autodesk

Case Study

Successful Network Installation of AutoCAD in a Large Design Firm

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Overview

A successful network installation of AutoCAD® 2004 and AutoCAD 2004–based software products depends not only on good planning, but also on sufficient testing of product functionality in a real-world business production environment. This white paper outlines considerations in successfully migrating from AutoCAD® 2000i to AutoCAD 2004 at Sasaki Associates, a large, multidisciplinary design firm with offices in Watertown, Massachusetts, and San Francisco, California, and about 160 CAD users companywide.

The information and steps outlined in this paper that pertain to AutoCAD 2004 and AutoCAD 2004-based products, can be directly applied to a rollout of or migration to AutoCAD® 2005 and AutoCAD 2005-based products.

Sasaki Associates has provided professional services nationally and internationally for 50 years in the practice of architecture, interior design, landscape architecture, planning, urban design, and civil engineering. Mark McDonough practiced architecture for 16 years and has managed CAD applications, geographic information systems (GIS), and 3D and CAD-related engineering software for more than a decade.

Network Licensing at Sasaki Associates

One of the benefits of running AutoCAD software using a network license manager is the ability to monitor concurrent license usage, ascertaining the correct number of licenses to meet typical peak license demands. The savings over purchasing one license for each user is substantial. Another benefit is knowing that license usage is in compliance, a concern of any CAD or IT manager. With a large pool of about 140 CAD users at our Watertown location, our experience has shown that the ratio of users to licenses is about 2:1; therefore 70 licenses can service the load. In our smaller San Francisco office with 20 CAD users, that ratio is closer to 1.5:1. The license manager log file provides the ability to evaluate peak license usage and duration of any license denials, providing insight on whether new licenses need to be purchased, and how many.

AutoCAD 2004 introduced the License Borrowing Utility, which permits users to borrow a license from the network license pool for a set amount of time. AutoCAD can thus be run independent of the license manager. After assessing the functionality of this utility, we decided to convert a quantity of stand-alone AutoCAD licenses (for laptop users) into network licenses. This change enabled us to increase the pool of network licenses for our growing CAD user base while enabling laptop users to borrow an AutoCAD license when traveling or attending off-site work sessions. This capability saved money by maximizing the efficiency of license resources.

It is worth noting that although we have data connectivity between offices, and it is feasible to have a single license server for both locations, each site has its own license server to avoid problems associated with a long-distance data connection. However, both servers are managed from the main corporate office.

Benefits of Network Deployment and Software Images

The benefits of network deployments and software images (a more developed extension of network deployments) are compelling. Some of the most important benefits include the following:

- **Easy distribution.** Once a client software installation has been configured in a network deployment or software image, it can easily be distributed to any number of computers in a matter of minutes, including unattended deployment across a network, whether

scheduled or pushed on demand. No more tedious "sneaker-net" installations on individual machines with a CD in hand.

- **Identical, standardized installations.** Deploying cloned installations makes it easier to train staff to use the new software releases by ensuring that everyone has the same setup and toolsets.
- **Invaluable troubleshooting tool for IT/CAD managers.** If a problem can't be resolved within a reasonable amount of time, you can just uninstall the software and reapply the network deployment or software image within a minute or two. Cloned installations reduce helpdesk calls by eliminating error-prone manual installations in which crucial steps and details often get missed.
- **Editable deployments.** Network deployments, and software images in particular, are editable and can be easily updated to reflect to configuration changes. You can create small "addenda" software images to automatically update client installations at will.
- **Automatic installation for new employees.** Network deployments and software images can be assigned to network login accounts and user groups to automatically install software when computers for new employees are set up, ensuring that they get the right software for their job classification.
- **Easier transition to upgrades.** The procedure of creating a network deployment or software image helps the creator understand and modularize the configuration steps. The experience provides insight when creating other software images, making it easier to move to new releases.

Deployment Criteria for a New Release

Based on our experience of installing and supporting previous AutoCAD versions for a large CAD user base, we established several steps to ensure a smooth transition to a new AutoCAD release. Our criteria include the following:

- Review licensing and network deployment tools in the new release, including the following:
  - Evaluate licensing needs, quantities, and any license policy changes.
  - Evaluate AutoCAD interaction with the license server.
  - Evaluate Network Installation Wizard (NIW) capabilities and whether alternative software is needed for the final software deployment package.
  - Ensure that the new release can temporarily run side by side with previous AutoCAD releases.
- Establish the configuration of the standard user installation, including the following:
  - Strategize the finished client installation, and document each configuration step.
  - Install all service packs, updates, extensions, object enablers, and related Autodesk utilities.
  - Provide a standardized AutoCAD desktop configuration to all users—for primary users as well as guest users.
  - Assign static standardized support file paths for AutoSave files, plot style tables, plotter configurations, profiles, and so forth.
  - Migrate CAD standards into the new release, and evaluate whether CAD standards need to be modified as a result of the new software version.

