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3 CHAPTER 1: Winds & Waves on the Software Sea

- Cloud Computing Gathers Force
- Application Platforms
- Analytics and Intelligence
- BYOD and Mobility
- UC and Collaboration Technologies

9 CHAPTER 2: Stages of Software Life

- Assessing for Today and Tomorrow
- Software Procurement Best Practices
- Contract Management
- Software Deployment, Services and Support
- Acquisition Policies

13 CHAPTER 3: Software Asset Management

- Strategy: Planning for Success
- Licensing Scenarios
- Licensing Compliance and Audits
- Mobile App Management

24 CHAPTER 4: A Spectrum of Software Solutions

- Information Workers
- Unified Communications
- Monitoring and Management
- Server Virtualization and Security
- Cloud Computing

30 CHAPTER 5: SaaS: At Your Service

- SaaS Superlatives
- SaaS Challenges
- Where SaaS Makes Sense
- Other Considerations

33 GLOSSARY

35 INDEX



SOFTWARE ASSET MANAGEMENT

HAVING A STRATEGY IN PLACE AT THE START YIELDS LONG-TERM GAINS.



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for more information on software asset and license management.

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

Our Reference Guides are designed to provide 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.

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Cloud Computing Gathers Strength
Application Platforms
Analytics and Intelligence
BYOD and Mobility
UC and Collaboration Technologies
Virtualization
Consolidation and Modernization

WINDS & WAVES ON THE SOFTWARE SEA

CHANGES
ACROSS THE
I.T. LANDSCAPE
INFLUENCE THE
SOFTWARE
ENVIRONMENT.

People are interacting with software from the moment they wake up (hearing an alarm on a smartphone) to the time they relax in the evening (reading or shopping online). And in between, software affects virtually every work function in some way, whether in the executive suite or on the shipping dock. For that reason, software is far more than a strategic asset; it's an operational necessity – one that involves major investment and management oversight.

Maximizing the value derived from software and minimizing the cost expended on it requires a lifecycle approach and an understanding of the major developments in software.

This reference guide will cover the full gamut of software, from end user to enterprise utility applications. It also will look at how to manage software, both as a technological asset and as a financial entity tied to specific licensing policies. But first, it's essential to examine some key trends affecting enterprise software use today.

Cloud Computing Gathers Strength

Cloud computing, in theory, is a simple concept. By outsourcing data center infrastructure, an organization can expect to realize more predictable costs and free up capital that it otherwise would spend on servers, network gear, power units and other support equipment. With cloud deployments now proving their worth, the industry is accelerating and evolving.

The cloud movement has branched into several distinct approaches, each of which affects the acquisition and licensing of software:

Platform as a service: PaaS is a solution in which an organization buys online hardware and operating system capacity (similar to a utility arrangement) to run its own software applications.

Infrastructure as a service: IaaS offers a configurable hardware environment, often used to host software development and testing. The buyer may choose to supply the OSs.

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Software as a service: With SaaS, the organization uses a supplier's applications, which it can configure (typically through a web interface) and for which it owns the data files but not the application. (To read about the SaaS model in depth, see Chapter 5.)

One of the chief complexities of software lifecycle management (SLM) results from the fact that most organizations use a combination of traditional data processing along with private and external cloud services.

Therefore, an organization must figure out, for purposes of software license compliance, how to account for instances when an application is running in both internal and external environments. Additionally, the IT department must determine how to synchronize updates under this hybrid approach.

Yet another wrinkle results from the need to ensure that local and cloud applications execute equally on various server, desktop and mobile platforms. Organization-owned and locally hosted applications, as well as those that are owned but cloud-hosted or third-party SaaS apps, each interact with endpoints slightly differently.

An organization may choose its cloud approach to accommodate its software choices. When hosting its own software, clearly the IT staff is responsible for acquisition, license monitoring, customizing, updating, maintaining and eventually retiring that software. Each of these lifecycle functions has a cost and a required skill set. The organization's CIO, financial staff and software program leaders must decide the most efficient allocation of those resources.

But the IaaS, PaaS and SaaS models divide software responsibility between the cloud provider and the organization. For example, under IaaS, the provider retains responsibility for the network



stack and disk controller software, while the customer is responsible for everything from the OS on up to data files and applications. PaaS gives the customer responsibility for both data and application logic code.

In its purest form, SaaS means all software is used strictly as a utility. Suppliers (such as Microsoft and Salesforce.com) have developed highly successful SaaS models. The turnkey approach is efficient and flexible, but an organization does not own the logic of the cloud applications it uses. On the other hand, software functions such as supply chain or customer relationship management (CRM) interact with other groups. Sharing a common platform with customers or trading partners eliminates interoperability hiccups.

Application Platforms

Technology expert David Chappell, principal of Chappell & Associates, describes an application platform as the combination of five services that support software:

- The OS
- Execution services (such as user interfaces and interapplication communications)
- Data services
- Development tools
- Cloud services (such as geographic information and search)

Application platforms do double duty. They work as development platforms on which organizations build and test new software, and they provide the runtime services for applications to work efficiently.

In the client/server era, an application

was associated with a physical server and, depending on the system architecture, with specific physical storage. Virtualization has decoupled applications and their associated resources from hardware, giving them portability across cloud and internal networks. Although virtualization offers a host of benefits, it has increased the complexity of demands made on application platforms.

Apps themselves have become more visual and more dependent on large data sets from a variety of sources, not just relational database management systems. What's more, they no longer must necessarily reside within an organization's infrastructure. Therefore, the application platform must be fast enough to avoid creating latency in performance for multimedia, multiple-data-source and distributed apps.

Because application platforms act as the connector between IT resources and users, the choice of the platform can affect both IT and organizational performance greatly. The platform affects how fast an app loads, how widely and quickly it scales, the variety of platforms it can run on and how efficiently it uses resources, such as storage and memory.

Also, because many organizations choose a combination of self-hosted and cloud-hosted apps, the ability of an application platform to operate in a hybrid environment is a factor in the decision.

Mobility support is another selection criterion. The platform must support mobile devices with interfaces and OSs that differ from those of desktop clients. And it also must accommodate both wired and wireless networking.

Analytics and Intelligence

The first enterprise apps arose

from the necessity of serving users in large organizations, where size and complexity spawned the need for automated information processing. In the 21st century, myriad enterprise apps – supporting operations, finance, customer service, human resources and market analysis – produce vast quantities of data. These data sets have become assets from which organizations can derive new value.

Whether public or private, enterprises are seeking the information equivalent of gold in that data. Using the latest business analytics and intelligence tools, the data is sifted to find trends in how to steer projects, as well as anomalies that might suggest financial or legal compliance problems.

Such business intelligence (BI) can reveal a variety of behavioral trends among customers and constituencies, leading to better sales or improved services. Data can unveil cybersecurity breaches, insider sabotage and even theft patterns. Basically, the large data sets that characterize today's organizations can be mined for just about any type of information imaginable.

One of the drawbacks to these vast pools of data is very little of that information resides in structured, relational database management systems. Instead, much of it resides in documents or network logs or social media streams – and therefore is not searchable using standard database management system (DBMS) reporting tools. This is where data analytics and intelligence, the so-called Big Data tools, come in.

In the last few years, the emphasis on Big Data has spawned a subindustry within IT, which has crafted an array



HOW TO MAKE ENTERPRISE APPS MOBILE

Smartphones and tablets burst into the enterprise through the consumerization of IT.

Organizations, from the U.S. Air Force to Hyatt Hotels, are deploying new-generation tablets on which users access enterprise apps. From Adobe to VMware, software makers now offer mobile versions of their tools. Plus, a whole generation of application development platforms enables new mobile app development.

But a basic challenge for any organization remains: how to optimize the user interfaces of existing, in-house developed client/server or web apps for screens as small as four inches diagonally.

Here are three ways to approach this challenge:

- **Terminal emulation:** Many organizations still use green-screen apps, and several terminal emulation products for tablet OS and chip architectures are available.
- **Optimized web interface:** These interfaces display better on small screens by providing enlarged input areas, removing extraneous elements and reorganizing layouts into lists.
- **Full app versioning:** With this approach, interfaces are completely re-rendered to resemble consumer apps.

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of tools and methodologies to derive useful information from large, mixed-format data sets.

Virtually every industry and government domain – healthcare, transportation, finance, retail and manufacturing – is exploring Big Data and how to derive maximum value from it.

More important than the software tools needed for business intelligence is an organization's approach to analytics. Experts agree that useful analytics programs require sustained support from leadership. They also require collaboration between business or mission chiefs and the IT team. Why? Because an analytics program generates value by asking the right questions, and the answers will help an organization achieve its goals.

The classic approach had been to use Big Data stores to stage information, which is parsed and aggregated before being loaded into a data warehouse. Once there, any number of Structured Query Language (SQL) tools can subject it to queries.

Today, organizations increasingly turn to cloud-hosted Hadoop environments that can amass large data sets in a variety of formats. Within Hadoop, tools in a variety of programming languages (such as Perl, Python and Java) can then mine the data. Many software providers now offer value-added platforms and analytic tools for these Hadoop environments.

**///
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EXPLORING BIG
DATA AND HOW TO
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BYOD and Mobility

The mobility movement builds on the growing desire to allow “anytime, anywhere” computing. The software industry has developed robust remote access tools over the last couple of decades to enable PCs to connect to enterprise servers, first using dial-up modems and later consumer-grade broadband. Virtual private network (VPN) software and virtual user desktops have been among the key enabling technologies for secure remote access.

Strictly speaking, use of notebook systems outside of the office or campus constitutes mobile computing. Nearly all notebooks come equipped with fast Ethernet, Wi-Fi and broadband capability.

