

## Benefits of Network Licensing

Network licensing is a powerful concept used by a broad array of workstation-based software products. The purpose of this white paper is to show how network licensing software can help you get the most from your software budget.

Network licensing helps ensure that your users have access to the right software at the right time and enables you to control the use of your software easily and efficiently. Effective use of network licensing software requires investment in planning, implementation, and maintenance. But, used properly, it can generate significant benefits for you and your organization.

Of course, all of the benefits discussed below are only available if you can get the network licensing software up and running during the installation of your software. With AutoCAD® 2005 software, we have introduced a new Network License Authorization utility. With this new utility and the Register Today software, CAD or IT managers can quickly and easily describe their license server configuration and company information and then submit that information electronically to Autodesk at any time and from anywhere in the world. This electronic transaction is then processed automatically (usually in a matter of minutes) and the license file is returned and placed on the license servers that the manager designated during the submittal process. The new utility works with both a direct connection over the Internet to Autodesk's systems, and through email. We will continue to support phone requests, but this method will not be as automated as using the new utility.

### Benefits

The benefits of network licensing fall into four main categories:

- 1. Flexible and Efficient Use of Licenses:** This is the most basic benefit of network licensing. Autodesk uses two types of software licensing. The most common type is the Stand-Alone License Manager, which binds the software to a specific workstation. This type of software licensing is almost transparent to the user and is most effective when there is no need to share the license or move it from one workstation to another. The second type is the Network License Manager, which requires communication between the client software and a software license server. When AutoCAD software runs, it acquires a license from the server, returning that license when it is shut down. Licenses can thus be "floated" over an entire corporate network, transferring instantaneously from one workstation to the next as required.
- 2. Usage Tracking:** Because a central license server manages all licenses, an administrator can easily see how licenses are being used. Network License Manager tracking tools allow report creation for information such as total licenses used per department, total hours of usage per week by named users, number of license requests denied, and so forth. This is crucial data for day-to-day administration of licenses as well as input for the budgeting and forecasting process for future software investments.
- 3. Control:** Network licensing gives an administrator much more control over the individual user's or group's ability to access software. Licenses can be moved from one group to another without having to install or uninstall software. Individual users can be guaranteed access or denied access to licenses. Specific network license features (such as the ability to borrow a license from the network) can be enabled or disabled as necessary.
- 4. Standardization:** The Network License Manager in AutoCAD 2005 is based on FLEXlm® technology from Macrovision Corporation, the de facto standard for network licensing. Use of FLEXlm ensures that you get the latest in network licensing technology as it is developed (an example of this

is the new license borrowing capability in AutoCAD 2005). More than 2,500 software vendors use FLEXlm, so it is possible that someone in your organization has already implemented FLEXlm technology. The next sections of this white paper look at each of these benefits in more detail and give examples of specific Network License Manager tools that make your network licensing more effective.

### Flexible and Efficient Use of Licenses

This section covers some of the basics of network license management and how you can use it to flexibly deploy licenses over a network. The use of network licensing assumes that you need to move licenses from workstation to workstation (and user to user). If you have a small number of users who use a single set of workstations and work continuously with their copies of AutoCAD software, then the time and effort to set up a network license server is probably not justified. If you have groups or projects that require heavy use of AutoCAD for limited periods of time, or if you have individuals who need intermittent access to AutoCAD, or if you need to track and control your software usage over a network, then network licensing is an appropriate tool.

Setting up a basic license server is a straightforward process. The hardware requirements for a license server are modest; the license server must be reliable and highly available, because users cannot run their application when the license server is down. You can use the Network License Manager and the FLEXlm utilities to set up your license server. When you register your newly purchased network licenses, you get a license file that defines how many licenses of each product you can run from your license server. The license file is locked to the server Network Interface Card (NIC) MAC address, so the server software is actually locked to an individual piece of hardware. Once the server is up and running, you use the Network Installation wizard to install a network-licensed version of AutoCAD software on individual workstations. Because the license server controls authorization centrally, you don't need to authorize individual workstations. In day-to-day operations, your users may not even be aware that they are acquiring a license over the network.

