VETCON BADGE

Team 32
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Problem Statement

VETCON wants a unique, functional, and production ready badge for DefCon 30

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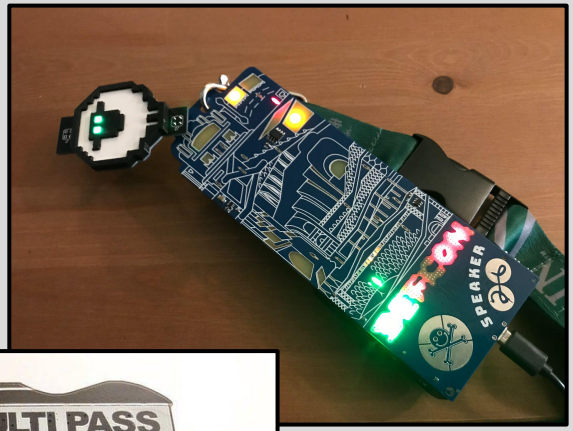
Our Client (VETCON): a group of information security professionals who have served in the armed forces of the United States or close allies.

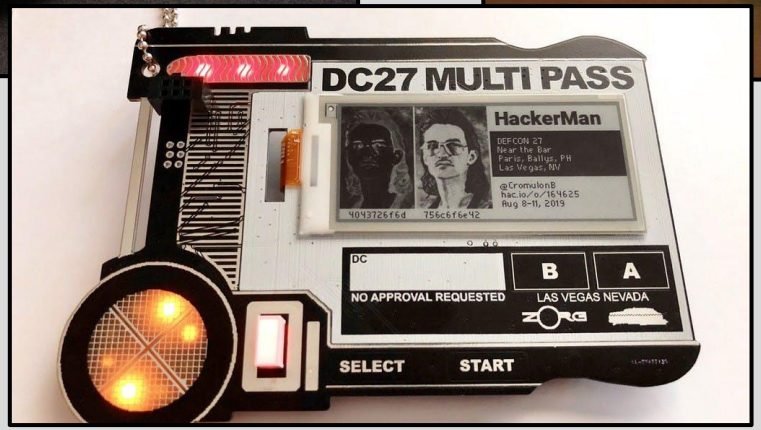
1

What is DefCon?

The world's longest running and largest underground hacking conference.

Badge Examples





Deliverables

Functional Badge

Working badge that meets all design constraints

Bill of Materials

Accurate bill of materials for badge production

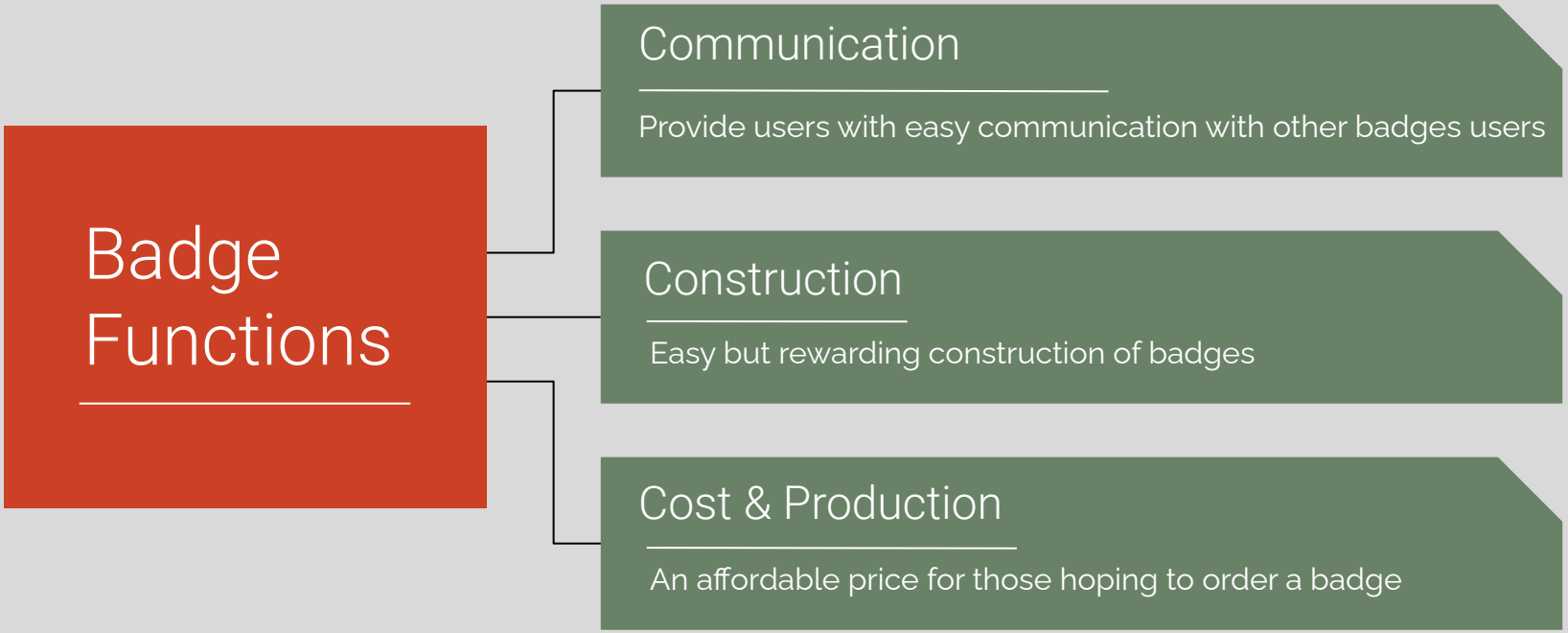
Badge Manual

Assembly & installation instructions, troubleshooting procedures, microcontroller flashing

