

The Darknet of Things

Building Sensor Networks to do our bidding.

Introductions

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- ✦ Omega - omega@omegacs.net

The Internet of Things

- ✦ Things...
 - ✦ No, Not your fridge.
- ✦ An Internet of things, not things on the Internet.

Sensor Networks

- ✦ What are they
- ✦ What they (are supposed to) do
- ✦ What they are used for (usually)

The Network part of Sensor Networks

- ✦ ZigBee (802.15.4)
 - ✦ LowPower Wireless Network
 - ✦ Advantages
 - ✦ Limitations

6LowPan

- ✦ 802.15.4 (Yup, Runs on top of ZigBee MAC)
 - ✦ IPv6 for Low Power Wireless
 - ✦ Advantages
 - ✦ Limitations

So...

- What are we doing here...

The Project

Build a Darknet... of Things

A darknet of things

- ✦ Something fun to build
 - ✦ Hardware hacking taken to the next level
 - ✦ build the largest free-roaming sensor network in the world. (DC21?!)
 - ✦ A project for the community to work on

Considerations

- ✦ NO ARDUINO
 - ✦ Overdone
 - ✦ People already know it (let's learn something new)
 - ✦ Processors aren't powerful enough. (to really do anything interesting)

Considerations

- ✦ Must be HACKABLE
 - ✦ People need to have fun with it.
 - ✦ Modifiable, Changeable, Bendable.
 - ✦ But still stable.

Considerations

- ✦ Maintainable
 - ✦ Fix shit if it b0rk3s.
 - ✦ Shit happens.

Considerations

- ✦ Must be a network of THINGS (Not things on a network)
 - ✦ Wearable/Moveable.
 - ✦ Pocketable.

Considerations

- ✦ Must work outside of DefCon
 - ✦ Needs to be able to work at home/hackerspaces
 - ✦ Access-Points/Development boards available

The Hardware

Darknet Badges...

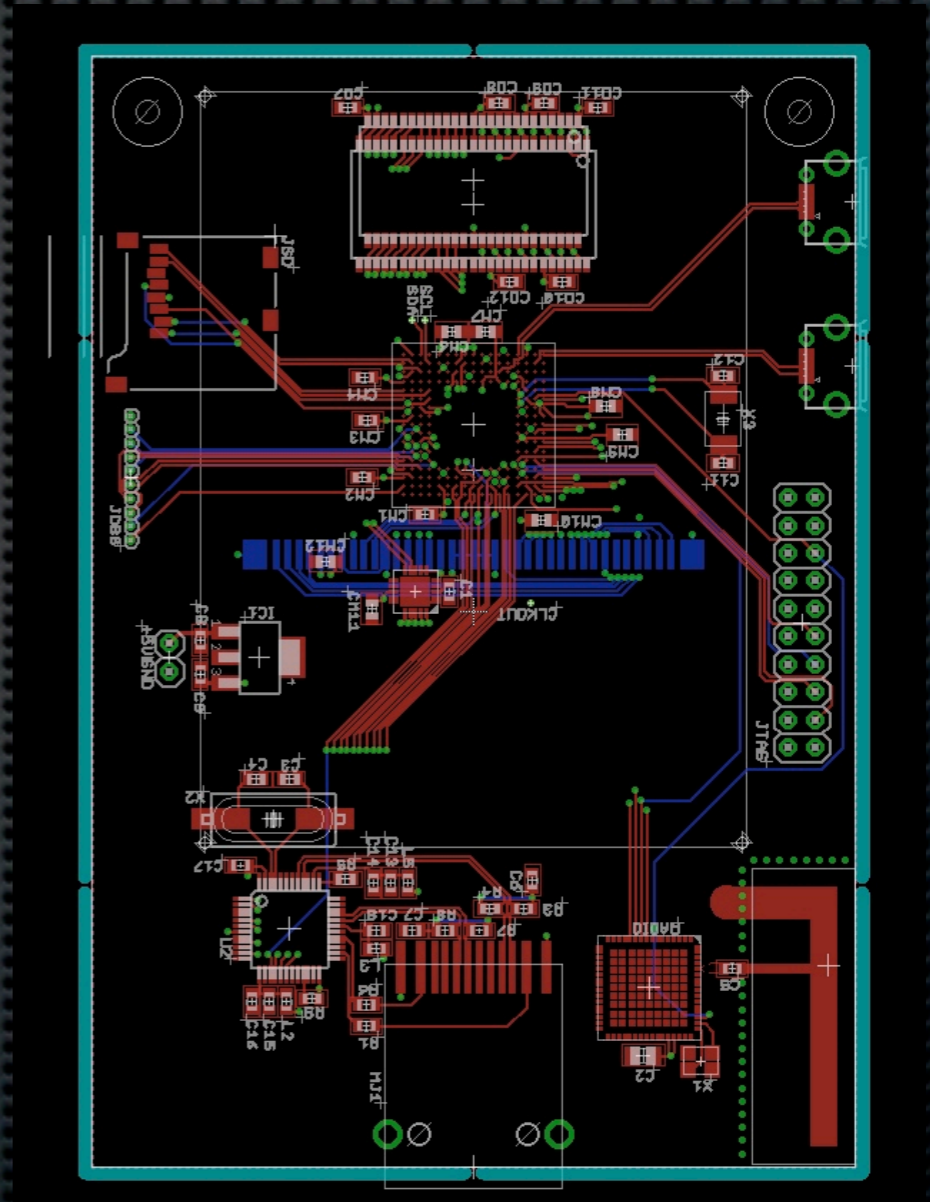
- ✦ Planned for DefCon 21
 - ✦ 2 ARM Micro Processors (1 Main, 1 Network)
 - ✦ USB (2 ports, host and client)
 - ✦ 2.8" TFT Touch Screen
 - ✦ 6LoWPan Network Connectivity
 - ✦ Battery Powered and Rechargeable

