

INTRODUCING LXI TO YOUR IT DEPARTMENT.

Early inquiry with those in-the-know can save you time and money.

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Should IT be involved in your new Test System?

As you build new or upgrade existing test systems, there are several items you normally consider such as; budget, space and time frames. With the addition of LXI-based instruments to your test arsenal, you have a new factor to consider – your network. LAN connectivity is likely under the reign of any company's IT department. Any device that has an RJ-45 connection and plugs into the company network comes under their scrutiny.

A little advance planning and getting IT involved early in the process can smooth your integration plans. In this paper, we explain the reasons why IT needs to understand and feel comfortable with your test system.

The world of IT

Today, every business relies to a greater extent on computers. From the desktop PC used to enter bookkeeping information to the PDA in your pocket, computers are everywhere and touch every aspect of our daily lives. When you pull up to traffic lights, these are controlled by a computer. When you draw cash from an automated teller machine, several hundreds of computers may communicate over long distances to authorize your transaction before the machine hands over your hard earned cash.



An IT department in the 80s primarily consisted of one or two people who, oftentimes, had no formal computer training. Today, a modern IT department may consist of a manager and a number of well-trained technicians with Microsoft and Cisco certifications – if not formal computer science degrees.

Behind the scenes, are an army of network specialists who maintain and manage these complex computer systems. Their work can seem mysterious, even unnecessary to an outside

observer. But without their intervention and work, most of the technology we rely on each day would soon grind to a halt as viruses infect workstations, hard drives fill up, and servers and components fail.

The IT manager ensures the IT equipment works as intended, the network infrastructure is modern, economical and operationally sound. Part of the IT manager job may also include planning for the introduction of new equipment. Essential business systems such as email and accounts may all be handled through this department. Additional responsibilities can include disaster recovery, security and routine maintenance.



**IT'S FASTER.
IT'S EASIER.
IT'S BETTER.**

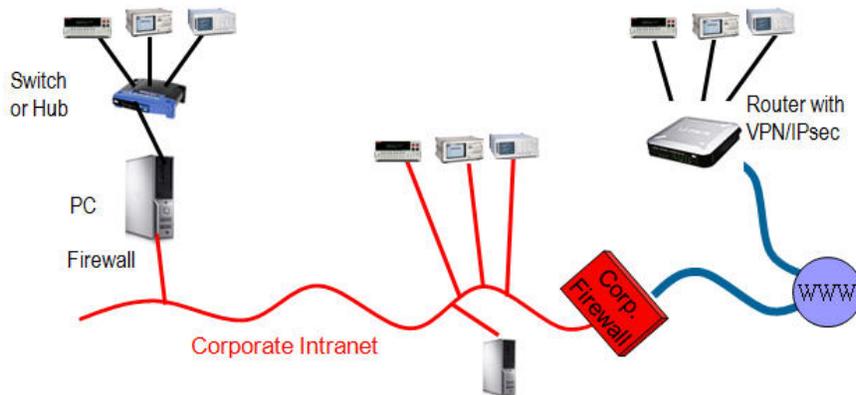


The IT team controls the corporate LAN network and traffic. Their primary consideration with your new test system, or any new device, is if someone wants to “hook on” to the corporate network. The introduction of new hardware should not disrupt existing systems, and that any new equipment is deployed in such a way as to maximize its potential. Given the IT department’s mission and the possibility of network troubles with every new node connected and you can see their concerns.

Adding LXI Devices to the Network Mix

Introducing LXI into the corporate network environment will require close liaison with your IT department to ensure that things behave in the manner expected and that its deployment does not interfere with other systems on the network. Approaching your IT manager early in the design phase of an LXI-based test system is a good idea. As LXI is still an emerging technology, your IT manager may not have knowledge about its capabilities and requirements. So coming prepared with some basic information will allow him to plan ahead and make sure your deployment goes smoothly.

One of the first things to discuss with your IT person is how your LXI test instruments will be used within the corporate LAN. Note that your LXI device may not need to be connected to the wider network, and instead be isolated to a lab or production cell. This information is necessary so the IT department can plan IP address allocations. These IP addresses can be thought of as ZIP or postal codes for computer systems, allowing messages across a network to send and receive information and ensuring it gets to its correct destination. You can imagine the chaos at your post office if we were allowed to choose arbitrary ZIP or postal codes, or even if we all had the same ZIP code! Your IT department may use DHCP (Dynamic Host Configuration Protocol) to dynamically assign addresses, or it may use static addresses where they are set manually.



Even if your equipment is isolated from the wider LAN to a cell or lab, IP addresses are still required. Your IT department can advise on the correct range of IP addresses to use so that everything will work as expected.

