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*LANrev*  
*Advanced Software*  
*Distribution*

 **HEAT** software

[www.heatsoftware.com](http://www.heatsoftware.com)

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LANrev Advanced Software Distribution 1.1 - Documentation Release 3

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# *LANrev Advanced Software Distribution*

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Welcome to the LANrev Advanced Software Distribution guide. The goal of this document is to explain some of the nuances, advanced concepts, and best practices for software distribution with LANrev that may not be discussed explicitly in the User Guide. This document assumes that you are already familiar with and understand the basics of LANrev software distribution. For basic instructions on how to configure and use software distribution please consult the LANrev Getting Started guide, User Guide, or built-in help.

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## Ways to distribute software

LANrev provides multiple ways to distribute software to accommodate various software distribution scenarios to optimize bandwidth usage and end user productivity. Software can be deployed to a group of computers at a scheduled time, pushed to a single computer immediately, or initiated by a user through LANrev's on-demand self-service portal. Installers can also first be pushed down and then executed at a later time.

The primary software distribution method is the Server Center window. It is very powerful and flexible, offering multiple configuration options for extensive customization. The major benefits of using this method include being able to:

- Customize installer behavior and user experience.
- Specify conditions when the software will or will not be installed on (e.g., do not install if prerequisite software is missing).
- Target new computers in the future by assigning software packages to smart computer groups (deployment via policy).
- Assign software packages to agents multiple times via different computer groups but having it install only once.
- Provide software to be installed from an on-demand self-service portal.
- Minimize WAN bandwidth usage by setting up local distribution points.
- Offload package transfers to distribution points to lighten the load on the server.
- Create workflows for installing multiple software packages or scripts.

Occasionally, it may be better to use another distribution method if you need to:

- Immediately install software on individual computers that are not part of an installation group.
- Install a package on a recurring basis.
- Automatically send a WOL packet in case the client computer is asleep.

- Initially push down the installer then execute at a later date and time.
- Quickly push down a single file or folder.

The table below describes the various ways to deploy software within LANrev aside from software distribution via the Server Center.

Deployment method	Advantages and disadvantages
Executing a script	<p>Good for script-driven packages. You can pass command line options to script. Within the script you can pass command line options to installer.</p> <p>A disadvantage is that you must add code to the script to pass exit error codes from the installer through the script in case the installation fails.</p> <p>Check <b>Transfer all files in folder containing executable</b> to include the actual installer and other accessory files.</p>
Executing a macOS or Windows file	<p>PKG, MPKG, VISE, and shell scripts for macOS and MSI, MSP, MSU, and BAT files for Windows are handled natively. Accepts any executable. You can specify files on an SMB or AFP share. You can pass command line options to executable.</p> <p>A disadvantage is that handling files not listed above requires adding command line options.</p> <p>Check <b>Transfer all files in folder containing executable</b> to include the actual installer and other accessory files if they are sourced from LANrev Admin itself and not a network share.</p>

Deployment method	Advantages and disadvantages
Installing software packages	<p>Payloads and package definitions from the Server Center are used, so distribution points are taken advantage of, as well as installation options, user interaction options, and installation conditions that are only available with software package definitions. You can pass command line options via package definitions.</p>
Transferring a file or folder	<p>Copies a file or folder from the admin computer to the target computer.</p> <p>Disadvantages include that you cannot pass command line parameters and the installer files are not removed from the agent computer.</p> <p>Check <b>Transfer all files in folder containing source file</b> to include the actual installer and other accessory files.</p> <p>Note that unlike the other methods, this method will leave the files transferred in place at the specified path on the target computer.</p>

Note that all of the above methods, except transferring files or folders, allow you to pass command line options to the installer executable. All of them, transferring files or folders, only store files temporarily for execution; after that the files are deleted.

Based on many factors such as the priority of the software, whether you can install silently, if you need to inform the user, or if it is optional, you may choose a particular deployment method that best fits your particular circumstances. This list outlines some possible scenarios and recommended deployment methods along with the reasons for the choices:

- Case 1: A critical security update for patching a zero-day vulnerability in a third-party application must be deployed as soon as possible.  
Recommended: Installing a software package.  
Reasons: The installation is executed immediately. Installation conditions can be used to detect the applications requiring patching.
- Case 2: A one-time deployment of an application from a network share to five computers. No other computers will ever install this application.  
Recommended: Executing a file.  
Reasons: The installation can be performed from the network share.
- Case 3: Installing an optional, non-essential application (such as Firefox).

Recommended: On-demand software distribution through the Server Center.

Reasons: Users can decide whether they want to install the package.

- Case 4: Computers must be woken up at 20:00 (8 pm) on a Friday to install packages after hours.

Recommended: Executing a file or installing software packages.

Reasons: Both ways include options to wake up the computers.

- Case 5: Users must be notified of the installation and allowed to reschedule it for up to 72 hours.

Recommended: Software distribution through the Server Center.

Reasons: Installation deadlines and rescheduling are available.

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## Distribution points

LANrev's distribution point architecture provides two major benefits for both software distribution and patch management. This functionality is built into the LANrev agent software. You can designate any LANrev agent that shows up in the **Computers** window with a green dot as a distribution point and tell it to host payloads for custom software packages and OS patches for the purposes of software distribution and patch management. Distribution points are cross-platform and can host both Windows and macOS payloads at the same time.

### Distribution point requirements

We recommend that agent computers to be designated as distribution points meet the following minimum requirements:

- At least a 100 Mbit/s network connection, although a 1 Gbit/s connection is preferable. The faster the network connection, the faster payloads are served to agents.
- At least an ATA-6 or Ultra ATA/133 hard disk, although a SATA hard disk (1.5 Gbit/s or higher transfer rate) is preferable. Most modern hard drives can read data faster than the network card can transmit it. However, an Ultra ATA/133 hard disk may become a bottleneck when paired with a 1 Gbit/s network card.
- A static IP address, unless dynamic DNS is implemented in your network environment. Agents must be able to consistently contact this distribution point agent at the same address every time.
- Is not a desktop system that users normally log into. During large software deployments, the hard disk and network adapter may be under heavy load, thus degrading the user experience for locally logged-in users.

We recommend that you assign your distribution points DNS names. This makes it much easier to move your distribution point agent computers to different IP addresses in the future if needed. The LANrev server must be able to resolve this DNS name at the time you specify it in the distribution point definition when adding it.

We highly recommend that you do not designate the computer running LANrev Server as the master distribution point. Evaluating smart groups for software distribution and serving payloads can both generate significant amounts of hard disk I/O. If both have to compete for hard disk access at the same time, it might degrade server performance during large software distributions. The only exception to this recommendation would be if your LANrev installation includes less than 1000 client devices.

