Title: CAN Documentation
Subteam: Sensing Team
Date: 2/18/2014
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Description of project: CAN was developed to make communications between nodes easier. Instead of having a the nodes connected in a star network or having a single master node, CAN allows a multimaster system. By giving each node in the CAN network a node ID, the CAN API will direct the message a declared target.

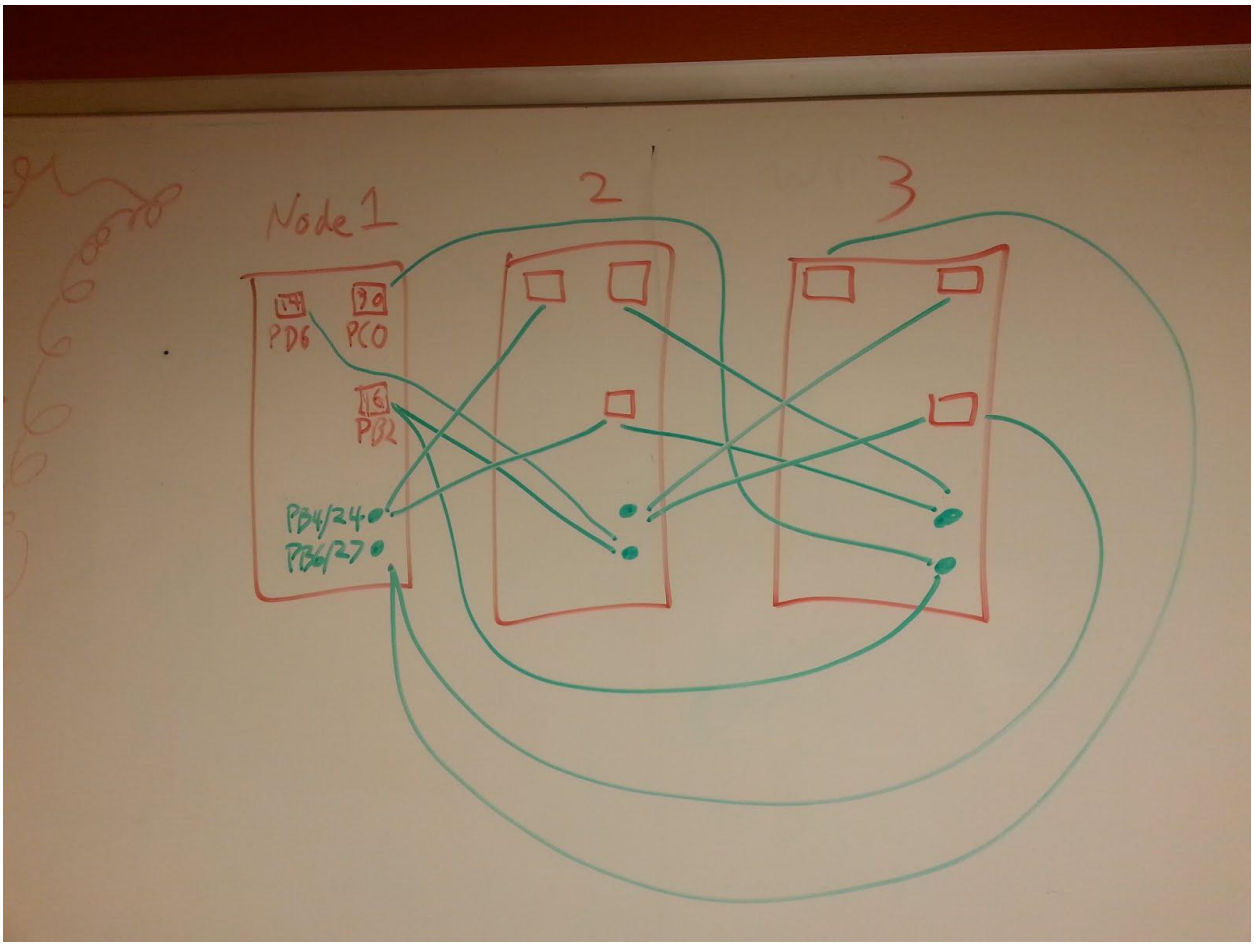
Section 1: CAN API
files: api.c, api.h
The goal of this API is to make implementing CAN easier by abstracting away the inner mechanisms. Nodes that implement CAN API will have access to 2 methods, initCAN and sendCANmsg. Additionally, the node must implement a method of it's own, handleCANmsg, in order to use the API. For examples of how this works, please view code for the CAN demo.

Section 2: Using the API
In order to use the API, you must include the handleCANmsg method even if you don't plan on sending any messages with the given chip. Make sure to include the following in your Makefile:
SOURCES += api.c INC += -Isrc/ CFLAGS += $(INC)

Section 3: CAN Demo
files: node1.c, node2.c, node3.c
This demo uses CAN to send a simple message that turns on an LED when a button is pressed. There are 3 physically separate boards that are given node IDs 1-3. When a button is pressed, it triggers an interrupt. The microcontroller then generates and sends the CAN message across the transceiver to the destination board.

Ports used for the buttons are: PD6/14, PC0/30
Ports used for the LEDs are: PB3/23, PB4/24

Prettier graphic later:



Making and flashing the demo

To flash code onto an ATmega chip, run the following commands:

- make FILE=client flash for the client
- make FILE=server flash for the server

You may need to append sudo to these commands based on your system setup. You can similarly flash the demo node codes to use the multiple node model.

The colors on the programmer are as follows:
Red = power
Orange = ground
Yellow = 1
Green = 2
Blue = 12
Purple = 31

Keep in mind that some of the boards may be numbered wrong, the purple wire always goes to the pin with the resistor on the left side of the PCB.