Security is also a concern that falls under the auspices of the IT manager. Security can mean many things. The data that flows across a network has commercial value, so it must be secured from unauthorized access. Also, the range of threats that a network connected to the Internet is exposed to is huge – viruses, worms, theft of IP, etc. are all events to be avoided. From outsiders hacking in to less intrusive but equally damaging threats from within the network, the deployment of equipment is often carefully controlled to minimize these threats. VPNs would be likely the highest level of individual security, but this can be expensive when implemented across a large number of users.



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If network connectivity of new equipment is uncontrolled, these threats are magnified. For example, when wireless access points became cheaper, it was often found that office users would purchase their own so they could eliminate cables or allow greater movement within their offices. As these purchases were often made without the knowledge of the IT department, problems ranging from data collisions to serious security holes opened up through badly-configured devices. More often than not, these wireless networks were utilized by passers-by, anxious to piggy-back on free Internet connections to get their email. But who is to say the man in the coffee shop down the road isn't using your open access point to download illegal content or is doing something more insidious, such as accessing your company's personnel or payroll records?

Security also covers protecting individual operating systems from threats such as viruses and other software that falls under the umbrella of so called malware. For many years the operating system of choice that hackers would target was Microsoft operating systems. Some LXI boxes run these operating systems, but if yours does not, it is certainly no reason to be complacent. Malware can be targeted at any operating system's vulnerability. Malware exists for almost any platform you care to mention, including the various flavours of Linux and Mac OSX. And targeted malware can emerge very quickly as vulnerabilities are discovered, often within a few hours. So it is essential that your device is secured, as embedded devices such as those in an LXI device often do not have sufficient storage capacity to run anti-virus programs. Your IT department will be able to give you specific instructions regarding its particular security policies and help you implement a system that is safe for the greater network and its security.

Another aspect of IT management is the allocation of network resources. Many people think that setting up a network is simply a job of connecting all the LAN ports on the computers to a hub or switch and turning everything on. With small systems consisting of a few PCs and a workgroup server, this is perfectly acceptable. But with a larger network consisting of many hundreds of computers, severe difficulties would result from this configuration.

A network cable has a specific capacity measured in bits per second. Most desktop computers have LAN ports capable of supporting 10, 100 or 1000 Million bits per second¹. Therefore the speed of the connection affects the amount of information that can be transmitted through the cable. This speed is known as the cable's bandwidth. With knowledge of the information flowing through a network, an IT manager can plan capacity based on bandwidth, and ensure the expensive and higher bandwidth connections are used only where needed, reserving the slower connections for devices such as printers.

Additionally, routers and switches can be deployed to segregate network traffic to prevent information from one part of a network from being copied to all others. These devices can also provide security by utilizing policies that prevent access from one part of the network to another. For instance, an IT manager may configure a router to prevent email from being sent via any other means than the corporate email server. By restricting network traffic to those services that are authorized, more bandwidth is made available to the applications the IT manager does actually want to run, and disables access to those that could cause harm.

¹ Some definitions utilize a different measure based upon the computer's architecture, usually some multiple or an exponent of two.



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When introducing LXI into your company's infrastructure, especially when connecting your device to the corporate network, inform your IT manager of the type and volume of data you expect to transfer. He can help ensure that capacity is available and configure routers and switches to allow access from those parts of the corporate LAN that require it. A good example is where test data from a production environment may need to be archived for quality control reasons. The archive location may be physically separated from the test location, with the data travelling across many departments. Having the tests pause while data transfers from one location to another could halt production and cause lost revenue. Additionally, you do not want your transfer to pause because someone in another department has decided to start a long print job. In these examples, having a fast, properly configured connection saves both time and money.

When deploying any new device, it is also useful to know which services are available on a specific device so that adequate bandwidth and security measures are implemented. Some devices connected to the network have only one service available. For example a printer may only have a port for receiving print jobs. Another type of printer may have multiple services. Not only does it have a port for receiving print jobs, it may run a service that eases discovery of the printer on the network. It might also have an administration page accessed via a web browser, yet another service.

LXI instruments by design have a minimum number of services – the web server used to configure the device, and a VXI-11 service for discovery. But this does not mean that an LXI device may only contain these services. On a complicated device such as a spectrum analyzer, there are likely to be additional services running to transfer data, for control or remote administration, as examples. Other services designed to ease control and logging tasks such as SOAP (Simple Object Access Protocol) and SNMP (Simple Network Management Protocol) may also be available, depending on the services the LXI device manufacturer chooses to offer and the configuration it designs. Some of these services may be controlled via the LXI device's web interface, giving the ability to switch off unwanted functionality and therefore the associated service. So it's useful before deploying an LXI device to discuss which services will be required for a given device and how they will be utilized. For example, SNMP is sometimes used by IT departments for remote administration. In that case, it may have special requirements for an LXI device with an SNMP service connected to the network regarding the configuration of routers or switches.

A Smooth Transition...

Connecting an LXI device or devices in a corporate environment can be made significantly easier with the help of your IT department. By using the experience and knowledge of the IT professionals within your organization, you can greatly reduce the problems associated with connecting a multitude of devices to your company's network.



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