But today the term mobility implies something different – and something more. For many users, the preferred end-point device is now a smartphone or tablet, likely one that originated in the consumer market. These devices have certain characteristics that affect software planning: OSs developed specifically for them, limited memory and solid-state storage (relative to notebooks), smaller screens, and virtual keyboards.

These hardware characteristics raise three major software questions:

1. How will the interface be rendered on a mobile device's screen?

Legacy, client/server Microsoft Windows interfaces or even green-screen interfaces typically are bitmapped, with input zones for keyboarding in the native application and then rendered to allow touch input.

Web interfaces can run as-is in small browsers, but it's more practical to reengineer them for the smaller screen. The other option

is to go the full app route, in which the interface works similar to the hundreds of thousands of consumer apps with which users are familiar.

2. How much enterprise data is stored on the device and for how long?

This is both an application and a security question. Other security questions center on where encryption occurs because mobile devices don't have trusted platform module (TPM) chips (at least not yet).

3. How will the IT department sequester organizational apps and data from the personal apps and information also riding aboard a device?

The bring-your-own-device phenomenon can produce considerable organizational soul-searching. Having an enterprise-approved list of devices isn't really BYOD, but allowing anything on the network has the potential to create excessive support costs and security issues.

A more practical approach is to subdivide employees into broad functional categories and determine the software they will use if mobile. For example, a group encompassing sales, marketing, business development, finance and general management workers will use a different suite of applications than one comprising software developers, systems administrators and engineers.

UC and Collaboration Technologies

Not so long ago, email was the one universal communications application within organizations. The many options for point-to-point and collaborative communications viable today are due, in part, to the enormous increases in network bandwidth, both Ethernet and wireless.

Users tailor their communications techniques to the needs of the moment. In some organizations, they might choose from a toolkit containing voice, email, instant messaging, video conferencing and social media.

A growing number of software makers now equip other enterprise applications, such as workflow or logistics programs, with social interfaces. This makes them accessible to more people.

Having a messaging and social capability in such apps also can boost productivity because it allows people to form ad-hoc workgroups to solve problems quickly. It lets them discover or supply information within the social interface. In other words, the applications become collaborative.

The toolkit metaphor is no accident. Unified communications brings all of these tools together into a single user environment. Users simply access whichever communications application that seems right for the task at hand. From the IT standpoint, the tools use a single, consolidated enterprise IP network that ties together locally hosted and cloud data resources.

A key UC consideration for software decision-makers is whether to use a single suite or a best-of-breed approach. Some UC manufacturers have a background in telephony, others in networking and still others in pure application development.

Selecting any software or system comes down to balancing price, functionality, scalability and performance. Specific considerations for UC purchases include:

- The degree of collaboration expected with entities outside

the organization, particularly customers and trading partners;

- How important telepresence (high-definition, high-fidelity video conferencing) is likely to be;
- The number of regular mobile users in the organization;
- Whether the organization plans to host application servers in a cloud environment or support them in-house.

Most important? The return on investment (ROI) for UC, which reduces operational costs by converging voice, video and data networks. For example, an enterprise can eliminate its switched-telephone infrastructure by moving to IP telephony. Plus, increased collaboration can shorten sales or product development cycles and cut travel expenses – all measurable outcomes.

Virtualization

Virtualization has revolutionized the data center. Use of virtual machines (VMs) greatly drives up server utilization, resulting in lower total cost per computing unit.

And it has produced flexibility for IT management through the ease of moving VMs from server to server within a data center, among multiple data centers and between data centers and external cloud hosts. End users such as web developers can be deputized to create their own VMs as needed, further lightening the

administrative load on the IT staff.

But virtualization also has reduced OS and application visibility. That in turn increases the likelihood of licensing compliance violations and the fines they engender. Additionally, there's the potential for overspending on licenses.

Keep in mind that in the virtualized world, where hundreds of VMs can reside on a rack of blade servers, there might be many multiple instances of an app running on any of several multicore servers. The essential licensing question then becomes: Is the app licensed on a per-VM, per-server or per-core basis?

For example, Microsoft licenses SQL 2012 on a per-VM basis. Each new VM requires a license, but it doesn't matter where in an environment the VM runs. Oracle licenses its enterprise database on a per-physical-core basis, which means the license holder can create as many VMs as it wants without incurring license charges – as long as the VMs run on the licensed cores.

In the Microsoft example, letting department or business-unit users create VMs with ease could lead to unwelcome, surprise licensing fees. In the Oracle case, failure to monitor the location of VMs could incur a substantial charge. In that scenario, the IT department likely would want to consolidate as many VMs as possible on a single hardware core.

The virtualization and failover planning gets complicated because of the potential number of cores

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CASE STUDY

THE VIRTUALIZATION TIPPING POINT

Learn why several companies decided to virtualize their data centers:

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in a single processor and then the number of processors that could be on a physical server.

Buyers face the added complication of whether a software maker treats physical and logical partitioning the same way for the purpose of limiting license quantities that customers will need. Manufacturers' licensing guidelines go into excruciating detail on these matters. Researching this issue in advance will help the IT department create detailed plans for how it will deploy VMs.

No license plan is inherently superior or inferior. But an organization must plan carefully and negotiate volume discounts up front, anticipating the environment in which each app will run. That's where software asset management (SAM) systems come in.

A SAM system should be able to scan the entire network, including external IaaS services, to discover instances of apps within VMs and to compare them against a database containing licensing agreement details (see Chapter 3 for more details). Although manufacturers generally let customers operate on good faith, software audits are on the rise – partly in response to the complexity of virtualized environments and concerns that customers may let users freely create app instances.

Consolidation and Modernization

Several forces have served as catalysts for data center consolidation and modernization: unpredictable energy costs, a desire to reduce the organization's carbon footprint, the maturation of cloud computing and falling prices for highly efficient blade server systems. Updating the infrastructure, whatever the driver, tends to prompt organizations to review their software inventories, too.

As explained earlier, virtualization often accompanies a move to a new



/// UPDATING THE INFRASTRUCTURE, WHATEVER THE REASON, TENDS TO PROMPT ORGANIZATIONS TO REVIEW THEIR SOFTWARE INVENTORIES, TOO. ///

server infrastructure, meaning server licensing arrangements require review. User or desktop virtualization may accompany data center modernization along with server virtualization, which makes it an ideal time to weed out highly localized, unneeded or rogue software instances.

Server virtualization reduces the time it takes to create a server to hours or minutes, compared to days or weeks for physical servers. The IT department can realize similar reductions in the time it takes to provision and reconfigure virtual network components – routers, switches and firewalls.

Client virtualization moves individuals' software bundles off the endpoint and into the data center, with users often operating on a combination of thin clients and mobile devices. This move raises licensing issues for users' software. When a single user's system exists as a VM in the data center, that person is able to access it using a notebook for teleworking or a tablet or smartphone for mobile computing.

A legacy overhaul also prompts organizations to examine their networking topologies and consider whether to virtualize their network infrastructure or perhaps to adopt a software-defined network, which is

but one form of network virtualization. The network requirements of virtualized application servers can outstrip the capabilities of existing networks – again, perhaps prompting a move to some form of virtualized networking.

There are additional software-related questions that accompany infrastructure modernization:

Is it time to consider a cloud approach to email and collaboration applications? The major providers of consumer email and apps also offer enterprise editions for which an organization can specify server locations and data retention policies.

If an upgrade also entails a mobility rollout, how will the IT group deploy legacy client/server and web applications to mobile devices? It's likely that more than just the device interface will need modification. The memory, processor and security features of allowed mobile devices might trigger a need to rebuild some apps, too.

Which legacy apps must be updated, replaced or retired? Many apps are not enterprise tools – neither deployed nor managed by the central IT shop. Instead, it's common for user workgroups to have created or purchased apps that proliferate over time and persist even after they have become obsolete. ■

STAGES OF SOFTWARE LIFE

SOFTWARE'S WIDESPREAD USE REQUIRES CONTINUOUS MANAGEMENT AND CARE THROUGHOUT ITS LIFECYCLE.

The software industry remains a dominant economic force worldwide.

According to the U.S. Census Bureau, domestic software and services sales exceed \$400 billion per year. For both public- and private-sector organizations, software represents a significant yearly investment. No organization can exist without software, yet nearly all enterprises have room to improve how they use and manage it, deriving savings in the process.

Getting the most out of every software dollar requires a lifecycle approach – knowing the steps in the lifecycle of software and how to best manage them.

Assessing for Today and Tomorrow

The first step toward gaining control over the software lifecycle requires inventorying the apps that are running in the organization and defining the true requirements. A systematic inventory also can identify rogue apps as well as out-of-compliance software.

A thorough inventory also can provide information to justify changes, such as

an app upgrade or a consolidation of several duplicate apps. It further can help the IT team discover underused apps or those needing security patches.

But ensuring an accurate inventory in today's complex environments requires automated discovery. Here are a few factors to consider when reviewing the myriad discovery and inventory tools available:

- **Agent vs. agentless** | Between the two, the latter has the benefit of avoiding the administrative headache of having to install a discovery agent on every piece of equipment. But agent-based scanning has the benefit of catching devices that are intermittently connected to the network and may provide a greater capture rate. A hybrid approach, utilizing both kinds of tools, is always an option.
- **Search capability** | The best tools can find and report software instances running on VMs as well as natively. Also, they can discover apps on mobile devices.

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- **Cloud compatibility** | Some products can access third-party cloud apps as well as those on the organization's own network.

A tool may specialize in discovery, or a SAM package may include discovery as a feature. For example, IBM offers Tivoli Asset Discovery, a software discovery and inventory tool, as part of its broader Tivoli management suite.

