



**DESKTOP LIFECYCLE
MANAGEMENT
REFERENCE GUIDE**



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desktop resources
from start to finish.

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DESKTOP LIFECYCLE MANAGEMENT REFERENCE GUIDE

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WHAT IS A CDW REFERENCE GUIDE?

At CDW, we're committed to getting you everything you need to make the right purchasing decisions — from products and services to information about the latest technology. Our Reference Guides are designed to provide you with an in-depth look at topics that relate directly to the IT challenges you face. Consider them an extension of your account manager's knowledge and expertise. We hope you find this guide to be a useful resource.

MAKING THE MOST OF DESKTOP RESOURCES



CHAPTER 1:

The Benefits of DLM

DLM Components

When IT managers are asked what part of their job they like least, most will mention some routine and time-consuming task that feels like busy work rather than a problem-solving project that really engages their skills.

Desktop Lifecycle Management (DLM) likely ranks high on that least-enjoyable job list. DLM is a thankless but critical job in the ongoing maintenance of an organization's IT infrastructure.

While some of its aspects are tedious and appear to have little value, with DLM, it's the little things that add up. Making sure that desktops, notebooks and workstations are running optimally allows a business to maximize the productivity of its operations. And hardware and software updates and upgrades are an inevitable necessity that cannot be avoided.

THE BENEFITS OF DLM

Organizations have much to gain from a purposeful, thought-out DLM strategy. In the area of cost prevention, a coordinated approach to DLM can reduce the amount of time that IT staff is spending on routine and time-consuming tasks, freeing up more time for more strategic projects.

And when general staff don't have to concern themselves with whether their notebook or desktop has the most up-to-date version of Windows on it or not, overall staff productivity increases.

Another cost-saving benefit of DLM is that the firm gains a wider understanding of the lifetime financial obligations of the solutions that it purchases. An organized DLM approach does away with the

inherent duplications that occur when equipment purchases are made on an ad-hoc basis with little forethought or planning for the built-in additional costs to come.

Organizations can see the associated costs beyond the initial purchase of a personal computer, for example. This is extremely important, because according to IT industry research firm Gartner, typically 70 percent of a company's IT budget goes toward service and support (and only 20 percent goes toward hardware and software purchases). Another consideration down the road will be disposal costs as businesses embrace a greener approach to product disposal.

Having a top-down view of IT spending is becoming increasingly important as the gap between acquisitions costs and the Total Cost of Ownership (TCO) for a desktop solution continues to widen.

For example, the TCO for a \$2,000 desktop computer can balloon to \$20,000 over a three-year period. With the growing complexity of desktop workstations and personal computers, this TCO is only going to grow in the future.

Another value gained from a DLM strategy is that a company avoids risks, such as not staying current on software licensing and the associated liabilities resulting from a violation.

When a mindful DLM process is in place, less time and attention needs to be invested in the little tasks of keeping a firm's assets up and running, and more time can be devoted to furthering the organization's mission.



DLM COMPONENTS

A successful DLM strategy is a process, a complete continuum that requires attention to detail at every phase.

DLM can be broken down into four distinct phases:

- **Assessment, planning and design:** Prior to any solution purchase, an organization should assess how its current desktop fleet is working to identify any unfulfilled needs. Having a full understanding of your staff, the firm's processes and the technology at its disposal will then allow you to map out and design the perfect solutions for your organization's needs.
- **Configuration:** Getting the initial deployment of your desktop solution right is crucial, and will save money and future headaches. A detailed understanding of your staff's computing needs will allow you to provide the optimal features that they need to excel at their jobs.
- **Installation:** Deploying a desktop solution is no simple matter. A good deal of forethought and planning needs to go into a successful installation. Addressing all of the system-wide issues and the finer details of how the solution works in the cubicle or office is a necessity for a good rollout.

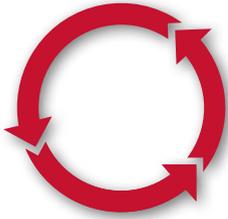
- **Asset lifecycle support:** This is the heart of a good DLM solution and includes resource tracking, help-desk support, maintenance, warranty and software licensing management, patch management and end-of-life disposition.

Another option explored in this guide is to go the managed services route: Hire a vendor to handle some or all of your DLM needs so that highly skilled (and highly paid) IT staff can focus on other important projects.

Uncertain economic times, lean IT budgets and the increasingly rapid pace of technological development are all factors that are pushing organizations to be more proactive in managing their desktop fleets.

Developing a well-thought-out approach to your organization's desktop lifecycle management will allow you to squeeze out as many efficiencies as you can from your resources, as well as reduce your IT expenditures, increase security and reduce your IT operational and support costs. ◇

ASSESSING, PLANNING AND PROCURING



CHAPTER 2:

.....
Taking Inventory

.....
Planning and Policy

.....
Assessing Infrastructure

.....
Procurement

No successful strategy can be implemented without careful planning. This holds true for desktop lifecycle management (DLM). The more time and attention your organization gives to this predeployment phase, the better the results will be.

TAKING INVENTORY

One of the first steps is to conduct an inventory of the company's desktop resources. With a firm accounting of what resources you have, your business will gain a few helpful insights. First, knowing what technology you currently possess will give you a better sense of where you might be lacking in meeting the desktop needs of your organization.

Second, you will have a benchmark to reference going forward, which will allow you to measure the progress you make with your DLM strategy. Third, having an idea of what resources are available will help you squeeze out greater efficiencies from them as you fine-tune your DLM plan. Knowing where you're starting from is essential to determine where you're going with your DLM plan.

As part of this taking-stock phase, your organization should also categorize each desktop asset's product specifications, its age and its operating system. Another helpful categorization method is to break down your resources into desktops, notebooks, workstations, tablets and thin clients.

It's easy to get carried away with this categorization process, so it's best to stick to the basics. Once all of the personal computer options are laid out, they should be further categorized to detail

specific user needs such as application requirements.

Asset management software solutions are available, and some organizations may find them helpful in this process, simplifying the data collection and summarization process.

PLANNING AND POLICY

Once your company has taken an inventory of its current desktop resources, it can begin to plan out and formulate policy for its DLM strategy. One important issue that you will want to address while planning is how long you will utilize your desktop hardware. In other words, what will its lifecycle be.

The lifespan of a PC is open to interpretation. Many vendors continue to support the traditional notion of a three- to four-year refresh cycle for PCs.

But a combination of performance advances and the uncertainty of the economy and budgets has led many firms to extend their refresh cycle to six-to-seven years. It's up to each company to determine how frequently it needs to update its technology.

With an inventory of desktop resources and a lifecycle nailed down, organizations can begin to research what desktop solutions are available and their product cycles. This is where having a firm understanding of the end user's needs proves its value. Obviously, you will want to match up products that best meet those needs at the most cost-effective price you can find.

Another consideration to plan out is whether your firm is going to standardize on its hardware and software choices. Generally,

standardization is a good idea, because it makes for easy maintenance throughout the lifecycle of the solution.

From a security standpoint, there might be some concern about vulnerabilities if all of your computers are the same — they'd all have the exact same vulnerabilities, which, if taken advantage of, could put your entire fleet at risk.

But standardization also makes staying up to date on security easier too. As long as the IT department stays on top of security patches, standardization will prove to be very helpful.

A GREEN PERSPECTIVE

As more and more companies take an interest in applying an environmentally friendly approach to their operations, you may wish to bring a green perspective to your DLM planning. A great area for improving an organization's everyday impact on the environment is computer efficiency. Researching the ENERGY STAR ratings of the PCs that you deploy can help you make the green choice.

Currently, one of the key metrics for computer efficiency that the ENERGY STAR rating focuses on is the 80 PLUS rating, an energy-saving incentive program funded by electric utilities for power supplies (80plus.org).

The 80 PLUS rating calls for power supplies to be at least 80

percent efficient at 20 percent, 50 percent and 100 percent output loads. Desktop computers have improved and there's been a dramatic drop in power consumption. Today, they're loading larger power supplies at only 5-to-10 percent output. But that metric alone really can't tell you how efficient a computer is.

Probably the most important consideration is power consumption. To get lower power consumption at the desktop level, a business should consider using thin clients or blade PCs. Short of these options, notebooks are a good choice because they are designed with long battery life in mind, and thus low power consumption.

Ideally, your company should try to conduct its own power measurements and create its own performance benchmarks on its actual workloads. This will help with purchasing decisions, as no standardized benchmark can be representative of all workloads.