## Distribution point benefits

Distributions points provide two major benefits that help lower the impact of software deployments on your network:

- Reduced WAN bandwidth usage in a distributed environment with multiple remote sites. You can designate an agent computer at each site as a distribution point and configure agents at those sites to retrieve payloads for their software packages and OS patches from their local distribution point instead of connecting to the master distribution point at the main office.
- If multiple distribution points are available to agents at a particular site, the LANrev server will load-balance them so that one is not maxed out while another is mostly idle. This maximizes the speed of deployment for your software packages and OS patches.

## Types of distribution points

There are two types of distribution points:

- **Master distribution point**  
This is the first distribution point to be set up, and it must have the **Is master distribution point** checkbox enabled. Whenever you upload payloads and save changes to the Server Center, the payloads are compressed, encrypted, and uploaded to the master distribution point first. After that they are replicated to the mirror or secondary distribution points. To minimize transfer times, consider uploading large payloads from LANrev Admin on a network segment close to the master distribution point.
- **Secondary distribution points**  
Once payloads have been uploaded to the master distribution point, they are immediately replicated to all secondary distribution points. However, if a mirroring time window has been specified, the replication is delayed until the local time on the secondary distribution point passes into the specified mirroring window.

In general, a distribution point can serve about 1000 concurrent connections. How many concurrent connections there are is affected by the frequency with which the agents check for new packages, and by how often there are new packages to download. One distribution point can thus serve at least 1000 agents, but possibly more if agents check infrequently or if new software is available only rarely.

We recommend, however, that you always have at least two distribution points, even if you have less than 1000 client computers, for

## Payload replication or mirroring

redundancy. If the master distribution point agent suffers a catastrophic hardware failure, you can temporarily promote the secondary distribution point to be a master distribution point. This secondary distribution point provides a mirror backup of all the payloads for your custom software packages and OS patches. Payloads for OS patches are automatically regenerated, but this is not the case for custom software packages; hence the need to have a backup of them. After you have replaced the malfunctioning master distribution point, demote the temporary master distribution point back to a secondary distribution point and promote the agent on the replacement master distribution point to master status.

By default, payloads are automatically replicated immediately from the master distribution point to all secondary distribution points as soon as they are uploaded to the master distribution point. In distributed environments, particularly those with slower WAN connections, it does not necessarily make sense to mirror payloads during work hours when network usage is highest and you need to reserve bandwidth for other essential services such as e-mail and user-facing applications. Distribution point definitions provide two different settings to help you minimize the impact of the payload replication process on your network:

- **Mirroring only between ... and ...:** Mirroring happens only when the local time on the secondary distribution point is within the specified window (not the time on the master distribution point). Once mirroring begins, it will continue to completion even if the time passes beyond the mirroring window. If you enable this option, be sure to set the availability date for all packages to at least 24 hours in the future to give them a chance to replicate to remote secondary distribution points before being installed.
- **Download bandwidth:** This setting throttles the bandwidth on the distribution point evenly between all connected agents so that the total bandwidth used to serve payloads never exceeds this value. If there is only one agent connected, it will get 100% of the bandwidth. If two agents are connected, the total bandwidth is split evenly between them, and so on. This setting affects master distribution points differently than secondary distribution points:
  - On master distribution points, the download bandwidth applies to both payload replication with secondary distribution points and payload download from agents. For example, if a secondary distribution point is replicating payloads at the same time a regular agent is downloading packages, each computer gets exactly 50% of the bandwidth.
  - On secondary distribution points, the download bandwidth only applies to payload downloads from agents.

By default, there is a 60-minute timeout on file transfer operations including payload mirroring. As a result, replicating extremely large payloads can fail over slow WAN links. To prevent this from happening:

1. Open the settings for LANrev Agent on the distribution points.

The settings are located in the registry or preferences files at:

- Windows (32-bit): HKLM\Software\Pole Position Software\LANrev Agent
- Windows (64-bit): HKLM\Software\Wow6432Node\Pole Position Software\LANrev Agent
- /Library/Preferences/com.poleposition-sw.lanrev\_agent.plist

Plist files can be edited with Xcode on the Mac.

2. Add the SDPackagePayloadTransferTimeout key (a number on macOS, a DWORD on Windows) and set it to the number of seconds you want the timeout to be.

For example, for a timeout of two hours, set the key to 7200.

Make sure the timeout is long enough so that even the largest payloads have sufficient time to replicate in your environment.

3. Restart the agent.

In macOS, double-click the LANrev Agent.app package to do so or use Activity Monitor. In Windows, use the Services applet.

## Manual replication or mirroring

At some sites with very slow network connections or where the bandwidth is limited, you may choose to manually mirror payloads so that you have more control over which ones are copied and when they are transferred. By default, all payloads are automatically replicated immediately from the master distribution point to all secondary distribution points as soon as they are uploaded to the master distribution point. To manually replicate payloads:

1. Disable automatic mirroring. This is done by adding the following value to the agent settings on the secondary distribution point. This needs to be added to the com.poleposition-sw.lanrev\_agent.plist preference file on macOS or the LANrev Agent registry key on Windows.

- SDAutoMirroringDisabled (DWORD/Boolean): 1/Yes

2. Determine the payload IDs associated with payloads of interest so you can copy those files manually from the packages root path on the master distribution point to the secondary distribution point that has mirroring disabled.

To do so, add the **Payload Unique ID** information item to the **Server Center** window to display the ID for your payloads.

You can add this information item to the **Payloads** and **Software Packages** sections.

3. Manually copy the desired payloads between your distribution points.

If you would like to force LANrev to mirror all payloads once while mirroring is disabled, run the agent executable with the `--MirrorSDPackages` command line option:

- Windows (32-bit): `"%ProgramFiles%\Pole Position Software\LANrevAgent\LANrev Agent.exe" --MirrorSDPackages`
- Windows (64-bit): `"%ProgramFiles(x86)%\Pole Position Software\LANrevAgent\LANrev Agent.exe" --MirrorSDPackages`
- macOS: `"/Library/Application Support/LANrev Agent/LANrev Agent.app/Contents/MacOS/LANrev Agent" --MirrorSDPackages`

## Replacing a failed master distribution point

If your master distribution point suffers a catastrophic hardware failure, you may have to replace it with an existing secondary distribution point. You should always have at least two distribution points for disaster recovery.

If an agent is unable to contact the distribution point it has been assigned for a particular payload, it will automatically contact the LANrev server for the contact information of another available distribution point. If no other distribution points are available, the installation will fail with an error message indicating this.