Microsoft makes a stand-alone discovery tool. Data derived from the Microsoft Assessment and Planning (MAP) toolkit provides information for a variety of IT options, including OS upgrades and cloud migrations. (MAP is one of a set of what Microsoft calls solution accelerators. Others cover compliance, security and deployment management.)

CDW also has a dedicated SAM practice and is partnered with Snow Software to deliver agent-based and agentless solutions. This practice can leverage current inventory data from the MAP toolkit, System Center Configuration Manager (SCCM), Altiris or from CDW's hosted solution. This data can then be leveraged to perform license analysis against the organization's Microsoft purchase history. Additional vendor license

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analysis services, such as for Symantec, AutoDesk and Adobe, are also available.

CDW, as an IBM, Microsoft and Snow channel partner, maintains a staff of account managers, systems engineers and field solution architects that can deploy and configure asset discovery tools while helping ensure license compliance for the tools themselves.

Software Procurement Best Practices

Increasingly, users have come to realize the value of the data they generate or collect. For instance, marketing and sales department workers understand the ROI potential of customer analytics and buying trend reports. Operations people see how they can improve processes based on supplier performance data collected in fine-grained detail.

In tandem with this trend, IT departments and CIOs within organizations are increasingly less likely to retain sole authority over software procurement.

Although information workers throughout an organization might have insights into software purchasing, sound governance dictates that the IT group should retain authority over how software is acquired, from whom and under what terms. After all, the technology staff conducts the periodic enterprisewide software inventories, so it has a bird's-eye view of software use and license volumes. The IT department also has experience negotiating software terms and conditions.

Interestingly, the mobility explosion has sparked two opposing software procurement dynamics. On the one hand, organizations are trying to manage the sheer volume of niche apps available. And on the other, they must continually prune and refine app inventories to maintain acceptable license costs, ensure license compliance

and preserve network resources.

One approach to managing apps is through the creation of an online app store. Individual users can download what they need from a selection of approved apps. The store records who downloads what, which lets the IT department keep an up-to-date log of deployed licenses.

Smaller organizations can opt to house their volume purchases in a private section within a public app store. For larger entities, several vendors offer on-demand delivery platforms. Examples include Citrix XenApp and Microsoft's App Controller, a component in its System Center 2012.

By deploying a self-service site and making it the sole source within the organization for software, the IT department can maintain control over volume license agreements, negotiate licenses before individuals or user groups begin installing new software and prevent the installation of rogue apps.

Regardless of the direction chosen, keep in mind that SLM requires a human component to interpret, understand and make sense of the often-confusing raw data provided by software vendors. While the technology is evolving, full automation is not an option.

Contract Management

Once software is acquired, contract management becomes an ongoing activity. It ensures that the buying organization uses licenses efficiently while helping it steer clear of compliance snafus.

Contracts normally give a buyer the right to use software within reason. Software manufacturers treat their products as intellectual property. Typical contract terms cover:

- **Usage** | the purpose for which the buyer will employ the software and any prohibited purposes
- **Quantity** | expressed in terms

of number of processors or cores, number of simultaneous users or total users

- **Transfer** | usually buyers may not relicense or otherwise transfer software to another party
- **Maintenance** | upgrade frequencies and associated maintenance fees

Don't assume that because a software contract exists that it is unchangeable. When negotiating a multiyear contract, always be sure it includes the opportunity to review and update terms and conditions annually.

Often, dollar savings lie in paring licenses down to what is actually used versus the initial estimate. The management process also guides an organization through an evaluation of how the software is employed and whether it fulfills its strategic goals. Quarterly reviews ensure that an organization maintains the right software in the required license quantities.

Software Deployment, Services and Support

Aside from the technical means to deploy a software package, it's wise to create a written plan if an app is critical or to be widely deployed. Many IT departments create a template deployment plan they can adapt and reuse for each rollout.

At a minimum, the deployment plan should detail the following:

- Business or mission purpose of the software
 - A package description
 - Who will be responsible for approving and installing it
 - A schedule of tasks and expected completion dates
 - The steps that will be required of users
 - The follow-up steps the IT staff will take to ensure the app runs properly
- The software deployment plan should

also explain compliance with the license agreement. Additionally, any tool used to distribute software should encompass license reporting while preventing random or unauthorized installs.

Distribution Directions

In practice, few IT departments with more than a handful of computers march from device to device with gold disks to do manual installations any longer. Instead, the staff creates a master file in the organization's online software library that is accessible only to authorized users.

Repackaging details vary by vendor. For example, the Microsoft Installer Package format has long been the standard by which Windows applications are distributed through the network and monitored. Mac, Linux and other OSs have their own application packaging formats.

In practice, software distribution is more complicated than simply writing a script and shooting out images across the network. Organizations require an app for deploying other apps.

The packaging and distribution components may exist as stand-alone applications or as part of the SAM suite. Software distribution management packages are designed to give diverse organizations the flexibility they need in deployment, and they ensure compliance with both enterprise policy and license agreements.

Mobility, BYOD and cloud computing have added new wrinkles to software deployment. The distribution management system must account for endpoints that vary by OS configuration. Plus, if the organization's infrastructure includes a third-party or public cloud, the software manager must recognize and accommodate this.

SAM vendors are adding specific mobility and cloud-aware extensions, such as Windows Intune

and IBM Tivoli Endpoint Manager.

How software is licensed also affects distribution. If an organization has a site license agreement for a set number of simultaneous users rather than an agreement for some maximum number of unlimited licenses, the distribution system must take that into account in the way it tracks usage.

Software tagging has become a widely accepted way for software distribution and SAM systems to track and optimize licenses. In general, software makers supply the tags for their apps.

Once deployed, a tag on each instance of the app is discoverable by the SAM system during scheduled inventories. The tag data, compared to a database of license purchases, produces an accurate report of license usage.

Given the large number and diversity of software manufacturers, tagging can become a source of chaos. But a still-evolving International Standards Organization/International Electrotechnical Commission (ISO/IEC) standard is bringing order to tagging.

Not every SAM vendor incorporates ISO/IEC 19770 into its products yet. But industry support is there. Microsoft, for instance, has announced that it plans

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ISO/IEC 19770

What it offers:

A data standard for license tags, known as the software entitlement tag

A data standard for identifying the applications themselves, known as a software ID (SWID)

A process framework by which an organization can verify it is following best practices for software management

to incorporate 19770-2 for software identification (SWID) in forthcoming releases of System Center and MAP.

Follow-up Focus

After-deployment services fall into two broad categories: services pushed automatically by the IT department and services requested by user groups or individuals.

Examples of the former include updating apps to newer versions or patching them for the latest security holes. Another example is automated remediation of crashed apps. These types of services require integration between subsystems that sense trouble and generate service tickets and the orchestrator, which automates the sequence of events and invokes the resources needed to regenerate or restart an app.

Requested services can come from users authorized to access the software library to add an app or create a VM. As mobile devices

have become commonplace, more organizations have added self-service provisioning sites for users that provide role-based access to apps.

Some IT departments outsource service management. CDW's managed services offerings include offsite management of software assets, with the ability to deliver apps preconfigured to customer specifications.

Acquisition Policies

The strategic importance of software dictates the need for strong organizational policies defining what software to use on the network, who can acquire apps and who can install them.

Mobile devices have caused enterprises to adopt procedural changes with respect to installation. IT departments control the apps available for provisioning and the accompanying policies, even for self-provisioning mobile-app sites.

One way of thinking about software policy is to consider what

could happen in its absence.

If users can buy software freely, the IT department will quickly lose control of what runs on the network. Locally furnished software, even deployed with the best of intentions, might be misconfigured, creating security gaps.

What's more, it won't be registered with the organization's SAM system, greatly increasing the potential for illegal copying. The buying group might not have the knowledge or contracting skill to get the best deal. Or the buyer could miss out on the terms and conditions the organization has negotiated in a master agreement with a software maker or provider.

A software acquisition policy can include procedures for requesting particular apps and so ensure that IT expertise and central-purchasing skills are brought to bear. The policy should include step-by-step procedures for requesting, acquiring, receiving, deploying and maintaining software within the organization. ■



MANAGE SERVICES AND ASSETS HOLISTICALLY

Because managing IT services is largely a technical function and managing assets a financial one, many organizations look to bridge the two areas so they benefit one another.

For example, a failed server clearly causes a service event and triggers a trouble ticket. Inventories of replacement servers or supply agreements to buy a new one exist in the asset management system. When the two systems share data, the IT service group can fix the problem faster because it can easily locate the required asset.

The IT Infrastructure Library can provide a standards-based approach to combining service and asset management. ITIL Version 3 consists of five volumes, or sets of practices, each covering a segment of the service management lifecycle. Although it reinforces the idea of technology and business alignment, ITIL can be exacting and expensive.

Other approaches exist for managing technology selection and deployment as well as the business functions of licensing and contract management. CDW's methodology consists of a continuing cycle of technology validation – matching apps with business needs – plus licensing and contract management, followed by rapid deployment.

This approach uses best-in-class solutions from companies such as Adobe, IBM, Microsoft, Symantec and VMware. It aims to ensure contracts and license arrangements that lower total cost of software ownership and maximize ROI.

SOFTWARE ASSET MANAGEMENT

HAVING A STRATEGY IN PLACE AT THE START YIELDS LONG-TERM GAINS.

Software asset management provides a way to control and leverage what organizations spend on software.

There are three ways to think of SAM:

- **Tool** | It inventories an organization's software and reports out rich data about what is running and where.
- **Process** | SAM enables active management of licensing arrangements, version control and security patches.
- **Event** | It issues reports in advance of an audit conducted by a vendor.

When considering SAM tools, organizations face a range of choices. They can acquire SAM either as a software package they install and use or as a managed service. Either way, the basic goals include establishing and maintaining control over licenses, assessing requirements at regular intervals or when special events (such as mergers) occur, and ensuring efficient software deployment.

