

Benefits of Network Licensing

Network licensing is a powerful concept used by a number 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 licenses 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 in this paper are only available through use of the network licensing software that is available during installation of your software.

AutoCAD® 2007 software contains a Network License Activation Utility. This utility works with the Register Today application to enable CAD or IT managers (“administrators”) to quickly and easily describe their license server configuration and company information and submit that information electronically to Autodesk online. This electronic transaction is processed quickly (usually a number of seconds) and a license file is returned and placed on the license servers designated by the administrator. The utility enables activation both directly over the Internet with Autodesk’s systems, or via email. Phone requests for license files continue to be supported in some areas, but the simplest and quickest method is on line.

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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: “stand-alone” (single installations) and network.

The Stand-Alone License type is most commonly used, and it binds the software to a specific workstation. This type of installation is most effective when there is little or no need to share the license, or move it from one workstation to another.

The second type, which is the subject of this paper, is the Network License. This license type requires communication between the client software (the application installed on the user’s PC) and network license management software installed on a central license server. When an AutoCAD installation 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 from one workstation to the next as required.

2. Usage Tracking: Because a central license server manages all licenses, an administrator can keep track of 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 on. This is useful 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 control over an 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 required.

4. Standardization: The Network License Manager in AutoCAD 2007 is based on FLEXlm[®] technology from Macrovision Corporation, the de facto standard for network licensing. Use of FLEXlm enables you to get the latest in network licensing technology as it is developed. 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. If you have a small number of users who use individual workstations 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 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 the right tool.

Setting up a basic license server is a straightforward process. The hardware requirements for a license server are modest. Connections between workstations and a reliable, always-available license server are essential as users cannot run their applications when the license server is not available. You can use the Network License Manager and the

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FLEXlm utilities to set up your license server. When you register and activate your network license(s), you receive a license file. This file defines how many licenses of each product for which you've purchased licenses can be run from your license server. The license file is tied to the server Network Interface Card (NIC) MAC address, so the server software is locked to an individual server. Once the license server is up and running, you use the Deployment Wizard to install "deployments" of AutoCAD software on individual workstations. Because the license server controls activation centrally, you don't need to activate individual workstations, and licenses are obtained silently from the server. In day-to-day operations, your users typically will not be aware that they are acquiring a license over the network.

Another feature of network licensing is the ability to "borrow" a license from the license server. 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. When a license is borrowed from the server pool, the total number of licenses available is temporarily decremented, until the license is returned. A borrowed license on a workstation (or laptop) means that there is no longer a need to be connected to the license server for the application to run. If the borrowed license on the workstation/laptop expires before the user reconnects to the network the license expires on the workstation, and it is automatically returned to the pool on the license server. At this point, the user can log on to the network to borrow another license – this can be done remotely, and does not require a direct connection to the LAN, but does require a secure connection. The most common use for license borrowing is to place an AutoCAD license onto a laptop that can then be taken on a trip.

The following examples show how an organization could implement individual license servers.

Example 1: A survey in your company reveals 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 your 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 2007, and then install AutoCAD 2007 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. It is essential that these users have access to a license when they need it. You have another group of 50 users who use AutoCAD for 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

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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, a free tool that is supplied with the AutoCAD 2007 Network License Manager to generate reports of license usage. SAMreport-Lite, a Macrovision product, is a subset of the full SAMreport product (which is available at extra cost from Macrovision) 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 the Media browser (the application that comes up when you insert the AutoCAD CD into your CD-ROM drive). It is located on the Network Deployment section under “Install Supplemental Tools.”

SAMreport-Lite is an 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 (Report Interchange Format). Using the RIF format, you can 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. 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 on Example 2, above. 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 up sharply at the end of the week. It turns out that many

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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 upon. It also helps you to 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:

- Single license server
- Distributed license server
- Redundant license server

Each configuration has advantages and disadvantages that will be explored in the following sections.

Single License Server: Recommended configuration. 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). 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 (low delay) and high availability. If communications between the server and client are disrupted, the AutoCAD license will time out after a period and AutoCAD will cease to operate. The licensing software is designed to compensate for brief periods of downtime (typically less than 15 minutes), but if communications are not restored in 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 their work and then AutoCAD shuts down. The application will not restart until it can reestablish communications with the license server and retrieve a license.

If you do not want to share licenses between groups of users, then you can set up multiple Single License Servers for each group. The main disadvantage with this method is that you cannot share licenses between servers. Even if the licenses on server A are not being used, users on server B cannot access them (which may be acceptable, especially if the groups of users are on separate budgets). An 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 servers, then your best configuration the next configuration: Distributed License Servers.

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Distributed License Servers: This configuration allows you to distribute your licenses over a number of servers. When a workstation attempts to retrieve a license, it can poll all of the servers until it is able to obtain an AutoCAD license. Each user's workstation has the paths to all (or some, at your discretion) of the license servers available, as defined during installation using the Deployment 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 on.

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 LAN. Each office is connected to the headquarters and to each other via high-speed connections. The interoffice connection (WAN) is generally 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 at headquarters, but are concerned that communications problems would prevent AutoCAD software from being used in local offices when connections are not available. Your solution is to configure a number of 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. Even if the server at headquarters fails, licenses from each regional office are available to the other offices (if you so designate).

Redundant License Servers: This server configuration is for situations that require extremely high availability. It is also the most demanding configuration to manage, and it is always better to choose a Distributed system if at all possible. A redundant configuration shares a single pool of licenses over three servers (it has to be exactly three) that are in constant communication with each other. As a result, if a server fails or is shut down for maintenance, the remaining servers support the whole license pool, with no negative 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 and has a number of other aspects which make them difficult to manage.

Options File

The options file is a text file that you can edit, and is the key to administrative control for a license server. You edit it to set up groups of users, enable the creation of log files, and to set other options. The following sections review the license borrowing and time-out features available in AutoCAD 2007 through the use of the options file.

License Borrowing: This is an AutoCAD 2007 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 back to the server pool when they are finished 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 the Tools menu within their running session of AutoCAD. This opens a dialog that shows the maximum borrowing period available and enables users to set a period up to the maximum, for which they would like to borrow a license. The options file gives the administrator 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.

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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 feature enables the administrator to set a maximum idle time for any AutoCAD session. If a user has checked out a license from the pool, but is not using the software (it is sitting idle), the maximum idle time set will control at what point the license is automatically returned to the pool. When the time limit is reached, the server reclaims the license and the workstation loses the license and will stop running. 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 goes to a five-hour meeting, 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 for managing your licenses. It is important to determine what type of licensing is most appropriate for your users. You can keep a majority of your seats as stand-alone users, while you run a pilot project with network licensing, or you can move most of your licenses to a license server, keeping a few essential stand-alone licenses for key users. Most companies that implement network licensing also have some stand-alone licenses for special cases.

Autodesk has many resources to help you implement network licensing. Autodesk Training Center (ATC[®]) sites offer classes on network licensing implementation and management. Autodesk Consulting 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.

The combination of flexibility, tracking, and control provided by the Autodesk 2007 Network License Manager delivers benefits from the moment you set up your license management system. You will see payoffs as you control costs, as well as improved levels 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 2007”
- “Installing the Autodesk Network License Manager for AutoCAD 2007”
- “Creating Deployments for AutoCAD 2007”

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There are three reference documents available in AutoCAD 2007 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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