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Deploying Your Hardware and Software Systems

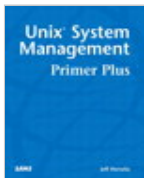
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This sample chapter discusses the details of the deployment process and all the caveats and pitfalls that accompany deployments. From ordering hardware and software to installing it, this chapter covers each step of the deployment process.

This chapter is from the book



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You will learn about the following in this chapter:

- Ordering new systems
- Handling shipments
- Hardware storage and transport-ation
- Installing hardware in racks
- Software installation methods
- Operating system patches
- Handing off completed systems

System deployment—ordering, receiving, and installing the new system hardware and software—is one of the most exciting and stressful parts of your job. Properly deploying the system is also the system administrator's most important duty, so you need to make sure it's done correctly. This chapter discusses the details of the deployment process and all the caveats and pitfalls that accompany deployments. From ordering hardware and software to installing it, this chapter covers each step of the deployment process.

The Ordering Process

The ordering process is quite possibly the most frustrating part of the entire deployment. Not only do you have to figure out the excruciating details of your every hardware and software need, you also

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have to make sure all of the hardware and software are compatible with each other.

A typical server network requires a wide variety of hardware and software, including servers, memory, disk drives, CPU modules, Ethernet cables, SCSI cables, tape drives, tape cartridges, serial adapters, routers, switches, firewalls, operating systems, database software, and communications lines—and that's just a partial list. In a larger environment, ordering all of this hardware and software can be quite a task. Miss even the slightest detail, and you could need another round of purchases to fix the problem.

Determining Your Hardware and Software Needs

Determining the exact hardware and software your organization needs is a difficult process. As a system administrator, the choice of application software is often not yours to make; developers and management may have chosen to work with a specific piece of software, and it is simply your job to verify that it will work and to implement it. However, you may be able to choose the operating system and any supplementary system software such as monitors, log analyzers, and backup software.

Freedom of Software

You should be allowed a certain degree of freedom to specify what supporting software you need to do your job. If a particular log analyzer helps you maintain your systems, you should be allowed to install and use it, assuming it meets your organization's basic software requirements (such as adequate security features and technical support). If your management is focusing on details this small, your job will be much more difficult.

Hardware, on the other hand, is usually specified by a system administrator, though you may be forced into working with a specific manufacturer such as Sun or IBM. Hardware consists of many different components that must function correctly, perform well, and work with each other.

Part III of this book, "A Well-Oiled Machine," contains detailed explanations concerning the performance, capacity, and security of various pieces of hardware and software, which can help you make the right choices when it is time to specify and order everything.

Cataloging Your Hardware and Software Needs

Once you have determined the pieces of hardware and software needed to build your new systems, document them in detail before ordering anything. Hastily ordered systems can result in missing pieces; all too often an administrator will be halfway through a long installation before realizing that a cable or an expansion card is missing because it got lost in the shuffle. To avoid this situation, catalog your proposed order in a spreadsheet so it can be easily referenced and changed if necessary. You should include the following details for each item:

- Description
- Manufacturer part number
- Quantity ordered
- Unit cost and total cost
- Vendor name

Take some time to become intimately familiar with the products you are ordering. For example, although a line item in your order might read "Sun Enterprise 420R, 4 CPU, 4GB RAM, 2 18GB disks," it is still a very generic description—what are the exact specifications of its components? Are they compatible with other hardware and software that will be installed on the machine? Every piece of hardware should be summarized on a specification sheet available from the manufacturer, which you should refer to when listing the details of your hardware. Some of the more important hardware specifications to be aware of are listed here:

- CPU type, speed, cache size
- Memory type, number of slots, error correction, minimum speed, and maximum capacity
- Storage interface types, number of controllers, number of drive bays, disk types, capacities
- Cables and adapters for power, external storage, video, network, and consoles
- Number, size, and type of expansion slots
- Expansion cards needed for external storage and network interfaces
- Power requirements and redundant power modules

Use Error-Correcting Memory in Servers

Always equip your servers with error-correcting memory (ECC is the most common form). Although this type of memory is significantly more expensive, it reduces the chance that a memory glitch will bring down your servers unexpectedly. Desktops can get away with cheaper memory because they do not have the uptime requirements of servers.