Strategy: Planning for Success

Consider the complexity of the IT environment in even small or medium-size organizations. Individual users often employ a variety of devices, with many utilizing two or three. Right there, the IT department might find itself required to support two or more OSs. The fast pace of today's work environment means short-term groups form for specific projects and eventually disband. Virtualization and cloud deployment disassociate software from specific physical locations.

It can all add up to a nightmarish licensing scenario. The IT group faces opposite but equal dangers: Overprovisioning, which results in wasted spending; underprovisioning, which drives up the risk of either illegal use and incurring penalties or work grinding to a halt until the organization can acquire sufficient licenses.

Therefore, the primary objective in implementing SAM is to create an organized way to plan, buy and manage licenses. A complete inventory

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of existing apps and licenses comes first. Whether as a stand-alone tool or part of a comprehensive SAM suite, an automated approach will produce more accurate and thorough inventories of software instances than manual counts are able to do.

By comparing inventories to license agreements, the SAM tool can report variances and enable the IT shop to make informed choices about license quantities. This should help avoid the cost of latent licenses, the potential productivity losses of underlicensing and the risk of being out of compliance with the license agreement.

Underutilization of licenses represents a hidden cost the SAM tool can ferret out. Depending on the type of license agreement an organization has for a particular app, it might be possible to harvest unused licenses by moving them to people who need them without inadvertently incurring new license fees.

The SAM inventory also serves up information about OSs, app versions and update histories. This information helps ensure an organization's software is uniform and up to date, which typically reduces overall support costs and enhances cybersecurity. The latest SAM tools also can detect app instances on VMs and on mobile devices – two different technical challenges, both critical to compiling enterprise inventories.

Licensing Scenarios

Organizations have several options for licensing software. But fundamentally, a software purchase is simply the acquisition of the right to use software. Proprietary software remains the legal possession of the creator. And the buyer, in most cases, does not have the right to modify or copy it. Therefore, it's important to choose the right type of license: per seat, concurrent use or volume.



/// THE LATEST SAM TOOLS CAN DETECT APP INSTANCES ON VMs AND ON MOBILE DEVICES. ///

A per-seat license gives the buyer an agreed-on number of authorized users, who are specifically designated in the contract. That is, in a 1,000-seat agreement, an organization would designate which computers and users could use the software.

Typically, the IT department would use the directory to control access. Within a per-seat license, it is possible to switch users, but the total number of designees doesn't change.

Under a concurrent-use license, an unlimited number of people in the organization could use the software, but only so many at a time. Apps under concurrent-use licenses tend to be server-hosted rather than installed on endpoints. The app tracks how many concurrent users are logged on and won't permit additional logons.

Under volume licensing arrangements, the software maker offers discounts for licenses of typically five or more for a title. The greater the volume, the deeper the discount. These licensing deals usually omit

physical software media (DVDs) and documentation to keep costs low.

A volume license can take the form of an open plan, in which the enterprise pays as it acquires licenses. These plans may have time limits so that the right to use the software expires at the end of the contract. Oracle, for example, offers one-, two- and four-year volume licenses in addition to perpetual-use licenses.

An additional factor when licensing server software concerns the environment in which the software will run. Vendors may license per processor, per core or per some number of cores. They also may allow an unlimited number of VMs on the designated servers or cores. In this scenario, it's wise to consolidate VMs to the designated hardware.

Other vendors license per VM, regardless of where the VM runs physically. In that case, the IT group needs to monitor and control the creation of VMs.

Licensing Compliance and Audits

Software contracts typically give the developer or provider the right to audit a customer for licensing compliance. Regular use of a SAM tool will allow an organization to remain ever ready for an audit.

Keep in mind, the inventory alone won't ensure compliance. The SAM tool also must measure usage, as well as match license keys in use or concurrent-user activity against contract terms for each app.

A SAM tool in the hands of a third party can sometimes serve as a neutral or nonadversarial auditor. Arrangements vary. The organization buying software may require the auditor to sign a nondisclosure agreement so that license audit results are not shared with vendors. Or a vendor may deputize a partner or reseller to conduct the audit on its behalf using a SAM tool.

The Business Software Alliance points out that instances of unauthorized software use can carry copyright infringement penalties of up to \$150,000 each. And, it says, organizations run cybersecurity risks when software is brought in over peer-to-peer file sharing sites.

Mobile App Management

The sudden boom in mobile device adoption for business and professional use has been one of the more exciting IT developments of recent years. It's also created new challenges for IT management. Security tops those challenges.

For example, a chief security concern is keeping enterprise apps and associated data separate from exposure to personal apps on the same device. Sandbox technology keeps the personal and enterprise ecosystems on a device from interacting. Sandboxing, a term borrowed from software development, means in effect running the enterprise apps as logically isolated VMs within the mobile device's memory.

Another mobile app management challenge is accounting for licenses aboard devices. Mobile device management (MDM) software performs for smartphones and/or tablets the functions that a SAM tool does for wired endpoints. MDM also includes functions specific to mobile devices, such as remote wiping in the event of loss and visibility into all of the apps running on the device. ■



CONSOLIDATE SOFTWARE SPENDING

Few strategic business decisions rival evaluating software and choosing applications in importance. For continuing operational tasks, managing software application licenses ranks high for potential financial repercussions. Negotiating a suboptimal license arrangement, or failing to adhere to licensing contract terms, can expose an organization to needless cost.

To both simplify and optimize software selection and contract management, an organization may opt to consolidate its software spending with a single vendor that specializes in software lifecycle management. A trusted, third-party adviser can help an organization maximize software ROI by bringing highly specialized expertise to the situation.

Externally, the vendor should have visibility across the software industry, bringing knowledge of current technology as well as technology roadmaps of application providers. As a consultant to the organization's IT team, the vendor should guide its members through the software lifecycle – starting with requirements, as well as realistic budget and licensing proposals that include total cost of ownership and ROI estimates.

As a follow-up, deployment and contract management will ensure contract compliance. Periodic “true-ups” can help maintain the alignment of licenses with usage patterns and organizational needs.

By having a single vendor for software lifecycle management, the IT team can focus its efforts on innovation, seeking efficiencies and planning.



WHITE PAPER SOFTWARE ASSET MANAGEMENT

Read about how to leverage SAM practices for software success:

CDW.com/softwareguide2

A BETTER WAY TO MANAGE YOUR SOFTWARE

68%
OF I.T.
PROFESSIONALS
SAY EMPLOYEES'
REQUESTS FOR
CLOUD SERVICES
HAVE INCREASED
OVER THE LAST
TWO YEARS.

Source: CDW's 2013 State of the Cloud Report

The traditional software model is more than just outdated. It's inefficient. And your organization is working hard to make the most of its resources. Reducing costs without compromising quality. Ensuring agility in order to keep up with organizational shifts. Streamlining every single facet of your operations whenever possible. It's no easy task.

Software as a Service (SaaS) can help you realize efficiencies throughout your organization. You'll improve flexibility and scalability. Free up your IT staff for more strategic projects. And finally get more control over your software investment.

The popularity of SaaS is growing steadily, as organizations are realizing the benefits it can bring. Not only does SaaS lower overall costs, it also makes more efficient use of your IT staff.

Anywhere Accessibility

Workers are more mobile than ever and are accustomed to getting what they need online. This lowers the learning curve and helps drive adoption of SaaS applications, which can be accessed easily from any user device.

Pay-As-You-Go Structure

Subscription based SaaS applications eliminate the need for a large upfront investment on software licenses. You'll also save on hardware as the provider manages the IT infrastructure.

Simplified Upgrades

The days of manually updating and upgrading software end with SaaS. The SaaS provider takes care of it all, including availability. And you don't even need to add hardware, software or bandwidth as your user base grows.

Easy Integration

Unlike most organizations, SaaS providers can scale indefinitely to answer demand. Many even provide customization to better meet specific needs, including integration with your existing internal applications.

Ready to get started with a SaaS solution? We can help you make it all happen. We'll review your organization's unique needs and help you find the right components for your SaaS solution. From security and monitoring to productivity and beyond.

/// LEARN MORE AT CDW.COM/CLOUD ///



CDW.com/adobe

Imagine if your team always had the latest tools, and could save time by seamlessly sharing files and folders. That's Adobe Creative Cloud for Teams. You get the entire collection of CS6 tools and exclusive updates, along with lots of team-specific features that make working together – and managing licenses – easier than ever.



Microsoft CDW.com/microsoft

Microsoft Office 365 for professionals and small organizations is a subscription service that combines the familiar Microsoft Office Apps with a set of web-enabled tools that are easy to learn and use, that work with your existing hardware, and that come backed by the robust security, reliability and control you need to run your organization.



CDW.com/ibm

IBM has integrated the essential tools for social business in the cloud: enterprise-grade file sharing, communities, instant messaging, web meetings, user profiles, mail and calendar. The solution is designed to let you work seamlessly with people inside and outside of your organization. You can meet online, share files, chat, manage projects, network with potential clients, schedule meetings, and send and receive mail anywhere, anytime. Whether you work remotely, manage remote teams, or need one place to bring colleagues, partners and vendors together, IBM helps you transform your business into a social business.

TOP 6 CLOUD BENEFITS ACCORDING TO CLOUD USERS

- #1 Increased efficiency (55%)
- #2 Improved employee mobility (59%)
- #3 Increased ability to innovate (32%)
- #4 Freed current IT staff for other projects (31%)
- #5 Reduced IT operating costs (25%)
- #6 Enabled us to offer new products/services (24%)

Source: CDW's 2013 State of the Cloud Report

CDW SOFTWARE LICENSE MANAGER

Managing software license compliance can be an overwhelming task, but we can help simplify the process while saving you time and money. Our value-added Software License Manager makes it easy to automate many of the tasks that can otherwise take hours to achieve.