ASSESSING INFRASTRUCTURE

Desktop systems do not operate in a vacuum. They are dependent on a company's infrastructure. So it is necessary to assess the infrastructure as part of your DLM predeployment strategy to make sure that what you plan out at the desktop level will work within your organization's larger systems. Three especially important areas that should be assessed are your network infrastructure, mobility infrastructure and security concerns.



NETWORK ASSESSMENT

Planning for your DLM strategy should include performing an accurate assessment of the current network environment and a gap analysis to determine if the existing infrastructure, sites and production environment can adequately support the planned upgrades to your desktop systems.

The assessment should take into consideration the following:

- Current applications and data on the network, such as Voice over Internet Protocol (VoIP), e-mail, Structured Query Language (SQL), Common Internet File System (CIFS), Internet and video on-demand
- Current network topology, including but not limited to: network devices, physical and logical links, external connections, frame types, routed and routing protocols, application-specific protocols, IP addressing scheme and traffic and network utilization analysis

Many tools exist to facilitate network assessment. These tools range from basic device information output tools that display the network device utilization to third-party tools.

For example, within Cisco devices, you can view interface statistics, CPU and memory utilization, NetFlow and application flows using Network Based Application Recognition (NBAR). Third-party tools that monitor networks, sniffers and Simple Network Management Protocol (SNMP) tools can be used too.

WIRELESS SITE SURVEY

After defining the devices (and their individual requirements) in your DLM strategy, a site survey of the areas requiring wireless coverage becomes indispensable. This process involves placing wireless signaling gear in the area and using special software or equipment to gather information about the site with regard to wireless networking.

Implementing wireless for voice involves more stringent requirements than those for data coverage. The survey requirements will change if location-based services will be overlaid on top of voice or data needs. Firms should give special consideration to access points, user requirements and cell overlap.

Other critical factors include the power capabilities of the users that will connect to the network, user roaming capabilities, whether these devices will attach to an 802.11a/b/g/n network and the number of users that will connect to a single access point at any given time.

Taking user and device density into consideration is important because in areas where the potential exists for a large number of users, you will want to add the appropriate number of access points to accommodate the traffic.

Placing too many users on one access point can degrade performance for everyone. It may also prove valuable to consider what mobile security solutions will be used on the organization's devices, as some facilitate faster transfers between access points than others.

A site survey ensures proper quantity and strategic placement of access points throughout the area in order to efficiently provide coverage. It also verifies sufficient coverage overlap between access points so that the users will have the ability to move freely through areas and roam seamlessly between them.

Note that a site survey physically conducted on premises remains the only reliable method for identifying the required number of access points and their proper placement.

SECURITY ASSESSMENT

It will prove valuable to do a security risk assessment as part of your DLM preparation. Knowing what your organization's security needs are will be an important consideration as you choose what hardware and software to equip your desktop fleet with.

Various approaches to security risk assessment can be adopted. At one end of the spectrum, it's possible to do risk assessment mostly on paper. Such abstract approaches to risk assessment focus on the following issues:

1. Identifying the organization's assets and thereby determining what's at stake in the event of a security incident
2. Identifying likely areas of trouble, or "threat modeling," which involves brainstorming about potential sources of harm to the assets identified above
3. Attempting to prioritize the risks posed to the business by ranking these potential troubles in terms of their likelihood and their potential impact

It's possible to complete the third step without either detailed actuarial data about security incidents or uninformed predictions of the organization's future security.

The advantage of this strategy is that it offers a relatively quick and inexpensive path to valuable organizational knowledge. However, because it's conducted in a vacuum, it may not bear much relation to actual vulnerabilities or threats.

At the other end of the spectrum, it's possible to approach risk assessment from an applied technical perspective. A team of engineers with expertise in discovering and gauging the impact of vulnerabilities can take a snapshot of the environment. They can identify both assets that stand in jeopardy because of vulnerabilities and the types of threats that might affect them.

Quantitative in nature, this tactic has the advantage of providing a more realistic measurement of the environment's resilience to the

conditions of actual incidents. At the same time, a purely technical approach will often overlook important but intangible assets, such as staff, public relations and good will. For this reason, it's a good idea to blend the two approaches.

PROCUREMENT

Every organization has its own unique (and often extensive) procurement process. With an uncertain economic climate and resulting uncertainty regarding budgets, it's a good idea for the IT team to educate themselves on the ins and outs of the steps they need to take in order to get the solutions they need for their DLM strategy.

Knowing how to use the procurement system to your advantage is knowledge that will pay off in large dividends when your organization determines its budgets.

IT teams need to know how to make the case for their budget needs. Here are some tips about how to make your case for the

DLM solutions that you need:

- **Translate performance into dollars:** If you are looking to upgrade your hardware as part of your DLM strategy, pilot a system to precisely quantify improvements in technical performance. Then try to quantify the financial benefits of the upgrade. Are end users demonstrably less productive without the upgrade? Are opportunities being missed?
- **Find the right advocates:** In the real world, the frustrations of managers carry more weight than those of rank-and-file staff. That's why it's smart to find the right allies when you're seeking approval for DLM spending.
- **Leverage inevitability:** PCs are aging assets that must be retired eventually. So it's better to position an upgrade as merely the acceleration of an inevitable purchase, rather than as a cost that could be avoided. ♦



DESKTOP CONFIGURATIONS



CHAPTER 3:

Desktop Considerations

Alternate Forms: Thin Clients, Blade PCs and Tablets

Monitors

Processor Upgrading

Software Imaging

Users need the right equipment to carry out their work responsibilities, which ultimately flow into supporting a company's mission. So it cannot be emphasized enough that an organization needs to do its due diligence when it comes to deciding what equipment its staff is going to work on. A good deal of planning, researching and options weighing needs to happen before a firm can come to a decision on what desktop equipment it purchases.

DESKTOP CONSIDERATIONS

Sorting through the many manufacturers and models of desktop and notebook computers can be an unenviable task. To start, you need to know what your staff's technology requirements are. What do they need to accomplish their work responsibilities? This may vary from department to department, or workgroup to workgroup.

Some additional questions you'll want to have answered are:

- Are staff working in the field or out of the office?
- Does the staff do a lot of calculations like utilizing Excel or accessing databases?
- Is the staff rendering pictures and video?

Once you have a good understanding of what you need to look for, you can examine more closely which manufacturers and models best meet those needs.

The most important features that you will want to take into

consideration when comparing products are:

- Battery life (for notebooks)
- Hard-disk drive size
- Processor speed
- Screen size
- Installed memory size (and how much additional memory the computer can support)
- Blu-ray/DVD reading and writing capabilities
- Webcam functionality

ALTERNATE FORMS: THIN CLIENTS, BLADE PCs AND TABLETS

With the budget having a stronger influence than ever on desktop topology, many businesses are looking beyond the typical desktop and notebook setup to increase resource efficiencies. Thin clients, blade PCs and tablets are three options that have been gaining ground as alternatives to traditional hardware.

THIN CLIENTS

Thin clients are the most popular alternative. Not familiar with thin-client technology? With thin-client computing, much like the old days of mainframe computers, all the action is in the data center, which powers the computing functions and stores all the

applications and data. Information flows back and forth to thin clients, which are small desktop devices with no hard drives and limited functionality.

The benefits of this arrangement are that data is more secure, and hardware and software is easier to manage and update because everything is stored centrally on servers. That, in turn, saves organizations money.

With new features that provide solutions to many of the problems that IT departments are now facing, it's no surprise that thin clients are being given serious consideration by companies in all types of industries.

Manufacturers have made many advances to thin clients. Gone are the days of the dumb terminal. It's now packed with a processor, RAM and flash memory, allowing some applications to run locally. This boosts the performance of some applications, including web browsing, videos and other multimedia applications.

Some manufacturers have also introduced thin-client notebooks that look like regular notebooks except they have no hard drives. Users access applications and data by connecting to their servers via Wi-Fi and other network connections. Thin-client computing has always been highly available and reliable, and the new architectures offer the same stability.

Thin clients have no moving parts, such as hard drives or fans that can fail, so their lifespan is much longer than regular PCs. Without a hard drive, viruses and spyware have far fewer attack vectors than a typical PC. If thin clients break down for any reason, IT departments can get the user up and running by moving them over to another device in minutes. Users face very little downtime.

Here's a closer look at four of the key advantages of thin clients:

1. Increased security: The lack of a hard drive in thin clients not only protects data from thieves, it protects the data from the users themselves. As long as the term server remains secured, the thin client itself is inherently safe. Users cannot disable antivirus software. They can't install unauthorized software or accidentally introduce viruses or spyware through web surfing or downloads.

