The Gadwall Network Checklist

Make sure you've got everything when you set up your network

By Jim Frazier

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Tame Your Technology

Executive Summary

This checklist is designed to guide you in making sure that you have covered all the bases with your network design and technology purchases. Most network installations suffer because parts are not ordered and the installation is held up until they are delivered, usually at an additional cost. In addition, there are important services to line up as well. Our objective is to cover as many products and services as possible so that your implementation will go smoothly.

This list covers the following major pieces of your network:

Hardware including servers, network infrastructure and workstations

Software including operating systems and application software

Services including support and implementation

We also include a general list of networking "gotchas" - common problems to look out for in any networking project.

Use this list as a means of specifying your network, or for helping to ensure that your network systems integrator has not missed anything. It'll be a good test of his or her care and attention to your solution.

This checklist, while designed for a network acquisition, can also be used effectively for any computer purchase, whether it is for a single workstation or a component of your existing network.

Hardware

See Hardware Component Checklists below to make sure that you've included all the necessary pieces in each system

Servers

On all servers, make sure that the compatible client software is available for the workstations and is installed. Check version numbers.

G File

This is where the data from desktop applications, such as word processing and spreadsheets, is stored. The files are kept on virtual drives such as the "F:" drive. These servers provide users with the ability to save their information on centralized, managed and backed-up volumes and enable them to share their resources with other members of the organization.

G Print

This may be a separate computer, or part of the file server. This server supports multiple network-based printers. It queues and controls print jobs. The first two servers shown on this list represent the original types that were used in networks. Even today, they are the reason most people invest in a network.

G Application

These are servers designed for specific functions such as accounting systems, manufacturing systems, etc. The rest of the servers listed really are simply different types of application servers.

G Fax

These servers provide network users with the ability to send faxes from their desktops and, in some cases, receive faxes as well.

G Email

This server supports the email system, acting as the post office and repository of all of the email messages.

G Web

If you're going to have information on a web, whether it is for the Internet, or for an extranet or intranet, you'll need to use a web server. Note that this type of server is frequently outsourced to a third party service provider, such as an ISP (Internet Service Provider).

G Gateway or host connection

Frequently referred to simply as a "gateway" these servers provide for terminal emulation and connectivity to mainframe and midrange computer systems.

G Management

As your network grows, you may find it necessary to implement network

management, allowing your networking staff to be able to remotely manage servers and hubs, assist users and spot problems before faults cause your network to fail. Management is not usually implemented in small networks.

- **G** Asynchronous communications

  Rather than have modems for individual users, these servers allow you to pool a small group of modems for dial in/dial out services, reducing the number of necessary phone lines and enhancing management and control. This capability allows users to dial out over the network and also allows them to dial into the network.

- **G** Imaging

  These servers support an imaging solution implemented by many companies to enhance their customer service. Images of paperwork, such as claim forms and invoices, are scanned and indexed making them quickly available to the appropriate users.

- **G** CD ROM

  More and more data is available on CD's which are placed in CD towers. Multiple network users can access the data, without having to get it from a library, or have a CD drive on their computer. Towers will accommodate multiple CD's allowing many databases to be accessible to users.

Workstations

- **G** Using the Hardware Component Checklist below, make sure that your workstations will support whatever software or other hardware that you expect to use.
- **G** Include the software that you'll need to connect to the network and to the network applications that you'll need access to.
- **G** Make sure that the rest of the network will support the types of workstations you will be using (Mac, Windows, Unix, Citrix, etc.)

Routers

- **G** DSU/CSU

  This device is similar to a standard modem. It provides the interface between your router and the data line. Think of it as a "digital" modem

- **G** Cables from line to DSU/CSU and from DSU/CSU to router
- **G** Mounting hardware and rack equipment
- **G** UPS

Wiring

- **G** Hub or switch

  Purchase the number of ports for the number of connections you'll require. Plan for growth.

- **G** Patch cables

  You'll need them for the wiring closet and from the workstations and servers to the wall plates.

- **G** Architectural cabling (inside the walls, floor, furniture and ceiling)

- **G** Punch-down blocks and hardware

- **G** UPS

- **G** Mounting hardware and rack equipment

- **G** Management module and software (if available for your components and if you expect to use management in the foreseeable future).

- **G** Ensure that cables are compatible with the topology and speed of the network. Get the highest grade cable available. Currently, Category 5 is the preferred grade of unshielded twisted pair cabling (UTP).

- **G** Consider the distance limitations of the topology. This issue can sneak up on you. The standards are real (it's a function of signal timing and attenuation). It's not like "E" on your gas gauge. Push the outside of the envelope and you'll pay for it later.

- **G** Ensure that all of the components of the network are compatible.

- **G** Ensure that cabling contractor is experienced at network cabling (it's easy to incorrectly splice or attach a connector). Find out what testing they will do. If this is their first job, beware! If you're doing it yourself, buy the correct pre-made cables (with the connectors already attached).

- **G** Determine fire and building code restrictions on cabling (use the contractor for this - they generally like to be careful about code violations.)