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SOFTWARE LICENSE
MANAGEMENT AT

CDW.COM/SOFTWARE-MANAGEMENT

A GROWING GLOBAL WORKFORCE SPURS MOBILITY

**WITH 450
MILLION
ESTIMATED
MOBILE WORKERS
AROUND THE WORLD,
ORGANIZATIONS
NOW OPERATE
EVERYWHERE, ALL
OF THE TIME.**

Source: Riverbed Technologies: 2012
White paper: *The CIO's new Guide to
Design of Global IT Infrastructure*

Since 2010, the use of mobile devices in the workplace has skyrocketed. Today, 95 percent of organizations allow staff-owned smartphones and tablets, according to a 2012 survey conducted by Cisco. That same report also predicts that the average number of connected devices per knowledge worker will reach 3.3 by 2014, up from an average of 2.8 in 2012.

One reason for explosive growth of mobile devices in the workplace is the realization that mobility makes staff more productive. Another is that workers want to use the same devices they use in their everyday lives for work purposes.

Recognize the Road Blocks

While the bring-your-own device (BYOD) trend gives users the freedom to use a device of their liking, it takes the control out of the hands of the IT department. Which can mean added security, manageability and bandwidth issues. A solid mobile solution can help alleviate the problems of mobile mayhem.

CDW: A Mobility Partner That Gets It

With all of the different variables, it

can seem daunting to choose a right-fit solution for your unique needs. There's a sea of mobile device management vendors that approach the discipline in different ways. But you don't have to do it alone. CDW can help.

CDW has partnerships with the leaders in mobile device management. We'll assist you with selecting the best products for your ever-changing mobile needs. Because CDW maintains partnerships with leading wireless vendors – including network providers and device manufacturers – we offer a one-stop shop of integrated mobility solutions consisting of software (security and management), hardware devices (smartphones, tablets and notebooks) and cellular wireless activation services.

Regardless of the mobile platform you choose, CDW can step in to help with activation and configuration services. What's more, we can ensure that the apps you want running on workers' wireless devices are installed and configured correctly before they turn them on the first time.

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Consolidate your endpoint and mobile security with a unified management infrastructure that offers global threat intelligence to stop malware in the cloud, and provides virtual patching against zero-day threats, and optimized security for virtual desktops. Optional modules allow instant deployment of data loss prevention, mobile device management, Mac protection and more.



Safeguard critical data and help ensure regulatory compliance with McAfee Data Protection solutions. Available individually or in suites, McAfee Endpoint Encryption and McAfee Data Loss Prevention solutions provide multilayered protection for your data regardless of where it resides – on the network, in storage systems or at the endpoint.



Kaspersky provides a complete, fully integrated platform that combines antimalware protection, robust application, device and web control tools, plus systems and patch management, data encryption, and Mobile Device Management – all managed from a single console and available for a single cost.



Symantec Mobile Security offers comprehensive protection for Android- and Windows-based mobile devices against malicious threats while ensuring compliance with regulatory requirements. Mobile Security provides antivirus technology, advanced firewall, and SMS antispam features to ensure mobile assets and maintenance of compliance policies.

70%
OF EMPLOYEES WITH
SMARTPHONES
**REGULARLY CHECK
THEIR EMAILS OUT-
SIDE OF NORMAL
BUSINESS HOURS.**

Source: Cisco Connected Technology World Report

LOCK DOWN THE RIGHT VENDOR

When you're ready to select a vendor, CDW can help you evaluate offerings that meet your needs. Working with your CIO, management team or IT department, we can design, plan, implement and support comprehensive mobile solutions built around you and your organization's needs.



LEARN MORE AT
CDW.COM/MOBILITY

VIRTUALIZATION: A STEPPING STONE TO THE CLOUD

66%
THE ESTIMATED
SAVINGS OF
**IMPLEMENTING AND
SUSTAINING A CLOUD
ENVIRONMENT**
COMPARED WITH
A TRADITIONAL,
NON-VIRTUALIZED
DATA CENTER
OVER 13 YEARS.

Source: Booz Allen Hamilton

Virtualization is a key data center technology for optimizing resources and keeping costs down. It's also a stepping stone to cloud deployment.

Virtualization provides a foundation for cloud services because it breaks the tight bond between hardware and

associated software and data that exists in traditional IT environments. It's an essential first step to creating the shared pool of resources and dynamic provisioning of workloads that are core to the cloud model. Cloud projects can benefit from server virtualization at all levels: server, storage, client and application.

Server virtualization has become a successful data center technology for two primary reasons. First, it enables large-scale consolidation of physical servers. Second, but no less significant, server virtualization can slash IT capital expenditures and lessen ongoing operational costs.

Storage virtualization offers similar benefits in cloud environments. Once IT administrators virtualize storage, they can create shared volumes and use thin provisioning technology to allocate disk storage among multiple users based on their minimum requirements at any given time. Fewer dedicated disks mean better capacity management and optimized storage utilization.

Increasingly, organizations are

turning their attention to **desktop virtualization**, which separates operating systems, applications and associated data from end users' physical devices. This lets IT departments centrally manage and deliver desktop environments from the data center. For IT administrators, desktop virtualization eases upgrades, patching and policy enforcement. For users, it supports access to needed IT services and data, no matter the client being used.

Similarly, **application virtualization** turns physical applications into virtual services that run in isolation from one another and underlying operating systems. As with desktop virtualization, IT staff can manage each app's virtual instances from a central console. Isolating apps as virtual instances also means that no two will conflict with each other.

Regardless of how many end-user systems and apps an organization has, easing deployment and migration processes will lay valuable groundwork for a dynamic self-service cloud-computing environment.

**/// TO LEARN MORE, CONTACT YOUR CDW ACCOUNT MANAGER
AT 800.800.4239 OR VISIT CDW.COM/CLOUD TODAY. ///**



vSphere with Operations Management combines one of the world's leading virtualization platforms, with VMware's management capabilities. This new solution enables users to gain operational insight into a vSphere platform while also optimizing capacity. As vSphere environments continue to grow it is essential that users have proactive management that can deliver monitoring, performance and capacity information at a glance.

Run business-critical applications with confidence and respond faster to your business needs with VMware vSphere, a leading virtualization platform for building cloud infrastructures. vSphere accelerates the shift to cloud computing for existing data centers, while also underpinning compatible public cloud offerings, paving the way for the only hybrid cloud model.



Red Hat Enterprise Virtualization is a complete virtualization management solution for server and desktop virtualization and an enterprise-ready, fully open-source virtualization platform. It offers enterprises the ideal platform on which to base large-scale virtualization initiatives and internal/private cloud deployments. It offers a total cost of ownership (TCO), faster return on investment (ROI), accelerated break-even and freedom from vendor lock-in.



Microsoft provides a 360-degree view approach to virtualization encompassing servers, applications, desktops and storage in a single, integrated environment. These virtualized environments reduce hardware, power and support costs, and improve application availability, stability and uniformity.

\$3300

THE AMOUNT OF ADMINISTRATIVE COST SAVINGS PER ADDITIONAL VIRTUAL MACHINE, REALIZED BY THE BEST PERFORMERS IN VIRTUAL SYSTEMS MANAGEMENT.

Source: Enterprise Management Association

CDW IAAS: MANAGED SERVICES

CDW provides several levels of managed services to help relieve the burden of day-to-day maintenance, monitoring and patching of virtual and physical servers. Options range from advanced performance monitoring to full availability management.



VISIT CDW.COM/IAAS TO LEARN MORE.

TAKING CONTROL OF THE CHAOS

**\$232
BILLION**
SOFTWARE
SPENDING TOTALS
\$232 BILLION AND
IS THE SECOND-
LARGEST PART OF
I.T. BUDGETS (2012).

Source: Forrester Report: *US Tech
Market Outlook For 2012 To 2013*

These days, the amount of software an organization relies on can be staggering. Moreover, software acquisition is often decentralized, with individuals and subordinate groups having authority to buy programs or provision software from a cloud provider for their particular needs.

The result? It can become difficult – even for the most organized IT department – to know exactly what software the enterprise has, who's using it and where, how many licenses have been negotiated, and the types and terms of those license agreements.

Like other IT investments, software is an asset that can be managed as such. When you implement software license management, you can make managing multiple licenses easier, rein in costs and improve mitigation risk. So the true benefits of software can be better appreciated, and you can spend more time focusing on what's important.

Put a Plan into Action

With all the challenges that come with managing software licenses, Software Lifecycle Management (SLM) practices

can help make sure your organization is using its agreements efficiently. A good SLM plan incorporates four steps that occur throughout the year.

- 1. Contract Management** | Create a baseline and reassess current software applications by checking each server and endpoint.
- 2. Deployment planning** | Make sure the software you're using is the best choice for your organization's goals.
- 3. Technology validation** | Review your organization's plans to determine technology requirements for the coming year.
- 4. Annual review and licensing purchase** | Evaluate your organization's specific software needs and choose the best contract option for each application.

With a Software Licensing Agreement (SLA) program, your organization can have one license that covers multiple people, no matter the size of your organization. Some programs also offer software support, maintenance and upgrade protection.

**/// TO LEARN MORE, CONTACT YOUR CDW ACCOUNT MANAGER
AT 800.800.4239 OR VISIT CDW.COM/SAM TODAY. ///**



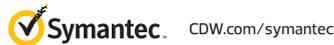
Whatever the size of your business, Acronis Backup & Recovery gives you the competitive edge you need to protect your data and systems wherever they're located. Acronis solutions address disaster recovery and data protection needs across physical, virtual and cloud environments.



