MAY 2012

SOFTWARE LIFECYCLE MANAGEMENT

Bringing a comprehensive approach to software assets

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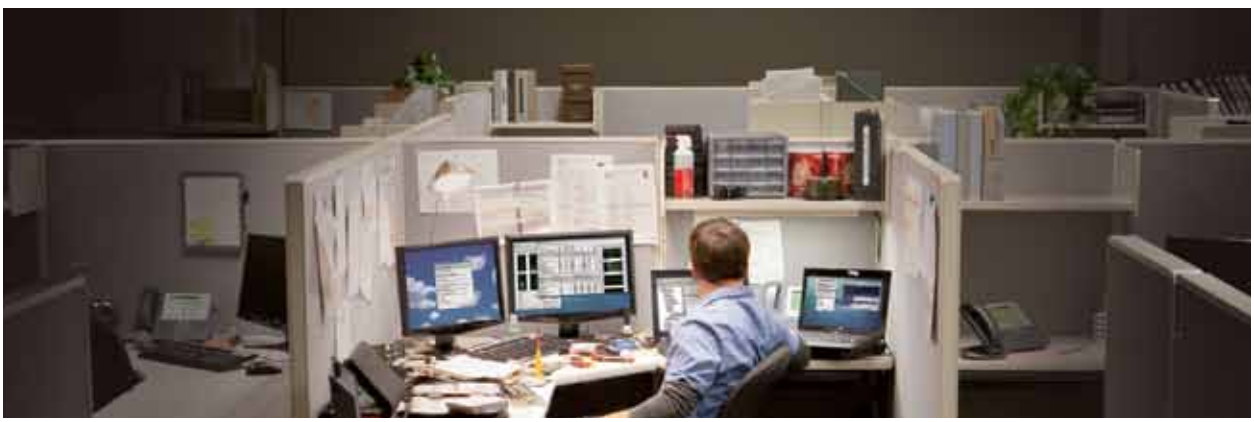

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At CDW·G, we're committed to getting you everything you need to make the right purchasing decisions — from products and services to information about the latest technology.

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.

Managing Software Resources

Saving money, boosting productivity and reducing management headaches

The world runs on software. As the primary enabler of communications, record keeping, operations continuity and interaction for both private- and public-sector organizations, it's no wonder that the design, development, acquisition and maintenance of software amounts to a $1 trillion industry.

And that industry is growing. Software comprises a major cost center for businesses, government agencies, nonprofits and educational institutions. It typically accounts for 20 percent or more of IT spending by the enterprise. Look at it this way: The purpose of all processing, storage and networking hardware (and the IT staff investments to install and maintain it) is ultimately to make sure that software runs properly.

It then comes as a surprise how many organizations still lack a comprehensive approach to managing their software and the money they spend on it. Organizations spend time and money tracking every hardware asset from mainframe computers to smartphones. But when it comes to software, they often overlook simple but crucial steps that can save money, boost staff productivity and avoid legal or vendor-relations problems related to software licenses.

If organizations do inventory their software assets, it's typically done in conjunction with an upgrade, such as migrating to a new operating system or obtaining new hardware on a mass scale, or when compelled by an urgent situation, such as a merger or cost-cutting initiative.

A comprehensive, focused approach to managing software resources lets an IT team avoid these last-minute inventories. In fact, an organization that manages its software using best practices will, at any given time, know its requirements, have an up-to-date and comprehensive picture of the software it has, and possess the tools needed to manage its assets.

A Comprehensive Management Process

Software management has technical components, but at its heart it's a process and organizational approach, more than a specific tool.

A comprehensive approach to software management produces numerous benefits, including the following.

Discovery: The IT staff knows with certainty what is installed on servers and endpoint devices throughout the organization. This lets the IT staff do a number of things.

For instance, staff can compare quantities of copies of sanctioned applications in use with the quantity permitted by the licensing agreement. Or they can determine if device images match the organization's master image. This also allows for discovering if any users have downloaded or otherwise installed rogue applications such as file-sharing software or other security risks.

Security and uniformity: The IT team knows if all devices are running not only licensed software but also the proper versions, with the most up-to-date patches and upgrades. This can help cut support costs and boost the organization's cybersecurity profile.

Compliance and risk mitigation: The CIO will be in a position to provide auditable proof that the organization is meeting its contractual obligations to software vendors. According to the Business Software Alliance, which conducts software licensing audits, the risks far exceed the $150,000 fine per instance of unlicensed software allowed under federal copyright infringement laws.

Multiple Risks

When an organization doesn't have a handle on its software assets, it's taking on risk in two capacities. It might be buying too little and buying too much. For example, often an IT department possesses more licenses for a given software application than it uses. Perhaps a reduction in staff has occurred. Why should an organization pay for licenses it doesn't need?

On the other hand, lack of a central repository can result in individual purchases as needs arise, and that can be more expensive — and harder to track in terms of updates and patch control — than a centrally managed license bundle. That's a key point. Software vendors often emphasize the legal, reputational and financial risks of underprovisioning, but may not mention the risks associated with overusing.

Compliance can also save money by revealing unused licenses available for provisioning new users.

Software is easy to buy but much harder to keep track of. A software asset management plan should therefore integrate software procurement with software resource management processes and tools.

But before the IT shop applies tools for software asset management, the enterprise must establish goals and policies to ensure that those goals are met.

Software asset management becomes an easier proposition for the IT department if the entire organization is aware of software policies. For instance, users must understand the damage that can be caused by downloading rogue software, or how duplicating a licensed application can throw the organization out of compliance.

License Scenarios

"Buying" software isn't quite the same as purchasing other products or services, such as hardware or tech support. Software manufacturers sell the right to use what is in essence their intellectual property. The product itself has no corporeal existence beyond the magnetic or optical medium that houses it. So, similar to music, software is easily reproduced and in fact is the object of widespread piracy.

That's why software vendors, while offering a variety of acquisition plans, tend to use mechanisms to make sure their customers stay in compliance with license agreements.

Individuals purchasing software are often given the right to deploy it on two machines or processors simultaneously, but typically may use of only one copy at a time. On a larger scale, this principle also applies to enterprise software. It's important to understand the types of licenses a vendor offers. Different types apply more efficiently in different user situations.

Per-seat license: This type of license assigns to specific, named individuals access or rights to an application. Typically, some mechanism in the enterprise directory administers the access.

So, if an accounting staff has access to the enterprise accounting system under a 25-seat license, members of that staff alone may use the software. Even on a weekend when most of the licenses are idle, someone from the controller's office cannot log on and gain access to the bookkeeping.

Concurrent-user license: These licenses allow a specific number of individuals, regardless of identity, to use an application simultaneously. If all of the licenses happen to

be in use at a given moment, no one else in the organization can use the software until someone else logs out.

Volume license agreement: This type of license gives discounts for as few as five licenses. For larger organizations, discounted prices often leave out media and documentation. Beyond that, software manufacturers typically offer a wide variety of volume licensing options.

For example, Microsoft has several plans for large organizations. Customers can purchase enterprise agreements, which include both onsite and cloud-hosted licenses. Enterprise subscription agreements may require a lower initial outlay, but the customer doesn't gain perpetual use rights. Each of these programs is available in different arrangements for governmental, nonprofit and educational organizations.

Licensing Considerations

Organizations should take the time to plan exactly which end-user license agreement (EULA) works best for them, understanding that this will vary by application. Organizationwide utilities are probably best purchased under a concurrent-user setup. For specific professional functions, it might be best to go with a per-seat license, assigned to specific individuals.

Most software vendors do not allow swapping users in and out of access permission if the total number of users will exceed the terms of the license, even though no more than the maximum number of licenses might be used at a given time. That is, an organization can't buy a 50-user, per-seat license and give 74 people access.

Also, the IT staff should check to see whether a volume license agreement allows installation on computers not belonging to the organization, such as a contractor's device.

Virtualization has brought a new wrinkle to the issue of managing software. When virtualization (which to software vendors looks like server partitioning) first became popular, conflicts arose over licenses because multiple instances of licensed copies ran simultaneously. But the industry has since settled down. Now software vendors offer ways for clients to operate in virtualized environments without incurring exploding license fees.