  - Test and migrate LISP, VBA, and ARX utilities to the new AutoCAD version. Determine whether the new release makes existing utilities obsolete, and migrate only the useful utilities.
  - Test plotting functionality and bring forward plotting setups, as near identical to the previous version as possible.
- Create a training plan for the new release:
  - Offer a variety of targeted training venues to introduce the new AutoCAD version, thus assuring a smooth transition and early adoption of the new release.

Once you have completed this preliminary work, you are ready to deploy your new version of AutoCAD software.

Setting up the AutoCAD Deployment

For AutoCAD® Release 14 and AutoCAD 2000i, we used a similar deployment strategy that consisted of the following steps:

1. Install the license manager.
2. Install the network deployment tree.
3. From the deployment tree image, perform a base client AutoCAD installation to verify interaction with the license server.
4. Apply a series of customizations and configurations as desired to the client AutoCAD installation.
5. Using a software imaging tool such as Prism Deploy®, capture the customized AutoCAD installation into a "software image" package, ready for subsequent automated delivery to AutoCAD users.

Once the software image was created, the AutoCAD network deployment image had served its purpose and was no longer needed.

With AutoCAD 2004, the interaction between the network deployment image and the client AutoCAD installation has changed. To configure the product most effectively it is necessary to understand the behavioral mechanisms of the AutoCAD 2004 product. We noted the following key differences:

- The capabilities of NIW had been significantly updated, making it a much more interactive tool for configuring one or more images for deployment of client AutoCAD installations. It was necessary to review the scope of these enhancements to evaluate potential benefits.
- The network "administrative image" was no longer just for the one-time installation of AutoCAD on a workstation because the image is subsequently accessed each time AutoCAD is launched. In previous releases of AutoCAD software, the deployment tree or administrative image became superfluous once client AutoCAD installations were done. But with AutoCAD 2004 the administrative image is an integral part of network license operation.
- The client installation of AutoCAD 2004 has a noticeably different file structure than in previous releases. AutoCAD 2004 introduced a hidden folder tree named *UserDataCache*, located under the main AutoCAD installation folders. The use and potential customization of this area are not fully explained, leaving the CAD manager wondering how AutoCAD uses it and what the configuration options might be. In addition, the *Support* folder has been split in two. The local AutoCAD installation has the familiar *Support* folder; however, the folder was missing most of the files normally associated

with it. There is a second *Support* folder under the *UserDataCache* folder tree, with the remainder of the support files.

- The most surprising aspect of AutoCAD 2004 is the creation of a unique AutoCAD files area for each Microsoft® Windows® login, with the user's AutoCAD support files installing to the Windows profile area *C:\Documents and Settings\[username]\Application Data\Autodesk\AutoCAD 2004\R16.0\enu* with a subset of folders created under this deep file location. It also writes some files to a second branch in the Windows profile area, with a similar set of subfolders at that location, namely, *C:\Documents and Settings\[username]\Local Settings\Application Data\Autodesk\AutoCAD 2004\R16.0\enu*. This strategy meets Windows XP compliance and certification. When a user first launches AutoCAD software, Windows checks to see if AutoCAD has been installed for that person's Windows login name and, if not, copies files from the *UserDataCache* area of the client AutoCAD installation, and as well as from the network administrative image, into the user's corresponding *c:\documents and settings* Windows profile area.
- Primary client installation and operation of AutoCAD behave differently from guest user operation of AutoCAD. It is possible to edit all the file paths in the Options dialog box to point to a simplified, static AutoCAD files location and to preserve that information in a profile. However, when someone else logs in to Windows on the same computer and launches AutoCAD, they get a default AutoCAD setup in that user's *c:\documents and settings\[username]\ area*, differing from the desired standard of a single static AutoCAD location. Thus it is a challenge to deliver a standard AutoCAD setup for all users within a facility.

Key Challenges with AutoCAD 2004 Network Deployment

We noted the following issues with network deployment of AutoCAD 2004.

Changes to File Structures

Because AutoCAD 2004 creates user-specific installation file areas deep within the *c:\documents and settings* area, meeting our goal of having a standardized AutoCAD 2004 configuration defined by a set of static folder locations was challenging. Attempts to manipulate the *UserDataCache* area were unsuccessful, because unwanted files such as default CTB files (plot style tables) were still pulled from the network administrative image, over which there wasn't sufficient control for our needs. Because there are other methods to address this problem, Autodesk does not recommend that users customize the *UserDataCache* area.