With extensive management features that work together to help reduce the time you spend managing your backups, CA ARCserve Backup provides functionality that is optimized to support your IT architecture, including virtual and cloud-based technologies, no matter how simple or complex your data or your IT infrastructure is.



IBM Tivoli Storage Manager gives you centralized, automated data protection to help reduce the risks associated with data loss. This highly scalable software helps you manage more data with less infrastructure and simplified administration. Now you can save money, improve service levels and comply with data retention regulations.



Enterprise Vault, an integrated content archiving product, enables users to store, manage and discover unstructured information across the organization. As a widely-deployed enterprise archiving solution, Enterprise Vault helps deduplicate information at the source to reduce costs, delete information confidently and discover information efficiently.

81%
OF I.T. DECISION-MAKERS ARE **NOT VERY CONFIDENT** THEY COULD FULLY RECOVER AFTER A DISASTER.

Source: The Disaster Recovery Survey 2012, EMC

ARE YOU PLANNING WISELY?

The data center has evolved considerably in the last few years. The explosion of storage growth, the rise of business analytics, and the wide adoption of virtualization and cloud across environments have forced backup solutions to continue to advance in order to keep pace. We understand the challenges you face and we're here to help. Our backup processes ensure total security and restoration options to guarantee nothing gets lost in cyberspace.



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Information Workers
Unified Communications
Monitoring and Management
Server Virtualization and Security
Cloud Computing

A SPECTRUM OF SOFTWARE SOLUTIONS

MATCHING THE TOOL TO THE JOB

IT departments almost need to focus full time on the dynamic software market just to keep up with the trends. Software choices must do more than simply fulfill technical requirements. They need to add something to business processes, making them more efficient. This chapter looks at the primary app areas currently supporting particular users or uses.

Information Workers

In an information and service economy, organizations employ large numbers of people who mainly deal with concepts, documents and other people. Service industries, education and the public sector are the obvious markets for information workers. But software has been embedded into the infrastructure of far more industries.

Think about businesses such as automobile dealer groups or manufacturers of all types. They've developed online commerce presences, and they deal with their supply chains and internal processes

using software systems.

Chief software product categories to support information workers include the following:

Enterprise content management | ECM has grown to become more than a system for posting material on websites. Full suites support content creation and customer experiences online. They incorporate analytical tools to measure and test how clients, partners and constituents interact with the organization and whether a visitor's encounter meets the goals set for visiting the site.

ECM suites also must accommodate two more recent phenomena: social media and mobile computing. For example, the Adobe CQ Web Experience Manager is geared to interactive multimedia online experiences in multiple languages. Users can configure it to respond differently depending on the visitor's own location.

Business process management | Thanks to graphical interfaces and simple, drag-and-drop functionality,

this group of tools has migrated from something only specialists touched to something used by line managers across organizations. BPM automates manual processes, such as approval chains, and it gives an organization the tools to continuously optimize processes.

Several vendors have added social collaboration layers to BPM tools. IBM's WebSphere Operational Decision Management software lets subject matter experts create their own logic to respond to change, without having to disturb underlying business systems or launch elaborate software programming projects.

Business intelligence | BI is the process of getting useful, decision-making information out of data. Over the years, organizations have used a succession of techniques for accomplishing this goal. BI tools today bring together several technologies for organizing, cleansing, formatting and querying data.

BI follows the trend of empowering users to make their own queries and reports on a variety of platforms. Microsoft calls this "self-service BI." As a product, Microsoft BI combines standard applications Excel, SharePoint and SQL Server and ties them together with an add-in called PowerPivot that's designed to create mashups from several data sources. IBM takes an analytics approach, using a combination of predictive, reporting and algorithmic tools applied to large data sets that may contain unlike formats.

Enterprise search | Search has become a nearly indispensable tool. Organizations supply a search function to their public-facing websites, but it is growing in importance as an internal tool, too. Given the size of even small enterprises' data assets, having a good search tool can boost productivity by speeding up people's information discovery.

Search products range from

highly industry-specific to universal. Broad-based software suppliers such as IBM, Microsoft and Oracle combine search functions with other enterprise IT functions, such as database or content management. Microsoft builds its search around SharePoint, the company's enterprise collaboration management system.

Project management | As a category of software, PM tools support project management as a discipline. These apps can be as simple as online charting or as comprehensive as Microsoft Project, aimed at enterprise portfolios of projects integrated with productivity applications.

With its Rational Suite, IBM brings a holistic approach to project management. It incorporates a view of the end product under development together with stakeholder input along the way. Similar to BPM software, project management apps have migrated from the domain of specialists to the types of tools that offices, workgroups, bureaus and clusters of professionals can use – while maintaining connectivity to enterprise resources.

Office productivity apps | Decades after their inception, productivity apps continue to be a source of innovation. Microsoft Office (arguably the standard for the tools used routinely and frequently by information workers) and other competing suites regularly gain improved functionality.

Plus, productivity apps have adapted to mobile, distributed environments. For example, once a purely Wintel, then a Wintel or Macintosh product, Office today also runs on Android and iOS devices in the ARM architecture world.

Once strictly a device-loaded suite, it now also runs in the cloud as a service (Office 365) or as a hybrid with over-the-air data syncing using Lync technology. Adobe's Creative Suite, widely used in multimedia content development, is also available in local and cloud versions.

The exciting development in email is not so much the advent of its availability as a cloud service, but its availability in an enterprise-class format as a cloud service.

It's important to keep in mind that vendors who offer both consumer and enterprise email and collaboration platforms also provide business-grade security, privacy and service levels in their "paid" versions. Also keep in mind that the data mining and context advertising don't apply to these enterprise products.

Unified Communications

Numerous methods for digitally communicating among people have sprung up in recent years. They threaten to create a tangle of noninteractive channels that run up costs by not sharing media.

Unified communications embraces the idea that people may need to use any of various means of communication at any

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/// MANY ORGANIZATIONS SUPPLY
A SEARCH FUNCTION TO THEIR
PUBLIC-FACING WEBSITES, BUT
IT IS GROWING IN IMPORTANCE
AS AN INTERNAL TOOL, TOO. ///

given time. UC brings instant messaging, telephony, email, video conferencing and social media tools into a single desktop or mobile environment. The applications share the enterprise IP network.

Messaging and collaboration tools in some sense replace email by separating the discrete act of contacting someone from the richer, content-driven interactions that get work done. In a typical scenario, individuals might exchange basic information or transactions via SMS messages: an agreement to meet in person or online at a specific time, for example. For more detailed interactions, while on the desktop or using a mobile device, users may switch to a social collaboration tool.

The latest tools, such as IBM Connections or the latest Microsoft SharePoint 2013, let people maintain conversation streams, calendars and task-specific document libraries in a way that resembles popular consumer social media, but with the security and access controls required by organizations. They also let people establish ad-hoc, interest-driven teams that may cross departmental or workgroup boundaries but create efficiencies by combining the knowledge needed for a particular task.

Communications may be offset in time, as with email. Or people can communicate in real time using voice and video conferencing. Microsoft's acquisition of Skype gives organizations an economical way to have voice or video conferencing

within their firewalls or with customers, constituents or trading partners.

Social collaboration platforms also contain programming interfaces to existing legacy or other third-party apps. This lets the IT team, in effect, migrate those apps into the social interactive stream. The result can be a highly efficient way for people to interact while maintaining access to the data and application resources they need to finish tasks within the UC environment.

Monitoring and Management

Peel back the applications and communications layers that an organization's users tap daily, and there's the software infrastructure layer. This is where OSs, app development tools and the underlying software to keep it all up and running reside.

Operating systems | OSs present ongoing challenges for users and IT departments, but different ones. For users, productivity can drop and frustration rise when presented with a new OS for which they have received little or no training. The IT group must deal with making sure apps, including security controls, are compatible with new versions. And all critical apps need to be capable of being upgraded to ensure compatibility.

Windows 8, the latest version of Microsoft's line of user OSs, supports touch, mouse and keyboard input. And it comes in versions for PCs, tablets and smartphones – all evidence of the

convergence of the mobile and desktop worlds. Windows 8's "tiles" takes both a data-centric and a traditional app-centric approach to the user interface.

Application development tools | These tools reflect the larger trends in computing. Vendors are orienting them toward cloud computing, mobility and social collaboration.

High-availability support | Highly available computing means 99.999 percent uptime. That's downtime of less than six minutes per year. Maintaining that degree of reliability requires continuous monitoring and reliable backup and recovery.

Continuous monitoring of networks focuses on intrusions and other cybersecurity threats, as well as other factors that might create bottlenecks or application crashes. Network monitoring software, such as Altiris Server Management Suite from Symantec, gives the IT department a comprehensive look at network activity across multiple OSs, of both physical and virtual machines, and of data center and cloud environments.

Backup and recovery also must cover physical and virtual machines. For efficiency of storage and network bandwidth, the backup solution should include data deduplication and compression. Products such as Symantec Backup Exec speed setup of backup and recovery options by including defaults based on the best practices of other users. They will



TACTICAL ADVICE

COLLABORATION'S TOP 3

Learn about the three most helpful tools available through collaboration software:

CDW.com/softwareguide3

back up apps and data to hardware dissimilar from the failed one.

Application virtualization | This software streamlines the IT group's ability to quickly provision users with their authorized applications by turning the apps into services. Microsoft's App-V, when applied to applications, lets them run and interact with other apps without actually being installed.

A management console integrated into Microsoft System Center lets the IT staff monitor the flow of virtual apps using a web browser. Keep in mind that virtual apps are subject to license agreements just like their physical counterparts.

Server Virtualization and Security

Server virtualization has grown immensely popular as a way to tame costs and improve the management of data centers. Virtualization software has two basic functions.