DarkNet Badges...

- ✦ HACKABLE
 - ✦ JTAG Headers and Peripherals Available
 - ✦ Hardware Schematics, Software ToolChain etc.
 - ✦ Open and Available, and part of a project we are starting today.. More information later.

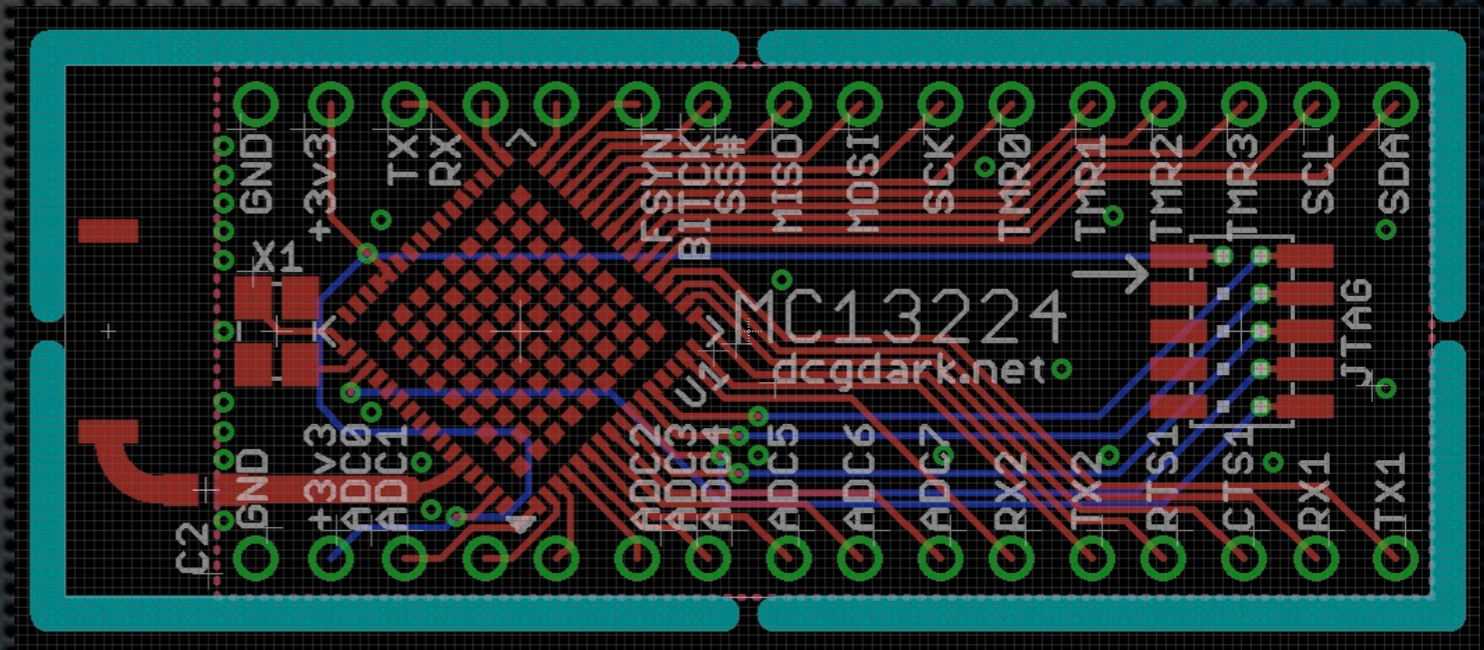
DarkNet Badges...