2. Total cost of ownership: Thin clients are less expensive than PCs and can last five-to-seven years, which is twice the lifespan of a typical PC. IT departments also save tremendously on support costs. The centralized architecture of a thin-client deployment creates efficiencies that translate into dollars saved.

3. Centralized management: IT staff can manage the computing infrastructure in one central location: the data center. IT departments can use management software to remotely manage user settings and install software and upgrades. And the IT department doesn't have to worry about backing up each user's hard drive. It's done on the server side.

4. Environmentally friendly computing: IT leaders are looking for ways to reduce energy consumption and be more environmentally friendly. Luckily, thin clients are far more eco-friendly than PCs. Thin clients use less energy, have a longer lifespan, and are smaller and require fewer parts, such as plastics, metals and electronics. As a result, thin clients can reduce the amount of hazardous materials that end up in landfills.

BLADE PC

Another desktop alternative that organizations may want to consider are blade PCs. Blade PCs are a mix of traditional desktop PCs and thin-client computing, in which servers deliver the computing power and storage for applications and data. The blade PCs themselves are thin computers that feature the standard PC parts, such as a processor, memory, a hard drive and a graphics card.

Like blade servers, blade PCs slip into a chassis that shares the same resources, including power supplies, cooling fans and network connections. Finally, "user ports" (small, thin-client devices that are placed on users' desks) connect to a monitor, keyboard and mouse, and provide access to the blade PC.

As a result, blade PCs give users the full power of regular PCs, but they are located in the data center, giving the IT department the security and centralized management of thin-client computing.

The security benefits stem from the blades being bolted into a chassis. You need both the blade and the chassis for the computer to work, so blade PCs are not nearly as attractive to steal as a notebook. Another security feature is that they don't have CD-ROM drives and the ports can be locked down to prevent web surfing. That way, users can't load or download applications that could potentially put the computers at risk.

Another reason that organizations purchase blade PCs is the desire for a more centralized computing model to simplify management. Improved manageability can make IT departments more efficient, which saves money. For example, management software lets IT staffers remotely troubleshoot blades, reducing the amount of help-desk visits to users' desks.

Blade PCs are also more reliable, which provides more uptime. If blades fail, for example, IT administrators can quickly use the management software to remotely move users to spare blades.

Blade PCs can also power a desktop virtualization effort. Blade PC manufacturers support Virtual Desktop Infrastructure (VDI), which lets IT departments slice their blade PCs into multiple virtual machines, allowing several users to share a computer. Desktop virtualization helps IT departments consolidate resources, which can further reduce IT costs.

TABLETS

For mobile computing, another form option for businesses to consider is the tablet. These days, mobile computing isn't just about notebooks. Tablets, which accept handwritten input from a stylus or touchscreen input, are ideal devices for work environments in which using a mouse or keyboard is impractical, such as public safety, transportation and inspections.

Industries are increasingly deploying mobile devices of all types. Manufacturers such as HP, Fujitsu, General Dynamics Itronix, Lenovo, Motion Computing and Panasonic offer a variety of tablet computer models.

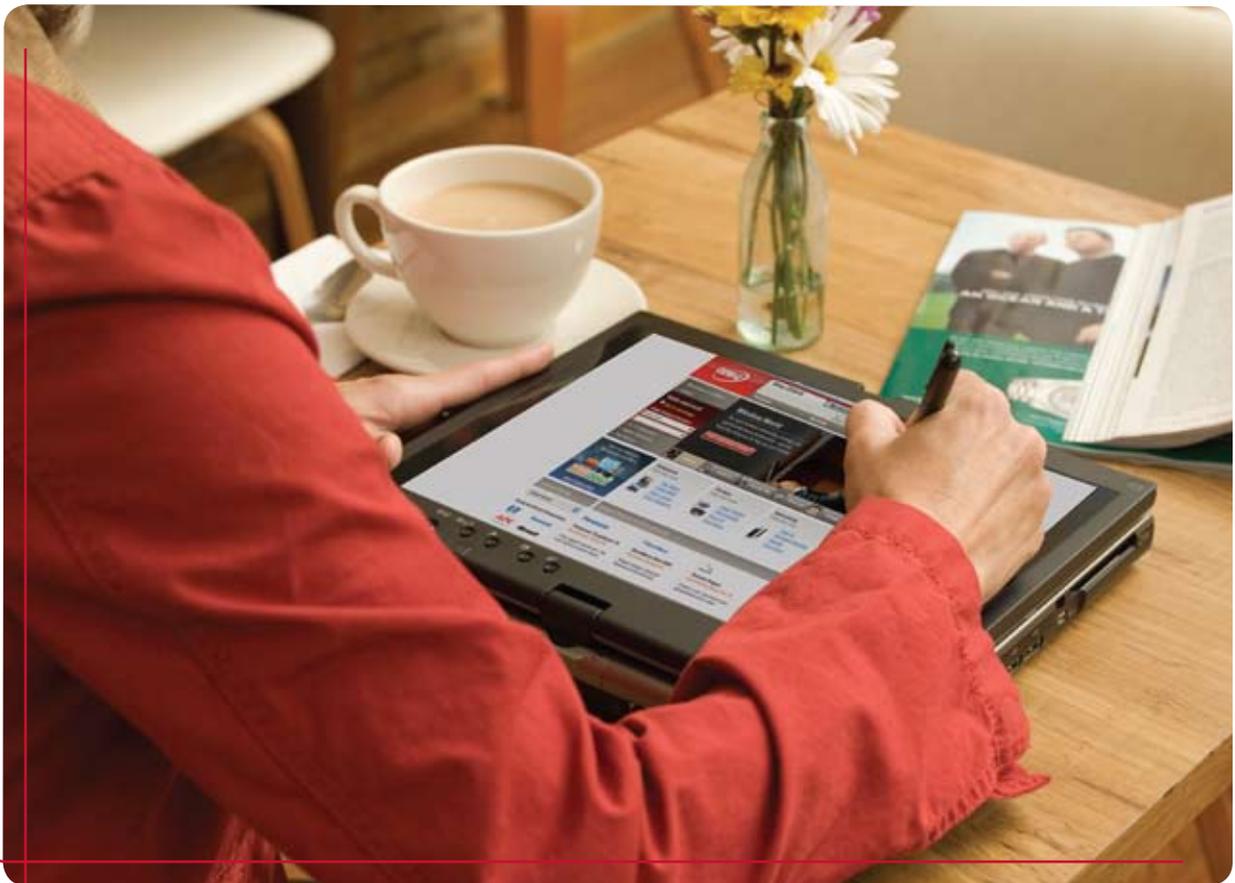
The two form options for tablets are the slate (without a keyboard) and the clamshell, which looks like a notebook, but the screen folds back on itself. The slate models typically have smaller screens and weigh less (averaging four-to-five pounds). The clamshell model offers two input options: either using the touchscreen or converting it to a keyboard and using it more like a notebook.

Mobile devices have the potential to improve productivity and increase worker satisfaction, depending on the nature of the work,

governing policies, management practices and individual skills.

If you are looking into tablet PCs for your business, here are some guidelines to consider:

- **Choose a tablet PC that fits the needs of users.** People who work out of cars or trucks may prefer a stylus or voice recognition unit over a keyboard. Car adapters may be required to recharge the tablets after four hours.
- **Provide adequate training.** Allow six-to-eight weeks for staff to practice new features. You can use the comprehensive tutorials provided by manufacturers and software makers.
- **Add wireless connectivity.** Wireless capabilities may depend on the mobile service available and its reliability in your area. But wireless connectivity enables users to access back-office systems for real-time information.
- **Once tablet PCs are connected, optimize communication.** Some organizations have replaced myriad e-mails with "burst" news updates sent to all staff on their tablets.



MONITORS

Monitors cannot be overlooked when planning your desktop infrastructure. They are the staff's entryway into a firm's IT resources. So making sure that your staff has monitors that meet their needs is important. Many organizations are now making the switch to Liquid Crystal Display (LCD) monitors from older Cathode Ray Tube (CRT) monitors.

