

6 necessary components of LAN

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Only the smallest companies can operate without computers, and once you have several computers, you may want to connect them. Local area networks, or LANs, turn personal computers into a co-working environment. A LAN may consist of thousands of computers or just a few, but all LANs are made up of some basic components.

Components of LAN

For users, the network is all the software they actually process, whether it's a word processor, accounting software or some kind of advanced custom program. To make those programs work, at the back you'll find a network operating system, drivers that help the computer communicate with network hardware, and all the specialized code that handles the communication between devices. These are the software components of the network.

So what are the hardware components of a LAN? These include actual computers, network interfaces, all switches, hubs, routers, and other special bits of technology that route communications. Finally, there is cable or equivalent wireless option. All of these components work together to create an operational network.



Network workstation

The main purpose of LANs is for users to collaborate with each other or at least share network resources, so all those users need a way to access the network. This is done through personal computers or workstations connected to each other, creating a LAN.

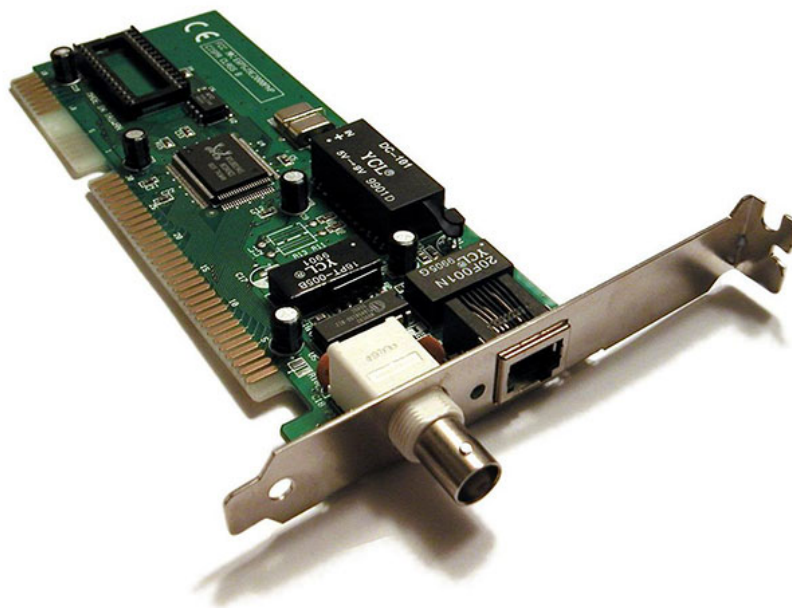
Such computers may include many types of devices. A certain office can contain everything, from low-end laptops or Chromebooks to high-tech engineering workstations, with many devices in between to handle routine tasks like accounting, word processing, and POS. (point-of-sale), etc. In a wireless network, even a tablet or mobile phone can be considered as a workstation.

Typically, the most important part of designing a LAN is how you group all of those users' workstations together. Sometimes it's as simple as connecting people in the same physical space, but what if their needs are different?

For example, the basic WiFi signal is suitable for guests and regular users, but engineers or video editors will need to connect as quickly as possible. Group users into different subnets, where they can share separate sets of resources, often the best option. Advanced user groups scattered across separate two- or three-storey offices can share a network at a few gigabits per second, while people around the network are using a slower network.

Network interface card and driver

Personal workstations will not be part of the network unless they have some way of communicating with other devices on the LAN. That requires something called a Network Interface Card, commonly referred to as a NIC. This card provides a way for the computer to connect to the LAN and exchange information with it.



Most computers are built with two types of NICs already in place, one that uses WiFi and one that uses Ethernet connectivity. You can use the integrated NIC to connect or install a dedicated dedicated card, to meet the needs of individuals in the company. For example, you might want a higher performance card than a built-in card or you may choose to connect to a network with an optical cable to upgrade performance. In those cases, you will need to purchase a separate physical card and install it on the computer.

NIC hardware also requires some additional software to make it work, called the driver. The driver helps translate operating system commands into instructions that the NIC can recognize and work with. The operating system has built-in drivers for almost every card, so when you restart your computer, it recognizes the NIC and works.

Sometimes you will need to have a driver from the card manufacturer instead, either because it provides better performance, better reliability or opens up some of the main features you won't have with a standard driver. Windows updates its own drivers, not third-party drivers, so you'll have to periodically check for those drivers and install any updates yourself. If you installed your drivers from an authorized source, Linux will track third-party drivers and update them along with everything else.

Shared hardware resources

There is certainly an expense incurred when creating and maintaining a network. Most importantly, improved productivity, but the resource sharing option will help save costs. For example, with printers, most users will need to be able to print, but only a few of them want to print large quantities regularly.

Instead of placing the printer on each desk, you can let people share a small number of networked printers. There will always be some situations where you need to allocate or dedicate resources to a specific user or group of users, but everything will be fine. If you only have one person performing large-scale artwork or creating large-scale drawings and designs, then others won't need access to their printers or plotter.