First, it creates software containers (VMs) that encapsulate an app, OS and memory. Second, it applies a layer of software called a hypervisor that separates the VM from the x86 hardware's bare metal. The result is that many VMs can run on a single physical machine, enabling far greater capacity utilization and a reduction in server footprint.

Now, vendors have tools for virtualizing the data center itself. VMware, one of the leading server virtualization vendors, calls this the software-defined data center.

Because more organizations are blending their own data centers and external clouds under PaaS models, they want to manage these hybrid environments in an integrated manner. VMware's vCloud Suite 5.1, for example, combines the company's core virtualization, cloud infrastructure and management tools into a single product. In effect, this

approach aggregates both internal and external data centers into a single, enterprisewide services pool.

Although users never touch them, directory services are at the heart of how the IT department manages computing resources in the enterprise. Essentially, a directory is a database of resources on an enterprise network (user IDs, computers, apps and other information), enabling the IT department (specifically the network administrator) to set up user rights according to policies, allocate resources and ensure security.

Directories such as Microsoft Active Directory and IBM Tivoli Directory Server encase resources in a security boundary called a domain. Within the domain, the administrator sets up subdomains corresponding to functions within the enterprise, such as sales or finance. The IT group controls the applications and data rights for users within those groups.

Directory services enable identity management and, therefore, management of access to the organization's IT resources. Directories use encryption to safeguard user ID data between endpoints and authentication servers. With the correct extensions and careful setup, the IT team also can extend directory services to manage external visitors accessing web apps, which can amount to millions of accounts for some organizations.

As a result of the persistent and ever-changing nature of cyberthreats, securing servers and networks has become a professional growth field. Network edge protection is one of several strategies for keeping malware out of an organization.

The vectors by which hackers launch worms and viruses have

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LOOK TO THE CLOUD

The selection criteria for a cloud computing service provider include:

- **geography** (especially if requirements call for minimizing wide area network costs or dictate that sensitive data remain physically in the United States);
- **hardware compatibility** with in-house data center equipment;
- **pricing plans and flexibility** (considering if requirements routinely fluctuate or utilization remains fairly steady over time).

Plus, the security situation needs to be considered:

PHYSICAL: Does the provider's facility offer anonymity and access protection? Hosting centers and cloud providers should have low-key or no signage and provide 24-hour guard service. They also should be able and willing to show a buyer their network and power utility redundancies, as well as their fire and water damage control systems.

CYBERSECURITY: What tools and techniques does the provider use? How are servers protected? When a customer departs, how does the provider ensure all vestiges of data are cleaned from servers?

MULTITENANCY: What logical and physical separation measures does the provider use between customers?

WORKERS: How does the cloud provider evaluate, test, vet and monitor work staff and their behavior? Are they bonded?

CORPORATE VIABILITY: Is it a large and well-known entity? Does its balance sheet indicate financial stability?



bloomed into a variety of methods. To traditional password cracking, add embedding malware in websites and PDF documents, social engineering techniques to induce clicking on malicious links, links embedded in spam text messages sent to mobile devices, and untrusted social media apps.

Network protection requires a multipronged approach, with antimalware software installed on endpoints (including mobile devices) and on network traffic-monitoring appliances. A comprehensive approach lessens the effectiveness of attacks. A recent survey of IT executives by Symantec found that organizations employing a full range of security techniques experienced a fifth of the hacking-induced downtime of others and were less likely to experience a successful attack in the first place.

Another endpoint best practice is encryption. Use of a public-key infrastructure protects data sent

between users or organizations, while full-disk encryption of device storage protects data at rest.

Central management of disk encryption software ensures that users don't circumvent policies. Properly configured disk encryption still allows convenient use of the device, thereby lessening users' temptation to work around it.

If data is the currency of the information age, then databases are the Fort Knox for data-driven organizations (which is just about every organization). The big trend in databases is hosting them in the cloud, either managed by the database software maker or by a third-party provider.

Some organizations opt to retain application and hosting development in house (the reverse of a PaaS model). IBM's stalwart DB2 database software, for example, is available through third-party cloud providers, or a customer can optimize it for private-cloud deployments.

Cloud Computing

Cloud computing models address an organization's need for greater IT efficiency by offering the flexibility of on-demand capacity. A big base of cloud providers has sprung up in recent years, ranging from well-known names to startups. When exploring the options, consider the following architectures:

IaaS | A purely infrastructure cloud can offload the considerable administrative costs of running data centers. These include planning, acquisition, operations, real estate and utility management – along with the staff necessary to maintain these activities.

PaaS | This approach adds software development, testing and runtime environments to IaaS. Some organizations limit PaaS to development and testing, with developers each having cloud accounts. Others find it advantageous for hosting new apps, such as web services deployed to customers or constituents.

SaaS | This model refers to the use of an enterprise (or personal) account with an application provider. For example, Microsoft Office 365 provides cloud-hosted access to email and other business productivity apps on a fee-per-user, per-month basis, with both personal and enterprise deals available. (For more about this cloud model, see Chapter 5.)

No matter the approach, organizations don't necessarily need to deal with a cloud provider directly. Even enterprises as large as federal departments have acquired cloud apps through resellers, who also can manage the cloud transition phase and the ongoing contract. Cloud brokers, a specialized class of companies, in effect virtualize the choice of cloud provider by handling the negotiation of service-level agreements and direct dealings with the cloud providers themselves. ■

On The Road With CDW



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- SaaS Superlatives
- SaaS Challenges
- Where SaaS Makes Sense
- Other Considerations

SAAS: AT YOUR SERVICE

SOFTWARE AS A SERVICE OFFERS MANY BENEFITS – IN THE RIGHT SITUATIONS.

Software as a service has grown rapidly for organizations seeking to gain predictability in enterprise apps, such as those for CRM or human resources.

Shared-use software is not new, but the model keeps evolving. Today, the principal model for SaaS looks like this: A vendor offers a business-grade, enterprise application that it hosts in its own data centers in a multitenant architecture. Customers buy subscriptions, typically a flat fee per user, per month. Users access the app through a web browser on a PC, thin client, tablet or smartphone.

This model builds on the older application services provider (ASP) approach, in which a third party hosts an app offered on a subscription basis. It's possible to trace the roots of SaaS back to the earliest mainframe-era time-sharing. SaaS has caught on now, in part because of the ubiquitous and inexpensive availability of broadband networking and in part because several software makers

have developed apps with appeal across a wide range of vertical markets.

SaaS Superlatives

SaaS offers several attractive facets as an alternative to traditional app purchase and distribution. Chief among these is avoidance of capital expenditures for software and dealing with the complexities of licensing. In general, when using SaaS, the buying organization is able to establish predictable software costs.

Another advantage is that users always have access to the latest version of an app. The provider continuously updates the software as needed, and when users log on, it's simply there. That means an organization avoids the administrative cost of propagating patches or upgrades across the network. Typically, improvements and tweaks come more frequently for online software than for software licensed and hosted on premises.

Although SaaS vendors provide common versions of one or more applications, individual customers

are able to configure the apps to their own parameters. Plus, with most of the established, larger cloud service providers, the organization can customize the look and feel of the application to some extent, allowing it to be branded with logos and colors of its choosing.

Customers of SaaS providers need to consider the security implications of having data associated with their apps stowed in the cloud. As a practical matter, major SaaS providers such as Microsoft and Salesforce.com take security quite seriously and have established top-tier data centers with enterprise-grade cybersecurity and solid operations continuity practices.

Ultimately, security depends largely on the SaaS supplier's controls. The service-level agreement therefore should include the right to inspect the supplier's cybersecurity procedures.

SaaS Challenges

Cloud providers all cite the hundreds of large and small enterprises, in both the public and private sectors, that now use SaaS. Even so, any organization considering adopting SaaS should be aware of the risks.

The industry is not yet standardized to the point of data interoperability. That brings up the concern of locking into a vendor. If the organization wants to change SaaS providers or switch to an in-house solution, it's unlikely it will be able to capture the logic and data associated with the chosen SaaS solution.

A personnel challenge also comes with SaaS. The organization may need to redeploy in-house database administrators and programmers. The buyer's network presents another consideration. Cloud-hosted apps necessarily connect over the WAN, so the IT department needs to optimize input/output service to reduce latency and ensure data transfers.

Where SaaS Makes Sense

Numerous apps exist as SaaS offerings. For many organizations, their first foray into SaaS involves email. It's an ideal SaaS app because everyone already knows how to use it; email systems are interoperable; and moving this service to the cloud can reduce costs by eliminating multiple servers, directories and the administration they entail.

Security and low-cost security administration also accrue when the vendor applies antispam and other email filtering services. In fact, those services are available as stand-alone SaaS security apps.

From email, which is perhaps the original collaboration tool, it's a small leap to online delivery of other collaboration software apps such as popular meeting services, video conferencing and call center software. The apps that seem to work best are those used widely within an organization – in part, because the subscription basis makes for simple administration and ease in scaling up or down. Several business-oriented social media tools started out as cloud apps and never migrated to individual licensed versions.

Another class of apps particularly suited to SaaS includes those that have common requirements and characteristics within a given function across many verticals. This is where SaaS use has expanded in recent years. CRM, financial accounting, HR, help desk, procurement and social marketing have joined payroll as routine SaaS apps.

Data backup and document storage are also available as services. They provide protection against a data center disaster and seem like a logical component in an organization's operations continuity plan.

A third group of SaaS friendly apps includes functions shared within a given vertical. This phenomenon actually goes back many years. For example, in the

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SAM ASSISTANCE FOR SAAS

Software asset management applies to cloud-hosted, subscription applications as much as it does to the app titles the organization has licensed. As for licensed apps also hosted in an IaaS cloud, SAM applies to them, too.