Suggestions from Autodesk technical engineers provided a direction to pursue. The steps include the following:

- Establish a unique folder area outside the AutoCAD software installation folders to store user-created AutoCAD support files such as plotter configurations (PC3 files) and plot style tables (CTB files). Include support file search paths to this folder location or locations.
- Do not attempt to use the *UserDataCache* area of the local installation.
- Make use of a LISP file that ships with AutoCAD 2004 products, named *sample-profile-utils.lsp*, found in the *Support* folder in the client AutoCAD 2004 installation. Use this utility to force a profile to be fully imported, thereby reliably controlling the program's file path and desktop setup.
- Use the NIW to get the base client AutoCAD installation as close to your desired setup as possible. Depending on the level of configuration customizations employed, however, it

is likely that an independent software deployment mechanism can be used to actually deliver AutoCAD to client installations.

Microsoft Internet Explorer 6 Requirement

A significant aspect of installing AutoCAD 2004 is the requirement that Microsoft® Internet Explorer (IE) 6 be installed (it is included on the AutoCAD 2004 installation CD). In our facility all staff had a customized, branded version of IE 5.5, along with a variety of browser plug-ins. The impact of the IE 6 prerequisite for AutoCAD 2004 cannot be underestimated. We decided on the following steps:

1. We would need to install the IE upgrade separately, before AutoCAD installation, and not attempt to roll it into the AutoCAD 2004 network deployment.
2. Because Internet Explorer is so tightly integrated into the Windows operating system, IE 6 had to be rolled out at least a week before AutoCAD 2004, to have enough time to work out problems with IE installations and various browser plug-ins. The wisdom of this decision was borne out with our actual experiences.
3. During a "silent installation" of AutoCAD 2004 from a deployment administrative image, if IE 6 is not present, the installation terminates without issuing any sort of error. Thus the silent installations suppress not only installation prompts, but also the IE 6 prerequisite installation failure error. This made it imperative to get IE 6 installed and debugged on all stations before the AutoCAD 2004 rollout.

In addition, we determined that the IE requirement for AutoCAD 2004 network deployment was outside the realm of NIW considerations.

Limitations of the Network Installation Wizard

NIW is a good step toward achieving an automated, configurable, software deployment tool integrated with the AutoCAD product. We particularly like the ability to edit existing software images and to create additional deployment image versions. The inclusion of the Express Tools in the deployment tool is a welcome addition. However, for our needs, NIW did not offer enough options or flexibility for delivery of AutoCAD 2004 to client workstations. Because the NIW must be used when installing the network version of AutoCAD software, we made the administrative image as close to our desired setup as possible. Some of the issues we experienced with NIW include the following:

- Insufficient access to file paths. Only a portion of the file paths found in the Options dialog box (Files tab) are accessible from NIW. For example, we wanted to set the AutoSave location, but it's not available in NIW.
- There is an NIW option to include additional files in the deployment image. However, you can't specify customized versions of standard AutoCAD files. For example, edited versions of files such as *acad.mnu, acad.lin,* and *acad.pgp* can't be included.
- Additional folders can be included, but they cannot be empty folders. We wanted to include an empty *AUTOSAVE* folder for each client installation, ready to eventually hold AutoSave files, but you can't do this with NIW (empty folders are ignored). A workaround is to include a placeholder file in the otherwise empty folders.
- We wanted to include various AutoCAD extensions such as the Autodesk Tool Palettes Extension, accessory utilities such as the Batch Drawing Converter and Autodesk Color Book Editor, the appropriate object enabler, and other utilities and updates. NIW can install service packs, but there is no provision to run additional executables that are usually considered part of a standard AutoCAD 2004 client installation.

Managing Administrative Images with the Network Installation Wizard

One of the best features of the NIW is the ability to create multiple administrative images and to modify existing images. It is nearly impossible the first time through the wizard to anticipate every setting, path, file, and folder that is to be included in the image. Thus the ability to easily change or update the contents of the image or to create new images for testing or other purposes are significant advances. For example, we created an additional "CAD Manager administrative image" that enables live updates, separate from the standard CAD user image, in which live updates are disabled.

One restrictive aspect of the NIW administrative images is that when a change is made to an administrative image, it is ineffective to simply run that new image and allow it to overlay or update a previous client installation. To ensure that the changes to the administrative image apply to your client AutoCAD 2004 installation, you must first uninstall the AutoCAD 2004 client, and then rerun the installation from the modified image. Then, of course, you must reinstall any other components that might have been installed (Batch Drawing Converter, Autodesk extensions, object enabler, and so forth), as well as perform any customized client configurations, which can be tedious. We hope that a future release of NIW will have the ability to perform a live update on existing client installations.

