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# 10 Golden Rules for Building out Your Network Infrastructure

Your company's business network is never static. New technologies emerge, additional users must be supported, and upgrades must be made. Eventually, even the smallest network must grow from a few PCs and a simple Internet connection to include more services, more computers and more applications. When it's time to expand your business network, you must consider the current and future needs of your organization and assess the technologies that will provide the best performance for mission-critical applications. Follow these 10 golden rules to build a network that will reliably support your business as it grows:

## **1. Assess your network requirements.**

In what ways do you need to build out your network infrastructure? Do you need more bandwidth so applications run faster? Do you need to scale it up to support more users? Do you need to build in more reliability and redundancy? Do you need to add quality of service (QoS) technologies to support a converged infrastructure of data and voice networks? Before you build out your infrastructure, you must ascertain what is missing in your current network and how you can most effectively fill those gaps.

## **2. Map out a network design.**

It's important to create a network diagram that shows your current infrastructure as well as the new components you plan to add. This diagram must include the connections between network components. The easiest way to map out a network design is with a vector graphics tool or a network diagram application that provides standard icons for different pieces of networking hardware.

## **3. Consider your network bandwidth.**

Most organizations first choose switches that provide several Ethernet and Fast Ethernet speeds; these are referred to as 10/100 switches and they transfer data as fast as 100Mbps. When you need more bandwidth to support a converged network that runs, for instance, voice applications, you're likely to upgrade to Gigabit Ethernet switches; these transfer data as fast as 1,000Mbps. But before you upgrade your switches to a higher speed, make sure you're running your current switches at full capacity.

## **4. Start with basic network components.**

IP networks are built on two components: switches and routers. A switch creates the network, connecting computers, printers, servers and other devices to one another. Do you need additional switches to build out your network? Do you need to move from an unmanaged switch to a managed switch for more control over your network traffic? Consider installing switches with power over Ethernet (PoE) ports that can supply electricity to other devices.

A router connects networks, particularly your LAN to the Internet, and it gives all the computers on your network access to the Internet through a single connection. Decide also if you need to upgrade your router to provide additional security or remote access capabilities.

**5. Build in network security from the start.**

Network security should be part of your network foundation, and you should consider all security issues as you build out your infrastructure. For instance, choose a router with a built-in firewall over one that doesn't include security measures. Consider also expanding your network security defenses with a gateway security appliance that applies preventative security measures to incoming Web traffic; look for one that includes anti-spam, anti-virus and anti-spyware protection and that provides secure messaging and Web usage controls.

**6. Prioritize network traffic.**

Most organizations expand their networks to accommodate more traffic and larger applications. But just throwing additional bandwidth at the problem doesn't solve the problem — you also need to prioritize the traffic on the network to make sure the most important applications are getting the bandwidth they need to perform at their peak. Choose managed switches and routers that have built-in QoS (quality of service) and other traffic management features that let you prioritize network traffic.

**7. Build in network reliability and redundancy.**

Networking equipment will, at some point, fail. When it does, you want your network to continue running. This means that you need to design your network so it does not have a single point of failure that will take the whole thing down. For instance, install switches that have a redundant power supply unit, so that the switch continues to operate even if its primary power supply fails. For further redundancy, look also for load balancing and failover features in routers and switches as well as network management tools that proactively monitor the health of each device on your network. The aim is to reduce unscheduled downtime on your network — the ideal uptime is called “five nines” or uptime 99.999 percent of the time.

**8. Add storage to your network design.**

Network attached storage (NAS) is an important component of a growing network. A NAS appliance is a self-contained networked box that is dedicated to storing and sharing files over the network. NAS provides centralized storage that all users can access, like a file server, and it can also be set up to provide load balancing and fault tolerance storage for email and Web servers.

**9. Go wireless.**

Another logical next step in network expansion is adding wireless LAN technology, which allows users to roam more freely throughout your facility and remain productive. It also lets guest users access your network and the Internet more easily, such as from a conference room during a meeting. You'll need to install a wireless router and wireless access points throughout your facility. This is especially easy to do if your switches have PoE ports; you can plug the access points directly into the PoE ports, without needing to find an electrical outlet. Going wireless introduces a raft of new security issues, so be sure you lock down your Wi-Fi connections just as you did the rest of your network.

**10. Consider your Internet connection.**

The last aspect of your network to consider is probably the one users notice most: the speed of your Internet connection. If you're going to run data-intensive applications like voice or subscribe to cloud-based services delivered over the Internet, you may need to upgrade. If you're running DSL, you might want to upgrade to business-level DSL, cable or satellite services. Larger companies often upgrade to a leased line like a T-1 line.

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