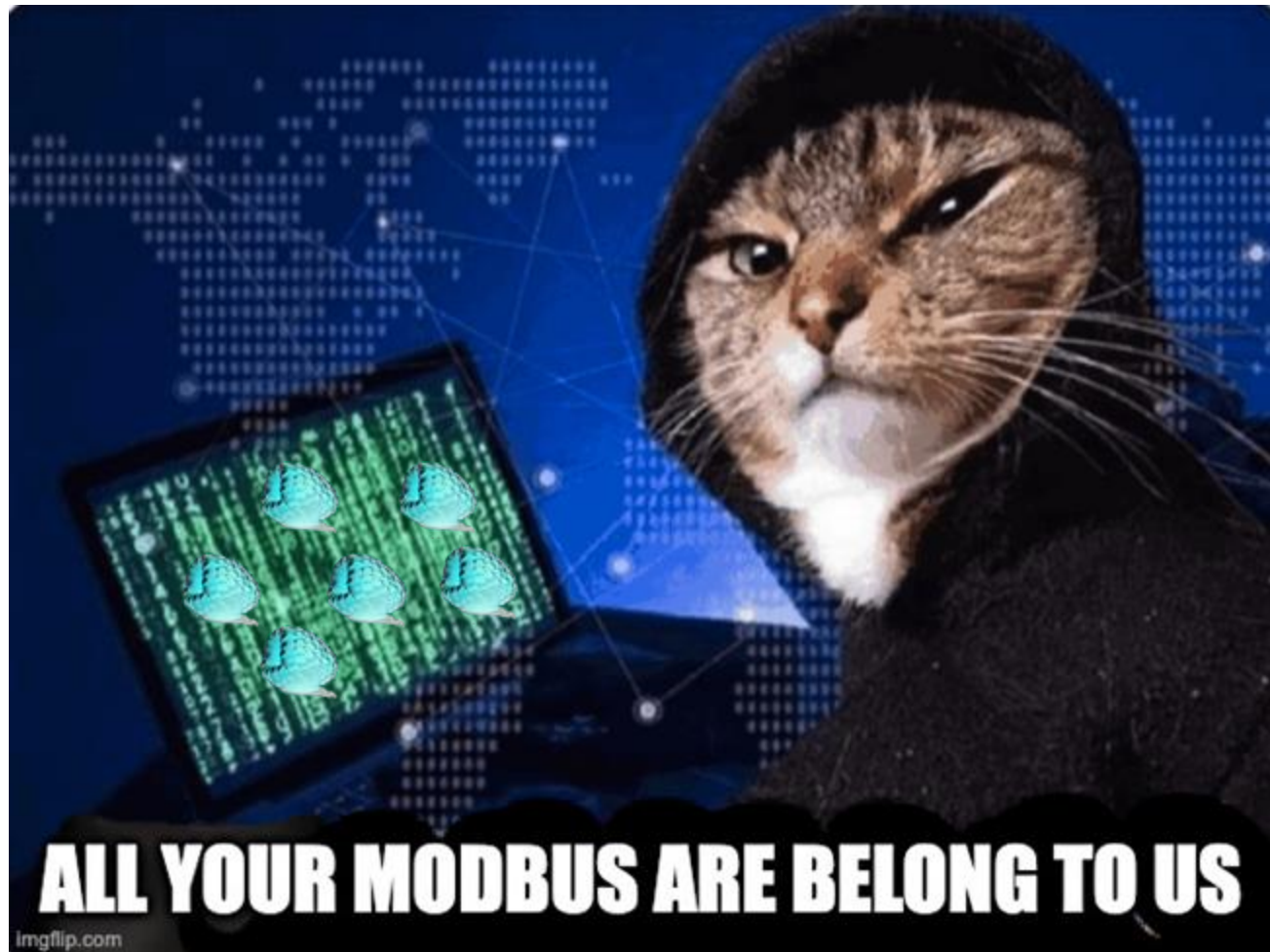


Diagram by Shane McFly

Obligatory Cat Meme



imgflip.com

<https://imgflip.com/memegenerator/449279069/Cyber-Hacker-Cat>

ICS Wind Challenge



Video by Shane McFly

Acknowledgements

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Where's Waldo puzzle image generated by Shane McFly using Stable Diffusion in ComfyUI with checkpoint <https://huggingface.co/SanDiegoDude/WheresWaldoStyle/tree/main>

Where's Waldo raspberry face image and raspberry image created by Shane McFly using elements generated by Google Gemini

Cat hacker meme generated by Shane McFly using <https://imgflip.com/memegenerator/449279069/Cyber-Hacker-Cat>

All photographs taken by Shane McFly and Brian Howard

Special thanks to all our current and previous employers for giving us cool challenges with limited resources. (no /s intended)

All thanks to ICS Village for hosting our challenge and letting us infodump about our special interests to you all. Oh and DEF CON too.

Thanks!
Any Questions?