To promote a secondary distribution point to temporary master distribution point status and remove the old master distribution point so you can fix it:

1. Edit the distribution point definition for the secondary distribution point and check **Is master distribution point**.
2. Delete the original master distribution point definition. When notified that "Changing the master distribution point requires the software installers to be transferred", click **Manually Copy Folder**.
3. Save your changes to the Server Center.

If you do repair the original master distribution point, you are done.

If you repair the original master distribution point then follow perform this procedure to restore it:

1. Once you have repaired the original master distribution point, make sure that it shows up in the **Computers** window with a green dot.
2. Add it as a distribution point and check **Is master distribution point**.
3. Edit the definition for the temporary master distribution point and uncheck the **Is master distribution point** checkbox.

4. When notified that “Changing the master distribution point requires the software installers to be transferred,” click **Re-Upload Packages**.
5. Save your changes to the Server Center. It may take a while to replicate payloads from the temporary master distribution point back to the repaired original, depending on the size of your packages root path folder.

## Assigning distribution points

Before you can configure agents to download software from particular distribution points, you must first assign the distribution points to agent devices.

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**NOTE** If you do not assign a distribution point to any computer groups, it is available to all computers. (A distribution point not assigned to any computer groups is functionally identical to one assigned to all computer groups.) If you only have one distribution point then there is no need to assign it to client computers for the above reason.

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There are two different ways to assign distribution points to agent computers, each with its own merits. They are not mutually exclusive and can be used at the same time, although it is better to use just one to keep things simple:

- Specify a contiguous IP address block in the **IP range to serve** field in the distribution point definition. Entering a beginning and ending IP address here assigns this distribution point to all devices within that IP range. This method is the easiest way to assign distribution points to agent computers if all your sites have distinct non-overlapping IP address blocks.
- Distribution points can also be explicitly assigned via computer groups, either standard or smart ones. You will need to use this method if you want to assign distribution points some other way than contiguous non-overlapping IP ranges. Some sites may have multiple non-contiguous IP blocks that overlap with other sites. You may also choose to assign distribution points via some other smart group criteria such as Active Directory computer OU or computer group.

To assign a single distribution point to multiple groups:

1. Click the distribution point in the sidebar of the **Server Center** window to display its detailed view.

You can also right-click the distribution point definition in the table area of the window and choose **Show Distribution Point Details**.

2. At the bottom of the details view, check the computer groups to which you would like to assign the distribution point.

## Decoupling distribution point assignment from package assignment

To assign multiple distribution points to a single computer group:

1. Expand the **Computer Groups** section in the sidebar of the **Server Center** window.
2. Click the **Software Distribution > Distribution Points** section in the sidebar.
3. Drag the desired distribution points from the table area on top of the target computer group in the sidebar.

It is possible to decouple distribution point assignment from package assignment. This is important because you most likely do not want to assign distribution points using the same computer groups that you would use to assign software packages. For example, distribution point assignment might be by non-contiguous IP address ranges that represent different geographic sites while package assignments might be by Active Directory computer OU that represent different departments (which may have agents in multiple geographic locations).

To accomplish this you would set up two different sets of smart computer groups and then assign only distribution points to the first set of computer groups and only software packages to the second set of computer groups.

Take the following example:

- San Francisco site
  - IP ranges 192.168.11.1–192.168.11.254 and 192.168.13.1–192.168.13.254
  - Distribution point A
- Dallas site
  - IP range 192.168.25.1–192.168.26.254
  - Distribution point B and C
- New York site
  - IP ranges 192.168.12.1–192.168.12.254 and 192.168.32.1–192.168.32.254
  - Distribution point D
  
- Marketing Department
  - Active Directory OU Marketing
  - Software Package 1
- Accounting Department
  - Active Directory OU Accounting
  - Software Package 2
- Technical Support Department
  - Active Directory OU Tech Support
  - Software Package 3

When a computer from the Marketing department located in Dallas with an IP address of 192.168.26.53 checks in for assigned software packages, it will download Package 1 from either distribution point B or C, depending on which one is the least busy at the time.

## Configuring agents to download payloads from assigned distribution points

By default, package payloads are available for download from any distribution point. This is because unassigned distribution points are available to all agents. From where agents download a particular payload for a package is decided on a per-package basis. To configure agents to only download a package from their assigned distribution points, you must choose the **From assigned distribution point only** option for the **Distribution point** setting in the **Installation Options** tab for each package. While this allows for more precise control of where individual payloads are downloaded from, it can become tedious to manage. We recommend that you specify **From assigned distribution point if available** because it allows for automatic fallback.

To set this option globally for all packages, enable the **Only use when assigned to group or via IP range** checkbox in the distribution point definition for all your distribution points. Doing this overrides the **Distribution point** installation setting for all software packages, and they behave as if **From assigned distribution point only** was chosen, regardless of the actual setting of the **Distribution point** option for a package.

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## Software Packages

Software packages in LANrev are composed of:

- One or more payloads, each containing a set of one or more installation files.
- A software package definition containing metadata that controls when the package installs, how it interacts with the user, and under which conditions it installs.

## Repackaging macOS applications with InstallEase

Most Windows applications do not need to be repackaged for deployment, since Windows installers, regardless of their type, typically include some kind of command line silent switch. (These switches can usually be obtained at <http://www.itninja.com/tips>.) Some Windows installers even let you customize the installation file by either recording an answer file or manually creating one, such as via an INI file.

This is not necessarily the case for macOS applications, as many of them do not come with installers and are installed simply by dragging them to the Applications folder. Most macOS installers cannot be customized with answer files. Third-party installers such as VISE installers will put up, at minimum, a progress bar and can sometimes even prompt users for information.

While we recommend using the native installers whenever possible to maintain the built-in intelligence and dependency checking, sometimes you have no choice except to repackage your application if the native installer does not behave exactly the way you need it to or it does not run completely silently. For these occasions, LANrev includes the snapshot repackaging utility InstallEase.

With InstallEase, you can:

- Take “before” and “after” snapshots of a reference Mac to generate a custom PKG or DMG installer.
- Output to Iceberg project format to add versioning or pre- and postinstallation scripts before building your PKG.
- Drag and drop files directly from the Finder to add them.
- Install files for the current user or all users.
- Automatically exclude extraneous file changes generated during the normal operation of the OS.
- Generate uninstallers based on the original PKG installer, the PKG installer receipt, or by manual addition from the Finder.
- Snapshot application registrations or activations to find out where that data is stored so you can create a package to deploy it.

Remember to always verify snapshot file changes to remove extraneous changes not part of your installation that can occur as part of the normal operation of macOS. Please consult the InstallEase user guide for detailed instructions on usage.