The NIW gives options about what AutoCAD 2004 components are to be installed. The options most important for our configuration include the following:

- Select "custom" client setup type, and choose not to install Drawing Encryption. This effectively removes the ability for CAD users to password-protect their files.
- Select Install Express Tools with This Deployment.
- Live Update: we chose Disable Live Updates, a function in the AutoCAD 2004 Communication Center. CAD users in our company do not have Windows privileges to install software; therefore this option doesn't apply to our CAD staff. Also, we prefer that the CAD manager download and evaluate all updates before releasing them to our CAD staff.
- On the last screen of the wizard, there's a Disable DC Online tab. We left it unchecked, thus enabling DC Online. We felt the DC Online utility was a good augmentation to the DesignCenter™ feature, giving our users access to a rich assortment of drawing symbols and information pertinent to the AEC industry.

Customizing the AutoCAD 2004 Installation

During the installation of AutoCAD 2004, we take the opportunity to specify the certain elements of the set up. Primarily the items we focus on are the locations of AutoCAD support files and folders.

Destination Folders

We configured the NIW to install AutoCAD 2004 to a folder named *C:\R2004*. We use short names for folders off the root of the *C:* drive to reduce file navigation, make it readily apparent where the software is installed, and reduce the length of support file search paths. We created a dedicated folder area named *C:\R2004_MyFiles* to hold user-created AutoCAD support files and then added paths to these locations. The benefit of creating static standardized folders for such things as AutoSave files and plot style tables is that CAD users know exactly where to save or retrieve such files. Also, in an environment with multiple AutoCAD 2004–based products, you can share these folders using a similar deployment strategy. The following table summarizes our local AutoCAD 2004 folders. Paths are added to these folder locations.

Path Name	Description

Path Name	Description
C:\R2004	Local client installation path for AutoCAD 2004
C:\R2004_MyFiles	Dedicated folder area to store user-created AutoCAD support files
C:\R2004_MyFiles\Autosave	Standardized location for user AutoSave files
C:\R2004_MyFiles\Color	Location of color books
C:\R2004_MyFiles\Plotting	Company-standard and user CTB, PC3, and PMP plot support files
C:\R2004_MyFiles\Profiles	Company-standard and user profiles
C:\R2004_MyFiles\Template	Company-standard and user drawing startup templates (DWT files)
C:\R2004_MyFiles\ToolPalette	Company-standard and user tool palettes (network locations are also used)

AutoCAD Support Folder

As mentioned earlier, the *Support* folder in AutoCAD 2004 has been split into two locations. We installed the AutoCAD client to *C:\r2004*; thus there is a *C:\R2004\Support* folder as well as a *C:\R2004\UserDataCache\Support* folder. When launching AutoCAD 2004 for the first time, the latter folder is copied to the user's *C:\Documents and Settings\[username]\Application Data\Autodesk\AutoCAD 2004\R16.0\enu\Support* folder , becoming the location for that user's support files. However, to achieve a static location for AutoCAD support files, we copied the contents of *C:\R2004\UserDataCache\Support* into *C:\R2004\Support*, thereby abandoning the former folder and rejoining them into a single support folder. Then we added a support file search path to the latter folder. Similarly, because we intend to use only static paths, we copied texture files from *C:\R2004\UserDataCache\Textures* into a standard static folder location, *C:\R2004\Textures*. For this folder, we deleted the help shortcut entitled Where Are My Textures, and we did the same for the other folders because they no longer apply to our implementation. We then added a path to this location from the Tools>Options>Files dialog box.

AutoCAD Support Files

In our facility, we place most LISP routines, ARX executables, and font and symbol libraries on a network drive, adding search paths to them. We delete the local *ACAD.PGP* file containing short-keystroke alias commands and instead use a network *ACAD.PGP* file so that all alias commands are standardized and published from a centralized source. We replace the local ACAD menu files, linetype file, and hatch pattern library with local, customized versions. Because our CAD users need write access to add or change toolbars, menu files are on local drives. Each CAD manager can determine the extent of customizations to the local AutoCAD installation appropriate for their CAD users.

Augmenting and Patching the AutoCAD Installation

Visit the Autodesk website (www.autodesk.com) knowledge base (www.autodesk.com/support) and discussion groups (www.autodesk.com/discussion) to learn about updates, patches, utilities, extensions, object enablers, and pertinent documentation. The goal is to create an AutoCAD 2004 deployment that is as complete and up-to-date as possible. For AutoCAD 2004, at the time of this writing, there is Service Pack 1a (DocUpdates) updating the AutoCAD 2004 help system, an update to Express Tools, the Tool Palettes Extension, and Autodesk Color Book Editor the Batch Drawing Converter, and an appropriate object enabler.