- ✦ EXPANDABLE
 - ✦ SDRAM Pads Available
 - ✦ unused peripherals available



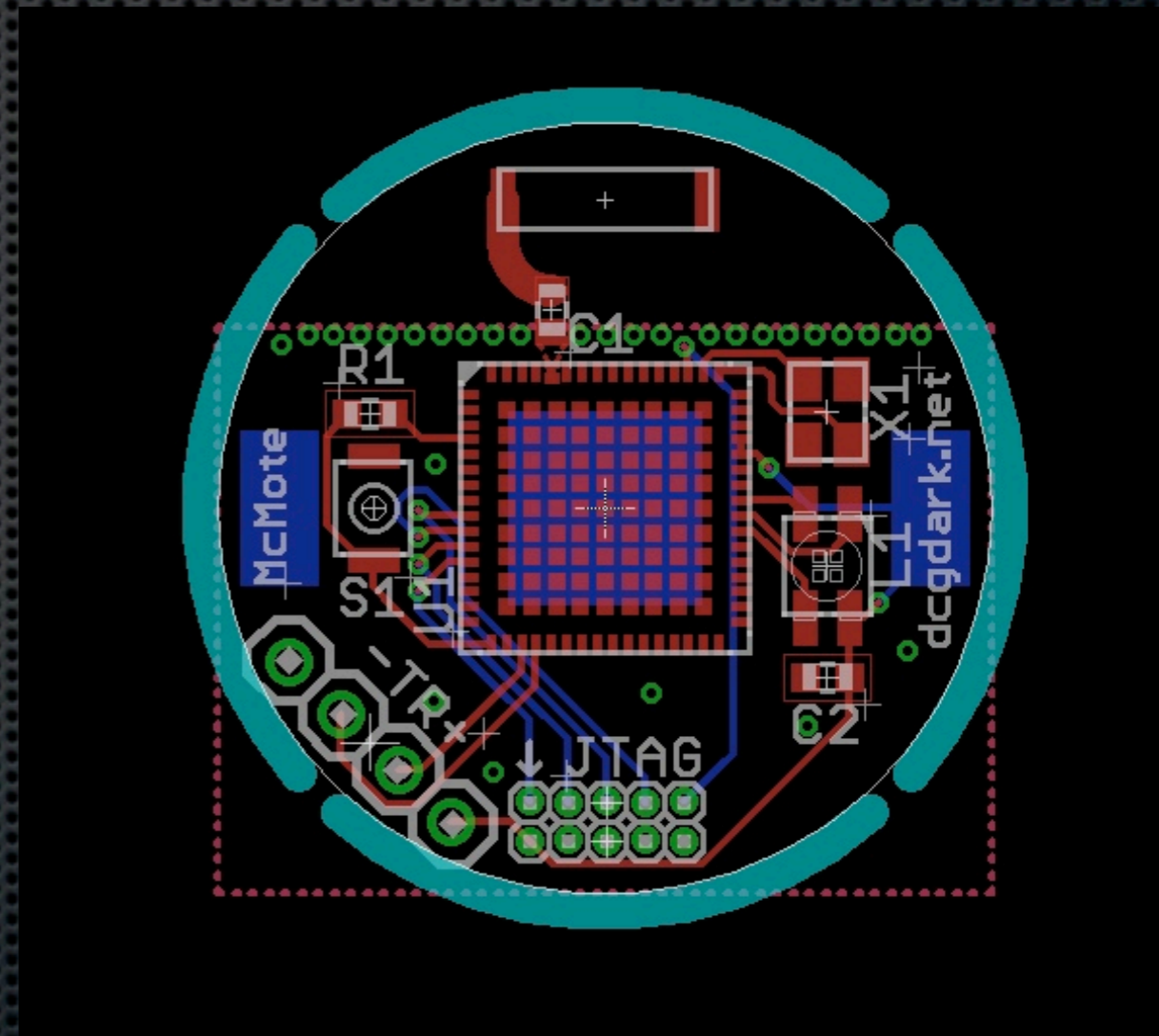
Dev. Boards and AP's

- ✦ Network only development boards
 - ✦ Designed to be attached to your projects
 - ✦ UART(s) exposed
 - ✦ 1 x MC13224v
 - ✦ USB + JTAG