Firewall

- **G** This device is used between your network and the Internet to increase security. It may also be used between sections of your internal network. See Hardware Component Checklist below.

Tape Backup

- **G** Develop a backup plan and tape rotation schedule and make sure that the software and hardware will meet the requirements

- **G** Is there sufficient capacity to back up the necessary files?

- **G** Does the software support the hardware?

- **G** Purchase sufficient media to accomplish the backup rotation.

- **G** If the device is internal, make sure you have the correct mounting hardware.

Management System

- **G** Agents

  These are generally pieces of software, running on network components, such as servers, switches, routers and workstations, that report back to the management server.

- **G** Management console

  This is a powerful workstation, generally dedicated, that allows the network manager to receive information and alerts about the state of the network and to solve problems.

- **G** Management server (mentioned above)

  This server holds the vast amount of data accumulated from the agents on the network and reports to the management console.

- **G** Confirm that all management components are compatible.

- **G** Determine workstation policies to be set and whether or not this will be feasible. Your users may rebel against your taking too much control over their desktop.

- **G** Note that management systems require significant executive commitment and network manager training to be effective. Be careful that you really will take advantage of the systems before you include this capability in your system.

- **G** That said, it is technically easier to establish network management at the beginning of a network implementation, rather than after the network is up and running.

UPS and Monitoring Software

- **G** If the UPS is supporting multiple systems, make sure that you have all of the software necessary to support every system.

- **G** Check that the power provided by the UPS is sufficient to maintain your hardware for the amount of time you'll need for a graceful shutdown.

Communication Line or Internet Connection

- **G** Match the DSU/CSU's at both ends of the connection

- **G** Provisioning (setting up the connection with the data carrier)

  This can be a long and painful paperwork-intensive process involving communication between you, your ISP, your network dealer, the phone company and the data service provider.

- **G** Routers (on both ends of the connection)

- **G** Installation of these lines can be tricky. Look for a dealer who can provide as many of the components as possible; so that you have one responsible party - one person to call if there are problems.

- **G** If you're setting up an Internet connection, don't forget your ISP and email.

Network Printers

- **G** Confirm support by your application software and operating systems
- **G** Confirm support by printer servers
- **G** Get latest drivers
- **G** Cables
- **G** Consumables (paper, toner, ink)

Software

For all software, make sure that you have purchased sufficient license connections, including any "hidden" connection requirements.

Make sure you have provided the necessary hardware for any special input/output requirements, such as bar coding, imaging, plotters or color printing.

Application Software

- **G** Get written assurance from manufacturers about the required hardware, software, service levels, memory, etc. Design the rest of your system to match those specs. Ask for references of successful implementations of the product, using that configuration.

Operating System

- **G** Windows, NetWare, NT, Unix, Linux, Citrix, OS/2, etc.

Backup

- **G** Make sure that you have both a workstation solution AND a server solution. If you don't plan to back up workstations, make sure you organize your data to insure that important data is backed up.

Antivirus

- **G** Consider both server-based and workstation-based solutions.

Management

- **G** You'll need agents, a server and a console - see above

Browser

- **G** You have your choice of Netscape, Microsoft and others. Most are free or included with other software. Discuss this decision with your dealer.

Office Suite

- **G** As with the browser, you also have a choice, even if you didn't realize it. There are other suites available from Corel and Lotus, for example.

Fax Software

- G You will need software on the workstation that is compatible with the software that is on the server.

Database Software

- G You will need software on the workstation that is compatible with the software that is on the server.

Hardware Component Checklists

For All Hardware Components

- G If the device can be managed, and management is in place or planned, determine what additional software or components will be necessary.
- G If any consumables are used, make sure you have a sufficient supply on hand.
- G Determine all cable requirements, both internal and external. Make sure that the cables meet the specifications of the equipment and software in use. This is a little more complicated than just going to Radio Shack for some speaker wire.
- G Determine all mounting requirements for internal or rack-mounted configurations.
- G Determine and walk through all interface requirements for any connections to the network or other systems. Make sure that cables, plugs and sockets match. Confirm that there are sufficient interfaces available and that the appropriate drivers are in place.
- G Determine all necessary software and driver requirements.
- G Is a separate power supply required?
- G Evaluate the need for a UPS.
- G Plan for growth and flexibility. You'll make mistakes, expand, change your mind, add new technology, implement management, etc. Make sure that the hardware is expandable, flexible, supports multiple standards and keeps your options open.

For All Servers and Computers

- G Determine the necessary hard drive, memory capacity and other requirements for the applications used on the system
- G Operating system
- G Application software
- G Will the system support the number of users and expected traffic and processing requirements?

- **G** If you have duplexed drives (recommended), remember that they require an additional hard drive, drive controller, cable and mounting hardware.
- **G** CD ROM drive - if you're loading software, you'll need this.
- **G** Diskette drive
- **G** Video card, drivers and display
- **G** Software required to connect to all planned servers and workstations
- **G** Sound card and speakers

  I'm not sure of the purpose of sound capability in a typical business environment, but you might need this.
- **G** Mouse and keyboard
- **G** Consider implementation of any redundant hardware components if fault tolerance is important.