Third-party add-on software may need to be carried forward from the previous release. In most cases, you need to contact the third-party vendor and upgrade the software to the

new release, as applicable. If such items are part of your standard AutoCAD desktop setup, you should install and test them during this phase. Similarly, all LISP, ARX, and Microsoft® Visual Basic® routines need to be checked for functionality in the new release and updated as required.

Easing the Transition

When supporting a large group of CAD users, it is imperative to thoroughly test the new AutoCAD software and anticipate areas where users may have problems. Taking time to smooth out the rough edges helps to provide a better user experience, as well as gain faster adoption of the new AutoCAD release. Often, problems take the form of small, repetitive tasks that can cause irritation when not implemented correctly, so attention to detail is a worthwhile investment. The following sections detail some of the items we implemented to make the transition easier.

Express Tools

In AutoCAD 2004, some Express Tools were incorporated into AutoCAD software. It is important to understand these changes and inform your users about crucial differences. For example, we made sure our CAD users knew that the improved eTransmit functionality in the core software had replaced the popular PACK Express Tool command (Pack 'n Go).

The Express menu omitted menu options for some of the tools. For example, few users know the OVERKILL command by name, because in earlier releases they chose Express>Modify>Delete Duplicate Objects from the Express menu. Our solution was to compare the previous version of the Express menu with the Express commands in 2004 and edit the *ACETMAIN.MNU* accordingly, adding the missing items. We also carried forward a favorite Express Tool (TEDIT) that was not part of AutoCAD 2004, adding it back to the menu.

Not to be underestimated is how commonly used commands become ingrained in the user's workstyle. Therefore it's not surprising that users may be confused about the companion LAYISO and LAYUNISO commands. In AutoCAD 2004, there is a LAYISO button (Isolate Objects Layer) on the Express Tools Layers toolbar; however, the adjacent button for the reciprocal command LAYUNISO (Undo Last LAYISO Operation) has been replaced with the new LayerP command and nearly identical button icon to the right of the layer drop-down list (Layers toolbar). Separating companion tools in this way causes confusion. The solution is to educate users or to add the LAYUNISO button back in (the LAYUNISO command does exist in 2004 as an Express Tool).

External Autodesk Utilities

After installing AutoCAD software and associated utilities, you must search the Windows Start menu to find these utilities while running AutoCAD. Too often, CAD users aren't aware of these utilities or don't use them because they are hard to find. To make the utilities more accessible, we implemented the following:

- We edited the Files menu in the ACAD menu system and added menu options for things like Batch Converter, Reference Manager, Color Books, and License Borrowing Utility.
- For each external utility we created a mnemonic short-keystroke alias command, such as BC for Batch Converter and RM for Reference Manager. We edited the ACAD menu, adding the alias commands to the right of the Files menu options as a way of reinforcing knowledge about alias commands.
- To help illustrate the capabilities of the Tool Palettes Extension, we created a standard tool palette with command buttons to launch each of these utilities.

- With 2004, we found the number of AutoCAD-related program folders to be too deep and too many. We reorganized them into two folders accessible from the Windows Start menu—one for Autodesk 2004 programs, the other for Autodesk 2004 help and documentation shortcuts. We also deleted shortcuts irrelevant to our users and simplified shortcut names for easier memorization. For example, we renamed ACDEditor to *Color Books*, reinforced with a mnemonic alias command *CB* and menu choices that reiterate these simplifications.

Manuals and Documentation

Beginning with AutoCAD 2004, the AutoCAD reference manuals are no longer included in the box in printed form. The manuals do exist in indexed PDF format, residing on the installation CD. We copied these PDF files to our network and edited the Help menu in the ACAD menu system to add links for the Command Reference, User Guide, and Customization Guide. We also added links to the Tool Palettes Extension help and tutorials.

Profiles Manipulation Utilities

A key part in our goal to establish a static location for AutoCAD support files and user files was to implement the Autodesk sample profiles manipulation utilities, a small file named *sample-profiles-util.lsp* located in the local AutoCAD 2004 installation *Support* folder. The file has several LISP functions that are well organized and clearly annotated, and are thus easy to follow. To implement the utilities, we did the following:

1. Set up the AutoCAD desktop, file paths, system variables, toolbars exactly as we wanted them.
2. Exported a profile to our *C:\R2004_MyFiles\Profiles* folder. This became our standard profile, named *Sasaki_std1.arg*.
3. Copied all of the LISP code from *sample-profiles-util.lsp* into our s::startup function, which is defined in a centralized *acad.lsp* file located on the network.
4. Customized the LISP code to force importation of our company-standard profile. Because you cannot import a profile having the same name as the current profile, the profiles manipulation utility renames the current profile if necessary, allowing the specified profile to be imported and set as current, thereby ensuring that the profile is loaded in its entirety. The renamed profile is then deleted.