All of these considerations add up to the need for an organizationwide approach to planning, acquiring and monitoring software resources. IT groups that have comprehensive information on their inventories and on the contracts under which they are acquired will see notable benefits such as the following:

- **Improved vendor relations:** These improvements will be based on trust stemming from the ability to prove compliance with licensing arrangements.
- **Operational agility:** This benefit stems from being able to quickly provision new users and accommodate employees' changing roles.
- **Financial efficiency:** This gain is derived from getting the most out of every software dollar. It's easy to overbuy software and spend too much on unused licenses or have suboptimal license agreements. Underbuying can, ironically, also be expensive when an organization buys single or low-volume licenses ad hoc because of poor planning. That drives up the price per seat. ■

CDW·G

SOFTWARE LIFECYCLE MANAGEMENT

CDW·G approaches software management as a lifecycle. We help manage the complexities of software and maximize return on investment. As a trusted advisor throughout the lifecycle of an organization's agreements, we offer a variety of resources to consult and manage your software solutions.

Our lifecycle approach includes the following:

- **Technology validation:** This includes briefings and strategy sessions to ensure the right technology meets operational requirements.
- **Licensing purchase assistance:** This includes evaluating total spend, assets, usage and purchase history; proposing total cost of ownership (TCO) and ROI friendly contracts; optimizing through vendor and contract consolidation.
- **Contract management:** This includes ensuring contract compliance for true ups and renewals and providing updates on products, licensing and technology roadmaps.
- **Deployment:** This includes providing solutions budgets, ensuring the realization of purchase value through deployment, and utilizing packaged design, planning and pilots for rapid deployment.

Software Asset Management

Planning and implementing strategies for software

IT leaders looking to better manage software resources must consider software in the right context. It's hard to imagine that there was a time when computer manufacturers gave away their software to help sell their hardware. But today, when you think of an organization's software expenses and couple that with software's importance in day-to-day operations, it becomes clear that this productivity resource is a mission-critical, strategic investment.

This is where software asset management comes in. SAM is a combination of several things: a way of thinking, a strategy, a process and a set of implementation tools. This chapter addresses the first two, thinking and strategy.

SAM is often touted as a way to manage software licenses so that an organization remains in compliance with often complex licensing arrangements. This is true — but SAM is much more than that.

A comprehensive software asset management plan starts with thinking about the goals for the SAM deployment. The first goal should be obtaining an accurate and complete knowledge base of all the organization's software resources. That should include both software in active use and software that, for a variety of reasons, the organization owns but doesn't use.

That unused software is more important than it may seem because in finding it, the enterprise is discovering assets that cost real dollars but accrue no benefit. In fact, organizations may experience a valuable by-product of software discovery: It often uncovers unused or underused hardware that amounts to latent assets available for disposal or recycling.

If discovery is the first goal, the second goal should enumerate the benefits that the organization expects from its SAM strategy. These benefits affect the entire organization, not merely the IT department. IT staff should spell out these benefits to other departments, because a SAM deployment is going to involve more than just the IT department.

The Benefits of SAM

Software asset management can save direct software outlays. That is, it can reduce, or at least slow, the growth in the software budget. It does this in a number of ways including the following.

Rightsizing licenses: Multiple instances of multiseat or multiconcurrent users can cost more than a consolidated, enterprise license when calculated on a per-user basis. SAM reveals this enterprise view of software and the license terms under which it was acquired.

By the same token, a divestiture or outsourcing of some functions may leave an organization with an oversized license arrangement for some applications. That presents another opportunity for savings via rightsizing.

Stopping needless purchases: Often, a department will purchase a single-user license for an application that the IT department has under a multiseat or enterprise license. By comparing available licenses with users, a SAM program can potentially discover unused licenses and avoid unnecessary expenditures.

Rescuing unused assets: When the IT department decommissions hardware, especially end-user devices such as PCs and notebooks, related licenses may also go out the door. That software can be uninstalled and kept for later use.

Reducing indirect software costs: These include security and patching downloads, installing upgrades and configuration management. SAM can help harmonize versions across the enterprise and thereby streamline the software maintenance process.

The knowledge leading to the savings illustrated above also enables more efficient operation of the IT department. Suppose an acquisition or personnel expansion will add more users of a particular application than an organization already has licenses for. A license analysis could present options in time for the organization to be ready.

Would a full enterprise license be more economical than expanding an existing multiuser plan? Is a server-based, concurrent-user license the way to go? Does one department have unused licenses that could be transferred to make up for a shortfall? Is it time to move to software as a service (SaaS), using a cloud provider?

Having knowledge of what versions of applications are where allows the IT department to automate routines such as installing patches and rolling out upgrades. This frees up IT staff for higher-level activities such as strategic planning and implementation.

Knowledge of software assets also benefits users by ensuring more timely upgrades and the added functionality they bring.

License Compliance

As global competition has grown increasingly intense, protection of intellectual property and prevention of piracy have become hot topics. Software vendors have become more vigilant in enforcing licensing agreements.

It should be simple: Buy software and use it how you please. Unfortunately, software acquisition and use are anything but simple at the enterprise level. Given that software acquisition can be a quarter of an organization's IT budget (when looking at direct costs), careful attention to software licensing can pay big financial and operational dividends.

SOFTWARE LICENSE **BASICS**

Reading through the legalese of a software license contract can be a dull experience. Digging beneath the wording, a typical contract should cover the following basics:

- ✓ Number of concurrent licenses, and the process (and price) for adding to or subtracting from that number
- ✓ Geographical limitations on usage, if any, where satellite or foreign locations exist
- ✓ Whether usage is exclusive to the organization; for example, with customized or custom-coded software
- ✓ Whether usage is transferable to outside parties, such as contract workers or business partners
- ✓ Length of usage, whether limited or perpetual
- ✓ Terms of transferring usage or installations, such as from one computer to another
- ✓ Terms of acceptance regarding whether the software is suitable for the intended use
- ✓ Upgrade and patching terms
- ✓ Terms of support; for example, whether it is provided 24x7 or only during business hours

Agreements are only the start of the usage relationship, though. Software vendors reserve the right to conduct license audits of their customers. An audit can be disruptive and time-consuming. That's bad enough.

But if an organization doesn't have an accurate inventory of its software assets, it may unwittingly be committing software piracy. Unauthorized copies, more users than permitted, even virtualization-related instances not backed up by licenses — these conditions can all result in expensive fines and a loss of negotiating strength with the software vendor.

In a sense, deploying a software asset management program gives the organization an ongoing license self-audit. That means when a software vendor notifies an organization of an impending audit, it won't need to perform a frantic inventory and last-minute license check.

More important, the organization will have confidence that its software usage complies with its licensing agreements. That lessens the chance of a fine or related negative publicity.

And from the software supplier's perspective, a management program identifies an organization that is serious about compliance. So a SAM program could actually lessen the frequency of audits and put the organization in a stronger negotiating position for future expansion as needs change.

Audits

Organizations often start a structured software asset management plan under threat of an audit by a software vendor. An audit certainly provides good motivation to have a SAM strategy in place. But SAM is best implemented in stages, each stage added as the organization gains maturity in using the SAM system.

Still, an audit should trigger at least a first-stage implementation of SAM. A good first step is for the enterprise to compare its software instances with its license agreements.

This step, when done with a standards-compliant SAM tool, provides trustworthy data that will (in effect) certify to the auditors that the organization is in compliance. Or it will let the organization discover any unlicensed software copies and correct them.

A major software upgrade affecting the enterprise can also trigger a SAM deployment. This could be a hardware replacement as PCs come to the end of their lifecycles, or it could be something like an operating system upgrade.

Regardless, a change in enterprise software is a logical opportunity to determine what license quantities an organization holds and what it needs. In effect, the IT shop uses the occurrence of the upgrade to establish a baseline. If the baseline is part of a SAM deployment, it will be continuously updated. ■

BEST PRACTICES

LICENSE MANAGEMENT IN THE VIRTUAL DATA CENTER

Review some tips on how to simplify the complex process of managing virtualized software licenses:

CDWG.com/softwareguidebp

STANDARDS FOR SOFTWARE CONTROL

Two major sets of standards cover software asset management.

The International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) created a standard, 19770, for software asset management. As are many standards, ISO/IEC 19770 is a work in progress.

The ISO standard has three components, the third of which is still under development. 19770-1 lets organizations establish a framework of best practices for SAM. Basically, 19770-1 takes industry best practices and attempts to work them into a kind of unified code.

