

ELIMINATING THE BLAME GAME

How to Properly Test and
Certify Your Network for IoT Readiness

INTRODUCTION

Many IoT devices like multi-sensor cameras, digital lighting, HVAC systems and badge scanners now run off Power over Ethernet (PoE). While this makes those devices easier to install, it's turning the network into a power distribution center. When PoE devices do not work as intended, the cable contractor is often blamed for it, even though there are many possible causes for this problem. It's important for cable contractors to test for PoE load while installing cables to avoid this blame game between themselves, the network team, and the IoT device installers. Luckily, modern multi-function cable testers have made that testing process much easier and cost-effective.

THE NETWORK AS POWER DISTRIBUTION CENTER

If the network is becoming a power distribution center, what does that look like? The most common types of powered devices (PDs) include VoIP phones, IP cameras, and Wireless Access Points (APs). And to add even more complexity, some devices such as 802.11ac Wave 2 APs require 2.5 or 5 Gbps to operate. According to some reports, the number of PoE powered ports in enterprise networks will **exceed 150M by next year**. If a device consuming 60W of PoE power is connected on each port of a 16-port PoE switch, the total power delivered by the switch is nearly 1 kW! With the 802.3bt standard for 90W on the horizon, and with the devices getting increasingly power-hungry, the total power requirements from PoE sources will only keep growing.

CHALLENGES AND THE BLAME GAME

When powered devices fail to work, the network admins, PoE device installer and cable certifier often find themselves arguing about who's at fault. To reduce this friction, network admins need to know the power demands being placed on their network, and the cabling contractors need to know how much power each of the devices will require and verify that the cables will be able to deliver that power (without impacting the data that's also flowing down the cable). If the PoE powering malfunctions, a combination of one or more of the following reasons might be at play:

- the switch is not able to provide the required power (it could be faulty, over-provisioned, or over-specified);
- the powered device is consuming more power than specification;
- the cable is dissipating more power than expected or specified, which could be due to high resistance, link length exceeding specs, or thermal stress in the cable bundle.

If the PoE seems to work but the device does not achieve required data throughput, finding root cause can be even more challenging. Among many possible reasons, an

unbalance of resistance between different conductors of the cable is known to be a major source of transformer saturation in the network interfaces. This degrades data throughput.

A ROADMAP TO POE SUCCESS

When a cabling contractor takes on an upgrade project or new installation for cabling that is going to be used for PoE, they can take a few simple steps to stop the blame game before it starts. These include:

- Ensuring that the cable meets the resistance (including resistance unbalance) criteria as well as CAT6 (or CAT6A, as the case may be) specifications. This is probably the most difficult troubleshooting task if the contractor did not test for it in the beginning.
- If the PoE source is available, use a test tool that enables loading of the PoE source, mimicking a real PoE device, and confirm that the PoE supply is good.
- If you suspect intermittent power issues, you must have a way to verify power load over a sustained period of time hours/days+ to catch a power anomaly.
- While the test tool is loading the PoE, also confirm that the data transfers can happen without errors and at the required network speed needed to support critical applications and connected devices.

This might look complex and even a little expensive with so many different types of tests across technologies that should be validated. However, today's digital network infrastructure is driving a change in what cable contractors will be required to support. Having the ability to validate and potentially troubleshoot these types of issues is required to remain competitive. Additionally, having the ability to test across these technologies and help to resolve conflict quickly and efficiently will build your reputation in the eye of your customer as a reliable partner.

The Role of the Tester and Adding Value

Multifunction cable testers help organizations overcome these challenges by providing a greater range of test functions that help in deployment, and also in ongoing support and troubleshooting. This saves costs and delivers significantly more value to the customer, making it easier to justify the increased investment in the tester.

Here's an example of how a multi-function tester saves time while installing cables. Network infrastructure usually gets deployed over time. For example, a PoE switch being installed cannot be tested under normal working conditions if powered devices (e.g. wireless APs) are not yet available. A test instrument that can act as a PoE device and confirm the functioning in advance can save a lot of headaches later. Without PoE validation (including power load testing) the cable will be the first suspect when a PoE

powered IoT device experiences a performance issue. A multifunction tester can help identify a problem domain and eliminate conflict between the cable contractor, the network engineer, and the IoT device installer when issues arise. And they will arise.

Being able to test for PoE and multi-gig speeds in advance will also help organization make informed decisions about cable upgrades. If the existing cabling can meet the new multi-gig and PoE requirements, upgrade can be avoided, saving a significant amount of time and money. On the other hand, a flawed assumption that existing cables will be good enough might lead to poor network performance. The best way to avoid unnecessary upgrade costs without relying on assumptions, is to perform multi-gigabit network validation testing using a cost-effective, simple test tool.

KEY TIPS FOR INSTALLERS

What should you look for when shopping for a new multifunction cable tester? First, be sure it offers the most comprehensive set of capabilities, or that “Triple Crown” approach. For certifying cables, look for a tester that certifies as fast as possible (more links laid means more money after all). Consider if you’ll have wireless internet access at the job site before you choose a cloud-based tool. For validating PoE, find a tester that supports all IEEE PoE standards, which include 802.3at/af/bt up to 90W to future proof your investment. Some other key questions to consider when choosing a multifunction cable tester are:

- Does it detect basic connectivity issues instantly with live wiremap testing?
- Does it certify all cabling types you use?
- Can it test cable under power load to see how its properties change even over a sustained time period?
- Does it report PSE configuration and powered pairs, voltage, current and real power?
- Is it able to qualify multiple link speeds in order to qualify and support varying needs such as 1 / 2.5 / 5 / 10Gbps?
- Does it offer stress testing of cable links?

Let’s face it, today’s networks are becoming more and more complex with the proliferation of IoT devices that require PoE and, in some cases, a specific link speed to operate. Therefore, more is needed from the test equipment you rely on to run your business and support your customers. Without adequate testing for PoE and multi-gig link speed, you may wind up on the hook for an IoT device problem that you have no control over. Make sure the cable testers you are using offer the features you need to support today’s digital infrastructure.



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