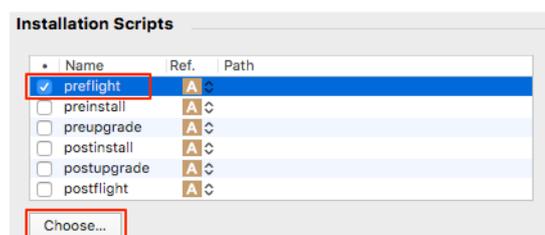
One of the benefits of repackaging macOS software into PKG format if it does not already come that way is that PKGs are the only type of Mac installers that leave behind an installer receipt, which is inventoried as part of installed software by LANrev.

## Adding pre- and postinstallation scripts with Iceberg

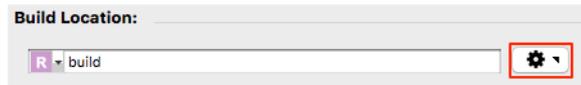
Iceberg is an integrated packaging environment with its own PKG generation engine. It is available at <http://s.sudre.free.fr/Software/Iceberg.html>. A preinstallation script can be used to close the current application being replaced or upgraded, and a postinstallation script can be used to customize the installed application.

To add pre- or postinstallation scripts:

1. In InstallEase, output your package as an Iceberg project. The project will automatically open in Iceberg if that application is installed.
2. In Iceberg’s sidebar, open the **Scripts** section for the project.
3. In the Installation Scripts section on the right, check the script type you would like to add (**preflight**, **preinstall**, **postflight**, **postinstall**), click the **Choose** button, browse to, and select the desired script file.



- Click **Project** in the sidebar. On the right side, click the gear menu icon, choose **Choose**, and choose your desktop folder as the build location.



- Choose **Build > Build**. Your new PKG with the scripts included will be created on your desktop.

## Software payloads

A payload is a set of installation files. LANrev will accept any installer executable, but the following installer formats receive special handling to automate them and help them run silently.

- Windows: MSI, MSP, MSU, and BAT files. Other installers require that you enter option switches into the **Command line options** field in the **Package** tab to drive them silently. Look up command line options for your applications at <http://www.itninja.com/tips>.
- Mac PKG/MPKG, VISE (progress bar appears on agent), and shell scripts (if they have been made executable by applying `chmod a+x`).  
DMG payloads must mirror the hard drive folder structure where you want files to be installed. They are a good choice for software that can be installed just by dragging it to the desired location (without requiring an installer).

While a software package definition can contain more than one payload, only one of them can be the primary executable payload. If you include more than one executable payload in a software package definition, only the primary executable payload will be installed. All other payloads are considered accessory files and are not executed. They are downloaded to the same temporary installation folder as the primary executable payload but they are not executed.

macOS software payloads should always be uploaded from LANrev Admin running on macOS because Windows cannot handle macOS file metadata nor Unix permissions and will discard them, rendering macOS installers nonfunctional. All other payload actions, such as assigning them to packages, can also be performed from LANrev Admin running on Windows once the payload has been successfully uploaded.

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**NOTE** Including multiple executable installers as payloads in the same package definition does not actually install all your installers. Only the primary executable payload is executed. To install multiple installers at the same time you need to add payloads and software packages for all of them and then bundle those packages together in a metapackage.

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The main purpose of including multiple payloads in one package is to be able to specify multiple answer files along with the same executable installer files to get different installations of the same product, usually a

software suite. This allows you to reuse your executable payloads with different answer files to reduce the amount of disk space used on the distribution points and thus reduce mirroring or replication. For example, you could use the same MSI installation file with multiple different MST files or the same PKG installer with different choice changes XML files. Remember to supply a switch in the **Command line options** field to reference the accessory answer file so that it is read by the primary executable payload. This typically requires that you reference the fully qualified path to the answer file in the command line options. The problem with this is that the installation files are normally extracted to a unique path on each agent which is different on every computer. To compensate for this, LANrev provides the LANREV\_EXECUTABLE\_DIRECTORY environment variable to reference the fully qualified path to where payload installation files have been downloaded and extracted. Use this environment variable for any command line switches or scripts in installation packages when you need to reference an answer file:

- Windows: %LANREV\_EXECUTABLE\_DIRECTORY%
- Mac: \${LANREV\_EXECUTABLE\_DIRECTORY}

## Installation options

For non-silent installations, an agent normally downloads payloads for software installations only after the user has clicked to initiate the installation in the locally displayed dialog. However, this can result in longer perceived installation times when **Inform user before installation, Allow to reschedule, Allow to refuse, or Display progress to user** is used.

For very large packages, such as those several GB in size, the possibly long download time can add to the perceived installation time by the end user. To enhance the user experience in these cases, you can set the **Download payloads** option to **Before user dialog**.

This prestages the software package so that the payload is downloaded silently in the background and is already present on the client computer when the user is presented with the installation dialog. The agent can then proceed immediately to the installation phase, for a noticeably shorter perceived installation time. This will improve perceived performance especially in networks with slow connections. The other benefit is that interrupted downloads will resume from where they left off when the network connection is working again. Since the download phase is silent, in this case the user is never even aware that there was an interruption or delay because the installation dialog is not presented until after the download is finished.

In general, set the following installation contexts for software packages. These will almost always allow the package to install even when the logged-in user has no admin privileges:

- Windows: **System account user**
- Mac: **Currently logged-in user**; check **Requires admin privileges**

In some rare instances, certain Windows software may not be packaged correctly by the software vendor and is configured to install on a user basis instead of a system basis. In that case, you may have to specify a domain or local user admin account and add command line options to change the installation basis for the package. Otherwise, the Start menu shortcuts and the Add/Remove Programs entry may not show up for your installed application even though the application appears to install correctly.

The most common reason why users ask for admin access to their workstations typically is because they need to install certain non-standard software to perform their jobs. The drawback of granting their request is that more often than not software other than what is sanctioned by your organization, such as peer-to-peer file sharing software or malware, ends up being installed on the system. LANrev's self-service on-demand installation option gives users the ability to install software without having to grant them admin privileges. As described in the previous section, software packages can be configured to install with admin privileges even if the currently logged-in user is a standard user. The advantages of this method are:

- Users can still install software as standard users without admin privileges.
- They can install assigned packages on their own schedule by initiating software installations themselves via a self-service on-demand interface.
- They can only install packages you have specifically assigned to them and not just any software they wish.
- Reduces over-installation of under-utilized applications that go unused by users they are assigned to.
- Reduces maintenance costs due to virus or malware infestations since users no longer have admin access to install unapproved software.
- Reduces liability due to peer-to-peer file sharing software on your corporate network.