The second component, 19770-2, establishes data standards for tagging software by SAM tools. The third data standard, covering the entitlement elements in software licenses, is still under committee work. It will be titled 19770-3.

The second set of standards, included in the IT Infrastructure Library (ITIL), take a slightly different approach. ITIL places software under a superset of what it calls service assets. The term refers to any financial asset, including those that comprise the IT infrastructure.

An effort called ISO/IEC 20000 seeks to harmonize the standards of the two groups. Understanding and tracking the standards and their ongoing development is a discipline unto itself.

As a practical matter, IT managers should look for software asset management tools that incorporate the best practices as defined by the standards bodies. They signal an organization's seriousness of intent toward good software management.

The Software Asset Management Cycle

Initiating a continuous management process

Maintaining control over software assets requires a continuous process in order for software licenses and usage to stay in sync within a dynamic organization. People and computers come and go, patches and upgrades arrive, business and operational requirements change.

Sound advice from the Business Software Alliance and other experts coalesces around three critical steps:

1. Know, or find out, what software the organization has.
2. Compare the organization's needs with what its license agreements provide.
3. Adjust inventory, policies and management approaches to keep requirements, licensing and software instances aligned.

Broken down in that manner, managing software seems simple. But even before an enterprise begins a software asset management program and buys a tool to carry out SAM, it should have some preliminary steps in place.

Acquisition Policy

A software acquisition policy can help manage software even if the enterprise never embarks on a formal SAM program. Such a policy should include the following elements.

Clear guidelines for who is authorized to acquire software: Best practices dictate that any strategic investment, including software, should be handled in a centralized manner.

An exclusive list of allowed software: If it's not on the list, it isn't allowed, except perhaps by written authorization. Applications for exceptions should be in writing.

The allowed list should be accompanied by a blacklist of specifically disallowed software, principally peer-to-peer file-sharing programs. P2P software exposes the enterprise to two dangers: illegal copying and the importation of malware.

A prohibition on user-installed software: The network administration can enforce this rule centrally, so that only someone logged on as an administrator can download, alter or copy software.

Some organizations establish a policy board that may consist of representatives from the IT team, purchasing and accounting. Responsibility for software asset management should reside with one person. That individual becomes the person responsible for conducting the SAM cycle, maintaining the records and answering questions about the program.

LEADING SAM APPLICATIONS

SAM applications range from single-brand license compliance tools to full-fledged management suites that let the IT department track hardware and software. ITIL standards recommend integration of software services with hardware as a best practice.

Most vendors provide free, downloadable trial versions of their SAM tools. Vendors continue to emphasize tools to ease the migration of users from Windows XP or Vista to Windows 7.

Given the growth of Apple OS X by users in large enterprises, most of the suites now track these assets. Here are examples of some of the more robust SAM tools available.

CDW Software License Manager: This is offered free to customers and shows what licenses are about to expire. It provides a complete, detailed purchase history, including the types of licenses purchased (for instance, single-box or enterprise).

CDW's Software Asset Manager: This solution is available for purchase and it adds functionality to the free license manager. It gives information on an organization's entire software landscape, licensed and unlicensed, including software that the organization may be entitled to but is not using. It also tracks hardware.

LANDesk Software Management Suite: This is a toolset composed of software distribution, license monitoring and hardware power management resources. LANDesk Software has updated the suite to optimize it for management of mobile devices, including the software licenses that might be on them.

Microsoft System Center Suite: This offering provides asset lifecycle management capabilities, visibility into existing software assets, and integrated physical and virtual server management and monitoring among its numerous capabilities.

Microsoft's Asset Inventory Service (AIS): This tool provides a comprehensive view into software assets deployed on desktops across an organization, scanning this inventory and translating the collected data into actionable information.

Microsoft Windows Intune: This cloud service is a single, easy-to-deploy solution for PC management and security. It provides updated management and asset inventory within a unified experience. This solution also includes upgrade rights to Windows 7 Enterprise and future versions of Windows.

Novell ZENworks 11: This is a four-component suite of tools for managing assets, configuration, endpoint security and patches. The asset management tool tracks licenses plus details of usage, even for multiple application users on a single machine. It features "connectors" to resellers from whom the organization may have acquired software, and normalizes license data from multiple sources.

Symantec's Altiris Asset Management Suite: This solution approaches software asset management from a lifecycle and configuration management perspective. Recent versions have improved search tools and an ITIL-compliant configuration management database that lets an organization model the financial impact of changes to products tracked.

The SAM Cycle

The software asset management cycle can be broken down into three primary steps. This cycle addresses the key steps needed to effectively manage an organization's software resources. Once implemented, it can be repeated and followed through on an ongoing basis.

SAM Cycle Step 1: REVIEW. A baseline inventory of software will enable the IT staff to later craft a migration path toward sound software management.

Many organizations are often shocked by the number of out-of-date, unlicensed and unauthorized applications found on their networks. This often varies from department to department.

For example, a creative group is more likely to have third-party add-ons or plug-ins to the tools they use, such the Adobe suite. Engineering teams are also fertile ground for highly specific but unsupported applications. Adherence to policy is likely to be more buttoned-down in finance or accounting departments.

In theory, IT staff could conduct a software inventory by hand, but that's hardly practical for medium or large inventories. This task can be handled by a software discovery tool, which could be one component in a vendor's suite of SAM tools or perhaps a stand-alone product.

Some vendors offer SAM tools for their own products, which can often be downloaded for free. Commercial products such as Microsoft Asset Inventory Service include a knowledge base of most commercially available software titles.

In general, SAM discovery tools have two components: an agent installed on each client machine and a console for viewing and managing inventory and reports. Among consoles, which some vendors call dashboards, the IT staff will find applications that run on a single device and those that are accessed via a web browser from anywhere in the enterprise.

In order to enforce policies down to the individual user, inventory tools should view not only the rolled-up number of instances of a software application but also what is running on each client device. This view will let the IT department root out unlicensed and rogue applications.

The inventory will become useful as a component in asset management only when paired with the organization's collected software licensing agreements. It also creates a list of authorized, supported applications.

SAM Cycle Step 2: RECONCILE. Once the IT department has essential data on software assets (the inventory of what is loaded on systems and the licensing agreements), it can answer several vital questions:

- What application instances are not backed by a license?
- Which applications does the organization possess unused licenses for?
- How extensive is the collection of unsupported, rogue applications, and who has them installed?

The reconciliation stage also helps answer more subtle questions, which can yield cost savings, such as the following:

- Are all instances of a support application up to date (in terms of version and patches)? Matching software means fewer work hours devoted to support.
- Are the license agreements effective? For example, 1,000 single-user licenses for a product and 1,000 copies might clear the organization from a compliance standpoint. But financially, it makes no sense given the savings that could be realized with an enterprise license.
- Is every installed, licensed copy actually in use? Can the IT department consolidate and cut licensing costs?
- How compliant are users within the organization?

SAM Cycle Step 3: REENGINEER AND RETOOL. Armed with the knowledge from the discovery and cataloging process, the organization can take a number of steps to ensure that it stays in compliance with its own policies and with the requirements of its software licenses.

If a software purchasing practice results in excessive purchases, the knowledge gained from the SAM tool will help make the case for ending that practice.

SAM also can help with hardware management. When examining devices for software, the IT department can also check hard-drive utilization rates, operating system versions and configuration information. This can help optimize end-user work by letting the IT group better match applications and software to hardware capabilities or know when to replace hardware.

A mismatch between license information and installed copies yields clues to unused hardware containing valuable licenses or software that have been purchased but not installed. So, while SAM can reveal the need to buy licenses to remain in compliance in overuse situations, it also might reveal opportunities for getting better licensing deals, reducing licenses to match needs and recovering unused assets. ■

CHAPTER 4

Licensing Management

Taking the necessary steps for smart compliance

Insufficient management of an organization's software licenses can easily incur unnecessary costs. Unused licenses represent budget spent on idle assets. Those numbers multiply if a department orders a copy of an application for which it already has an unused license. Unlicensed instances can result in fines and expensive legal action. And mismatching license types with enterprise requirements is likely more expensive per license than necessary.

From a cost standpoint alone, it makes sense for an organization to closely scrutinize its software assets. Legal and reputational considerations strengthen the case for management tools. Imagine the consequences if an organization were found to be a software pirate.