Another standard feature of network licensing is the ability to "borrow" a license from the license server. With AutoCAD 2005, you have access to license borrowing from within the AutoCAD application itself, rather than through an external utility. License borrowing enables users to "check out" a network license from the license server for a limited time and then "check in" the license when they no longer need it. Users can lock a software license to their workstation, so that they no longer need to be in contact with the license server for the application to run. If the borrowed license expires before the user reconnects to the network, he or she can log on to the network remotely to borrow another license. The most common use for license borrowing is locking an AutoCAD license to a laptop that can then be taken on a trip.

The following scenarios show how your organization could implement individual license servers.

**Example 1:** A survey shows that about 20 users share 10 copies of AutoCAD software. An additional 20 users need AutoCAD only occasionally (average anticipated use is about eight hours per week). Your 20 "core users" indicate that they use the software about half time, although some stated that they used it full time for specific projects, usually lasting three to four weeks. These users are in a single geographic area (your design office) with reliable access to a 10 MB corporate network. One solution would be to purchase 40 copies of AutoCAD software, one for every user, but your budget does not allow you to do so. Rough calculations indicate that you need 4 full-time licenses, 16 half-time licenses, and 20 eight-hour licenses. This gives  $4 + (16 \times .5) + (20 \times .2)$ , or 16 licenses (on average). You purchase 6 new licenses, upgrade your existing 10 licenses to AutoCAD 2005, and then install AutoCAD 2005 on all the systems in your group. You then enable access to the license server for the users covered by your original survey. If you have missed anyone (or if your users' needs change), you can easily enable them to access the license server from your desktop. You then monitor AutoCAD usage as you roll out the new software to see how closely your estimates match actual use.

**Example 2:** You have surveyed your users and found a strong split in their patterns of usage. You have a core group of 10 users who need AutoCAD software on average for 20 hours a week. But this actually means that they use it intensively when they are working on a project and very little at other times. They also need to take their software with them on a laptop when they are called to a remote project site. These users are intolerant of not having access to a license when they need it. You have another group

of 50 users who use AutoCAD a few hours a week, usually for viewing and light editing. They appreciate access to an AutoCAD license but do not want to expend budget for their own desktop copy. They are flexible in receiving access to licenses and will try again later if no licenses are available.

In this scenario, the best setup would be a single license server, with 10 licenses “reserved” for the high-availability users through the use of an options file. The high-availability users want licenses on 15 computers, 10 for their workstations and 5 for their project site pool of laptops. This would have meant purchasing 10 stand-alone licenses and then manually moving them from the workstations to the laptops when required. With your new network license server, you configure their licenses with the ability to borrow five of them. As a result, they will always have a license available, since they can only work on either a laptop or a workstation at one time. You set up a separate server for the more casual users that has an additional five licenses on it. You then monitor the levels of usage and license denial to make sure that these casual users are at the agreed-upon level of service.

## Usage Tracking

This section describes the use of SAMreport-Lite, the tool that is supplied with the AutoCAD 2005 Network License Manager to generate reports of license usage. SAMreport-Lite, a Macrovision product, is a subset of the full SAMreport product and is intended as a basic, easy-to-use tool for understanding the actual usage of your network licenses. The SAMreport-Lite documentation is available in PDF format from the CD browser (the application that comes up when you insert the AutoCAD CD into your CD-ROM drive). It is located on the Network Deployment page under “Step 1: Review Product Documentation.”

SAMreport-Lite is a Java™-based application that processes information from a report log file that you set up on each of your license servers. It lets you filter and sort based on criteria such as report time period, user name, and product, and then outputs the data into HTML, text, or RIF format. Using the RIF format, you can then use a standard office tool (for example, Microsoft® Excel) to put the data into charts or graphs.

Some typical parameters that can be tracked in the log file are license server uptime, number of licenses available, number of license requests denied, maximum number of licenses used, and percent of available licenses used. This data, of course, needs to be tied to actual user perception. For some types of users, server availability of 98 percent is more than adequate, but for others it is unacceptable. Some users feel that being denied a license at any time is unacceptable; others simply try again later. The key benefit of SAMreport-Lite is as an objective measurement tool that provides data for negotiations with your users, managers, and purchasing department.

