Five Easy Steps to Smarter Systems Imaging

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ABSTRACT

With traditional methods for systems imaging, each image captures a particular hardware and software configuration at a specific moment in time — static, unchanging, unmanageable. Even in the days when IT had to support only on-site Windows PCs, this approach had serious limitations. In today's IT environments, which are far more diverse and complex, traditional methods for imaging are simply unworkable. A smarter approach to systems imaging is to layer atop the core image a set of unique drivers, updates, applications, configurations and user personality — turning a basic systems image into a viable user experience. This white paper explains how to get there in five easy steps.

INTRODUCTION

Nearly every IT shop uses imaging for systems deployment. Gone are the days of manually installing an operating system (OS) via the "Next, Next, Finish" method. Today, automated tools that lay an OS and subsequent applications onto awaiting hardware replace that long and painful process. Imaging is by no means a new approach. Solutions for capturing images from reference computers and deploying them over the network have been around for nearly two decades. You needn't look hard to find IT pros who first learned systems deployment atop its most original of toolsets. In fact, those ancient toolsets were so immensely popular that you can still find them in use today. Their success creates a curious technological paradox: They work well enough, but they don't work well.

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IMAGING'S PROBLEM: IMAGES

A major problem with the old way of imaging systems lies in the image itself. Each image captures a particular hardware and software configuration at a specific moment in time — static, unchanging, unmanageable. You may have heard the not-very-funny joke that imaging's original tools got harder to use the longer you use them.

You're surely aware of the limitations. An image captured on one piece of hardware could be deployed only to similar hardware. Applications in an image could be updated only via a complicated process of deploying the image, updating the application and recapturing the image. Updates were similarly difficult to true up. An image all by itself was useful only for the exact same use case for which it was captured.

GETTING SMARTER IN FIVE EASY STEPS

Of course, you can't have imaging without images, and systems images are not going away any time soon. But smart imaging needs automation that wraps around the traditional static image.

Smart imaging uses its images as merely a starting point for systems deployment. Layered atop that core image are the unique drivers, updates, applications, configurations and user personality that turn a basic systems image into a viable user experience, as illustrated in Figure 1.

Get the layers right, and systems deployment becomes an infinitely malleable activity. All the building blocks to create any desktop — regardless of hardware or software composition — can be delivered at the moment the system gets deployed.

In the old days, getting the layers right was difficult. Nowadays, all you need is the right platform and these five easy steps.

STEP 1. IMAGING

Managing the ever-increasing catalog of static images was the central reason why early imaging tools got harder the longer you used them. In a perfect world, every system looks like every other system — the same drivers, applications and application configurations.
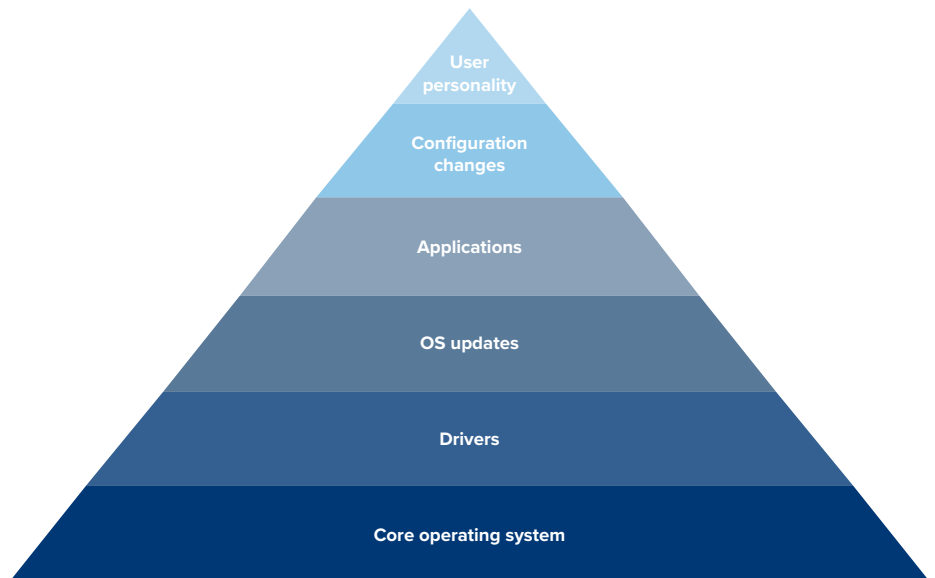

Figure 1. The layers that turn a basic systems image into a viable user experience

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The real world isn't so perfect. Each new class of hardware requires new drivers, and each group of users probably requires slight variations on the applications they need. What results isn't workable in a world of static images.