A third argument in favor of thorough license management focuses on indirect costs. Understanding the version and patch history of software assets lowers the cost of administering them, reducing hassle for end users and saving time for the IT staff.

This all adds up to better control of total software spending, by user group or department, and by application. An organization saves by matching copies precisely to its needs without having to create a safety margin by overbuying. Why should an organization have 250 licenses for an application when it needs only 237?

Plus, having an enterprise view of requirements puts the purchasing authority in a stronger negotiating position with software manufacturers and resellers. Through proper management of software licenses, organizations can achieve a number of important objectives.

Reducing Unnecessary Software Spending

Reducing spending starts with software discovery and building out a comprehensive database of software assets. The database should relate each software instance to its acquisition documentation, license agreement and location within the enterprise. The goal is to have a

precise match between licensing entitlements and the software in use.

The IT staff should not overlook the variations in license agreements that result when an application or operating system resides on either a physical or virtual machine. Streamed applications accessed online by end users or partners might also have different licensing treatments.

Still another variable to consider is cloud computing. Most cloud agreements give the cloud provider some leeway on the physical location of a given customer's computing resources. This brings another layer of complexity to the maintenance of a software inventory.

SAM tool vendors such as Symantec recommend quarterly reviews of software contracts. This periodic approach helps to ensure that the organization doesn't drift out of compliance with license agreements. It also keeps unused assets from piling up. An ongoing SAM program reduces maintenance and support costs if it prevents those services from being applied to software no longer in use.

Preparing for an Audit

There's been a great deal of debate about intellectual property and ways to protect it. IT organizations and researchers report an uptick in the audit activity of software vendors. That's one reason a SAM program is so important.

A second reason is that it will reveal rogue software that could potentially expose the organization to legal trouble unrelated to its software vendors. File sharing, gambling and even unauthorized software used for legitimate work purposes — many troublesome scenarios can come to light in the discovery phase.

An audit can go one of two ways. In the absence of an organized approach to software asset management, an audit can turn into a nerve-wracking fire drill as the IT group, legal, purchasing and accounting departments pull together documentation to build a picture of the organization's software landscape.

Of course, both the organization and the vendor are likely to be caught by surprise when license mismatches are identified. The organization may find that it has been paying way too much, or it could face sudden license costs as well as harsh fines — and that can occur for each vendor that decides to perform an audit.

On the other hand, the audit can run quickly and efficiently if the organization has the SAM-generated reports that match software instances, licenses and license agreements.

Improving Software Management

Better software management practices also flow from continuous audit preparation. Armed with a continuously up-to-date dashboard, the IT shop becomes more efficient at provisioning new users and pulling back licenses from people who depart or change jobs.

And because state-of-the-art tools give detailed information about the version and patch status of software, the IT team can better plan the work of upgrades and configuration management. These packages, briefly described in

Chapter 3, typically come with workflow tools that automate SAM practices.

For example, a request for software would trigger the appropriate approval and registration processes, touching the IT, finance and purchasing departments. When the software arrives, the SAM suite automatically registers installation and records license compliance, serial number, support agreements and any other pertinent information.

Organizations should look for tools that fulfill IT Infrastructure Library (ITIL) requirements, including vendor neutrality. Vendors of widely used or industry-standard applications often supply discovery and license compliance tools, but only for their own products.

ITIL practice also promotes the ability to generate comprehensive reports, enabling the enterprise to answer questions an auditor might have. The same reporting function helps the IT shop survey software assets for version, support history, even bug and crash patterns leading to more proactive system administration.

Using the Right License

The fundamental decision when purchasing software for the enterprise is what type of license agreement to use. Software acquisition gives the buyer the right to use the vendor's intellectual property, but that right is limited by the licensing agreement. In general, basic license agreements preclude copying the software, making it available to multiple users or deploying it outside of the organization.

Several factors determine the most optimal type of license agreement. First, there's the issue of the number of user licenses needed. Another important consideration is the architecture under which the software will be installed. Software instances can occur on each end-user device, on a server, in the cloud as a service, or as multiple virtual machines on two or more physical servers.

A final factor is how the software is deployed. The organization may use it for development, testing, production or runtime, or it may be publicly accessible via the web.

Vendor Assistance

A large reseller has the technical resources and experience to consult with volume software buyers, keeping them in compliance and helping to ensure that they use the most advantageous volume license agreement.

This process typically begins with an assessment of the computing environment and organizational goals. The assessment includes examining the customer's internal processes for managing licenses, vendors and procurement. And it will look at whether there is sufficient support for the SAM process itself from senior management. The SAM team will obtain answers to questions such as:

- How does attention to compliance vary among departments?
- Are processes too reliant on manual or homegrown tools that don't scale well?
- Where is licensing and other software information — gathered centrally or scattered among teams and departments?
- Are procurement, chargeback and tracking processes adequate?
- How does virtualization affect licensing agreements and compliance?

Asset management is typically the centerpiece of a range of software-related services that vendors offer. Making use of a professional services group to assess software needs can improve the likelihood of having a controlled, compliant software inventory.

This team can also oversee installation and configuration, the kinds of chores that keep IT staff from devoting more time to strategic application development. In short, outsourcing the operational steps of software asset management optimizes the deployment of software while keeping costs under control. ■

CDW·G: HELPING MAKE THE MOST OF MICROSOFT

The IT department should not undertake licensing agreements on its own. The legal and finance departments should also be included. Large software vendors offer many resources, but taking advantage of them requires an organization to do its homework.

Microsoft provides a good example. Its volume licensing reference guide is thorough and well-written, but it is 73 pages long. That's because its customers range from small businesses with a few PCs to the largest global enterprises.

CDW·G's team of Microsoft experts are also available to guide organizations through the entire lifecycle of Microsoft enterprise and end-user software products. As a gold-certified Microsoft Partner in nine competency areas, including volume licensing and software asset management, CDW·G's licensing specialists can get an organization up to speed quickly on acquiring the right software and managing it effectively.

CDW·G can help customers choose from among Microsoft's wide range of licensing plans, including Open Value for organizations with fewer than 250 PCs, and Select Plus for larger enterprises. Microsoft also offers two types of enterprise agreements for very large organizations, with both purchase and subscription options.

Software Solutions

An array of options available to address most any IT need

With a framework for managing the organization's software assets in place, the IT department gains freedom to do its primary job: optimizing the technology infrastructure to best support the missions of the enterprise. This chapter will review important classes of enterprise software solutions and provide some guidance on how to sort through the available options.

Infrastructure Optimization

This class of software stays invisible to users, but infrastructure products form the enabling foundation for a secure, mobile, work-anywhere enterprise.

Server Virtualization

The concept of virtual machines dates to the earliest mainframe computers. But server virtualization has thrived in enterprises looking to both cut infrastructure costs and optimize their systems for web applications, mobility, security, availability and performance. Virtualization renders all of the elements of a server, from storage to application, as a logical (virtual) unit.

A physical x86 server that may have been devoted to one or two applications (and operating at 20 percent of capacity) can potentially host 20 or more virtual machines. That consolidation ripples outward through the infrastructure, generating savings on hardware, real estate and electricity costs.

The virtual machines themselves can be replicated at regional clouds or data centers, or moved among them at wirespeed for backup, redundancy and failover, as well as more efficient use of network capacity.

A few proven products dominate the server virtualization market. **VMware's vSphere 5** is the latest version of the manufacturer's core product. It features an updated hypervisor architecture. The hypervisor includes a layer of software that mediates between the operating systems of the virtual machines and the hardware.

The vSphere 5 software has improved tools for managing storage, and it lets the system administrator control performance down to the individual virtual machine. Plus, vSphere 5 supports USB 3.0 and Apple OS X Server 10.6.

Microsoft's Windows Server 2008 R2 Hyper-V ships as a stand-alone product or with the company's Windows Server enterprise edition. When coupled with Microsoft's System Center solution, this server virtualization platform provides a highly reliable, scalable and manageable data center.

Citrix Systems' XenServer features simple, per-server pricing options. Version 6 adds tools for managing a virtual network and distributed access management to applications.

Client Virtualization

Client virtualization follows server virtualization in many organizations. Converting users' computing resources to virtual machines simplifies administration and allows deployment of secure, inexpensive thin desktop clients. It also promotes mobility, because a user's state is no longer tied to their desktop machine.

