



Making DIGITAL CONNECTIONS

Now this may sound odd, but when I was asked about writing this article about the Internet of Things (IoT) and what people in the HVAC/R industry should be thinking about, the one person I knew I needed to call was a plumber friend of mine.

Yes, Bill's been a plumber for decades, but he does the kind of plumbing most plumbers don't do. You see, Bill is a plumber of the internet.

CONNECTING THE PIPES

When visualizing the internet, it can help to think of it as a series of pipes that can be connected in many different ways. Paths can be direct, or through a series of multiple connections.

With the evolution of smarter devices, like sensors and actuators, these pipes are now being connected between devices, or things, without the need of a person to receive the information being sent. These devices are smart enough to share information with each other to assist with the decisions that these smarter (IoT) devices are designed to make.

These devices can also share their information over the internet. Big computing systems can analyze the trillions of bytes of information and do things like predictive maintenance, so that a contractor or business owner can prevent equipment breakdowns and downtime.

This area of connected devices and buildings is growing at an extremely fast rate, and contractors risk being left in the dust if they don't take it seriously, and start to build their digital skillsets now.



Types of connectivity

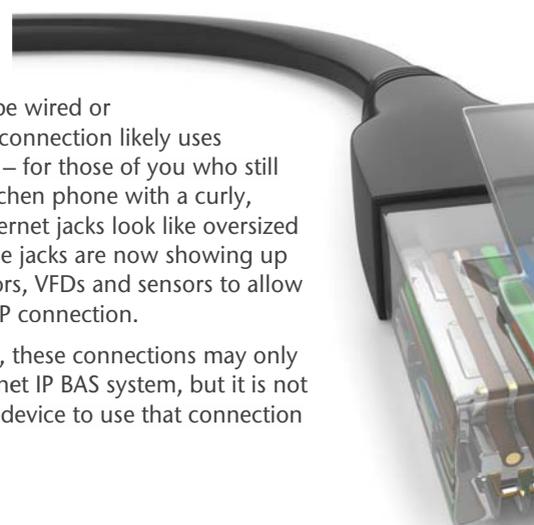
When working with IoT devices, there are two basic types of connectivity: temporary and permanent.

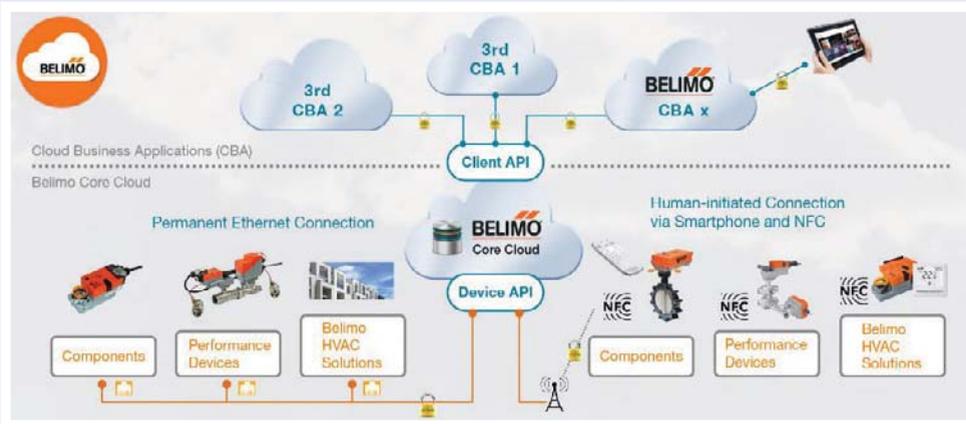
Temporary connectivity: An example is your mobile phone that has the ability to connect wirelessly to the internet through a cellular network. For some Internet of Things devices, when you connect to them for the purpose of configuration, perhaps using an app to set up a thermostat's parameters, the thermostat will piggyback on the internet connection it realizes it has and send a request to the manufacturer's cloud site for updates, and to share information about where it is. The connection disengages when you finish the setup. In this way, the temporary connection is used only for a limited time.

Permanent connectivity:

Permanent connections can be wired or wireless. A wired connection likely uses an Ethernet cable – for those of you who still remember the kitchen phone with a curly, knotted cord, Ethernet jacks look like oversized phone jacks. These jacks are now showing up on valves, actuators, VFDs and sensors to allow them to have an IP connection.

On some systems, these connections may only connect to a BACnet IP BAS system, but it is not a big leap for the device to use that connection





DATA – IT’S ALL IN A NAME

With all these sensors, actuators, drives, chillers, pumps, and more sharing all of the information they collect, the amount of data can be overwhelming. And a big problem stems from the lack of uniformity of the data. Maybe Manufacturer A calls its pressure data output “Condenser Pump P1” and Manufacturer B calls theirs “Pump - Condenser P1”.

Each company means the same thing, but without a common naming convention the differences can cause a lot of extra work for data analytics tools and people.

Thankfully, a group of HVAC/R and building automation folks got together to decide a way to move forward with common names everyone can use. The group is called Project Haystack, (project-haystack.org) and their work is another area worth getting familiar with if you want to be a savvy HVAC/R contractor in the modern digital age.

and the network piping to find its way out to the internet, so it can communicate.

A permanent wireless connection uses a device that has one of the many available wireless protocols built into it. It uses that to connect to a wireless router to find a pathway out to the internet. In most systems, the wireless device uses a wireless router that is connected into the network, but with the advent of 5G networks, we can now go right to a cellular router and directly to the internet over a cellular network.

You may hear the term “tethered” in relation to a wireless permanent connection. What this means is that the permanently connected device has access to the internet, and will allow you to view what is happening in the device, remotely, as it happens.

TOOLS OF A NEW TRADE

You are a trade professional in the HVAC/R industry, but there’s a new trade that is evolving, and it’s impacting (and is a part of) the HVAC/R industry. Networking and data analytics, connecting to and taking advantage of the Internet of Things, is changing what goes on in the mechanical room. And the HVAC/R world is no longer just confined to a building and its boiler room.



Picture yourself standing in a mechanical room watching gauges flicker as pressures change in the system. You see the internal fluid temperatures of the water and air, and you hear noises that inform you about the system’s health. If you are a wise old dog of the trade, sometimes sounds are all you need to know that trouble is brewing.

As you listen to the system, that ball of mush between your ears is doing millions of computations. It’s comparing the inputs to information you have in your head from experience; making yes or no decisions to guide you to a conclusion. This is what data analytics is all about, and it is the next frontier for the Internet of Things.

Analytics tools are generally sold as a service, like software, and they allow you to perform remote diagnostics of the system, based on the outputs you have set the tool up to provide.

DIDYOUKNOW?

Companies like Cisco offer a wide array of training modules and certifications that can help further your knowledge and comfort with networking systems.

A new type of contractor

If you really want to take full advantage of this growing adoption of smart sensors and actuators, it can help to look for training that will help you understand how and what these devices can communicate, as well as the network requirements needed to integrate devices together in a building.

Some have already been trained in these systems. You may already have seen the terms “Master Systems Integrator” or “Master Technology Integrator,” and if you haven’t, you soon will.

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