Here are some important points to consider when planning a switch to LCDs:

- **Cut energy consumption.** LCD monitors consume less power than CRT monitors. A 17-inch CRT in active mode consumes around 80-to-100 watts compared with only 30-to-50 watts for a 17-inch LCD monitor. Many organizations are now requiring ENERGY STAR-approved equipment. While LCDs carry the ENERGY STAR label, CRTs do not.
- **Pick the right interface.** Be sure to determine that the monitor has the right interface or port to connect not only to your current PC units, but that it will work with the next generation of PCs as well.
- **Aim for adjustability.** Do you want to spend more for a monitor that can be height adjusted, or is a one-size-fits-all approach adequate? If users sit at standard desks, the monitors might need to be adjusted higher depending on the worker's height. LCD monitors cost more with an adjustable stand, so decide whether to buy a separate stand or a standard one that comes with the monitor.
- **Go for visual quality.** The visual quality of an LCD is superior, and there's no burn-in when you leave your computer on for days. CRTs typically can't go into sleep mode or some other energy reserve mode. And the burn eventually diminishes screen quality because it gets corrupted and can't be repaired.
- **Smaller desktop surface footprint.** LCD monitors take up a smaller footprint on desks because they're only a few inches deep. Conserving desk space is a major priority for many people in small cubicles.

DUAL-MONITOR SETUP

Companies that are looking for a way to help maximize staff productivity may want to consider a dual-monitor setup. Dual-monitor deployments are on the rise because such a setup boosts user productivity.

Another reason more organizations are turning to a two-monitor setup is that growing numbers of workers rely on notebook computers or mobile computing devices, which tend to have smaller screens. When users are back at their desks, they will often set up an additional monitor to perform most of their work.

A dual-monitor setup reduces the need to toggle between applications, so staff can work with large panes instead of small windows. There's also an ergonomic benefit, as users don't have as much eyestrain.

A case can also be made for the energy-savings benefits of dual monitors. Though dual monitors consume additional power, they draw less electricity than the older CRT monitors they are often replacing.

Microsoft Windows and other operating systems support capability for dual displays. On the hardware side, there are a few options for connecting multiple monitors to a PC. The workstation needs either a dual-head graphics card or multiple graphics cards, or you can choose an external adapter.

Notebooks and netbooks lack the slots for graphics cards, so the USB port offers the best means of connecting multiple displays. Some monitors have USB connectivity built in.

PROCESSOR UPGRADING

Enhanced processors can take a company's performance level up a notch. But first you need to have a business case for an upgrade. Organizations that are considering a system upgrade may want to consider two main issues: performance and payback.

Performance can be a critical consideration, especially when deciding on desktops for users that run graphics- or video-intense software, or users that keep large numbers of browser windows open at the same time. The sluggish performance of an application can become immediately noticeable on machines that aren't providing enough horsepower.

Another point of view to consider when planning a processor upgrade is the increasing use of web-based application architectures. Businesses are extending the lives of their PCs thanks to this trend because these applications put far less strain on desktop processing capacity than traditional client-server apps.

Whatever your firm's unique situation is, you may find yourself weighing the value of simply buying new machines with higher processing power versus sticking with older machines and upgrading their processors. As refresh cycles continue to lengthen, organizations are giving more consideration to upgrading older PCs and getting as much life out of them as they can, especially given the uncertainty around budgets right now.

Ultimately, any IT investment has to be cost-justified — "what's the payback?" ROI can come in many forms. One approach that is gaining ground among companies is coupling performance-driven upgrades with "green" computing initiatives.

Some machines can deliver 70-to-80 percent reductions in energy costs, which is more than enough to justify the purchase of newer,

more powerful computers. Purchases of new PCs that meet energy standards such as ENERGY STAR 4.0 and 80 PLUS can make a lot of sense to CFOs who are skeptical about spending money for performance alone.

If you do go the processor upgrade route, outfitting PCs with additional processing power is a very simple process. However, it comes at a price. It will add significant cost to each machine for both the hardware and the labor of installing the processors.

SOFTWARE IMAGING

Computer imaging is a beneficial technology for IT departments, especially those with a large number of users to service. Imaging allows organizations to create a duplicate copy of a computer's entire hard drive and/or partition inside the hard drive, and then transfer this copy to another computer.

This will copy every single file, all the drivers and every setting on the machine. This image is normally copied to an imaging server



where many computers can access the image file and copy it to their hard drives.

Imaging is helpful in several different situations. Its most common use being the deployment of new computers. Many IT departments standardize on the same model of desktops, notebooks and servers, purchasing large numbers at a time.

Also, most IT departments prefer their users have the same base install of operating systems and programs. With imaging software, an IT department can create a base image of a machine, copy it to the main image server and then pull that image down to as many computers as it needs to in a very short time.

And when a computer crashes, the IT administrator can simply copy the image back onto the hard drive and have the user up and running with a fresh install within the hour. This saves a tremendous amount of time, allowing IT staff to focus on other tasks.

With features like Preboot Execution Environment (PXE) boot (the ability to boot to a small OS via the LAN card), an administrator can set up a computer to have an image pulled down from the user's desk instead of bringing the computer back to the repair center. Most images take anywhere from five to 20 minutes to pull down over the network.

A few other popular uses for imaging are upgrading a hard drive, doing a full backup and restoring a computer to its original format. Imaging software has features that allow it to take a copy of a smaller hard drive and place it on a larger one, which is perfect for upgrading their storage when you don't want to reinstall everything.

The ability to restore a computer back to the original settings after every reboot is a must for computer labs as well. If someone installs software that causes the computer crash, just reboot and everything is working correctly again.

There are several different types of imaging packages available, from hardware appliances to open-source software. Also, imaging software manufacturers are adding more features to help IT departments operate more efficiently. Some of the newer features allow IT departments to perform a full software/hardware inventory, partition and format hard drives, change computer names, and deploy service packs and applications. ♦

DESKTOP MANAGEMENT MADE EASY

When it comes to the endless care and feeding of your desktops, CDW understands the struggles you face. You need to ensure that your desktops are running optimally to maximize the productivity of your business.

Our Desktop Lifecycle Management specialists can help your organization keep its IT systems running optimally in the years to come. You get comprehensive assistance before, during and after your purchase, coupled with the personalized attention of your dedicated CDW account manager who understands your needs.



WHAT YOU GET

- Expert consultation regarding your desktop lifecycle management
- Hardware configuration
- Software configuration/image deployment
- Asset management
- Onsite installation
- Warranties and maintenance contracts
- CDW's award-winning technical expertise

SPECIALIST AREAS

- Networking (LAN/WAN)
- Telephony
- Security
- Power
- Mobile Wireless
- Server/Storage
- Software
- Voice and Data
- Services
- POS
- Desktop**
- Notebook

We're only a phone call away.

Call your dedicated account manager to connect with any of our technology specialists.

CONFIGURATION, BURN-IN AND INSTALLATION



CHAPTER 4:

Vendor Configuration Benefits

Configuration and Burn-In

Installation

Enterprises now operate in an environment where budget considerations are causing them to cut back on IT funding while — at the same time — IT services are becoming more complex and sophisticated. This puts IT departments in a bind.

Where can their time, energy and resources be best utilized? Most IT teams conclude that they should be focusing their personnel resources on higher-level projects. But keeping a network up and running requires attention to many mundane, time-consuming tasks as well.

So how do you maintain the network's day-to-day functions while giving attention to other projects that support the firm's mission? Many IT departments have turned to third-party vendors to handle the simpler tasks that they're responsible for. And one area where this trend has taken hold is in configuring, testing and installing desktop equipment — setting up the desktop gear so that it's ready for users.

VENDOR CONFIGURATION BENEFITS

While this is an often overlooked area of the DLM cycle, configuration is an important step that can help make or break the cost-savings value of the program. When it's managed in an efficient manner, organizations can reap greater financial reward from their DLM program. But if problems arise during this phase, it can kill enthusiasm for the project, as well as cost you additional money.

Configuring, testing and installing desktop gear are tasks that no IT team looks forward to — but they have to be done. When a third-party vendor is hired for these jobs, they bring an efficiency

to them that might not be available within the IT department.

Teams that do configuring, testing and installing every day will zip through these tasks much quicker than a team that does it every so often. Having this phase of the DLM cycle done quickly will save an organization precious IT budget.

And rather than pay its well-trained IT team to handle these simple (though very necessary) tasks, the organization can make better use of its personnel by having them focus on other projects that have a higher priority in the organization.

CONFIGURATION AND BURN-IN

Configuring and testing your new desktop equipment is a valuable service that a vendor can provide your firm. Contrary to what manufacturers may advertise, most desktop equipment is not ready to go out of the box. Most organizations need some kind of customized configuration.