Rather than fitting users into static images, why not reverse the process by analyzing and collecting what you already have? Today's intelligent imaging solutions now incorporate an inventory function that remotely finds and reports on the elements in each layer. These smart solutions eliminate the manual steps in driver matching by collecting and uploading driver files into a centralized database for later provisioning.

Having a centralized database lets you have a minimal few gold master images — or perhaps even just a single one — that can be deployed to multiple PC platforms with the specific drivers and configurations required for particular PCs selected by simply checking a box. Suddenly, every PC deploys like every other PC with minimal manual work.

STEP 2. CAPTURE

The Windows desktop no longer stands alone as the operating system for business. Look around any organization, and you'll also find desktop and laptop PCs running Mac OS X and Linux. These devices require no less IT support, adding to IT's management overhead.

It seems that just as you're learning how to consolidate images, your users are demanding you add more.

While new operating systems and form factors complicate the single image dream, today's intelligent deployment platforms can simplify the process by unifying image capture and storage. A smart solution lets you capture images across a range of devices and operating systems — eliminating deployment duplication while consolidating your view of computing assets.

STEP 3. CUSTOMIZATION

The native image formats used by both Microsoft and Apple are designed to support the kinds of layering discussed earlier. That layering can happen via an offline process before images get provisioned to hardware. Or, it can happen in line with the deployment itself.

Smart deployment solutions facilitate in-line customization through one or more task sequences — a literal sequence of tasks that must occur during image deployment. They include actions such as querying for drivers, installing applications, synchronizing updates and downloading user personality data.

A well-built task sequence allows a provisioning administrator to modify deployment characteristics without the arduous task of deploying, adjusting and recapturing core images. Task sequences provide workflow for deployments, enabling each layer to assemble the correct building blocks at the moment they're required. And, it's even better if a solution can provide real-time feedback on the performance of the tasks. That way, IT administrators can view the deployment process from start to finish, and if a deployment fails, they can easily determine exactly where the failure occurred, simplifying remediation.

STEP 4. DEPLOYMENT

Deployment comes fourth in smarter systems imaging because, by this point, the difficult work is already done. Your layers are populated with drivers, applications, updates and all the other necessary building blocks. All that's left is the act of deploying the image itself.

That act is no small feat, particularly for large or distributed organizations. Smart solutions support the ability to image multiple computers at the same time via multicasting technologies that support self-recovery in case of network interruption. The ability to deploy images to multiple PCs simultaneously can be

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essential, especially for larger organizations instituting an OS update or for organizations such as universities that need to periodically reimage their PCs.

In addition to multicasting, the ability to centrally deploy images to remote locations is a key feature of today's smarter imaging solutions. This is a critical requirement for widely distributed organizations with minimal or no on-site IT support. An intelligent solution will facilitate deployment of images to PCs at remote sites without the need for on-site IT personnel. This centralization of deployment activities ensures that every system, regardless of location, is always correctly provisioned.

STEP 5. MAINTENANCE

Deploying an image is only the beginning of that device's lifecycle. Once a device is provisioned, IT must continue maintenance with further updates, configurations and new applications over time.

Also important is the occasional reimaging when troubleshooting efforts fail. That reimaging must support the capture and reinstatement of user personality information as an integral part of the provisioning process. Every IT pro has seen the look on a user's face when personal data comes up missing. Avoid the apologies by integrating user state migration into your ongoing maintenance activities. And if an imaging solution can repair an installation without having to fully wipe and reimage a PC, it can save both IT and the end user considerable time and consternation.

SUMMARY

It goes without saying that static images are an artifact of a time long past. The new best practice for adding intelligence into systems deployment focuses on the layers: drivers, updates, applications, configurations and user personality. The systems deployment solution for your needs assembles the building blocks in each layer, with each deployment, at exactly the right time.

Manage those layers effectively, and you've got smarter systems deployment that not only works well enough, it also works well.

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KACE SYSTEMS DEPLOYMENT APPLIANCE

The KACE Systems Deployment Appliance (K2000) fulfills the systems provisioning needs of organizations today, delivering system imaging, image management, OS deployment, configuration and recovery. With KACE, you can rest assured that your organization is well equipped to take each of the easy steps to smarter systems imaging.