As expected, the server virtualization

leaders also offer client products. **Citrix XenDesktop, Microsoft Application Virtualization (App-V)** and **VMware View** take different architectural approaches, but all support remote access.

Microsoft App-V delivers online applications even if the app is not installed on the client. VMware View and XenDesktop virtualize the user's image, including the operating system. Another entrant, **Symantec Endpoint Virtualization Suite**, features "reharvesting" of software licenses from virtual user machines to help ensure compliance.

Storage Virtualization

Virtualization doesn't end with individual computers. Storage virtualization separates logical blocks of data from physical disks. Its goal is to simplify application and user provisioning and to add capacity. A four-tier, enterprise storage complex may have scores of arrays, each with its own network connections and each requiring settings for how their capacity is allocated. Virtualization hides and manages that underlying complexity.

Storage virtualization presents a single management console to systems administrators through which they can create storage pools allocated per application and per storage tier (depending on the service requirements of the application) without regard to which individual subsystems might physically house the data.

It also eases administration, as operators need to learn only one management console, even in heterogeneous storage environments. And virtualization increases utilization rates of disk systems, so organizations can avoid unnecessary investment in capacity.

Leading storage virtualization software includes **EMC's Invista**, a software-only solution that lets an administrator move virtual volumes among multivendor storage area networks. **HP LeftHand P4000 Virtual SAN Appliance Software** is a virtual machine itself, tuned to optimize storage availability to ESX and Hyper-V virtual machines. **IBM's System Storage SAN Volume Controller** is highly scalable and features an optimizing function for fast Tier 1 solid-state storage.

Storage Management

Analysts sometimes characterize storage as the dog wagging the IT tail, in that such a basic commodity consumes so much time and money. That's why storage management solutions should be a part of any IT optimization strategy.

Storage management encompasses several functions besides the basic I/O writing of data. It also includes assignment of data to the correct storage tier, depending on frequency of use and retrieval speed requirements.

This ensures that backups occur on time and without errors, maintaining high availability so applications keep running. It optimizes allocation of capacity and storage networks to maintain high utilization rates.

The top products also include important storage utilities such as online encryption, deduplication, tape support and connectors to specific storage brands. **IBM Tivoli Storage Manager** encompasses 10 components available separately or as a bundle, all controllable from a single console.

EMC (the parent company of VMware) offers comprehensive storage management tools aimed at optimizing virtualized environments in the cloud delivery model. **Symantec Enterprise Vault** specializes in archiving and retrieving unstructured data such as e-mail and documents, while managing that data's storage in the appropriate tier.

Infrastructure Management

Managing infrastructure resources is part of optimization — in some ways the function that ties it all together. **VMware** offers a converged approach to management, which gives IT a single view into both virtualized and cloud environments, and across applications and functional areas such as data center operations and application development.

It does this by embedding agents that monitor vSphere functions where they occur. Converged management, the company says, offers a high degree of automation in addressing performance problems and restoring crashed or corrupted machines, as well as in provisioning new servers or clients.

Microsoft's System Center 2012 is a comprehensive monitoring and management platform that spans the data center to the desktop. With this resource, organizations have the ability to start with the tools they need, from desktop management to data center automation, adding software and features as they grow.

With the App Controller and Virtual Machine Manager features, System Center gives organizations the tools they need to manage their public and private clouds. Orchestrator and Operations Manager

provide the ability to automate day-to-day tasks and monitor infrastructure. Service Manager offers an ITIL and Microsoft Operations Framework (MOF) problem and change management system to track incidents in the environment. And Configuration Manager provides a means for organizations to manage their desktops and servers.

Security

Few IT challenges vex organizations more than security. Upcoming comprehensive cybersecurity legislation will begin to federalize standards for how enterprises secure networks that control critical infrastructure. Cybersecurity cuts across all of the risk silos organizations deal with: continuity of operations, legal compliance, end user and partner faith, privacy liability. This occurs against a backdrop of an ever-changing threat environment.

Data Loss Prevention

Sometimes threats gain access to network resources. That's where DLP software comes in. DLP has evolved in recent years from its origins in compliance for regulated data. Online privacy concerns, data location proliferation caused by mobile devices and adoption of cloud computing have all driven DLP toward deployment for all types of enterprise information.

Comprehensive products such as **CA Technologies'** DLP solution provide end-to-end protection using a portfolio of technologies. It distinguishes classes of data, such as personally identifiable information or intellectual property.

Software from others, such as **Check Point**, protects applications from unauthorized users while keeping potentially dangerous applications from accessing the network. **McAfee** ties DLP to deep content inspection and the ability to roll back network audit logs for a forensic look at potential losses. Another DLP leader, **Trend Micro**, offers solutions for specific enterprise applications such as e-mail or Microsoft SharePoint.

Symantec takes a comprehensive approach in its DLP solution, starting with discovery of sensitive information. Then it automatically applies rules for who can access, read, alter or copy it. Symantec's DLP solution works on tablets and tracks social media and enterprise data. Plus, it includes a new tool to speed discovery and protection of intellectual property such as source code.

Threat Prevention

Cybercriminals use a variety of techniques to gain access to enterprise networks. Software that counters this falls under the general category of threat prevention. The latest threat vectors include socially engineered spam. Also, criminals use techniques such as embedded links to malware in websites, denial of service attacks and sophisticated password cracking to gain administrative access. Social media have also provided new avenues for malware and data theft.

Repelling these attacks requires defense in depth. This means using a variety of tools in concert with continuous monitoring of network traffic.

Network intrusion monitors, sometimes hosted on dedicated rack servers, have sophisticated profile libraries to stop unwanted traffic. Tools to mine network activity logs provide clues to sources and methods of intrusion attempts.

Endpoint tools such as antivirus and antispam software continue to play a role in cybersecurity. But hosted content filters or blacklists of known or suspected malware senders can prevent malware-laden e-mails and attachments from reaching users' in-boxes in the first place.

Numerous vendors function in the highly competitive market for cybersecurity tools. **Symantec** and **McAfee** continually expand their portfolios from individual workstations to enterprise products. General software manufacturers such as **CA Technologies** offer a wide variety of authentication, governance and access control products.

Companies such as **Websense** approach security from the content and data point of view, and offer special tools for protecting enterprise information on social media. Network hardware vendors such as **Cisco** tend to take the appliance approach, offering integrated hardware-software security solutions. **Microsoft's Forefront Security** product line provides an end-to-end set of security solutions, signaling the company's continued investment in this area.

Secure Remote Access

With the growth in mobility, secure remote access tools have become increasingly popular. The challenge is to maintain security while providing a responsive, satisfying remote-user experience.

Secure Sockets Layer virtual private networks (SSL VPNs) constitute the basic building blocks of secure remote access. A VPN is a persistent connection using the public Internet

between two points, using encrypted traffic and added features such as quality of service (QoS) and routing.

Analysts point out that as more organizations let workers use personal devices for work (known as "bring your own device"), they need to install network access controls (NACs) capable of profiling individual devices and carefully delineating which areas of the network they can access.

VPN leaders include **Cisco**, which offers VPN technology for both site-to-site secure connectivity and for remote access. **Juniper Networks** also has a broad line of VPN and NAC products. **Check Point** offers what it calls software blades for endpoint and network security and related functions. Combinations of blades run on a single appliance from which they are centrally managed. **Microsoft's DirectAccess** provides seamless, secure remote access for Windows 7 clients.

NetMotion Wireless specializes in mobile secure access for Windows clients and on addressing the challenges of maintaining persistence using cellular networks as the transport medium. **SonicWALL's Mobile Connect VPN** for mobile devices works with a variety of operating systems, including iOS, Android and Linux.

NAC leaders also include **CA**, **Check Point**, **Cisco**, **Juniper**, **McAfee**, **Microsoft** and **Symantec**.

Highly secure remote access often encompasses two-factor authentication; for example, a fingerprint and a password. Known for its encryption products, **RSA** (the security division of EMC) also offers one-time random password generators that can be used in conjunction with regular passwords.

Endpoint Protection

Some organizations encrypt sensitive data accessed by notebook PCs and other devices, both in motion and when stored. Endpoint protection software includes products such as **Symantec's PGP Whole Disk Encryption**, which ensures that a lost or stolen device won't yield data. **Trend Micro** sells a suite of products covering remote patching, multiple operating systems, mobile devices and virtualized end users.