## Access to the on-demand self-service portal

There are three different ways for users to install software on demand.

1. There is a **Show On-Demand Software** button in the **Software Updates** tab of the agent control panel or preference pane.
2. The agent implements a URL handler that responds to the following URL in most popular browsers:

```
lanrevagent://ShowOnDemandPackages
```

You can either link to this URL on your intranet or add a shortcut to it in users' Start menus, Docks, or desktops.

3. The agent executable also accepts the `--ShowOnDemand-Packages` command line option.
  - Windows (32-bit): "%ProgramFiles%\Pole Position Software\LANrevAgent\LANrev Agent.exe" -- ShowOnDemandPackages

- Windows (64-bit): "%ProgramFiles(x86)%\Pole Position Software\LANrevAgent\LANrev Agent.exe" --ShowOnDemandPackages
- macOS: "/Library/Application Support/LANrev Agent/LANrev Agent.app/Contents/MacOS/LANrev Agent" --ShowOnDemandPackages

Using the **Install Software Packages** command with a package marked for on-demand distribution will automatically bring display the on-demand window on the user system.

## Linking to the on-demand self-service portal

Follow the instructions below to create shortcuts to access the on-demand self-service portal. This can be particularly useful if you have hidden the LANrev agent control panel or preference pane.

### Windows

1. In your browser of choice, drag the icon at the far left of the address field to the desktop
2. Right click this Internet shortcut and choose **Properties**. In the **General** tab, enter the desired name for this shortcut in the field at the top, e.g., "On-Demand Software"
3. In the **Web Document** tab, change the **URL** field to "lanrevagent://ShowOnDemandPackages"
4. If you want to give the shortcut a custom icon, click **Change Icon** and choose the icon file you want to use.
5. In the **Security** tab, grant the **Everyone** group **Read & execute** permission so that anyone can launch the shortcut.

### macOS

1. Enter "lanrevagent://ShowOnDemandPackages"" into the Safari address field and drag the globe icon at the left of the field to desktop.

2. Rename the Internet shortcut as desired.

If you want to give the shortcut a custom icon, continue below. Otherwise, you are done.

3. Right-click a file with the desired icon and choose **Get Info** from the context menu.
4. In the information window, click the icon in the upper left corner so that it is outlined in blue.
5. Choose **Edit > Copy**.
6. Right-click the bookmark file you created in step 1 and choose **Get Info** from the context menu.

7. In the information window, click the icon in the upper left corner so that it is outlined in blue.
8. Choose **Edit > Paste**.

## User interaction options

LANrev provides multiple ways for packages to interact with users and does not assume that they will always install silently. The list of user interaction options is cumulative, which means that every interaction option includes all the other ones above it. For example, **Allow to refuse** will also inform the user before installation and allow them to reschedule.

**Inform user before installation** and **Allow to reschedule** only take effect if a user is logged in. If no user is logged in at the time, then packages with these options enabled are installed silently without any user interaction. **Allow to refuse** automatically sets **Install when** to only **A user is logged in**. As a result it will wait for a user to log in before installing. Instead of **Allow to refuse** consider using the **Allow on-demand installation** option for the reasons discussed above in the “Installation options” section.

## Installation conditions

Installation conditions let you add intelligence to a software package definition to resolve dependencies, so that you can require other prerequisite software to be present or not present for a package to install. There are many possible uses for installation conditions. Below is a short list of three very common use cases:

- Install a mandatory piece of software only on computers that do not already have it installed.

Install the software on all target computers  
 Install the software only on computers where the software specified below is not present :

Identify software by: Windows Installed Software

Identify software matching all of the following conditions:

Name	begins with	Symantec Endpoint Protection	-	+
------	-------------	------------------------------	---	---

- Patch or upgrade a third-party application only on unpatched or non-upgraded computers, while ignoring those on which the application is not installed.

Install the software on all target computers  
 Install the software only on computers where the software specified below is present :

Identify software by: Windows Application File

Identify software matching all of the following conditions:

Name	is	AcroRd32.exe	-	+
File Version	is less than	9.4.0.195	-	+

- Install software only if other prerequisite software is present.

The screenshot shows a configuration window for software installation. It has two radio buttons at the top: "Install the software on all target computers" (unselected) and "Install the software only on computers where the software specified below is" (selected). To the right of the second radio button is a dropdown menu set to "present". Below this, there are two fields: "Identify software by:" set to "Windows Installed Software" and "Identify software matching" set to "all" of the following conditions. Below these fields is a list of conditions. The first condition is "Name" set to "begins with" and "Microsoft .NET Framework". There are minus and plus buttons to the right of the condition list.

If you have chosen to identify software matching **all** specified conditions, the conditions are evaluated serially in the order listed. Only entries that meet the first identification criterion are processed against the second criterion. Only entries that meet both the first and second criteria are processed against the third, and so on. If **any** is chosen for the installation conditions, they are processed in parallel at the same time for all entries.

Because of the way LANrev processes installation conditions as illustrated above, the most efficient way to detect a piece of software based upon multiple criteria is with the **all** option. Whenever possible, use Path for the first identification criterion and specify the fully qualified path to the file, including the actual filename. Doing so means you do not require Name as the second criterion. You should only use both Path and Name when the same file might be found at multiple different paths.

Computationally, Checksum is the most expensive criterion to evaluate, so we strongly recommend that you only use it together with other criteria and with the **all** setting. (LANrev then automatically evaluates it only for those files that already match all other criteria.)

Note that on-demand packages respect installation conditions, which means that assigned software packages whose installation conditions are not satisfied will not show up in the on-demand self-service portal. Only when their installation conditions are met will they be offered to the end user.

Note that installation conditions accept environment variables both from the OS and from LANrev. These can, for example, be used to reference different file and registry paths that may change depending on the versions of Windows. A complete listing of these can be found in the section labeled "Environment Variables" in the User Guide.

## Metapackages

Metapackages provide a way for bundling multiple packages and scripts together into a single entity and installing them in a particular order. Each subpackage has its own payloads. It is also possible to nest metapackages within other metapackages. If a subpackage is assigned to the same agent computer more than once directly or indirectly via one or more packages, it will still be installed only once. This behavior is to prevent packages from installing redundantly on client computers.

There are many uses for metapackages, including:

- Installing packages in a particular order, in case an application includes updates.
- Executing a pre-installation subpackage, such as a script, to close the current application to be updated if the subpackage that follows is an update.
- Executing a post-installation package, such as a script, to register or configure the application that was installed in the previous subpackage.