The example code from Autodesk indicates how to add the code to an s::startup function. However, we realized that it would force the complete reload of the standard profile every time AutoCAD 2004 is launched. We wanted to load our company-standard profile the first time users launch AutoCAD software, but then enable users to customize their desktop and toolbar preferences without their changes being overwritten. To do this, we added LISP code that creates a "marker file" (zero-length text file) stored locally and named after the user. The code checks to see if *username.txt* exists. If the file doesn't exist, then the profile is initialized. This approach ensures that CAD users have the same AutoCAD desktop experience no matter which computer they log in to. The following example LISP code shows our modifications to a portion of the sample profiles manipulation utilities.

```
(defun-q S::STARTUP ()

    (do_your_lisp_stuff_here)

     ;;force standard profiles function
     ;;======================
     (setq flagfile (strcat "c:\\r2004\\log\\" (getenv "username") ".txt"))  ;;set user's name of marker file
     (if (not (findfile flagfile))
        (progn (setq fi (open flagfile "w"))  ;;file doesn't exist, so write the marker file & import profile
              (setq fi (close fi))
              (if (not (vl-bb-ref ':sample-imported-profile)) ;; have we imported the profile yet?
                 (progn
                   (vl-bb-set ':sample-imported-profile T)
                   (sample-profile-import "c:\\r2004_MyFiles\\Profiles\\Sasaki_std1.arg" "Sasaki_std1" T)
                   (sample-profile-set-active "Sasaki_std1")
                 )
              )
         )
     )
     (princ)
)    ;end s::startup
```

Creating the AutoCAD 2004 Deployment Image

The NIW is a significant step forward in the management and deployment of networked AutoCAD installations. However, except for simple installations, third-party software is still necessary for effective network deployment. We use Prism Deploy by New Boundary Technologies to successfully and efficiently roll out Autodesk software, including AutoCAD 2004, Autodesk Map™ 2004, Autodesk® Land Desktop, Volo® View, Autodesk® Buzzsaw®, and Autodesk® VIZ. The easy-to-use Prism Deploy software is feature rich, customizable, and powerful, and has proved an invaluable tool for rolling out not just Autodesk software, but also all our business and graphics applications.

The concept of Prism Deploy is simple. Launch Prism Deploy on a PC without any of the target software installed and use it to take a "snapshot" of all computer files and settings. Then, install the software, copy or delete files, and so forth. When you're finished making changes, take a final snapshot to capture any differences. The resulting "software image" is a single file that can be "pushed" remotely to individual users or groups of users via the Prism Deploy Console. The file is fully editable and can be easily modified to keep pace with updates. Each software image can also be converted into a self-executing EXE file, a useful tool for reapplying software without going back to the Prism Deploy Console.

To create our AutoCAD 2004 package, we did the following:

1. During the AutoCAD 2004 review phase, keep a list of all manual configuration changes to the local client installation.
2. Select a typical computer that has Internet Explorer 6 installed but does not yet have AutoCAD 2004. Launch the Prism Deploy Editor and allow it to take a computer snapshot.
3. Install the AutoCAD 2004 client from the network administrative image.
4. Assuming all utilities have been downloaded and are available for installation, perform all the manual configuration steps to the client installation documented in step 1. This includes installing additional Autodesk utilities, DocUpdates, AutoCAD extensions, object enablers, and so forth. Create folders, copy or delete local files, apply CAD standards

and customizations, and make changes to program folders and shortcuts. Every change is recorded.

5. Launch AutoCAD 2004, and make sure it is running the way you want it to. Then close AutoCAD.
6. Take a second snapshot using the Prism Deploy Editor.
7. Open and review the AutoCAD 2004 software image created with Prism Deploy. Pay special attention to paths and replace references to the installer's personal Windows settings with generic %username% references.
8. Test the software image by "pushing" it to a trial group of user computers and testing the EXE version of the image on one or more computers.
9. Make final changes to the software image as necessary. The image is now ready for deployment and can be automatically sent to individual users or groups of users, silently installing on their computers in unattended mode.

As the challenges of installing networked CAD software grow, it becomes more important to use a third-party software deployment utility to make the process manageable. The ability to distill a complete customized installation into a single, easily deployable file is efficient and effective.

