DIY Zoning: Can I do it?

by Vadim Tkachenko

1. Prerequisites for starting DZ on your own

The entry threshold is pretty high, though it differs a little bit for different DZ subsystems. Below are the requirements that you must satisfy in order to complete some steps on the way to a full installation.

2. General Considerations

2.1. Keep in touch

You are not alone (take a look at Site Statistics to see how many others like you are out there). Chances are, whatever problems you are having, someone else already has, and they found the solution, and didn't think of sharing it just because they didn't know that someone out there needed it.

Consider joining the `diy-zoning-general` mailing list (details here).

2.2. Thoroughly understand everything that is written here

Note:

Cost of a failure will be quite high, both temporal and material.

Make sure you understand what this is all about ***before*** you start. If something is not clear, read both the Homeowner's FAQs and Technical FAQs.

If something is still not clear, post a message to `diy-zoning-general` mailing list.

Note:

And I ***mean*** ***everything***. There may be information in the latter stages of installation that you'd wish you knew when you were starting it, but didn't. In particular, a type of the connector your thermostat has which is described in the last chapter, Total Control, - if it is a proprietary one, you're stuck with what you have (passive mode at best). And this is just one example.

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2.3. Understand that this is not on-the-laps five-minutes-to-finish affair

Since you came all the way down to read this sentence, it is obvious that you have decided to forego the convenient route of paying someone to install a commercially available residential temperature zoning system. There may have been several reasons for it, which boil down to basically two:

You can't afford a commercial system
Well, as the saying goes, "you get what you paid for", and if you are not paying money, you are paying time. It won't take you years to finish it (*I have spent this time so you can do it faster* --vt), but it'll take quite a while to plan, buy parts, run the wiring, install and configure the system.

Features offered by commercial systems fall short of your expectations
Well, I guess in this case the time doesn't even matter, you're doing it for kicks. In this case, it'll take you longer, 'cause the pleasure is in the journey, not in the destination.

3. To use the code DZ provides

3.1. Make sure you can read the schematics

Note:
This is a must. If you can't read the schematics, this project is not for you.

3.2. Make sure you know what UNIX is

DZ can theoretically run on any UNIX that supports Java Communications API (RxTx is the OpenSource implementation for it), and, in case you are using USB devices with DZ, javax.usb.

If you are planning to install it on Linux, to be exact, on a Linux distribution that supports RPM, you're in luck - there is a prepackaged RPM distribution. Otherwise, be prepared to compile the project.

3.3. Get familiar with 1-Wire network concepts

As of the moment of writing, the 1-Wire devices provide the most cost efficient solution for sensor networks. Feel free to waive this requirement if you are planning to use different hardware for data acquisition, though it is an interesting read in any case.

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3.4. Decide upon the subset of DZ you are willing to implement

Different people have different needs. In order to satisfy requirements of different categories of users, DZ had been made modular. Here's a list of possible choices:

- All you need is to find out if it is really that hot, cold, or whatever: you need to complete Step 1, Step 2 and Step 3.
- You want to have better comfort, but don't want to go through a hassle of tampering with your HVAC equipment: in addition to previous, you need to complete Step 4, Step 5 and Step 6.
- Step 7, as of now, gives you total control over temperature related aspects of your HVAC system.

Note:
Connecting a device other than "approved" thermostat to your HVAC equipment will get you in trouble with your HVAC contractors and/or servicemen. Consequently, this may cause problems with your home warranty company, if you have one, as well as problems proving that you did not violate the factory specifications and thus didn't void your HVAC unit manufacturer's and/or installers waranty.

Note:
YOU MUST UNDERSTAND THE CONSEQUENCES AND TAKE RESPONSIBILITY. IF YOU DO IT, YOU'RE ON YOUR OWN. IF IT BREAKS, YOU KEEP BOTH PIECES.

- After this, there are no more hardware modifications required, except for probably installing some more sensors (pressure, humidity, airflow, etc.), which is going to be a trivial task by this time.

4. To fix problems and help the project improve

4.1. Know how install software the GNU way

This is simple - you should be able to type `./configure && make install`, and be able to read the output of `./configure --help`. Some basic reading skills, in general, won't hurt - there's a lot of stuff to read.

4.2. Know the way around 1-Wire API for Java

If it works, it works. If it fails, it fails badly. Be prepared to grok the source - a slightly improved copy of OWAPI is included with the project.

4.3. Have HVAC experience

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The project originator is but a humble software engineer. The precious bits of knowledge were respectfully accepted from those who know what they are talking about, most of them being HVAC professionals. If you are a HVAC professional, there's a good chance you know something that I don't, and I'd appreciate every single bit of it.

4.4. Have Process Control experience

Most of the HVAC related algorithms used in DZ are pretty straightforward, it's the composition of them that is not trivial. If you know something about process controll, you'll be able to find your way around pretty quickly, and quite possibly, improve a lot of small details that you get a grip on only after working with it for decades (which I haven't).

4.5. Have Networking and Security experience

At this point in time, DZ is about to become plug-and-play. As the network administrators know, there's but a few things that will **not** break when looked upon cross-eyed, and there's an eternal tradeoff between convenience and security.

Currently, DZ communications are encrypted, they are planned to be authenticated soon as well, using strong cryptography, but this is still not good enough. A full-time network security expert would most definitely be welcome on the team.

4.6. Think outside of the box

There are things in life other than air conditioning. DZ is designed in such a way that it would prefer to run on a computer (though it's possible to make it run on simpler hardware such as TINI). Now, it would be a waste to use a computer just to run DZ, wouldn't it? Therefore, integrating DZ with other home automation software is a natural choice. I don't have enough manpower nor time to do it (at least now), but you could - for example, wouldn't it be cool if DZ was integrated with Mister House?

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