Step 1. Imaging

The KACE appliance eliminates the manual steps in driver matching by collecting and uploading driver files into a centralized database for later provisioning. Specifically, the solution provides:

- **Computer scanning and assessment** — Collects detailed hardware information on target systems.

- **Windows driver management** — Automatically downloads the latest drivers by computer model, while the driver harvesting tool makes working with drivers easy.

- **A centralized deployment library** — Enables easy storing of deployment assets in one manageable, secure location.

- **Gold master images** — Enables you to manipulate a small number of thin gold master images rather than maintaining large numbers of images for each possible configuration. In addition, you can also:

  - Use scripted installations and never have to build an actual gold master image.

  - Use K-image (Quest's proprietary format) to manipulate your gold master image at the file level.

Step 2. Capture

The KACE appliance captures images across a range of devices and operating systems by delivering:

- **Hardware-independent imaging** — Provides industry-standardized imaging in a clean and unified fashion. The KACE appliance's hardware-independent native imaging streamlines image capture and management, and reduces storage costs, while scaling to a growing portfolio of managed operating systems.

- **Native imaging** — Supports native imaging formats supported by Microsoft and Apple.

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Step 3. Customization

The KACE Systems Deployment Appliance facilitates in-line customization with the following features:

- **Customizable pre- and post-deployment configuration** — Enables automation of all deployment tasks, such as RAID and BIOS configuration, application installation and your own scripts.

- **Native imaging** — Allows use of third-party tools for customization of images.

- **Task sequencing engine** — Lets you control the order of deployment tasks for further customization.

Step 4. Deployment

The KACE appliance enables you to image multiple computers simultaneously, and to centrally deploy images to remote locations:

- **Windows network OS install** — Allows for hardware-independent provisioning of any system.

- **Windows user state migration** — Centrally captures, stores and deploys user-specific settings and files; enforces compliance by excluding files by type and location; and offers a single-step offline migration.

- **Remote site management** — Allows deployment of disk images, operating systems, drivers and applications at remote sites without dedicated on-site hardware or staff.

- **Network boot architecture** — Allows deployment assets to be provisioned over the network, even for bare-metal machines (that is, those without any OS or other software).

- **Multicast deployment** — The KACE appliance can send bits of a deployment once and have that data received by multiple devices. This approach greatly improves imaging performance when you are deploying to many devices — it takes the same amount of time to image, regardless of the number of PCs.

- **Task scheduling and sequencing** — Enables you to schedule imaging of a large number of images after business hours. Moreover, when you return the next morning, you can easily determine which machines were successful, which failed and where those failed machines actually had issues.

Step 5. Maintenance

KACE enables easy maintenance of the full lifecycle of each device with the following features:

- **Centralized administration** — Includes an integrated, web-based console for easy, centralized systems deployment and systems recovery.

- **Remote systems repair and recovery** — Recovers systems using native Windows and Mac tools, including native imaging tools.

- **Flexible K-image format** — Enables you to repair an installation without requiring that you fully wipe and reimage a machine.

- **Integrated reporting** — Eases systems deployment and appliance administration.

- **Task sequencing** — Ensures that things go smoothly, that reboots are handled gracefully and that the KACE Systems Deployment Appliance is updated in real time with the status of a target device's deployment, eliminating the time-consuming task of digging through logs to determine what went wrong during a deployment.

- **End-to-end systems management of a PC** — The KACE Systems Deployment Appliance, combined with the KACE Systems Management Appliance (K1000), enables IT to maintain a PC from the beginning (deploying an image on bare hardware) through the entire lifecycle of the PC. The Systems Management Appliance provides management of the imaged PC, while the Systems Deployment Appliance enables upgrading and migrating of the OS, as well as any required reimaging.

CONCLUSION

It's easy to escape the imaging quagmire if you have the right tools. With a smart imaging solution such as the KACE Systems Deployment Appliance, you can transform what has traditionally been a painful process and free up IT resources for more business-critical tasks.

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ABOUT QUEST

At Quest, our purpose is to solve complex problems with simple solutions. We accomplish this with a philosophy focused on great products, great service and an overall goal of being simple to do business with. Our vision is to deliver technology that eliminates the need to choose between efficiency and effectiveness, which means you and your organization can spend less time on IT administration and more time on business innovation.

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