Check Point's Endpoint Policy Management suite provides a central console for administering user access and device security configurations. **McAfee** takes a device-level approach to encryption, with products that can encrypt an entire hard drive or selected files and folders. Encryption can also apply to USB drives and other removable media. **Microsoft Windows 7 client** provides native drive encryption, which is applied to the local hard drive and can also be extended to removable media.

Host-based intrusion detection/prevention systems, such as **Cisco's IPS 4200 Series**, combine hardware and software in turnkey appliances that usually sit at the edge of the enterprise network. They detect and trap malicious intrusion attempts using a knowledge base of unwanted behaviors. Packages may combine edge appliances with endpoint firewalls and antivirus software.

Risk Assessment & Compliance

Organizations operating in regulated fields must periodically certify that they are following regulations and guidelines for data security and risk mitigation. Risk assessment and compliance software can help do just that. The elements of such software amount to data governance.

No single tool provides instant risk assessment or regulatory compliance. But by combining network assessment, identity management, access control and audit tools from companies such as **Quest**, **McAfee** and **CA Technologies**, the IT group can achieve assurance that data is secure and manipulated only by those who have the authority to do so — and demonstrate to financial or regulatory auditors that this is the case.

Unified Communications

Traditionally, organizations would pay to own and operate two separate networks — telephone and data. A unified communications strategy reduces costs by moving telephony, video, instant messaging and call center management to a common IP network.

Unified communications requires interoperability among applications. The Session Initiation Protocol (SIP) is the standard used to achieve interoperability. SIP has been around since 1999, but it continues to evolve. SIP doesn't cover all functions or applications. But vendors in the IP communications field tend to adopt it as the foundation for their products.

In choosing a UC product vendor, look for standards support but also for innovation that will let the user add platforms and applications going into the future. The big trend in UC is incorporating mobile devices, enabling them to take on the same functions available to deskphones and other endpoints.

IP Telephony

IP telephony looks to users like traditional telephony. People have desk sets with all of the functionality of standard switched-circuit phones (and a whole lot more), but the features are available digitally. The routing infrastructure that replaces a traditional private branch exchange moves to the data center.

Cisco's Unified Communications Manager Session Management Edition is a major player in this market. Together with **Cisco's Unified Border Element (CUBE)**, it acts as an IP integration hub for a variety of devices and services within an organization. **Avaya's Aura** is its underlying architecture for SIP unified communications, combined with the **Avaya Agile Communication Environment**. ACE links operations processes and systems to the communications infrastructure, Avaya says, for improved

collaboration within the enterprise.

Both Avaya and Cisco make a wide range of hardware and software platforms, principally appliances to host their enterprise software and IP telephones. Some combine services such as telephones with built-in video conferencing. **Avaya's Flare**, an iPad application, combines the organization's employee directory with mobile phone and text messaging functions. **ShoreTel's Core Software** emphasizes simplicity in achieving UC, providing a central point into which an organization can plug its applications into.

Collaboration & Conferencing

A major benefit of unified communications, improved collaboration stems from richer conferencing technology that was not available with legacy telephony. Growth in teleworking and mobility, coupled with a decreasing appetite for the costs and inefficiencies of work-related travel, has driven organizations to find ways for people to collaborate, even when they are separated by distance.

Adobe Connect uses Flash technology as the basis for its rich webinar software. Online events can scale to thousands of simultaneous participants and can incorporate rich media, including high-definition video.

Citrix GoToMeeting is a hosted service requiring a small agent on participants' PCs. Users can initiate meetings spontaneously or schedule them ahead of time. During meetings, they can share content and view each others' desktops.

IBM's Lotus brand groups a large suite of collaboration products. The suite includes software for unified communications, social media, collaboration for mobile devices and messaging.

Microsoft's Lync Server 2010 is the hub of the company's unified communications strategy. Lync forms a platform that supports audio and video conferencing, VoIP calling and instant messaging. It integrates with Office applications and works at fixed endpoints or on mobile devices. To give users and administrators a single contact list, Lync connects to Exchange Server.

Microsoft's Office 365 brings together the company's Office 2010 with cloud-based shared documents, instant messaging (IM), web conferencing and the power of Exchange Online with 25-gigabyte mailboxes and built-in layers of antivirus and antispam protection. This comprehensive solution provides enterprise-grade tools at a predictable monthly cost and no upfront infrastructure investments.

Messaging Technologies

Organizations are turning to more efficient messaging technologies. Messages might occur person to person for instant collaboration or fact checking. Device-to-device messaging can synchronize host-based information with mobile devices, or vice versa, for everything from a new contact to updated organizational data.

IBM's Lotus Notes client software (mobile or fixed endpoint) provides the front end for workflow-driven information updates to users' social, contact, calendar and business applications. It includes instant messaging and access to coworkers' status. Notes works in conjunction with Domino, an enterprise platform that hosts applications. Domino controls workflow and other workflow processes.

Microsoft's Exchange also operates on desktop PCs and mobile devices. It gives a unified front end for users to see and manage all forms of communication: e-mail, voicemail, instant messaging, RSS feeds and calendar invitations.

Contact Center Management

Few things can enhance (or potentially damage) the reputation of private- and public-sector organizations more than customers' experiences with call centers. Contact center management starts with establishing clear performance goals, metrics by which to measure progress and effective training of call center operators. After that, technology puts the plans into action.

Enterprises are increasingly turning to distributed call center agents using multiple incoming channels. **Cisco's** IP contact center technology exemplifies this approach. IP telephony applied to call centers gives detailed reports on call center performance metrics down to the individual agent. It also lets centers allow people to contact the organization not only by phone, but also via e-mail and live web chat sessions.

At the core of the top vendors' contact center software solutions is intelligent routing. This technology lets the call center automatically send calls to the first available, least busy or most expert operator, depending on the rules the organization has built in. IP standards let operators work anywhere.

Avaya's Call Center Elite, offered under its Aura architecture, is available directly or via carriers as a managed service. **Avaya's Social Media Manager** follows Twitter postings for keywords and routes them to its contact management software, where they can be handled by call center staff. **Cisco's Unified Contact Center Enterprise** stores information about end users so organizations can prioritize their inquiries.

Continuity of Operations

Always-available IT provides assurance that work processes and online presence will continue even during a catastrophe or other operational threat. That can mean there is little danger of permanently losing records. But to assure continuity of operations (COOP), an organization's IT department has to make sure it has fail-safe technology.

Backup Strategies

Properly architected backup strategies form the foundation of COOP. The top solutions let an organization tune its backup processes so that the backup facilities are never too far behind production systems in terms of time or number of transactions.

The terms *recovery time objective* (the acceptable period of downtime for a process) and *recovery point objective* (the maximum time needed to recover data) are important when considering solutions in this area. Acceptable RTO and RPO depend on the operational focus. A high-volume transaction environment such as a university course registration period or a local government tax payment deadline has requirements in the milliseconds, whereas a brick-and-mortar operation might be able to tolerate minutes or even hours of downtime.

Other important features include granularity in backup at both the file and system software levels, and coverage of heterogeneous, multivendor systems in a single package. Additional key technologies for efficient storage and recovery are incremental backup (that is, backing up only changed data), built-in deduplication and compression.

Acronis Backup & Recovery 11 is one top solution, adding stronger support for Linux, tape emulation on disk and virtual machine backups. **IBM's Tivoli Storage Manager suite** includes robust backup and recovery software. Tivoli Storage Manager and **CA Technologies' ARCserve** feature a single point of control for backing up distributed environments and are geared toward high application availability.

These products back up both physical and virtual machines, and have tools to warn of potential data storage capacity problems. **Symantec's Backup Exec 2012** is another enterprise solution covering physical and virtual servers and providing highly granular application data backup.

Archiving

No organization has infinite disk storage, so ultimately, data must pass from primary storage to an archiving system. Archives, depending on required retrieval speeds, typically consist of tape or optical storage.

The enterprise backup products mentioned previously also provide file archiving functionality. In addition, **CommVault Simpana Archive suite** includes specialized e-discovery archiving and retrieval software. **Symnatec's Enterprise Vault** focuses on unstructured data, taking a document-centric approach to archiving.