It might seem counterintuitive to bother with SAM when the organization subscribes to software month-by-month and there aren't license agreements to worry about. But think about it: The purpose of SAM is not merely license compliance. It's also to enable the organization to derive as much value as possible out of each software dollar.

CDW contract management and SAM services include quarterly reviews of license utilization, with the goal of finding gaps between usage and license availability to head off audit and compliance problems. But the process also uncovers purchased assets that might not have been deployed. These represent money providing no return whatsoever. With discovery, those licenses become available to use or to return to the provider.

Similarly, as an organization grows and expands subscribers of a SaaS product, the potential grows for unused subscriptions to draw on budget dollars month after month. The quarterly review may uncover no-no's such as shared logons. Either way, applying asset management tools to SaaS avoids needless costs and potential compliance violations.

airline industry, multiple players (even competitors) share back-end systems for booking tickets and maintaining seat inventories. Organizations in healthcare all require pharmacy management or patient appointment booking functions, the requirements for which don't vary much from place to place.

Industries as diverse as physical distribution, food service, agriculture, education and publishing have specific applications for which SaaS can meet the requirements. It often can be more economical for thousands of users to share a cloud service on a subscription basis than for an individual organization to acquire its own set of licenses.

Emerging SaaS areas include IT management functions such as capacity planning and asset management.

Not every app is necessarily suited for SaaS. For example, BI and analytics are so highly specific to a particular organization that such software is better hosted in-house, where the IT staff can constantly tweak and monitor it. Similarly, supply chain management approaches vary greatly and haven't as yet made deep SaaS inroads.

/// AN ORGANIZATION MAY CHOOSE TO LICENSE AN APP BUT HOST IT IN A THIRD-PARTY CLOUD PRECISELY TO TAKE ADVANTAGE OF AN OPTIMIZED INFRASTRUCTURE OFFERED BY THAT IaaS PROVIDER. ///

Other Considerations

Deciding whether to host an app in-house or subscribe to it as a service depends on many factors. Initially, the IT group should make a simple cost comparison of subscriptions versus licensing, taking into account the initial acquisition price. Knowing these basic costs can help the organization make judgments about other factors.

Chief among these are costs related to support required for in-house hosting in contrast to cloud delivery. No software is set-and-forget, and apps are not created equally in terms of required support.

Support costs can mount with frequency of updates and patches that the IT team must install and test. The newness of the software to the users in the organization, along with the degree of difficulty users might encounter in learning the app, are also factors to include in support cost estimates.

Also take into account any customizing an app may require. At some point, if potential settings and configuration in a SaaS app don't quite meet an organization's particular requirements, it might be better off acquiring a fully customizable solution. Or the organization's leaders might decide to alter business processes to align with the SaaS app if analysis shows sufficient savings are possible.

Technical considerations also can figure into the decision about whether to go with in-house or cloud-hosted apps. Response times might be the single most important determinant for users in their ratings of a particular app.

If responses slow to a crawl because of server misconfiguration or undercapacity, the IT department will quickly hear about it. Ironically, this might favor SaaS, on the presumption that providers have optimized their cloud infrastructures to a degree that they routinely support thousands of simultaneous,

geographically dispersed users.

An organization can certainly make whatever infrastructure changes it must to ensure fast responses to remote users. Available techniques include local application and data replication and point-to-point bandwidth improvements, but the cost of these moves may tilt the decision in favor of cloud hosting or SaaS. An organization may choose to license an app but host it in a third-party cloud precisely to take advantage of an optimized infrastructure offered by that IaaS provider.

In this new hybrid world of software management, no single approach trumps the others. In the end, each organization must set its course based on the needs of its users relative to a software program's price and value. Luckily, SLM and SAM provide automated methods for helping an organization rise to the challenge. ■



WHITE PAPER

SaaS's CODE OF SERVICE

Read about how SaaS can transform the economics and logistics of app delivery:

CDW.com/softwareguide4

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

App store

A private or public online location from which users can provision their computers or mobile devices by downloading authorized applications.

Audit

The process by which a software provider or a third party (hired by either the provider or a software buyer) reviews software usage to determine whether it matches the terms and conditions of an organization's software contract.

Backup and recovery

Any of several methodologies for copying data, or applications and data, to a storage system physically separate from the production environment so that an organization can restart operations quickly in the event of a system failure or physical disaster.

Bring your own device (BYOD)

Using a personally owned mobile device, such as a notebook or smartphone, to perform work on the job.

Business intelligence (BI)

Software designed to query data, typically large data sets generated by other applications, to discover trends and patterns.

Business process automation

Software designed to capture information relative to decision-making, workflow, manufacturing or other processes so they become transparent and repeatable.

Cloud computing

A set of virtualized resources that can provide computing power, storage, applications and/or platforms as a pay-as-you-go service.

Collaboration tools

Any of several types of applications that let users see, use or create information products simultaneously – especially in real time.

Compliance

Activities aimed at making sure an organization's practices meet contractual, legal or regulatory terms. Software compliance means adherence to terms and conditions of software licensing agreements.

Concurrent-user license

A software license granting an organization a maximum number of people who may use an application at a given time, without regard to the users' identities (see "per-seat license" entry).

Data center

A facility housing the hardware, software and any supporting IT infrastructure and utilities needed to operate applications and systems required by an organization. Data centers are often replicated in one or more locations to provide disaster protection and reduce network latency.

Deployment

The act of installing, configuring, tuning and maintaining software either on servers or endpoints.

Directory services

A set of software functions for managing identities, network and application rights, and access controls for users on an enterprise network. The directory itself is a database of user attributes to which the IT department applies tools for provisioning users according to their roles within the organization.

Encryption

A technique to protect the confidentiality of data by using a cryptographic algorithm and a secret encryption key to restrict access to only those individuals or devices that possess the secret key.

Enterprise content management (ECM)

A software application – or often a suite of applications – for creating, editing, publishing online, tracking and monitoring an organization's information.

Infrastructure as a Service (IaaS)

Server, storage, networking and input/output resources that can be provisioned on demand from a third-party cloud provider.

IT Infrastructure Library (ITIL)

A series of standardized best practices for how IT services are deployed and managed. Developed in the United Kingdom, ITIL practices now form the basis of the ISO/IEC 20000 IT services standard.

Mobile device management (MDM)

Software for centralized provisioning, monitoring, tracking and, if necessary, remotely erasing an organization's smartphones and tablets.

Open-source software

Software for which the source code is shared and available for modification and republishing. Open-source software is sometimes licensed for free. Numerous software makers offer open-source software bundled with value-added services for a fee.

Operating system (OS)

A software program that controls access to hardware resources by applications. Applications are normally written to interface with an OS rather than directly with the underlying hardware. OSs have evolved into highly complex programs that incorporate numerous bundled utilities.

Orchestration

The automation and coordination of a series of software service actions, such as the provisioning of multiple computers.

Per-seat license

A type of software purchase agreement that identifies the individuals in an organization who can use an application. There is no limit to the number of simultaneous users, as long as it's consistent with the maximum number of copies licensed to an organization (see "concurrent-user license" entry).

Platform as a service (PaaS)

A cloud offering of hardware and operating system software plus networking, on which customers host applications.

Social media

Any of several types of applications and services that let people in self-selected groups interact. In organizational social-media environments, the organization's users interact with one another, or with customers and external partners.

Software as a service (SaaS)

Applications owned and hosted by a provider in a multitenant cloud architecture, available for subscription by unlimited numbers of organizations and users.

Software asset management (SAM)

The process of systematically tracking, evaluating and managing software licenses and usage. Automated tools are often used to track software license use within an organization. Additionally, many SAM systems also can maintain security patches and upgrades.

Tagging

The attachment of identifiers to instances of software to allow inventorying and use monitoring. Tagging is covered by the ISO/IEC 19770 standard.

Unified communications

The integration or convergence of multiple communications technologies – typically SMS messaging, voice and

video telephony, email, and social media – into a common IP enterprise network.

Virtualization

The encapsulation of an application, operating system or memory as a self-contained software use, known as a virtual machine, that can reside with other VMs on a single physical server.

Volume license agreement

A software contract in which the buyer pays a reduced price depending on the number of licenses purchased. Volume licenses usually omit physical media and documentation.

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Index

Acquisition policies	12	Enterprise search	25
Analytics.....	5-6, 32	High-availability support	26-27
App store	10	Inventory/discovery.....	9-10, 14-15
Application platform	4-5	Licenses	7, 10-11, 13-15
Application virtualization	27	Mobile app management	15
Audit.....	8, 13, 15, 31	Mobility.....	6, 8, 10-11
Big Data	5-6	Office productivity apps	25
Bring your own device (BYOD)	6-7, 11	Operating systems (OSs).....	26
Business intelligence (BI).....	5-6, 25	Project management.....	25
Business process management	24-25	Security	6, 8, 9, 10, 12, 15, 27-28, 31
Cloud computing.....	3-4, 8, 11, 26-28	Server virtualization.....	8, 27-28
Collaboration.....	6-7, 25-26, 31	Software as a service (SaaS).....	4, 28, 29-32
Compliance.....	4, 5, 7, 9-11, 15, 31	Software asset management (SAM).....	8, 10-12, 13-15, 31
Contract management	10-12, 15, 31	Software lifecycle	4, 9-12, 15
Data center consolidation.....	8	Tagging.....	11
Deployment/distribution.....	11-12, 13	Unified communications (UC)	6-7, 25-26
Enterprise content management.....	24-25	Virtualization.....	5, 7-8, 27-28

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LOOK INSIDE FOR MORE INFORMATION ON:

- Navigating the software lifecycle
- Staying on top of licensing and compliance
- Managing mobile apps
- Figuring out where SaaS makes sense



SCAN THIS!

And try out a demo of the CDW Software Asset Manager tool to see how it can benefit your organization.