Here are some of the configuration services that organizations can have third parties handle for them:

- Hardware setup and installation
- PC imaging
- IP configuration
- Basic Input/Basic Output (BIOS) customization
- Application installation
- VPN setup
- Asset tagging

Once configured, the gear needs to be tested. Performing a burn-in (testing the gear for any problems before it is delivered and installed) is perhaps the most overlooked part of this brushed-over phase in the DLM cycle. It can't be emphasized enough: Get your equipment tested. Testing can save an inordinate amount of time and energy.

If you forego testing and have your equipment shipped straight to you and set up without testing, you run the very real risk of receiving a computer that's dead on arrival. Your organization may have to push back a rollout for days or even weeks while it sends the equipment back, the manufacturer finds and configures a new machine, and then ships it back.

With vendor testing, you're guaranteed that the equipment you receive is ready to go. Should the vendor run into any problems, it can simply pull a new computer from its inventory and quickly swap it out, with no loss of time in the process.

INSTALLATION

Your company's desktop gear had been configured and tested. The gear has arrived and the IT staff is ready to be pulled from that server virtualization project they've been working on to take care of installing your new desktop gear — not likely. You'd better

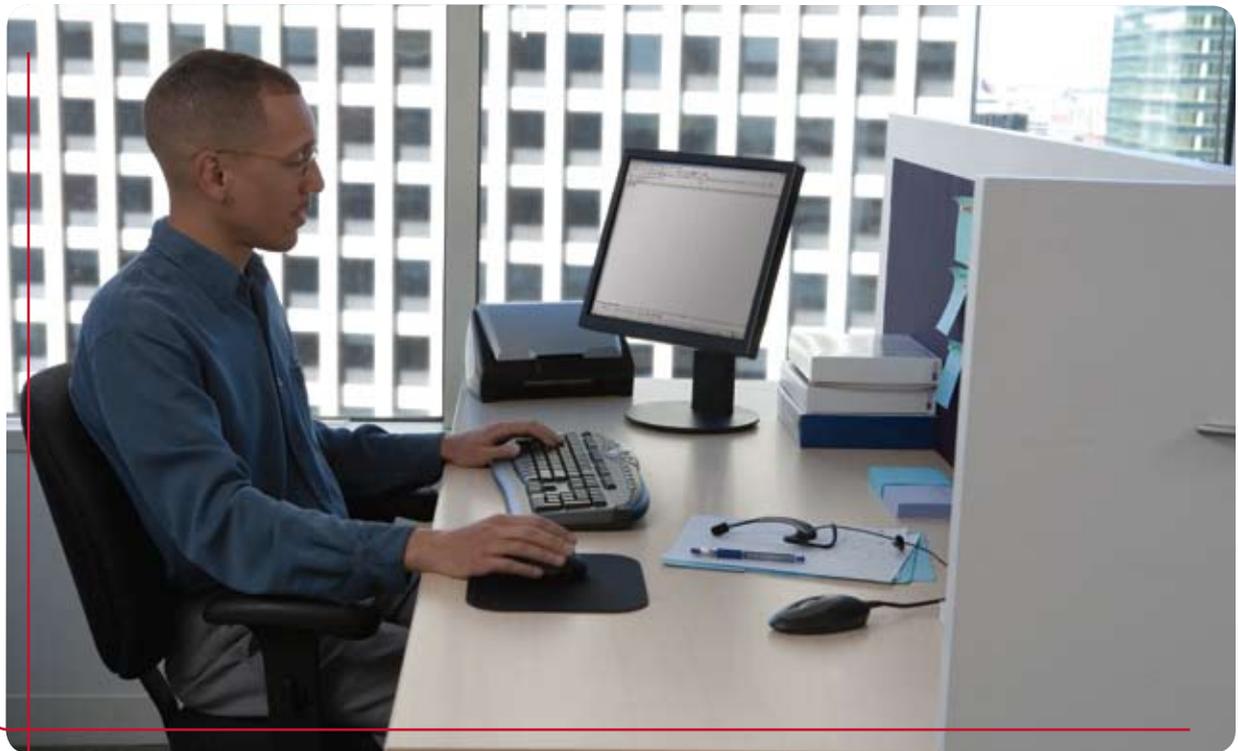
believe that their time can be better spent on other projects.

But you do need a focused hand to get this equipment properly installed and up-and-running quickly. So, yes, your organization will probably want to turn to the vendor for the installation phase of its DLM program as well.

A standard vendor installation will start with getting one desktop configuration set up at a user workstation. The vendor will test the setup and work through any bugs that may come up. Once this test setup is a success, the vendor will return and perform the wider desktop equipment installation for the firm.

The vendor typically works hand-in-hand with the organization on the installation, facilitating consultations with the vendor's imaging team and senior technicians to address any issues that may crop up during the installation. So if any problems do arise, they can be addressed right away.

A vendor installation is usually quick and efficient, allowing your business to tap into its newly acquired desktop resources as soon as they're online and ready. Allowing a third-party vendor to take care of the configuration, burn-in and installation of your desktop equipment can go a long way toward supporting the overall success of your DLM program. ♦



ASSET MANAGEMENT



CHAPTER 5:

Software Licensing

Warranties and Maintenance Agreements

Staff Training

The Help Desk

Notebook Battery Maintenance

Asset Disposition

The first stages of a sound DLM strategy, the assessment and planning stages, were covered in Chapter 2. Now that your firm's desktop resources have been purchased, you can begin the product lifecycle support phase, the primary thrust of the DLM strategy. This phase covers a broad range of responsibilities, starting with properly managing your assets.

With all the asset data housed in a central repository, the IT department can analyze the different types of PC models, operating systems and software applications that are supported throughout the enterprise. This will help IT administrators drive a PC and software standardization effort, which in turn, can simplify help-desk support and cut costs.

SOFTWARE LICENSING

IT departments can also monitor software usage on every PC. If it turns out that widely deployed applications are seldom used, IT administrators can reduce the number of software licenses for those particular applications to save money. For example, an organization may have 5,000 copies of Microsoft Access or FileMaker Pro deployed, but only 500 are being used.

IT departments should monitor software usage for four-to-six months. Closely monitoring software usage will allow your firm to be much more effective at the bargaining table come license

renewal time. Also, you can report all of your software usage to the vendor. Certain combinations of software can make you eligible to receive discount pricing on them.

Many organizations may find 5-to-15 percent savings from software licensing fees the first year and possibly 2-to-3 percent savings in subsequent years. More importantly, monitoring will give you a better handle on what the organization will need over the next one-to-three years, allowing you to plan for things such as software assurance and enterprise agreements.

An important best practice in asset management is to divide group users into categories, such as task workers who need low-end desktops, mobile users who need notebooks and power users who need high-performance computers for graphics or processor-intensive applications.

This allows the IT department to match users with the computing resources they need, and it helps the IT staff determine PC replacement cycles. For example, if a group of users needs a new application, IT administrators can analyze whether their current hardware configurations can run the new software.

Your company can also take advantage of desktop performance monitoring. By doing this, you can see which users really do need an extra gigabyte of RAM, and provide it before it becomes an issue.

RISK MITIGATION AND COMPLIANCE

No matter the organization, sooner or later it will be audited. Your asset management plan provides a great benefit when it comes to mitigating risk and being compliant.

A good DLM appraisal not only includes what software is being used, but how well it is being maintained. So you will have a good handle on which security patches have been installed, and which systems need remediation.

This is an obvious benefit for minimizing risk. But it also has an additional side benefit for monitoring compliance: The auditors will have a clear picture of the process you've implemented to make your firm secure.

Controlling the spread of unauthorized software installations is a headache that most desktop managers have dealt with. Yet by knowing what you have, and what you've purchased, your company can avoid any penalties (which may have financial consequences) should you be audited by a particular vendor.

WARRANTIES AND MAINTENANCE AGREEMENTS

Should IT departments purchase extended warranties or maintenance agreements that cover PCs when the original manufacturers' warranties expire?

PC makers typically offer one-year warranties for new desktops and notebooks. So the choice is whether to purchase two-year, three-year or longer extended warranties that provide onsite or mail-in repairs. Some warranties offer next-day service, while others have a turnaround time of three-to-five days. The additional coverage typically protects users from accidental damage, such as drops, spills and electrical surges.

The extended warranties or maintenance agreements have their pros and cons, but experts typically recommend that IT departments purchase them when they are buying new PCs. The main benefit is that it reduces risks.

Another benefit is convenience. Your organization may have remote offices or mobile workers, so it's easier to have a vendor's support organization handle the repairs. The extended warranties also help IT organizations that are short-staffed and don't have the time to handle repairs.