For example, you could create an application metapackage that includes the following subpackages:

- Microsoft Office 2010
- Office 2010 SP1
- Office 2010 point update

You could then also build an even bigger departmental metapackage that includes the above metapackage along with some other packages:

- Microsoft Office 2010 metapackage
- Adobe CS5 Design Standard
- Firefox 8

Metapackages can also be preassigned to client computers via smart computer groups so that software is automatically redeployed to client devices after reimaging. This lets you restore a base image that does not include user applications and does not have to constantly be rebuilt every time there is a change or update in one of these applications.

Some of the installation items in metapackages are disabled since they are overridden by the ones set for the subpackages, while other options set for the metapackage override those for the subpackages. Some installation items can be set for both the metapackage itself and subpackages. In these instances the setting for one of them will take precedence or both of them will be evaluated in a particular order. This list describes the evaluation priorities for package settings:

- **Availability date:** metapackage only
- **Install at:** metapackage only
- **Install when:**
  - **A user is logged in:** metapackage only
  - **No user is logged in:** metapackage only
  - **Only install between:** metapackage only
  - **Don't install on slow network:** metapackage only
- **Download payloads:** metapackage only
- **Priority:** metapackage only
- **Distribution point:** metapackage only
- **Installation user context:** subpackage only
- **User context password:** subpackage only
- **Requires admin privileges:** subpackage only
- **Other options:**
  - **Keep package files after installation:** subpackage only
  - **Other options:** metapackage only

- **OS platform:** Conditions from both metapackage and subpackage must be met
- **Minimum version:** Conditions from both metapackage and subpackage must be met
- **Maximum version:** Conditions from both metapackage and subpackage must be met
- **Platform architecture:** Conditions from both metapackage and subpackage must be met
- **User Interaction** tab (all items): metapackage only
- **Installation Conditions** tab (all items): Conditions from both metapackage and subpackage must be met

---

## Tracking software installations

LANrev includes reports for software packages that are currently being installed, have installed successfully, or have failed to install. These reports list installations for any applications with these respective statuses. Note that you can build your own installation status reports for specific applications to make it easier to track them by simply adding a selection criteria for the Package Name information item.

By default, LANrev does not include a report for pending software packages (those that have been assigned but have yet to be installed). To create a report for pending software packages:

1. Right-click the table area of the **Server Center** window and choose **Software Distribution > New Missing Software Packages Group**.
2. Fill in the fields as follows:
  - **Smart Group Name:** Pending Software Packages
  - **Package Name: is not** "n/a"
3. Click **OK**.

If you would like to create pending software packages reports for a specific application then enter a specific application name in for the *Package Name* selection criteria in step 2. Note that all installation status entries in the **Status Reports** area of the Server Center are updated as the agent transmit new information. The **Installation Status** column will change according to the progress of the installation from "Download started" to "Download done" to "Installation started" to "Installation done" or "Installation failed".

If an assigned software package for a particular agent does not appear in one of the installation status reports then it means that some installation option or condition was not met, which means it should still appear in your custom pending software packages report.

## When do agents check for assigned packages?

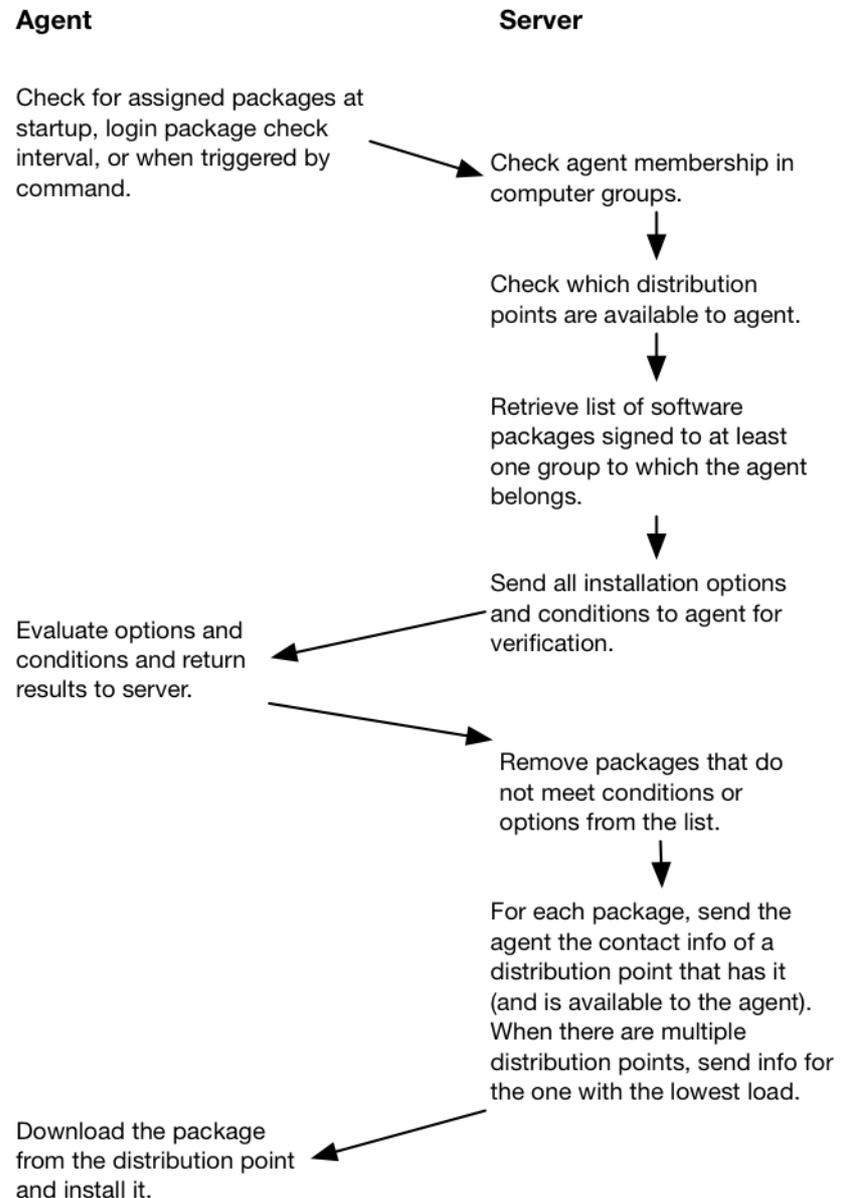
LANrev agents check for assigned custom software packages:

- When the agent starts, such as during bootup.
- Immediately after login.
- When the software package check interval passes
- When a **Run Software Distribution Check** command is received by the agent.
- When a software distribution check is initiated locally by the agent via the SDCheck registry value or --SDCheck command line switch.

Knowing when agents check for packages allows you to predict when an assigned software package might install and lets you force a package to install sooner if needed.

