IP Thermostat
Web control of your thermostat

Introduction

An IP Thermostat is the replacement for your regular thermostat, with the ability to connect it to your local data network and/or to the Internet. There is no need to replace the HVAC unit itself in order to implement an IP Thermostat. These products are excellent if you want to monitor readings and control remotely the settings of your thermostat using an Internet browser.

Aside from the techno-babble that is necessary to discuss this topic, this article is written from a functional perspective, to help you find the answers to the problems you have and/or peak your interest in this subject, so you can implement this technology into your life.

Applications

Typical applications include:

- *Rental properties,* where monitoring and controlling the IP Thermostat settings can help you reduce your cooling and heating costs.
- *Caring for a loved one,* by helping make sure their IP Thermostat is set remotely as they need/want it to be.
- *Remotely monitoring and managing controlled containers*; e.g. computer server cabinets, data rooms, greenhouses, etc.
- *Reducing the heating and cooling costs of your home*, especially when you are not there.

History

Network devices of old for this application use either a serial bus or MODBUS connection. Newer technologies work using an often-dedicated analog telephone line with X10 or UPB, where dialing into the device and entering number codes or a proprietary controller with a proprietary communication language achieves the desired result. All are prevalent and still in use today, though MODBUS is more frequent. Both the serial and MODBUS approach are found in larger, commercial environments, such as manufacturing facilities or larger office buildings. X10 and UPB are for much smaller installations. The integration of Internet technology to the HVAC world is new and therefore not very common. The option of using the Internet to connect and service your HVAC saves you money, time, and effort. Money, in the form of being able to control your HVAC for more effective usage. Time, in the form of not having to call someone, double check their work, or go to a thermostat that is not physically where you are at (possibly across town on a busy day). Effort, in the form of being able to do more, in less

time, by sitting at a computer, or your cell phone if you have Internet access going on in your cell phone.

Product Choice

The only real IP Thermostat offered today, that uses Internet technology to allow accessing it and managing it from within a browser, is offered by Proliphix. The other thermostats out there use some form of serial bus communication or do not use TCP/IP addressing for networking. Proliphix offers both consumer and commercial grade IP Thermostats. All you have to decide are what features you need/want on your IP Thermostat and choose a suitable model. The product line matches all conventional room thermostats out there, so a direct replacement is a relatively straightforward solution.

Installation

The premise of implementing an IP Thermostat is that the data network it runs on is both consistent and secure. Consistent, in the form of an "always on" Internet connection, such as Cable Internet, DSL Internet, or commercial grade Internet connection(s). Secure, in the form of only having the necessary user accounts, strong passwords, ports, and firewall openings to allow data network traffic to and from your IP Thermostat. Explanation of a consistent and secure data network is out of the scope of this article. Please contact us for more in depth discussion on this topic.

Once your data network connection to your IP Thermostat is running, you then need to setup the networking behavior of the IP Thermostat. Do this by logging into the IP Thermostat via the administrative panel option and configure the detailed network settings of the IP Thermostat.

Additional Hardware Possibilities

1. *Extra Sensors*

   After all of the above network settings have been implemented, you may want to connect to your IP Thermostat any additional (optional) sensors. These external (to the IP Thermostat) temperature sensors can be used to average the temperature throughout your facility. Depending on the positioning of the external sensors, the IP Thermostat can be set to compensate for cold and hot spots in your property.

2. *External Relay Triggered Alarm Connection*

   An external relay can be used to provide an input to the thermostat from an external system, or device. In essence, the input is an ***on/off*** switch to trigger chosen actions on the thermostat. For example, such an input from a relay can be used to trigger an email or SMS alert message by your thermostat, or it can in turn switch on your heating, etc. An illustration of this would be a basement that has an occasional ground water leak and you need to watch out for flooding down there. You have a pump in your basement that pumps out the water when a water

leak occurs. That water pump has the feature of an external relay. You connect the pump to your IP Thermostat through a separate piece of wire (gauged according to what the manufacture requires). The pump turns on to pump the water, and in the process transmits the "on" signal, which is received by your IP Thermostat. That event then is capable of lots of good actions, like turning on your A/C to help remove moisture, or sending you a notification through an email or SMS message. There are many options available to deal with the notification part of this illustration. You now know when your basement has a water problem, and you are not even there to know it. Pretty nice way to save money, and be informed in a timely manner, when there is a problem. Or, you have a sprinkler system, again with an external relay. This example would use the same process to be notified when those sprinklers have gone off. Food for thought and good usage of technology that is (at this point) already in place.

When it is all said and done, here is a straightforward look at your network.