Using Tool Palettes and the Tool Palettes Extension

Past experience shows that our CAD users do not investigate many capabilities in Autodesk software. In rolling out AutoCAD 2004, we were particularly interested in exploiting the dramatic new capabilities of the Tool Palettes Extension, a feature sure to force a reevaluation about how companies deliver CAD standards, symbol libraries, and other tools to CAD users. In conjunction with other standout AutoCAD 2004 features, such as the modeless DesignCenter feature (ADCENTER command), Autodesk has taken an impressive leap forward.

To demonstrate the usefulness of the Tool Palette Extension to our users, we created a "commands" tool palette, with easy access to some of our custom LISP tool suites, sample commands, and buttons to launch external AutoCAD utilities such as Reference Manager, Batch Drawing Converter, and Color Books. We also wanted to demonstrate the potential of the Color Books utility for creating custom color palettes for use on illustrative color drawings using solid hatches. Our architectural discipline developed color palettes for illustrative drawings and color presentation boards using Adobe® Photoshop® and Adobe® Illustrator®. With Color Books, we easily replicated the same color palettes for quick access directly from AutoCAD. When rolling out AutoCAD 2004 to our users, it was tool palettes and the ability to access the Color Books utility from the Layer Manager that elicited the most enthusiasm.

AutoCAD 2004 Deployment Tips

- **Plot support file location:** Experience has shown that putting plot support files (PC3, PMP, and CTB) on a write-protected network location sounds good in theory but doesn't work well in practice. Without write access, even the simplest changes result in confusing write-protect error messages. If users create a custom sheet size or change a paper margin, they get a write-protect error. With AutoCAD 2004, we still used standard plot support files but put them on local drives where the user can work with them. To reinforce our standards and as a troubleshooting solution, we created custom commands that reset our company standards by copying them to the client from a network library location.

- **Page setups:** In previous versions of AutoCAD software, there was a utility from Autodesk that enabled importing page setups via LISP (*aclyutil.arx*). We had AutoCAD configured to always load a standard suite of page setups each time an AutoCAD drawing was started. AutoCAD 2004 no longer supported this utility, so we had to find alternative methods of implementing standard page setups. We promoted three methods of importing page setups into drawings:
  - We set AutoCAD to use a template (DWT) file when starting a new drawing. If the user selects one of our template files, it is preloaded with standard page setups.
  - We encourage the existing capability whereby the Plot and Page Setup dialog boxes allow importing page setups from other drawings, preferably from the aforementioned DWT template files.
  - We use the Batch Drawing Converter to include page setups from a specified source. This method has the added benefit of stripping out page setups other than those selected for installation.
- **Side-by-side installation issues:** For the most part, AutoCAD 2000i and 2004 can be run simultaneously without incident. The ability to temporarily run two releases concurrently and assist in the migration to the new release is important. We found only a couple of minor issues to be aware of:
  - If both versions are running concurrently, the version of AutoCAD that was launched first controls the version of AutoCAD help documentation for both AutoCAD sessions, even if you close one version of AutoCAD.
  - A change in the behavior of automatic menu recompiling in AutoCAD 2004 caught us by surprise. Our custom menus (partial menus that are loaded and unloaded with AutoLISP® routines) reside in network folders. Traditionally, only the physical deletion of a compiled menu file triggers it to recompile the next time the menu is called. Because of menu format differences and changes to the toolbar image format in AutoCAD 2004, when AutoCAD 2004 accesses a menu compiled in AutoCAD 2000i, it automatically recompiles the menu to the 2004 format, and does so on the fly. In our attempt to share these menu folders between AutoCAD 2000i and 2004, we discovered that the on-the-fly conversion of the compiled menu to 2004 made the menu files subsequently inaccessible in 2000i. It was necessary to make duplicate menu folders, one for 2000i and the other for 2004, thus separating them.
- ***Acad2004.cfg* file:** This file is a carryover from previous AutoCAD releases. The file is created on the fly if it doesn't exist. Yet, the configuration file path is read-only and may only be changed using the /c command line switch. To use the /c command line switch, edit the shortcut properties of the AutoCAD icon on the Windows Desktop, and in the Target box, edit the parameters to include the switch. The default read-only value for the Configuration File path points to another branch of the *C:\Documents and Settings* area, namely,

  C:\Documents and Settings\[username]\Local Settings\Application Data\Autodesk\AutoCAD 2004\R16.0\enu

  If left unchanged, to become part of a profile delivered to your CAD users, the situation can cause AutoCAD sessions to display errors or crash when AutoCAD tries to write to the configuration file in another user's protected system area. The solution is to add the /c switch within the AutoCAD 2004 desktop icon properties, specifying a benign static location to which everyone has write access. In our example, we added the following to the Target box of our AutoCAD 2004 icons: */c c:\r2004\support*. Restarting AutoCAD 2004 after taking this action, will change the read-only value of the Configuration File path to its preferred benign location. Since this path is part of an AutoCAD profile, ones

company standard profile should be created (exported) after making the configuration file path change.