## Software installation process

The workflow diagram below outlines the software installation process and how LANrev Agent determines which packages to install and which distribution point to download them from. Knowing how this process works will help you understand why a package may not install correctly as intended.



## Software distribution troubleshooting

If software distribution fails or does not attempt to install, please go through the following checklist to verify that it is not misconfigured.

1. Is the agent computer pointing at the correct address for the software distribution server and has the correct server certificate been specified? Add the **SD Server Address** and **SD Server Unique ID** information items to the **Computers** window to find out. If the server certificate has been installed correctly, the value reported in the **SD Server Unique ID** field will match the server

unique identifier displayed at the bottom of the **Server Settings** section of the **Server Center** window.

Agent Name ▲	SD Server Address	SD Server Unique ID
● Ricot	192.168.178.23	7F2AA0A8-7A3A-4271-AA42-F3ADE47C8BDC
Server unique identifier: 7F2AA0A8-7A3A-4271-AA42-F3ADE47C8BDC		
Server certificate fingerprint: 4C:9C:BF:F2:E4:EE:2F:D5:57:0C:DC:63:21:1E:FE:7C:66:62:37:8E		

- Have you defined at least one master distribution point to host software packages? If not, LANrev will not be able to upload software payloads you have added. Make sure you have at least one distribution point set up in the Server Center, and that one of them has the distribution point type set to **Is master distribution point**. When this is set up correctly, two packages named “LANrev Agent (macOS)” and “LANrev Agent (Windows)” are shown in the **Software Packages** section.

Max. downloads may be exceeded

Distribution point type:  Is master distribution point

Distribution bandwidth:  Limit to  kilobytes per second

- Has the package being deployed been assigned to at least one distribution group of which the target computer is a member? Check the software package details display for a particular package to find out to which distribution groups it has been assigned. Make sure that the target in question is a member of at least one of those distribution groups.

Group Name
<input type="checkbox"/> All Macs
<input type="checkbox"/> All PCs
<input checked="" type="checkbox"/> Marketing Department

- Have you saved your changes to the software distribution server? If the **Save Distribution and Licensing Info** command in the **Server** menu is not grayed out or the save changes icon is active it means that you have pending changes that must be saved. Many changes you have made to the Server Center do not become effective until you have explicitly saved them to the server.
- Has the package check interval (60 minutes by default) passed yet? If not, you can trigger a check immediately with the **Run Software Distribution Check** command. Normally, agents check for new packages when one of the following occurs:
  - When the package check interval passes.
  - Every time the agent computer is started or a user logs in.
  - When a **Run Software Distribution Check** command is sent.
  - When a package check is triggered locally on the agent computer via the command line or registry.
- Have all of the installation options and conditions for the package been met? Check the software package details view of the package and make sure all of these options and conditions have been met.

7. If the package is set to interact with the user (such as **Inform user before installation**, Allow to reschedule, Allow to refuse, or Display progress to user) on a Windows computer, have you logged out and logged back in at least once since the Windows LANrev agent was initially installed? Packages can fail to install on Windows if user interaction is enabled for the installation and the LANrevAgentInstallerHelper.exe process, which allows the agent to interact with the current user and launches as a login process, is not currently running. Logging out and back in will resolve this issue.

## Reinstalling software

LANrev agents keep track of every assigned software package it has installed before. Packages are tracked via a universally unique ID (UUID) that is assigned to the package at the time it was added in the Server Center. The display name is merely for admins' convenience as LANrev actually uses the software package UUID to track software packages. As a result, it is possible to have two different packages with the exact same display name but two different UUIDs. The Server Center includes a context menu command to duplicate software packages, in case you want to build similar packages that have slight different payloads or installation items, depending on the computers you want to target.

LANrev agents track previously installed packages in the Installed Software Packages.plist file that can be found at the following locations:

- Windows XP: %ALLUSERSPROFILE%\Application Data\Pole Position Software\LANrev Agent
- Windows Vista and up: %ProgramData%\Pole Position Software\LANrev Agent
- macOS: /Library/Application Support/LANrev Agent

Once an agent has initiated the installation of a package, whether it completed successfully or not, it will not attempt to install that package again. Failed packages do not attempt to reinstall because the agent does not necessarily know what error condition caused the installation to fail. An exit code or message along with additional data can be found in the **Installation Result Error** and **Add. Status Information** fields of the Failed Installations status report in the Server Center. In some instances you may wish to reinstall successfully installed packages again because they were removed or have become corrupt. In other cases you only want to reattempt installations on targets that they previously failed on. In both instances there are context commands in the Server Center to accomplish this by either resetting or retrying the packages:

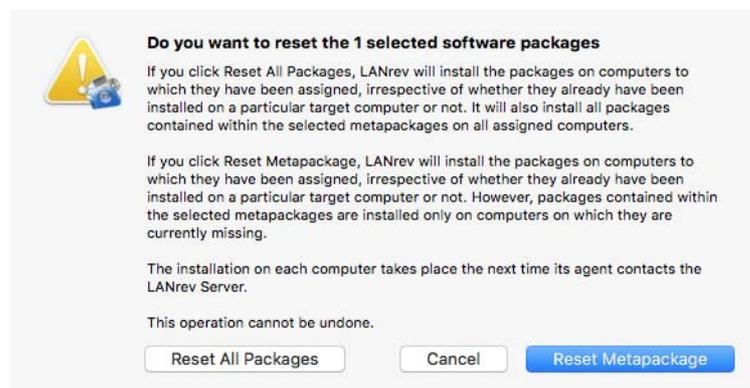
- **Retry Package:** Causes the selected package to only attempt to reinstall on computers where it previously failed to install. Agents that successfully installed the package before will not attempt to install it again.
- **Reset Package:** Tells all agents the package is currently assigned to, to treat it as a new package as if they have never

seen the software package before, regardless of whether it previously installed successfully or not.

When retrying or resetting metapackages you must choose whether you want to retry or reset just the metapackage itself or the metapackage and all of its subpackages. Retrying or resetting just the metapackage will cause only the subpackages that previously failed or have not already installed to install. Retrying or resetting the metapackage and all of its subpackages will cause all subpackages to reinstall regardless of their previous installation status on the target computer.

Consider the following scenario: Your metapackage contains subpackages A, B, and C in that order. You replace package B with a new package D.