**Example 3:** Let us expand Example 2, from the first section of this paper. You purchased licenses based on surveys of each group’s expected usage. Now you can use your log file data to monitor actual use. On the license server you keep a record of license usage per named user by downloading the log file once a week, filtering and sorting by product and user name, and then loading the list into an Excel spreadsheet. You also track the number of license requests denied. The data shows that the high-availability users are working at expected levels and that they have little or no denial of licenses. However, the server log file data for occasional users tells a different story. You create a spreadsheet of the usage per day over a month and then meet with the affected department heads. They are generally pleased with the fact that their users now have access to AutoCAD software, but they are receiving complaints about license denials. You create a line graph in Excel to show them two key facts. One is that the average usage per person is about twice that estimated (that is, they had estimated two hours per user per week, but they are actually using four hours). In addition, usage spikes sharply at the end of the week. It turns out that many of the groups have deadlines that fall on Friday, and they do a lot of their final edits on that day. You then show some license models you have created in Excel and show how the models track against actual usage. You show that an additional five licenses of AutoCAD will meet their average demand, and an additional 10 licenses will handle 95 percent of peak demand seen to date. They agree to allocate budget for five additional licenses and to change business processes to level out the spike in demand on Friday. You also agree on an acceptable rate of license denial and arrange to contact them when they reach 90 percent of that level.

## Control

Another important benefit of network licensing is the control that it gives you over each software license, enabling you to maintain the level of service that you and your users have agreed on. It also helps you get the maximum value from each software license.

There are two primary tools available for control of network licenses: the license server configuration and the options file—which is a text file that enables you to configure how the licenses on the license server are used.

## License Server Configurations

License servers can be configured in three ways: a single license server, a distributed license server, and a redundant license server. Each configuration has advantages and disadvantages that will be explored in the following sections.

**Single License Server:** This is the simplest license server configuration and is the one that most companies start with. As stated earlier, the hardware and software requirements for a license server are fairly modest. Memory and CPU usage is small (although it is affected by the number of clients using the server), and the only disk space requirements are for the FLEXlm utilities and the log files, which can get quite large and should be archived somewhere else. The main requirement is that every client workstation that needs access to an AutoCAD license should be able to access the license server with low latency and high availability. If communications between the server and client are disrupted, the AutoCAD license will eventually be lost and AutoCAD will shut down. The licensing software is designed to compensate for brief periods of downtime (typically less than 15 minutes), but if communications are not restored in that time, then AutoCAD warns the user that it has lost contact with the license server. After a number of tries to reestablish communication, it asks the user to save and then shuts down. The application will not restart until it can reestablish communications with the license server.

If you do not want to share licenses between groups, then you can set up multiple individual license servers for each group. The main disadvantage here is that you cannot share licenses between servers. Even if the licenses on server A are not used, users on server B cannot access them (which may be acceptable, especially if the groups of users are on separate budgets). The advantage to this setup is that the failure of one server will not affect licenses on the other servers. If you want to share licenses between license servers, then your best configuration is a set of distributed license servers.

**Distributed License Servers:** This configuration allows a workstation to work its way through a list of multiple license servers to obtain an AutoCAD license. Each user's workstation has the paths to all (or some) of the license servers available, as defined during installation using the Network Installation wizard. If a user is denied a license on the first server on the list, then the software automatically tries the second server on the list, and so forth.

**Example 4:** Your Company has a design office in Chicago, with regional offices in Portland, St. Louis, and Atlanta. A single license server in each office serves licenses on a high-speed local area network (LAN). Each office is connected by a T1 line to the headquarters and to each other. This interoffice connection is much less reliable than the LAN in each office. To get the most from your company's software licenses, you would like to combine all licenses into a single "pool," but you are concerned that communications problems would keep AutoCAD software from being used in local offices. Your solution is to configure all license servers as a distributed license pool. When communications are working between the offices, then each office has access to the entire pool of licenses. If one of the office connections fails, then that local office at least has access to licenses on the local server.