Badge Production

Process for mass badge production

Requirements: Functions



Requirements: Objectives

1

Operating System

System software to manage our microcontroller(s) and ROMs

2

Point-Point Networking

Communication between two endpoints

3

Battery Life

Ability to operate for 21 hours; σ = 2.1

4

USB-C

Charging, data transfer, software flashing

5

Interface Switch

On/Off/Data Transfer Switch

Requirements: “Stretch Goals”

6

LEDs

Configurable and addressable indicator lights

7

SMDs

Any other surface mount device

8

Wireless Mesh

Communications network made of radio nodes

9

Puzzle Game

Interactive game that unlocks achievements

10

Color Display

320 x 240 pixel display

Requirements: Constraints

Size

4” wide, 4” long, 1” deep

Weight

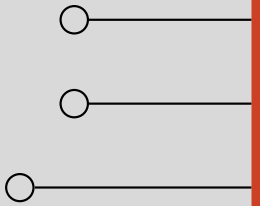
150 grams

Lanyard

Attachment points for wearing

UP

Describing Approaches



RIGHT

Single Board Computers (SBC)

Full-fledged computer that can run desktop/server Operating Systems with support for virtualized I/O & networking

+Extremely flexible
+Dirt Simple programming interface
-Power Hungry, need large battery.
-Tricky to isolate functionality

Raspberry pi

Jetson Nanos

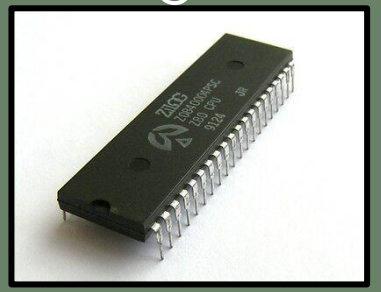
RIGHT

Bare-Metal MCUs

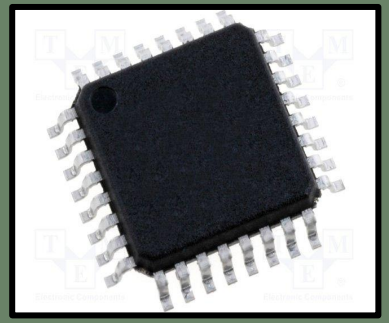
A “small” Computing Unit that resides on a single IC some ROM dedicated to processing instructions.

+Extremely power efficient
+Very low cost (in the single dollar range)
-Very manual process
-Low on built-in memory. Need ROM & JTAG

Zilog Z80



STM8L



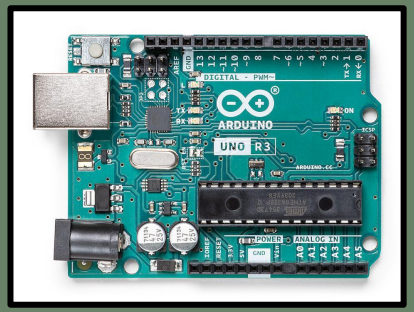
RIGHT

Systems On a Chip (SOC)

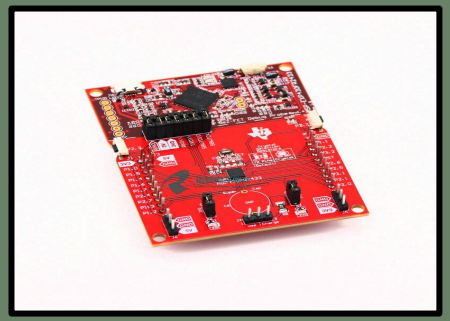
An IC that includes “most” circuit components of -a- Computer / Electronic System.

+”Sandboxed” Dev Environment
+Rapid Prototyping Capabilities (fast compile)
-Software Suite heavily dependent on Manufacturer.
-Reliant on Community for implementation

Arduino Minis

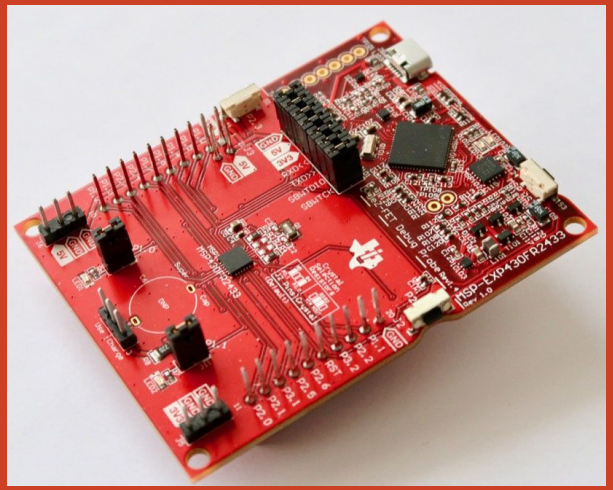


TI MSP430XXX



Our Decision

LEFT



TI MSP430

Why?

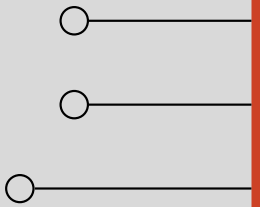
Best balance between “efficient” and pliable.

+Maintains excellent power efficiency

+Approachable programming interface

+Based in the US (faster shipping).

Competing Technologies / Patents / Other Products



Thank You