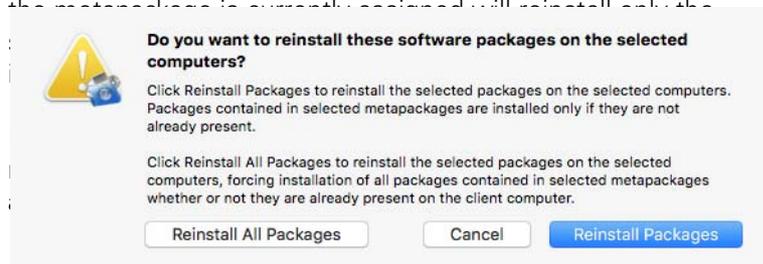
If you invoke **Reset Package** on the metapackage, you will be presented with the following dialog:



Clicking the buttons has the following effects:

- **Reset All Packages:** All agents to which the metapackage is currently assigned will reinstall all subpackages A, D, and C (but not B since it was removed from the metapackage).
- **Reset Metapackage:** All agents to which package is currently assigned will install subpackage D only (since it is new).

If you invoke **Retry Package** on the metapackage, all agents to which the metapackage is currently assigned will reinstall each of the



Clicking the buttons has the following effects:

- **Reinstall All Packages:** Subpackages A, D, and C will reinstall on the selected agent (but not B since it was removed from metapackage).

- **Reinstall Packages:** Only subpackage D is reinstalled on the selected agent (since it is new).

If you use the **Install Software Package** command to deploy metapackages, the following options correspond to the behavior seen in the **Server Center** window:

- **Install packages even if they are already present:** Same behavior as **Reset Metapackage** and **Reinstall Packages**. Only new subpackages are installed
- **Install packages contained in metapackages even if they are already present: Same behavior as Reset All Packages and Reinstall All Packages.** All subpackages are reinstalled.

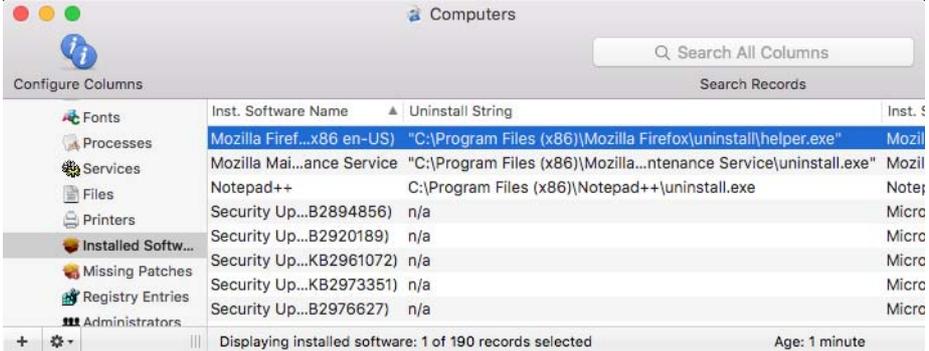
## Uninstalling or rolling back software

For various reasons, you may occasionally need to remove software that you have previously deployed. Perhaps you deployed the wrong package or targeted the wrong agents.

### Uninstalling Windows software

This can be accomplished by looking up the uninstall string for the installed software in question and then issuing an **Execute Script** command that uses the uninstalling string to remove it. You can also put the uninstall string in a BAT file and add that as a software package that can be deployed via software distribution.

To find out what the uninstall string is for a piece of software, add the **Uninstall String** information item to the **Installed Software** section of the details view for an agent or to the **PC Installer Receipts** report in the **Installed Software** window. Then right-click the uninstall string of interest and choose **Copy "Uninstall String"**.



Inst. Software Name	Uninstall String	Inst. s
Mozilla Firef...x86 en-US)	"C:\Program Files (x86)\Mozilla Firefox\uninstall\helper.exe"	Mozil
Mozilla Mai...ance Service	"C:\Program Files (x86)\Mozilla...ntenance Service\uninstall.exe"	Mozil
Notepad++	C:\Program Files (x86)\Notepad++\uninstall.exe	Note;
Security Up...B2894856)	n/a	Micrc
Security Up...B2920189)	n/a	Micrc
Security Up...KB2961072)	n/a	Micrc
Security Up...KB2973351)	n/a	Micrc
Security Up...B2976627)	n/a	Micrc

The uninstall string is the command that gets executed when you click **Remove** in the Add/Remove Programs control panel or **Uninstall** in the Programs and Features control panel. These typically run interactively. Many of them can be modified to include a silent switch to drive them silently. Please consult the vendor for your software to find out if there is a silent switch. These silent switches, if available are typically /s, -s, /q, /silent, -silent, or /quiet and can sometimes be found at <http://www.itninja.com/tips>. You may also be able to uninstall an application silently using WMIC statements such as wmic product

where `name=<product name>` call `uninstall /nointeractive` (where you replace `<product name>` with the actual name of the product).

For MSI packages, you can simply edit the command to replace the `/I` with a `/X` if it does not already have one and append `/QN` to drive the uninstallation silently:

- Original uninstall string: `MsiExec.exe /X{CDA2B651-FA2F-47E6-BA8A-D690C096E064}`  
Silent uninstall string: `MsiExec.exe /X{CDA2B651-FA2F-47E6-BA8A-D690C096E064} /QN`
- Original uninstall string: `MsiExec.exe /I{CDA2B651-FA2F-47E6-BA8A-D690C096E064}`  
Silent uninstall string: `MsiExec.exe /X{CDA2B651-FA2F-47E6-BA8A-D690C096E064} /QN`

## Uninstalling Mac software

Mac software typically comes in two formats, PKG installers and drag-and-drop app packages, neither of which include by default a built-in mechanism for uninstallation. As a result, you must build your own uninstaller using InstallEase.

For PKG installers, choose the **Uninstaller package** method in InstallEase and then specify either the original installation PKG or the installer receipt PKG from `/Library/Receipts` (if you do not have the original installer available). For drag-and-drop app packages, choose **Manually** as the method and drag the app package from its installation location into InstallEase. To build the uninstaller, check the **Uninstaller package for Apple Installer (.pkg)** option and click **Create**.

As best practice and a matter of convenience, you should always enable the option to build an uninstaller when creating custom packages with InstallEase, just in case you need to remove the software at a later time. These PKGs can be deployed either via software distribution or the **Execute macOS File** command to uninstall the software.

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## Agent localization and branding

While LANrev Admin is available in English only, LANrev Agent is localized into Danish, French, German, Norwegian, Spanish, and English.

LANrev always displays agent messages in the correct language by automatically detecting the language of the client OS. You can also rebrand the LANrev Agent user interface, allowing to you replace many of the default logos and text strings such as those displayed by software distribution.

Customizing LANrev Agent to reflect your company's logo and wording helps assure end-users that the management action or software package is coming from your organization's IT department and is not part of some malware. This branding is configured on the LANrev

server and is synchronized by agents with each heartbeat. For more information and instructions, see the Agent Branding Guide.