Block Diagram of Network Topology
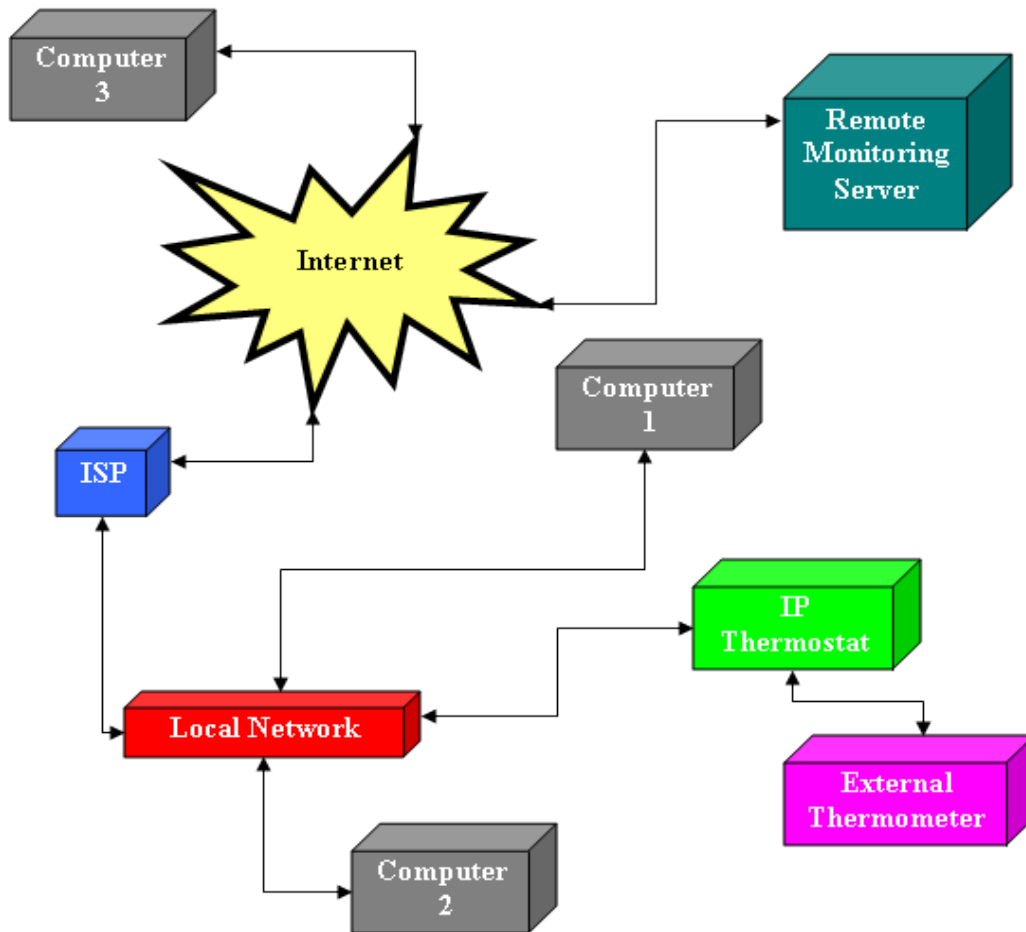
Installation and Configuration - Considerations
The following items are things you as the owner have to decide as to what you need/want to do and what you need/want help with. Sometimes it is a matter of choice, other times it is a matter of necessity. I recommend you choose whatever makes you the most comfortable for the integration process. If you can do it all, great. If not, get some help.

Physical Installation
This is a matter of, "got the hands and the back?" It is not that bad, but it is a bit of work. Be prepared to do a lot of cable installation. Specifically, measuring where to cut your walls, making a path behind the wall for the cable (as necessary), and properly securing your cable to your building. If you do not want to do the cable work yourself, a local Low Voltage cabling company can run the line(s) for a per foot charge.

Network Installation
This is a matter of, "got the skill set to edit (or setup) the data network?", as defined above. If you do not have the skill set, take my advice: Don't experiment with opening up your Internet connection to the world, unless you're ready for hackers to play with everything connected to it. It really, really is not worth the chance. Employ the skill set of someone who understands and is experienced in configuring data networks to make the necessary edits and get this part running. If and when a hacker finds your network, they will try to access the network. If you have properly secured you network, nothing much hackers can do about that. They will either try different password combinations until they figure the necessary password, or they can monitor your data network and find the password which is sent in clear text by legitimate users. Eventually, when they find your network is secure and your passwords are strong, they will get bored and move on.

Be sure to use randomly selected upper and lower case letters, in association with characters and numbers when defining your passwords. Use as many characters as you can when you make your passwords. Those combinations are almost impossible to break. Keep a record of your passwords somewhere safe. KeePass is a great tool to help with this if you need help managing your passwords.

IP Thermostat Configuration
This is a matter of, "want to get the thing running solo -*or*- work with people who have done this before?" I like to learn lessons first hand on most things. However, so as to not damage my HVAC unit, I would rather work with someone who has been there, if possible.

Arrival and Success
The IP addresses that go through your data network will now safely get to the webpage of the IP Thermostat and see what temperature your site has and what humidity, so on and so forth.

GREAT! You are now online with you thermostat.

You will probably find that having remote access to your HVAC thermostat is a nice way to manage the activities of life. The flexibility of using the Internet to setup your TiVo box is a nice and helpful way to save lots of time and effort when selecting what you want to record for later viewing. Most folks I speak with say their Internet connection to their TiVo is used more and more for scheduling recording. Owners of IP Thermostats share the same types of comments.

Conclusion
If you need to *remotely read or change the settings on your thermostat,* the Proliphix series of IP Thermostats is for you. Perhaps you need to take care of the thermostat of a loved one soon, but not so much now, and want to get things ready for that day. As

stated in the introduction of this article, there are many reasons to do this. Life is not a regularly scheduled thing. Thinking it through, you will probably find several reasons why you need Internet access to your thermostat. It can be some work to set up, but you will find the benefits of having remote access to this common and often-necessary device will prove highly valuable.

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