The main negative is cost. With tightened budgets, IT departments need to decide if they should forego extended warranties and maintenance contracts and take on more risk to save money.

STAFF TRAINING

Work staff know how to use computers and the Windows

operating system, as well as e-mail and word-processing programs, so it's not necessary to teach them how to use these applications. But training staff members how to use new applications or new versions of existing applications is a critical part of PC lifecycle support because it reduces help-desk calls and optimizes worker productivity.

It's also important to teach staff security policies and acceptable use policies, such as banning users from installing their own software on their work computers. Such training reduces security risks and prevents future computer problems.

Businesses have numerous ways to train staff and each has its own benefits: Classroom training is good for new workers or unsophisticated users because it gives them personalized attention. Live, web-based classroom sessions allow organizations to reach remote users, but this approach is less personalized.

Another option is personal trainers who work with individual users for 10-to-20 minutes at a time. The most cost-effective option is self-paced online training courses.

PC manufacturers and software vendors offer training services. If it's a specialized application, most organizations ask the vendor to perform the training. But if it's a general application, such as Microsoft Office, most IT departments will have the knowledge to perform the training themselves.

THE HELP DESK

Running an efficient computer help desk is a key component of an asset management strategy. Staff depend on computers to do their work. When a problem occurs that prevents users from getting work done, it can cost the firm a tremendous amount of time and money.

Providing a place where users can get their computers serviced and working in a timely fashion is an important part of leveraging your DLM resources.

DOCUMENTATION

Keeping full documentation of what services your help desk renders is very important. It takes some time to do, but the effort is well worth it. There are several key items that need to be documented.

First, document all help desk processes. "How-to" documents of all the tasks needed to run your help desk are good to have around. They can be as simple as how to add a printer, or include more complicated information such as how to install a certain custom database that is located on a specific server.

The goal is to create documentation that is so good that if help-desk support isn't there, someone could read the documentation

and know how to perform most of the functions.

Another nice characteristic of very detailed “how-to” documents is that if a user sends you an e-mail or calls asking about how to do something, you already have a very detailed set of instructions to provide them.

You should also keep documentation of all your policies. This might include policies regarding the organization’s stance on users storing personal files on your servers or the proper use of the organization’s e-mail system. If any changes are made to any of these documents, then be sure to pass that information onto the organization’s users.

A great place to store this documentation is on a wiki site. This will allow you to set permissions as you see fit and allows easy access for your users. The editing of wiki documents is basic and simple for almost any user.

IMAGING

If your business has a large fleet of notebook and desktops, you will have several of the same makes and models. This kind of standardization allows you to use disk cloning/imaging technology to quickly deploy computers. (Imaging is explained in detail in Chapter 3.)

Imaging is a valuable tool for the help desk. You can keep several images of each model of notebook and desktop on a server. Then you boot into your imaging software and choose which image you

want to pull onto the computer.

A best practice is to keep at least three older versions of an image for each model of computer your organization uses. This allows you the opportunity to roll back to an older version if you make a change that causes a problem.

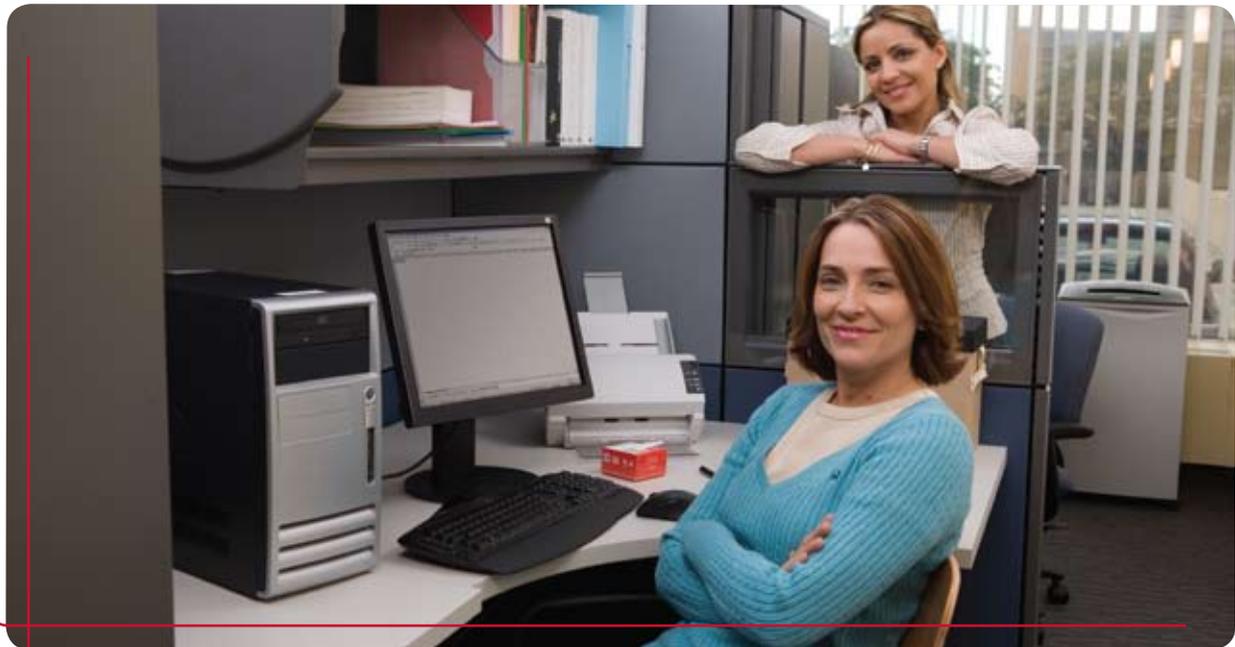
TROUBLE TICKET SYSTEM

It’s important to keep track of all the calls that come into your help desk. This is imperative to keep your help desk performing at maximum efficiency.

A trouble ticketing system can alert you to any recurring problem that you may need to contact the manufacturer about. It can also help to troubleshoot future issues because that problem has been seen before, and there are detailed notes in the ticket about how to correct it.

You can also use this system to keep track of your technicians’ time, determining whether you are understaffed or overstaffed by looking at the amount of time they spend on work orders. There are several commercial brands of trouble ticketing software available: some open source and some you must pay for.

Your company may prefer to have a custom system developed. That way you can have all of the features you want without any overhead that is not needed. There are several commercial products available, but they allow very little customization to meet your organization’s unique needs.



BECOME A SELF-MAINTAINER

Many notebook and desktop manufacturers will let IT shops (with a large number of computers) train to become self-maintainers of their devices. This typically includes a short test and a fee to gain the certification. This will allow your help desk to perform warranty repairs in-house instead of shipping the computer to a repair depot, wait for them to fix it and then have them ship it back. Certification can save a lot of valuable time.

When you become a self-maintainer, you can have your users back to work much faster, plus most manufacturers will actually pay you to do the warranty work. It is actually cheaper for the manufacturer to have you do the work because they don't have to pay for all of the shipping and administration fees.

You will probably want to refrain from doing any sort of accident protection repairs. Accident protection repairs include a notebook being dropped down the stairs, run over with a car, etc.

Send those to the manufacturer so they can decide if it is covered.

If you choose to go the self-repair route, make sure your documentation is detailed because eventually you may be audited by the manufacturer.

NOTEBOOK BATTERY MAINTENANCE

Notebooks and other mobile devices play a large role in many organizations' IT strategies. From a DLM standpoint, it's a good idea to try to maximize your notebooks' power supplies. Knowing how to properly calibrate your notebook batteries will allow you to get more juice from a single charge and squeeze out more efficiencies from your fleet.