Microsoft's Exchange Online Archiving is a cloud-based, enterprise-class archiving solution for Exchange Server 2010 Service Pack 1 (SP1) or later on-premise organizations. This solution allows an organization to host users' primary mailboxes on on-premise servers and store their historical e-mail data in cloud-based archive mailboxes. It can assist with archiving, compliance, regulatory and e-discovery challenges, while simplifying the on-premise infrastructure. ■

BACKUP IS ONLY HALF OF CONTINUITY OF OPERATIONS

Backup technology enables high availability but doesn't by itself provide it. As the corollary function to backup, recovery uses backup data to restore functionality.

To be sure, data backup must be comprehensive. Application data alone won't ensure recovery in all instances. Full recovery sometimes requires a backup of the application itself and the operating system over which it is running. That includes all of the updates and patches.

Bare-metal backup may put an entire application environment, complete with moments-ago data, on a new server in the event of a failure. Or, backup may involve a complete virtual machine restored to a running server if the VM is corrupted, or to a different server in the event of a hardware failure.

Still, presuming full backup, recovery also requires other software capabilities, including the following:

- **Continuous operation:** In smaller organizations, users might be able to get away with periodic backups. Enterprises need continuous backup, coupled with intelligence and analytic capabilities to conserve disk space and bandwidth by only backing up data that has changed.
- **Server support:** This includes support for clustered servers, side-by-side virtual and physical servers, and replication over the WAN to ensure that physical data center damage doesn't wipe out both production and backup environments simultaneously.
- **Hybrid environment support:** This includes having some applications and data hosted in a third-party cloud.
- **Automatic failover:** The complexity and speed of a transactional computing environment requires recovery software to kick in without operator intervention.

Software as a Service

Determining when a software subscription is the best option

Software as a service (SaaS) has emerged as a way for enterprises to gain the benefits of software without the cost and complexity of actually licensing it. Because "buying" is, in essence, licensing the right to use software, buying into the SaaS model distills the benefits of enterprise applications from the complexity of licensing and maintaining them.

The model itself isn't new, though it failed to catch on with large organizations that had the in-house capability to handle software when SaaS emerged a decade ago. Today, concern with costs and other constraints in deploying necessary capabilities is prompting many large organizations to look seriously at the SaaS model.

An explosion in cloud computing capacity and falling costs for high-speed networking have also sparked interest in SaaS. User virtualization, telework and mobility together form a third driver of interest in this technology.

What Is SaaS?

Software as a service delivers application functionality from a central host, granting user access from any client hardware, typically via a web browser over a secure connection. In the most common pricing models, SaaS is priced per user, per month or per year.

SaaS gained its enterprise foothold with human resources services such as payroll and customer relationship management (CRM) software. The moniker *SaaS* came later.

Today, many more applications are moving to the SaaS model, most notably personal productivity software. Behind many organizations' adoption of services such as Microsoft Office 365 is a desire to reduce operations and maintenance costs.

E-mail is a case in point. It appears an inexpensive commodity from the single-user point of view. But at the enterprise level, with the administration required by multiple directories, coupled with the disk storage and server

capacity it requires, e-mail costs add up.

Collaboration tools such as SharePoint are becoming more common as online services. Document and word processing packages, which act like wikis in the SaaS model, reduce confusion and lower storage requirements because users don't have to sort through version after version as documents evolve.

Two basic delivery models apply to SaaS. The publisher of the software may host the application itself, delivering it to the customer via its own data center. Or third-party partners work with the software publisher.

When looking at SaaS, an organization's analysis should take into account several ancillary cost considerations, including the following.

Infrastructure: What effect does moving to an on-demand application have on hardware and networking requirements? While some support gear, such as specific servers, may no longer be needed, organizations will likely need to make upgrades to their LAN and WAN infrastructures. At the user level, the IT department may be able to replace "thick" PC clients with less expensive (and more secure) display terminals running only a browser.

Staff support: SaaS vendors stress the gains of instant provisioning of new or changed users versus whatever administrative work a licensed version requires of the staff. The service provider handles administration of the software itself — updates, patches and version replacement.

Payment systems: What payment systems does the vendor offer? The most common type of payment is per user, per month. Vendors of CRM and HR software may also price their products as hybrids, with per-transaction fees applying. Vendors may also add fees for exceeding preset storage limits.

Response times and user experience: Delays caused by service delivery over a wide area network can negatively affect mission delivery.

Security: SaaS providers realize that security tops their customers' list of concerns. The National Institute of Standards and Technology has developed, in conjunction with both business and government groups, extensive security standards for cloud computing. Reference these standards in service agreements.

Also, keep in mind that all data is not equally sensitive. Since more stringent security entails higher costs, reserve the highest security requirements for the most sensitive

data, such as personally identifiable information, intellectual property, financial documentation and any data subject to state or federal regulation.

SAM and SaaS

An obvious question arises with growing frequency as enterprises adopt software as a service: Is software asset management needed when consuming software as a subscription and the vendor is metering the number of instances it uses?

The answer, in essence, is no. Organizations enter into SaaS agreements precisely because they yield benefits similar to SAM.

For example, an organization will face fewer software audits. It won't have to worry about a vendor or third-party launching an audit when the vendor maintains all of the licensing and usage information itself.

SaaS customers, thanks to reports provided by SaaS vendors, will gain a clearer understanding of their enterprisewide software requirements and usage patterns.

Beyond simplifying software asset management, SaaS provides technology benefits that can save money by helping the IT department avoid certain tasks required of on-premise software. For instance, vendors apply security patches. When they upgrade applications, the new functionality simply exists at the next user login. If an upgrade results in bugs, as they often do, the vendor takes care of it.

SaaS also brings an added level of continuity of operations assurance, because applications and user data are housed remotely.

Many SaaS vendors let organizations customize otherwise standard applications. For instance, the customer might be able to specify how the interface appears to its own users in the case of customer service apps. Most enterprises want their own logo, typography and color scheme to appear to staff and customers.

So generally speaking, SAM, as practiced for software acquired and maintained by the organization, doesn't really apply to a SaaS deployment because the hosting vendor monitors how many licenses or users the client has.

But that's not true across the board. In cases where SaaS usage is assigned to specific users, the organization may not exceed a specified number of users. That is, two or more users may not be allowed to access a license.

Some SaaS suppliers reserve the right to compare login records, including passwords, with the agreed-to users. Service agreements typically provide for additional payments if the software provider discovers users have exceeded the agreement.

CDW·G IN THE CLOUD

Planning is the most important element in deciding when and how to move to cloud computing and software as a service (SaaS). As a licensed reseller of scores of software brands and hundreds of applications, CDW·G has the resources to help even large enterprises better understand their software requirements and the best approach to fulfill them.

CDW·G's professional services group has more than 500 engineers available to assess an organization's current technology, plan what it will need for future operations, and design an infrastructure to support it all.

Beyond that, CDW·G provides managed services for cloud computing. Many organizations try cloud computing for their application development environments. Platform as a service (PaaS) is a hosted approach to software development tools and the underlying hardware resources needed to support them. Development then operates separately from critical production environments and doesn't require in-house IT support.

CDW·G's infrastructure as a service (IaaS) provides new or expanded computers, storage, networking and other data center essentials from a secure location. This setup lets organizations scale their capacity up and down quickly, using products from top manufacturers such as VMware, HP, Microsoft and NetApp.

The IT department doesn't necessarily have visibility into the activities of SaaS use within departments or bureaus. So when undertaking a SaaS deployment, it may be necessary to notify users that specific terms of service apply and that they aren't allowed to exceed those terms.

Maintaining a Hybrid Environment

There are few types of software that are not available as hosted services these days. Even software asset management itself is available as a service. Other classes of applications available as a service include cybersecurity, social networking (for use in customer surveys or satisfaction measurement) and the whole area of green practices and environmental health.

Still, no realistic scenario depicts an organization outsourcing all of its software needs. More likely, it will have a mixed environment consisting of both licensed and served software, and it will have to decide for each application whether or not the SaaS model is appropriate.

How does an enterprise decide whether to acquire licenses and host an application on premise versus subscribing to it as a service? Determining the answer requires going through a decision tree for each application. Ultimately, the decision should rest on a total cost of ownership (TCO) calculation. What follows are some key inputs to that equation.