- **Profiles manipulation utilities:** These powerful and easy-to-implement LISP utilities are shipped with AutoCAD. The utilities provide the ability to control AutoCAD behavior and the desktop interface. The CAD manager can also use them to create profile tools that CAD users will actually use and understand. For example, we created a menu selection to effectively reset the company standard profile, avoiding the multistep process of importing and resetting profiles through the Options dialog box. These utilities are one of the best-kept secrets of AutoCAD 2004.
- **SaveAs AutoCAD 2000:** During the migration to a new release, our CAD users often need to finish jobs in the previous AutoCAD release. We recommend that users set AutoCAD 2004 to always save in AutoCAD 2000 format during the transition. This approach works well, except that when users save their drawings, they are actually performing a SaveAs and are thus prompted about overwriting the file, with a default of No or <N>. Having to type Y (for Yes) repeatedly is tedious. Our solution was to write a LISP alias command "SS" that temporarily sets the EXPERT system variable to 2, thus suppressing the prompt and allowing a seamless SaveAs function, and then returning EXPERT to its original value.
- **Links to external AutoCAD utilities and commands:** The simple steps required to make external AutoCAD utilities more accessible—by creating LISP macros to launch them, adding them to toolbars, menus, or tool palettes—ensure knowledge and better use of these accessories. Making tools like Batch Drawing Converter, Reference Manager, License Borrowing Utility, and Autodesk Color Book Editor more accessible increases user productivity.

Autodesk Resources and Training

When researching such a large task as migrating to a new version of AutoCAD, the CAD manager has a variety of resources, such as CAD websites, Autodesk's knowledge base and technical bulletins, Autodesk resellers, and Autodesk discussion groups. However, one of the best resources is Autodesk itself. We contacted and met with Autodesk technical staff to discuss our plans to migrate to AutoCAD 2004, and they were supportive and instrumental in leading us in the right direction to achieve our goals.

Adequate training is crucial to the success of any software rollout. To ensure a successful transition to AutoCAD 2004, we arranged for a variety of training opportunities, including the following:

- An Autodesk Authorized Reseller performed on-site AutoCAD 2004 orientation seminars. The trainer became acquainted with our AutoCAD 2004 configuration and customizations to better tailor the training content and delivery.
- In-house training seminars highlighted company-specific customizations that CAD users should know about. An illustrated handout reinforced knowledge of the customizations and were posted to the company intranet.
- Off-site, one-day AutoCAD 2004 Update classes were made available to all users, with make-up dates scheduled for those who couldn't attend because of business travel.
- Multiple session times and dates were scheduled for each event.
- We purchased quantities of two books about AutoCAD 2004 to encourage staff to use the new release.

Conclusion

Managing CAD applications in a large size design firm presents unique challenges that demand streamlined methods of software deployment and implementation. Hence, the benefits of network deployment and software imaging are too compelling to ignore. Autodesk is addressing these demands with the development of network licensing technology, making it easier for CAD Managers to effectively introduce and manage new releases of Autodesk software.

Convinced of the benefits of network licensing, we implement network "floating license" versions of all software where possible, even when purchasing just a single license of a product, such as with our first foray into Autodesk Map. Network licensing allows greater flexibility in distributing the product to multiple users, while at the same time guarantying license compliance and fiscal prudence. The ability to monitor license usage gives accurate data to assist with I.T. budgeting and helps in securing approval for additional licenses when required. Invariably when purchasing a limited number of software licenses, there are more requests for the software than there are licenses and available budget. By utilizing network floating licenses, even when just purchasing one or few licenses, we can distribute software to a broad range of staff, avoiding the inefficiencies of purchasing valuable resources for occasional users of the software.

Rolling out a new release of AutoCAD, particularly in a large firm, can be met with trepidation from the base of CAD users. These busy professionals are tasked with being productive on project work and justifiably experience anxiety about learning a new software release. Mapping out a strategic plan of implementation, with careful attention to detail, goes a long way towards mitigating the trauma affects of upgrading. Implementing standardized network deployments, allows for easier adoption of the new release, while at the same time providing valuable management benefits to the CAD Manager and the company.

Mark McDonough practiced architecture for 16 years and has managed CAD applications, geographic information systems (GIS), and 3D and CAD-related engineering software for more than a decade. Mr. McDonough graciously volunteered his time to describe his experience with Autodesk products and was not commissioned by Autodesk for this work.

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