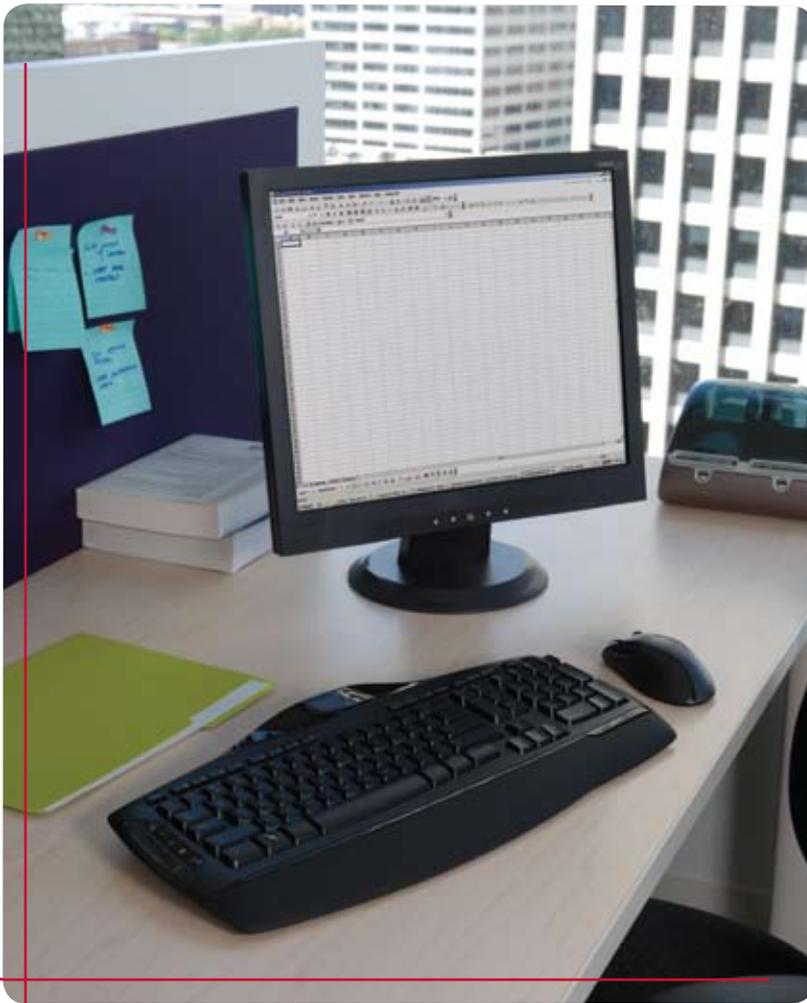
Like all rechargeable batteries, a notebook computer battery's ability to hold a maximum charge will decrease over time or with use. Lithium-ion batteries, used in notebook computers, typically have a lifespan of 300 to 500 charge cycles.

After a year of use (or 300 charge cycles), a lithium-ion battery holds only about 80 percent of its original capacity. But there are ways to extend a notebook battery's life, which reduces the need to buy additional batteries, which in turn is good for the environment.

First, conserve battery power by reducing power consumption on your notebook. Hewlett-Packard recommends several steps, such as keeping the computer cool (between 65 and 77 degrees Fahrenheit). You can also try adjusting screen brightness, removing peripherals and lowering processor speed.

Second, because high temperatures accelerate the deterioration of lithium-ion cells, keep the notebook away from prolonged exposure to heat (for example, don't leave it in your car on a warm day). Also, remove the battery if the notebook is turned off and not plugged into an AC adapter for more than two weeks — or if the notebook is plugged into AC power continuously for more than two weeks.

Third, calibrate the battery. When users power up in fits and starts and then recharge without fully draining the battery, it reduces the amount of power available in a single charge cycle and can render the battery meter inaccurate.



There are four steps to calibrating a battery:

1. Disable power management in the Microsoft Windows operating system and select “always on” in the power scheme. That prevents the notebook from going to sleep.
2. Connect the AC adapter to the notebook and charge the battery until the meter says it’s at 100 percent.
3. Remove the AC adapter and drain the battery until the notebook shuts off.
4. Reconnect the AC adapter, charge the battery and then turn Windows power management back on.

Last, Lenovo advises against leaving a notebook always plugged in. The battery will last longer if it charges and discharges, so you don’t want it 100 percent charged all the time. Once in a while, let the battery drain. But contrary to popular opinion, it does not have to drain completely the first time it’s used.

HIBERNATION

Should you set your organization’s computers to power off, hibernate or sleep? It depends. When initiating power settings, consider eliminating screen savers, which waste energy.

Desktops typically use 60-to-80 watts during normal use and 10 watts when idle. Notebooks use 10-to-30 watts under normal use, and six watts while idle. In hibernation mode, computers use zero watts, while computers in sleep mode use about 0.2 watts.

There is a debate over which is most efficient. Going into and out of hibernation mode does consume considerable energy. And some argue that completely shutting down the computer hurts productivity because the boot-up time in the morning takes a few minutes. A best practice is to hibernate if you are gone for two or three days, but put it to sleep if you’re only away overnight.

ASSET DISPOSITION

As more organizations begin to recognize their responsibility to include a sustainability strategy as part of their DLM programs, the disposition of IT assets deserves a special mention here.

Retiring PCs is an integral part of the PC lifecycle. Asset management tools allow IT departments to keep track of the age of computers and when to retire them. As part of the process, IT administrators need to budget for PC disposition, including the cost of wiping out hard drives and the cost of recycling equipment to comply with electronics recycling laws.

There are three main options for organizations for asset disposition: resell it, donate it or recycle it.

Resell: This is the one option that provides some kind of monetary reimbursement (what little there is). Many businesses establish a staff purchasing program that allows workers to purchase retiring equipment.

Short of that, you may have to do some legwork to find a buyer. Your best bet is to locate a reputable local third-party service that will sell or auction your equipment for you.

Donate to charity: Organizations can also consider donating their equipment to a worthwhile cause. There are plenty of charity and nonprofit organizations that can make good use of retired equipment.

And many charitable organizations are experienced enough with receiving IT donations that they have an established regiment down for renovating the computers, including wiping the hard drives clean and removing any asset tags or other identifying information.

But keep in mind too that charities often have specific requirements about what they can and cannot take. Be sure that any organization you donate to is partnered with a recycler for any equipment that cannot be used.

Recycle: Organizations can hire a recycling service or negotiate a deal with PC makers to do the recycling for them. Fortunately, there are third parties that handle recycling and disposition in accordance with local regulations.

Depending on the state, they might even pay you. In other states, you will have to pay a small fee. An Internet search by county and “technology disposal” will help your firm find local agents.

DATA WIPING

If you decide to use a recycling service, you will want to make sure that the data on your equipment is truly erased as part of the disposition process. Data on hard drives and other storage media can be read long after you think you’ve deleted it — even after it’s been written over by newer files. Your organization should have a strict policy covering the disposition of storage media.

You can perform the data wipe in-house using software that is NIST SP-80088 certified compliant. Or if the third-party recycler is responsible for the data wipe, they must be NIST SP-80088 compliant and be able to provide an audit trail of their recycling process for you. ♦



Services designed with you in mind.

To manage your technology assets and deliver measurable business value — your IT resources can't be divided. They must act as one.

At CDW, our goal is to help you:

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- Minimize business risk
- Reduce your overall technology costs
- Deliver a strong return on your technology investment
- Support your end users without losing focus on your primary business goals
- Do more with less

CDW revolves around you, providing service and support for every phase of your technology lifecycle. You get one-stop shopping for a full range of technology products and services. We can help you evaluate upgraded warranty plans, consolidate contract expirations into a single report or implement an accidental damage protection plan.

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- Cabling installation
- Help desk services for hardware and software

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PRODUCT LIFECYCLE SUPPORT FOR DLM



CHAPTER 6:

Managed Services Benefits

Managed Services Offerings

Service Level Agreements

Two key considerations for supporting your IT devices through their lifecycle are price and contractual obligations. If terms can be defined and agreed to, outsourcing product lifecycle support functions can be far more effective and efficient (as well as less costly) compared to an in-house management strategy.

Outsourcing also offers a key benefit in relation to DLM. It allows an organization's IT teams to concentrate on more pressing issues, such as keeping the network secure and servers up and running, rather than time-consuming DLM tasks. Many businesses have turned to these types of solutions rather than continuing to devote human and financial resources to routine, yet critical, tasks.

MANAGED SERVICES BENEFITS

Managed services solutions offer increased performance and additional layers of redundancy that might be difficult for a business to afford and manage on its own. Additionally, organizations benefit from a single point of accountability, including compliance audits for standards and best practices that are required of these service providers.

And the scalability offered by a managed services vendor works both ways: services increasing or decreasing in response to an organization's strategic initiatives.

Just as you would qualify a doctor by checking references, it's worth the effort to investigate how a provider runs its DLM service. Only in doing so can you responsibly select a provider to monitor and manage your desktop resources.

For example, find out what certifications the provider has and

what its overall reputation is in the marketplace. How well is its DLM department staffed? What kind of Service Level Agreements (SLA) does the provider offer, and will any of them aptly fit your needs?

You may want to inquire as to what green energy measures the provider has implemented. And it's critical to know what the service will truly cost. Answers to such questions will help you select the proper vendor for your DLM needs.