Facility Issues

- **G** Check for adequate available room for systems.
- **G** Is there sufficient power?
- **G** Is there sufficient air-conditioning and ventilation?
- **G** If components are to be mounted in a chassis or rack, check:
  - need for mounting hardware
  - available room
  - heat problems
  - size
  - mounting compatibility

Services

Note that these services must be accounted for with each product in your network, both hardware and software.

- **G** Determine exactly what your procedure is (who to call, what are response time expectations and guarantees, what are the costs) for every component you've purchased. These would be covered by
  - Warranties
  - Service and support contracts (offered by the dealer and vendor)
  - Time and material service

  Some day your systems will fail. Walk through and be familiar with the recovery process before your purchase. Surprise about what is or isn't covered is not something you need when your production server goes down.

- **G** Installation services
- **G** Cable installation
- **G** Training for users, support, help desk and network management personnel.
- **G** Follow-up services, for coaching, fine-tuning, support, enhancements and routine maintenance.
- **G** Agree on the scope of the project, including objectives, activities, responsibilities, deliverables and acceptance criteria.

A Little Extra

- **G** Always budget a little extra when you're planning your network. No matter how carefully you go through this checklist, there will always be a missing component or discontinued part that you didn't plan for. As a rule of thumb, plan for about 5% if you carefully follow this checklist, 10 to 20% if you haven't been paying much attention and +30% if you pretty much ignore everything.

Some Networking "Gotchas"

Networking is tricky. Just in case you haven't read every word of this report, we've included a few special snags to remember as you venture forth.

- **G** Cabling

  This is not an area to skimp on. Cable problems can haunt you for a long time. Mysterious network problems are often cabling problems and it will take a long time, lots of consulting hours, and much frustration to find them. Make sure your cabling contractor is qualified and check that sufficient testing is done to ensure that the job is done right.

- **G** Power

  Another area that can cause obvious, as well as mysterious problems, is your power supply. Making sure that your equipment is protected from power surges and spikes. In addition, depending on your situation, you may have "dirty" power which the standard surge suppression won't take care of. Discuss power with your systems integrator and make sure you have the important equipment fully protected.

- **G** Using early releases of software

  There is a maxim in the networking and computer industry - never buy version "dot oh" of anything. The rule of thumb is to wait for the third release of a product before implementing it. This applies to packages, as well as patches and updates. If you're going with a more recent release, make sure the integrator has confidence in the product and

experience. And be prepared for trouble.

G Rambunctious users

The single biggest support headache in most networks is the users' inclination to either be creative, or solve problems on their own. Problems range from making their own cable, to installing shareware software which blows up your critical business applications. And when you ask them what they've changed, their reply will be "Nothing." Where possible, rule your users with an iron fist.

G Buying more than you need

You may be inclined to get that email/calendaring/scheduling system right away, or you might want Internet connectivity immediately. They may be appropriate, but consider your original motivation for the network. Is there room in the project for these enhancements, or should you plan for them later?

G Not planning ahead

Your network will likely grow, either because your business does, your needs change, or because new technology becomes available. You might start off with a peer-to-peer network and find that you soon need a file server and a different protocol. A good systems integrator or consultant can help you plan out the growth path that your network may take and help design an effective foundation. Ask for this assistance. Their response will help you figure out if you have found the right company.

G Choosing the wrong integrator

The barriers to entry into the network integrator market are very small. When choosing your integrator, make sure they have the experience and knowledge necessary, carefully check their references, define the scope, and interview the technical staff.

G Doing it yourself

The networking industry is mature enough, and there are sufficient vendor support programs in place, that you can often install small networks yourself. However, no amount of articles, books, instructions or 800 numbers will provide you with the experience necessary to build a solid, optimized network. In addition, do you really want to spend the time and effort to do it yourself? Can your business afford it?

G Basing your purchase on what you've read and not real world experience

Consultants and the press frequently make technology recommendations based, not on actual real world experience, but on what they've read in reviews, heard at vendor seminars or seen at trade shows. Pay close attention to the recommendations of people who have actually used and implemented the technology, not to people who have only read about it.

G Forgetting about disaster recovery

Have a plan written for that horrible eventuality - your server going down or lost data. Do you have a sufficient backup plan in place? Do you know who to call for tech support? Do you know how fast the response times are? Can you survive for that long? Do you have hard copy backups available?

G You didn't check references

Not only do you have to check your integrator's references, you should pay attention to other specialized products, like industry specific packages. Talk to real users in your type of business with your type of environment. Make site visits. Many users go through a couple of business packages before they find a good one. Save yourself the time and effort by being careful right off the bat.

Implementing a network can be a challenge. It relies on a sizable cash investment on your part, a smart and competent vendor, and patience. Using this checklist just might help you catch most of the potential problems early on. If you have any questions, or if The Gadwall Group can be of any assistance, please email us at jfrazier@gadwall.com.

THE GADWALL GROUP

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President

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Where could we improve?

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On what other topics would you like us to offer reports?

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