This part of the LAN also includes all the hubs, switches and routers physically connected between devices on the network and between the network and the Internet or the company's larger WAN. A LAN includes things like routers and extenders that can expand your network. Normal users won't need to know how to use them - or care about them existing - but without them, you won't be able to connect and exchange information.

In small networks, each computer on the LAN is quite similar. In a larger network, you may have physical servers, rack cabinets that provide storage and processing capacity for the network. Traditionally, these were kept indoors, but the proliferation of cloud computing - huge clusters of servers accessed via the Internet - meant that servers could be located in remote locations or even Releases are operated by third-party vendors, usually large companies such as Amazon, Microsoft or Google.

Network operating system

One of the most important parts of a LAN is the software that handles all resources and users on the network, so everyone has what they need. It keeps track of which devices are on the LAN, which programs are running, what information is being circulated on the network, and what network resources are needed to make everything work.

From the 1980s to the beginning of this century, you needed a separate program like Novell's Netware or Banyan's Vines to do it. These are complex, expensive programs, and it takes a lot of training to learn how to use them properly.

Now Windows, OS X and Linux are all capable of running the network without requiring a separate operating system. They can even communicate with each other, so IT staff can use Linux to provide network services to Windows users in the office and Mac users to do graphic work in the Marketing department. Daily users will not see or use those advanced features. It is the job of the network administrator, who has a higher level password, and can add, remove and re-allocate users, as well as resources on the LAN.

In a small office that shares 5 computers, 1 printer and 1 WiFi connection, that administrator can be someone with basic training. In a larger business, you can find an entire IT team of people handling those functions. As you grow, demand will increase and you will need people with better skills to keep things running.

Network-Aware programs

The most visible part of the network, for users, is the software in which they actually work. For example, in the past, the network was the only convenient way that many users could collaborate on a Word document or Excel spreadsheet. Now that can be done in the cloud (other collaboration tools like Slack and Evernote make it easier for everyone to work together). You will also rely on the intranet to provide users with access to the company's main database, accounting software and other core programs, even if they are located on physical servers. in your own data center or on cloud servers of Microsoft, Amazon, Google or some other provider

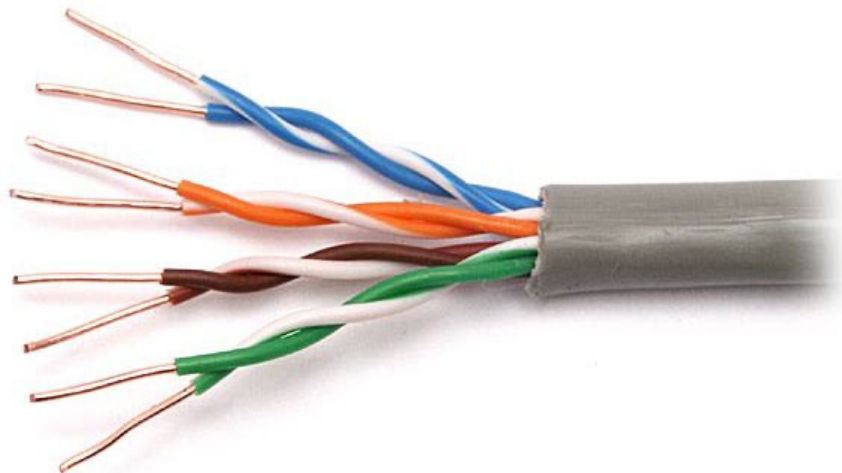
There is a second set of network-aware programs (programs that are specifically tailored to a specific purpose) that few people will use, but no less important. These are the tools that administrators use to monitor LAN performance and security.

Of course, some of these tools are built right into the operating system, but others are provided by third parties or can even be written by developers in the company. Network security is especially important, because if hackers gain access to sensitive data about company or customer activity, things can actually get really bad.

Means of communication

You may have everything you need for an office LAN, all of which are new, but they're just separate hardware until you really have a way for them to communicate. You need to connect all those computers together, physically to the cabling system or via WiFi connection.

In the past, you used to coaxial cable, very similar to the type used for cable or satellite TV. Over time, most networks switch to a different type of cable, called a twisted pair cable, with pairs of wires running through a flat, lightweight cable that looks like (and is) a variation of the wiring used. for landline phones.



The twisted-pair cable is more compact and easier to install, the phone-type connector at both ends makes it easy to plug it into computers, switches, hubs and other network devices. You'll often hear this type of connection called a pin and an Ethernet jack, though that's not entirely true. Ethernet refers to how it communicates over a cable, not a cable or connector, and it is used on older networks with coaxial cables.

Wireless LANs, or WLANs, use radio waves instead of physical wires to send signals between computers and other devices on the network. There are two separate frequency sets you can use, depending on your needs. Most older wireless networks use the 2.4GHz band, while newer devices can also use the 5GHz band.

1. The 2.4GHz band has several advantages such as the 2.4GHz signal will give you a longer and better range when going through walls, which can be important in a large office. Unfortunately, it is also more susceptible to interference, because there are many devices out there that have the same frequency.
2. The 5GHz band is not as good as transmitting signals through walls and preferably at short distances, but when operating, it will give you a better signal.

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