MANAGED SERVICES OFFERINGS

A typical managed services provider may offer some combination or all of the following services:

- **Warranties:** Providers may be able to offer an extension or an upgrade of the manufacturer's warranty to ensure your company's desktop resources continue to perform optimally, minimize your financial risk and reduce downtime. Many providers have strategic partnerships with manufacturers and vendors, which can help strengthen a warranty agreement.
- **Maintenance agreements:** If warranties and extensions don't go far enough, providers may offer a single contract that covers the repair or replacement of in- or out-of-warranty desktop gear from all vendors, product lines and service levels. This contract should stipulate a definite response time for the work. One call gets your organization a certified technician to quickly conduct onsite repairs.

- **Staff augmentation:** Typical staff augmentation services will provide your organization with skilled/certified temporary staff to address particular DLM challenges. This service can provide a knowledgeable resource to augment your IT team, leaving your staff free to tackle more strategic projects.
- **Training and education:** Some providers offer training and education services to upgrade your IT department's skills. This can be facilitated through classroom training, a self-guided e-learning program, an e-lab or a web-based classroom that's streamed right to your department's desktops.
- **Asset disposition:** Recycling, remarketing or retiring your organization's desktop assets can be a difficult, time-consuming task. If you're doing a desktop refresh, closing a location or simply need to get rid of excess equipment, it may benefit you to have someone else do it for you. Managed services providers can oversee the proper disposition of your desktop equipment.



SERVICE LEVEL AGREEMENTS

An SLA is a contract between a service provider and the end user that should contain a specified level of service — typically a guaranteed level of system performance and/or uptime — as well as support options, enforcement or penalty provisions for services not provided, a specified level of customer support, what software or hardware will be provided and for what fee.

SLAs allow an organization to determine the degree of outsourced management that best suits it. This model scales well and ultimately proves more cost effective than self-maintaining the environment 24x7.

Since SLAs are contracts, they are open to negotiation prior to their implementation. Here are some tips to help your business negotiate an SLA in your favor:

- **Don't pay for what you don't need.** Many organizations don't need (and don't want to pay for) the high level of service that providers offer. Determine what level of service will meet your firm's needs and get this into the SLA.
- **Understand all the components of the system that determine the service level.** Managed services can sometimes involve complex systems with many moving parts. Customers should know which components the service provider is responsible for and who to call when something goes wrong.
- **Collaborate with IT staff on SLAs.** Just as financial and legal people typically review service contracts that IT departments negotiate, it's important for IT staff to "look under the hood" of the SLA for a service procured by a firm's leaders.
- **Ensure regulatory compliance.** For example, if a provider supplies end-of-life asset disposition for your desktop hardware, make sure the SLA addresses compliance with the e-waste regulations that are out there. Any regulations that might hold the organization liable — not necessarily the service provider — need to be covered in the SLA.
- **Review all SLAs with legal counsel.** Sloppy contracts or those that can't be enforced are invitations for trouble.
- **Create competition.** Even if you have a favorite vendor, make sure that this organization knows it must compete for your business. The fact that they know there are other bidders increases the probability that your business can get a better deal. ♦

GLOSSARY



This glossary should serve as a quick overview to the most essential terms touched on in this guide. Please note that acronyms are commonly used in the IT field and that variations exist.

80 PLUS RATING

This term refers to an energy-saving incentive program funded by electric utilities. To receive this rating, the product's power supply must be at least 80 percent efficient at 20 percent, 50 percent and 100 percent output loads.

ASSET DISPOSITION

As part of the DLM cycle, asset disposition addresses what to do with desktop hardware that's reached its end of life. Organizations need to plan for this part of the cycle, setting aside budget to cover the cost of recycling equipment and wiping hard drives of data.

BLADE PC

This technology is a mix of traditional desktop PCs and thin-client computing, with servers delivering the computing power and storage. The blade PCs slip into a chassis in the data center and share resources with other blade PCs while a user port sits on the staffer's desk.

BURN-IN

An overlooked but necessary part of the configuration process, burn-in refers to the testing of the desktop gear for any problems before it is delivered and installed.

COMPLIANCE

One of the benefits of a robust DLM program is how it can assist in complying with security and best practice standards. Asset management provides a clear picture of what software is being used and how up to date the business is on upgrades and patches.

CONFIGURATION SERVICES

Companies can upgrade the hardware and software they purchase. They can also arrange for the third-party vendor to do the installation. Some of the more popular configuration services offered are hardware setup and installation, PC imaging, IP configuration, BIOS customization, application installation, Virtual Private Network (VPN) setup and asset tagging.

DATA WIPING

An important step in the asset disposal phase of a DLM program is to erase the data on the hardware that is being deactivated. Data wiping can be done with third-party software or a recycler will take care of it as part of their asset disposal service.

HELP DESK

A key component of an organization's asset management is the help desk. Having an in-house help desk will save lots of time and money with computer repairs.

IMAGING

This term refers to the technology that allows organizations to create a duplicate copy of a computer's entire hard drive and/or partition inside the hard drive, and then transfer this copy to another computer.

LIQUID CRYSTAL DISPLAY (LCD) MONITORS

Inefficient CRT monitors have given way to LCD monitors. Some of the benefits for organizations switching over to LCD monitors are reduced energy consumption, better visual quality and a smaller desktop footprint.

MANAGED SERVICES

Managed services is an option for outsourcing a company's DLM responsibilities, offering increased performance and additional layers of redundancy. Some of the offerings available are warranty extensions or upgrades, maintenance agreements, staff augmentation, training and education, and asset disposition.

NETWORK ASSESSMENT

A network assessment is an important step when planning out a DLM strategy. It should determine whether the existing infrastructure, sites and production environment can support the planned upgrades to the desktop system.

NETWORK-BASED APPLICATION RECOGNITION (NBAR)

NBAR is a classification engine feature found in Cisco routers and switches that recognizes a variety of applications, including those that use dynamic Transmission Control Protocol/User Datagram Protocol (TCP/UDP) port assignments. Upon the application being recognized and classified by NBAR, the network arranges services for that application, emphasizing efficient use of bandwidth and Quality of Service (QoS).

PC LIFESPAN

The lifespan of a PC can vary. Vendors suggest a three- to four-year refresh cycle for PCs. However, performance advances and budgetary considerations have many organizations refreshing every six-to-seven years.

PREBOOT EXECUTION ENVIRONMENT (PXE) BOOT

A PXE boot refers to a setup wherein a computer that crashes can be programmed to pull down a fresh image from the network to the user's desktop instead of having to take the computer into the repair center.

SELF-MAINTAINER

IT shops that train their staff to do repairs on the organization's notebooks and desktops are self-maintainers. This requires certification from the manufacturers, following a short test and paying a fee.

SERVICE LEVEL AGREEMENT (SLA)

An SLA is a contract onsite that specifies the level of service that the Hosted Managed Services (HMS) will provide, as well as support options, enforcement and penalty provisions for services

not provided, a specified level of customer support and what software or hardware will be provided and for what fee.

STAFF TRAINING

An important strategy for reducing the number of help-desk calls is training staff how to use new applications or new versions of existing applications. Staff training can also include communicating the security and acceptable-use policies of the firm as well.

STANDARDIZATION

Standardization on software and hardware is a good idea for most companies. But security must be addressed as part of any standardization effort, as standardization means your entire fleet has the same vulnerabilities.

THIN CLIENT

A thin client is a small desktop device with no hard drive and limited functionality. All of the processing and storage is done by servers in the data center. This setup's benefits include greater security and easier software and hardware updating.

TROUBLE TICKETING SYSTEM

Help-desk service can be greatly enhanced with a trouble ticket system. This allows the help desk to keep track of all calls, which will improve its efficiency, alert you to any recurring problems and help you troubleshoot future problems that have occurred before.

VIRTUAL DESKTOP INFRASTRUCTURE (VDI)

VDI is a virtualization advance based on blade PC technology. This approach to infrastructure allows IT departments to slice up their blade PCs into multiple virtual machines, allowing several users to share a computer's resources.

WARRANTIES

PC manufacturers typically present one-year warranties with their products. They also offer two-year, three-year or longer extended warranties that provide onsite or mail-in repairs. Purchasing an extended warranty will likely save money for a business because it reduces risks.

WIRELESS SURVEY

Part of the planning phase of your DLM strategy should include a wireless site survey. This process involves placing wireless signaling gear in an area and using software or equipment to gather information about the site's wireless capacity.

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