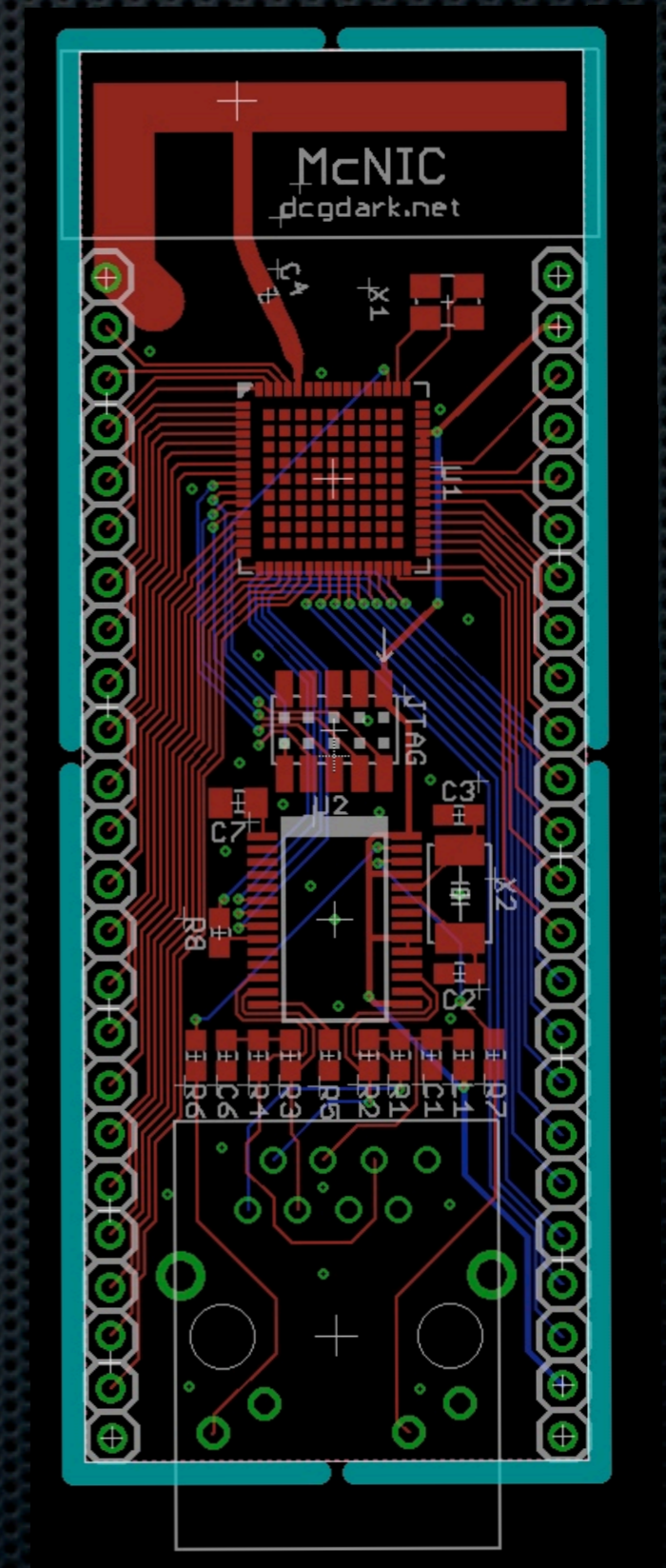
Dev. Boards and AP's

- ✦ McMote
 - ✦ 1" circular size.
 - ✦ UART for expansion (direct FT232R compat.)
 - ✦ RGB LED
 - ✦ CR2032 Powered



Dev Boards and AP's

- ✦ MC13224v to Ethernet (McNic)
 - ✦ Small form factor
 - ✦ AP style operation
 - ✦ 6lowPan -> ipv6 ethernet



Hardware Demonstration

Lets hope the sacrifices have worked...

The Potential

For Fun and Profit!

Now to the fun part...

Why and how you can get involved.

If you build it...

- ✦ We felt the community needed a common project.
- ✦ Break people OUT of the Arduino RUT!
 - ✦ Expose people to a new chip and coding possibilities
- ✦ Something Different and Fun to work on.

Projects - Darknet of things.

- ✦ Goal
 - ✦ Build fun things that operate *AS* a DarkNet of things.
 - ✦ We've got badges for next year... what are you going to do?

Projects - Darknet of things.

- ✦ Hardware information at:
 - ✦ <http://www.dcgdark.net> - ipv4/ipv6
 - ✦ <http://dev.dcgdark.net> - ipv6 only
 - ✦ Working ipv6 connectivity is a requirement.

Projects - ARM Dev Environment.

- ✦ Goal
 - ✦ Create a better development library for the ARM chips.
 - ✦ CMSIS is bullshit.
 - ✦ Something More akin to atmega libraries.

Projects - ARM Dev Environment.

- ✦ More Information at:
 - ✦ <http://arm.dcgdark.net> - ipv4/ipv6

Get Involved!

- ✦ Custom badge artwork for DCG's
- ✦ Get some hardware (we will have more information later)
- ✦ Get the BOM/Schematics, make your own!
- ✦ LEARN, HACK, HAVE FUN, TEACH!

Thanks!

- ✦ Big thanks go out to the following people to who helped us get started on this adventure...
 - ✦ Our Wives
 - ✦ Russr and DC719 for Inspiration and encouragment.
 - ✦ DC503 for being awesome!
 - ✦ Your Mom... (:-P) Well, we won't go into that one.