How much customization will the application require for the organization's needs? SaaS options tend to provide limited flexibility, so an organization may choose to keep mission-critical, enterprise applications in house while outsourcing e-mail, which typically requires little customization. On the other hand, a TCO calculation might indicate it's worth changing operational practices to match the capabilities of a best-in-class SaaS app.

How scalable is the application? Each class of application has competing vendors. Some are purposely oriented toward small- or medium-size enterprises. They likely use a multitenant hosting setup.

Large enterprises may have the clout to negotiate exclusive tenancy. That might include multiple locations to minimize network latency. The main consideration is whether the vendor's environment, help desk and concurrent user capabilities can accommodate needed service levels.

Also, organizations should take into account their growth or change curve. SaaS can often provision new users, or deprovision users who are leaving or changing jobs, much more quickly than in-house staff can when applications or agents run on individual machines.

What staff size and expertise are required? Maintenance and upgrade requirements vary among applications. The decision to let a vendor manage software depends on whether the staff has the skills for a particular package, or whether the administrative overhead will overwhelm a small IT staff.

Preparing for SaaS

The idea behind software as a service is to offload the infrastructure and administrative costs of software hosting and license management. But that doesn't absolve the IT department from certain tasks to make sure the organization has success with SaaS.

Timing is important when a SaaS solution is to replace an application that an enterprise owns and operates. A hardware refresh cycle, for example, might be a logical time to switch. Or an impending new version of the application could require an investment the organization would rather avoid, leading to a decision to implement SaaS.

Organizational buy-in will help ensure a smooth transition to SaaS. Moving to subscription software doesn't mean the elimination of IT support. But the IT group's role will change, at least for some of the staff.

Also, some department managers might be uncomfortable with the idea of their critical data being stored and managed by a remote vendor. That's why SaaS planning should involve all of the organization's stakeholders. Not only will this guarantee buy-in, but it will also ensure that the organization has the information necessary to craft the best possible SLA.

SaaS provides a good opportunity to review underlying IT infrastructure. In particular, the IT department should make sure that inbound and outbound network bandwidth is sufficient.

This review is also a good time to check security and backup procedures. If an application will deal with intellectual property or sensitive information, make sure application access controls and data protection measures are up to snuff. ■

This glossary serves as a quick reference to some of the essential terms touched on in this guide. Please note that acronyms are commonly used in the IT field and that variations exist.

Glossary

Bring your own device (BYOD)

BYOD refers to an organizational policy of not specifying the endpoint devices used by employees, but instead letting them use a device of their choice to access enterprise applications. Increasingly, usable devices include tablets and smartphones. Some policies require staff to pay for their own devices.

Business Software Alliance (BSA)

The BSA is a nonprofit organization of major software publishers that promulgates license agreement compliance. The BSA stresses intellectual property protection and prevention of software piracy, and it publishes guidelines for software buyers to help them maintain compliance. Members include Adobe, Apple, Intuit and McAfee.

Cloud computing

Cloud computing enables convenient, on-demand network access to a shared pool of configurable computing resources (networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

Clustered servers

This term refers to a group of servers linked so that they perform as a single logical entity. Clustering is a technique for building high-capacity computing resources using low-cost servers.

Concurrent-user license

This is a software licensing arrangement based on the number of users who will be using an application simultaneously. It allows for an unlimited number of users in an organization, but limits the number who can work at any one time.

Data loss prevention (DLP)

DLP is a set of practices and software tools intended to prevent theft, unauthorized transfer, loss, accidental erasure or misuse of information.

Deduplication

Dedup is the practice of minimizing required storage space and network bandwidth use by eliminating redundant copies of data. Deduplication can occur at either the block or file level.

E-discovery

E-discovery is a process by which civil or criminal litigants seek to obtain evidentiary information stored electronically in opponents' systems. For compliance-related data and other information that might have potential legal implications, companies (especially publicly traded ones) and government agencies maintain metadata to aid in e-discovery processes. Sometimes e-discovery is conducted online, device-to-device, without the need to transfer large volumes of data to optical media.

End-user license agreement (EULA)

EULA is the basic legal contract giving a customer the right to use a software application, utility or operating system. The word "license" distinguishes software, in that a purchaser acquires the limited right to use the software but does not own the source code.

High availability

This term refers to the viability of an information system that gives users confidence that it will operate when needed. The level of availability depends on the application and the

level of service the organization requires for users or customers.

Infrastructure as a service (IaaS)

Provisioning servers, storage, routers and other data center resources as a turnkey product, IaaS is a component of cloud computing used by organizations as a way of avoiding the capital costs of data centers.

Infrastructure optimization

This term refers to a set of techniques and activities for obtaining maximum performance at minimum cost from an organization's data centers, networks and endpoint devices. Optimization includes, but is not limited to, consolidating IP and telephony networks onto an all-IP network, data deduplication and storage virtualization, and server and end-user virtualization.

ISO 19770

This is the series of International Organization for Standardization standards that define software asset management.

IT Infrastructure Library (ITIL)

ITIL is a set of best practices for managing IT services.

Per-seat license

This is a software license specifying how many named individuals that can access the software. Each individual must be specifically named. Access control is usually maintained through the directory where the program is housed.

Secure Socket Layer virtual private network (SSL VPN)

SSL VPN uses encryption to create a secure communication channel between an endpoint outside of the organization's physical network and the software resources inside. SSL VPNs let users access files and applications through a browser so they don't require installation of special client software.

Session Initiation Protocol (SIP)

SIP refers to standards established under the Internet Engineering Task Force for how voice and video messages are created and transmitted over the Internet. SIP helps ensure interoperability of Voice over IP systems and endpoint devices.

Site license

This is a software license permitting more than one user of an application at a specified location. The actual number may be specified or unlimited. Site licenses typically let the buyer copy the software as many times as needed.

Software as a service (SaaS)

SaaS is a contractual arrangement under which an organization subscribes to the use of software housed and maintained by the vendor. In a typical arrangement, the organization pays a monthly fee per user, and users access the application via a web browser.

Software asset management (SAM)

SAM refers to practices for ensuring that an organization purchases only the software licenses specifically required, and that all licenses in use are paid for according to the vendor agreement. License management also includes retrieving unused licenses from departing staff and decommissioned servers or PCs.

Software audit

A software audit is a formal investigation by a software vendor or its designated agent regarding an organization's compliance with its software licensing agreement.

Software license

A software license is a contractual right to use software. Most licenses have unlimited duration but place limits on the number of users as well as the number of machines on which software can be installed.

Unified communications (UC)

UC merges various forms of an organization's communications into a single interface over a single physical network, most often the IP data network. Voice, video, instant messaging and application data share a common network. The goal of unified communications is to lower costs, reduce administration and facilitate collaboration among staff, users and partners.

Virtualization

This term refers to the abstraction of application and operating system software into a single logical unit. The resulting virtual machine acts as a computer, but is separate from the supporting hardware. This means virtual machines can easily shift from physical machine to physical machine over a network for load balancing, security or continuity of operations. Physical servers are capable of hosting 20 or more virtual machines, resulting in greater hardware utilization and the need for fewer servers.

Volume license agreement

This is a method of contracting for software when, typically, an organization will need five or more end-user licenses. Software vendors offer discounts from single-copy pricing, depending on the number of licenses needed.

Index

ABOUT THE CONTRIBUTORS

ANDREW HITCHCOCK is Practice Architect for the Unified Communications (UC) solution team at CDW. A UC veteran, Andrew has been working with Microsoft UC since Exchange version 4.0. He guides CDW's participation in the Technology Adoption Program (TAP) and closely interacts with the Microsoft product teams for Exchange and Lync. Andrew directs the technology roadmap and strategy for the CDW UC practice, provides indirect pre-sales support for the Microsoft UC technical specialists and offers direct support for customer-driven strategic opportunities.

PAT SIMPSON has been with CDW since 2005, working on the Server & Security delivery team and progressing up to a technical lead position. The past two years, Pat has been Practice Architect for the Server & Security team, where he currently provides guidance for pre-sales and sales in the various server and security technology areas.

LOOK INSIDE FOR MORE INFORMATION ON:

- Navigating software license compliance
- Determining the most efficient licensing scenario
- Choosing the right software solution
- Managing a SaaS-licensed software hybrid environment