**Redundant License Servers:** This server configuration is for situations that require extremely high availability. A redundant configuration shares a single pool of licenses over three servers that are in constant communication. As a result, if a server fails or is taken down for maintenance, the remaining servers support the whole license pool, with no effect on license availability. This configuration requires that all three servers reside on the same subnet and have consistent network communications (unlike distributed servers, which can work together over a wide-area network). Unlike distributed servers, this configuration offers no protection for network failures.

### Options File

The options file is the key administrative control for a license server. You use it to set up groups of users, enable the creation of log files, and so forth. The following sections review the new license borrowing and time-out features available in AutoCAD 2005 through the use of the options file.

**License Borrowing:** This is an AutoCAD 2005 feature in that enables users to “check out” a network license from the license server for a predetermined period of time and then “check in” the license to the server pool when they are done with it. The borrowed license is locked to the user’s computer and does not require any communication with the license server during the borrowing period. The user borrows a license by selecting “license borrowing” from under the Tools menu within AutoCAD. This menu selection opens a dialog box that shows the maximum borrowing period available and enables users to set the period for which they would like to borrow a license. The options file gives the administrator more control over how many licenses can be borrowed and who is allowed to borrow them. There is also a menu selection that allows a user return the license early (if, for instance, the user’s business trip concludes earlier than anticipated). A “borrow” icon in the AutoCAD status tray reminds users that they are working with a borrowed license, and shows them the amount of time they have left before their borrowed license expires.

**Example 5:** You have 10 licenses on a server and want to allow 5 of them to be borrowed. You also want to restrict the maximum borrowing period to no more than two weeks, and you want to limit borrowing to a specific group of users. There are specific options file and system variables that control each of these actions.

**Time-out:** This is another feature of AutoCAD 2005. It enables the administrator to set a maximum idle time for any AutoCAD session. When that time limit is reached, the server reclaims the license. In the options file, the administrator can set the maximum allowable idle time for any AutoCAD session.

**Example 6:** You have two users who are not using their network licenses effectively. They both require AutoCAD software to complete their work, but one forgets to close AutoCAD when he finishes work and the other keeps a copy of AutoCAD open “just in case” he needs to use it. In both cases, these users are keeping the licenses from floating on the network to be used by others. Setting an idle time limit of two hours for these users means the server can reclaim the license for use elsewhere if it is idle for more than two hours. When the user attempts to use AutoCAD again, the AutoCAD session will continue uninterrupted as long as a license is available. If no license is available, the behavior of AutoCAD is the same as when it loses a connection to the license server.

### Conclusion

Network licensing is a powerful tool. As noted earlier, you need to determine what type of licensing is most appropriate for your users. You can keep a majority of your users on stand-alone licensing while you run a pilot project with network licensing, or you can move most of your licenses to a license server, keeping a few stand-alone licenses for key users.

Autodesk has many resources to help you implement network licensing. Autodesk Training Centers offer classes on network licensing implementation and management. Autodesk Professional Services (APS) offers consulting services that include everything from a customized on-site training class tailored to your specific needs to a fully assisted roll-out plan in which APS professionals set up license servers at your facilities.

The combination of flexibility, tracking, and control provided by the Autodesk 2005 Network License Manager delivers benefits from the moment you set up your license management system. You will quickly see significant payoffs in both efficient use of your software purchasing dollar, as well as the level of service that you can deliver to your AutoCAD users.

### Additional Resources

These three technical white papers can help you plan and implement network licensing at your company:

- “Planning a Successful Network Installation of AutoCAD 2005 or AutoCAD 2005–Based Products”
- “Installing the Autodesk Network License Manager for AutoCAD 2005 or AutoCAD 2005–Based Products”
- “Creating Deployments for AutoCAD 2005 or AutoCAD 2005-Based Products”

There are three reference documents available in AutoCAD 2005 that can also help answer your questions about network license deployment:

- *Network Administrator’s Guide*
- *Network Licensing Guide*
- *SAMreport-Lite User’s Guide*



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