Software requirements are more ambiguous than hardware requirements, but you should review the following common specifications:

- Operating system requirements, including patch levels
- Minimum and recommended memory
- Required disk space for programs and data
- Prerequisite software that should be installed
- Licensing requirements

Managing Licenses

Licensing is a confusing area of the software industry. A license gives you the right to use software in a specific configuration and comes in many forms. Some licenses are simply contracts that you implicitly agree to by breaking the seal on the software media, while others come in the form of strings called license keys that you enter into a program to unlock its functionality. Software can enforce licenses using various technical methods, the most common of which are as follows:

- Restricting use to specific systems
- Limiting the number of CPUs used
- Requiring a key to run the software
- Requiring a key to activate certain functions
- Limiting the number of users or connections for shared software

Identifying Individual Sun Servers

An individual Sun server can be uniquely identified by its "host ID", which is a 4-byte value stored on a chip on the server's motherboard. Many software vendors use the host ID to generate license keys tied to specific servers so you cannot run more than one instance of their software without paying for additional licenses. You can view a system's host ID on Solaris with the `hostid` command.

Choosing Vendors

Once you've cataloged all of the items you need, it's time to order them from your vendors. All companies are different, so this can happen in a variety of ways. The two most common ways to order are directly from the manufacturer or through a reseller. Ordering from the manufacturer has its benefits: You know you're getting the real thing, and vendors typically have a good-sized inventory of their own equipment. However, in large deployments, you'll be ordering a variety of hardware and software, so you'll need to work with a number of manufacturers and vendors. Contacting each manufacturer individually and reviewing individual quotes from each of them can consume a great deal of time and energy.

One solution to this problem is to use a reseller. Most resellers sell products from a number of companies, allowing you to incorporate the processes for multiple purchases into a single effort. Reviewing a quote that incorporates multiple items can save time over reviewing an individual quote for each item you need to purchase, with each quote arriving at different times from different vendors. Many resellers also offer consulting services, so not only can you buy that router, you can get someone onsite to help you configure it.

Work with Preferred Vendors

You might save time and money by working with "preferred vendors" for certain items. Preferred vendors are those you go to first when making new purchases. Because you have an existing relationship with preferred vendors, your credit standing should be good with them and you might even receive some perks or discounts based on the amount of business you do. Plus, your accounting department has already filed all the financial paperwork about your dealings with these vendors (CFOs and controllers like to know where the money is going). Switching vendors frequently can cause headaches for you and your accounting department. Choose a few vendors that are both knowledgeable and responsive to help alleviate these potential problems.

Always—always—get competitive quotes for any major purchase. Even if you work with preferred vendors, you still need to make sure they're offering you the best price and service; if not, go elsewhere. If you get a better quote from another vendor, tell your preferred vendor, and maybe it can match it. In fact, preferred vendors are very likely to match lower prices, because their primary goal is to remain your preferred vendor and to keep receiving your business and your money.

When deciding whether a vendor is right for you, you should be able to answer "yes" to most of the following questions:

- Is the vendor responsive to email and phone calls?
- Are the vendor's prices and discounts competitive with other vendors?
- If the vendor is a reseller, is it an authorized reseller of the products it sells? If in doubt, you can contact individual manufacturers to verify this.
- Are the vendor's credit policies agreeable with your accounting department?
- Does the vendor employ industry-certified engineers or work directly with manufacturers to support your purchases?
- Does the vendor do business in all of your organization's locations?

Soliciting Quotes and Completing Purchase Orders

A quote simply a list of prices at which a vendor is willing to sell you goods, whether those goods are hardware, software, or consulting services. Quotes are exact; whatever price is in the quote is what the vendor will charge—no more and no less. So when asking vendors for quotes, make sure you've nailed down every possible detail of what you need from them—down to the last cable—to make sure their quote includes all of the costs. When possible, supply your specifications to them in writing, so there's no mistake about what you're asking for. When you receive a quote, check it against your specs to make sure the vendor or reseller didn't leave out anything.

In most cases, you'll craft quotes into purchase orders, which are your company's own forms for making purchases. Chances are that you, as the purchaser, will be filling out the purchase orders, so make sure they match the quotes letter for letter! The finished purchase order is usually approved by management, then sent off to the vendor.

Copying and Pasting Purchase Orders

Receiving electronic quotes and filling out purchase orders electronically can save you time and avoid errors. If vendors email quotes to you, you can just copy and paste the information into your electronic copy of the purchase order.

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