

# KeyShot 9 Network Rendering Manual

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# KeyShot 9 Network Rendering

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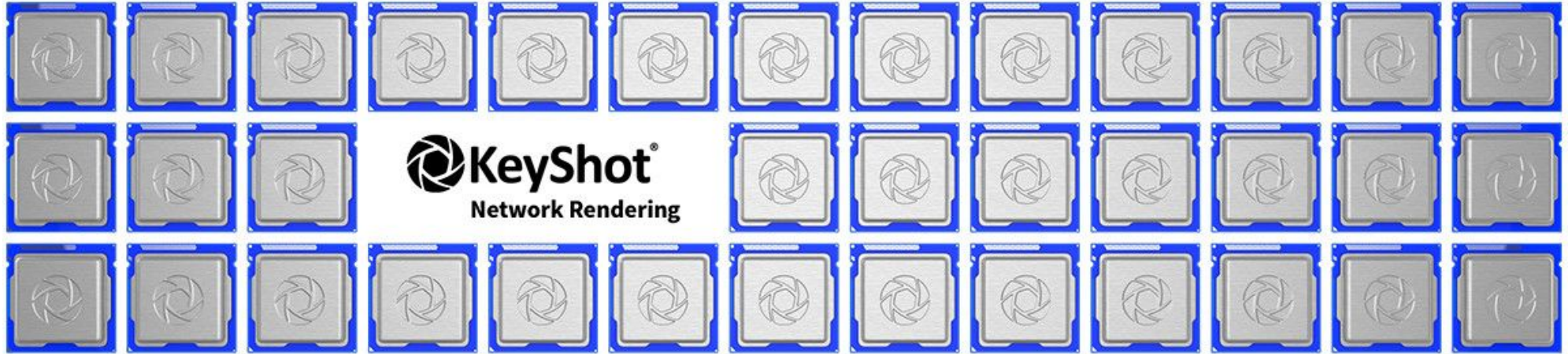
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# KeyShot 9 Network Rendering Manual



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- [KeyShot 9 Network Rendering Manual \(PDF\)](#)
- [KeyShot 9 Manual](#)
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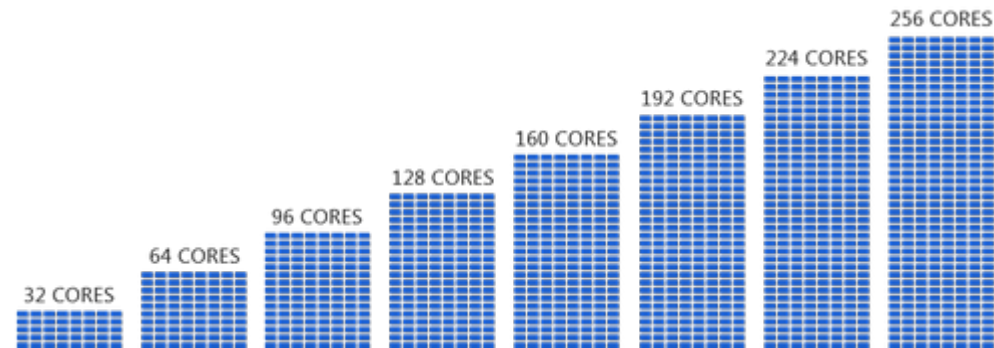
## About Network Rendering

KeyShot Network Rendering allows you to connect multiple computer systems in your office network and utilize the available hardware to reduce rendering times significantly. In addition, rendering over the network is convenient. You may continue working in KeyShot or any other application without slowing down your system while the designated rendering stations process your render "jobs".

The KeyShot Network Rendering software is compatible with macOS, Windows, and Linux. And like KeyShot, Network Rendering (9.1 and newer) can process jobs in both CPU and GPU mode, depending on the abilities of the connected *Workers*.

### CPU Jobs

For CPU jobs, the correlation between render time and number of cores in your network is approximately linear and inversely proportional. In other words, by doubling the number of cores you potentially cut your render time in half.<sup>1</sup>



*The more cores you have, the faster your images and animations will render.<sup>2</sup>*

### GPU Jobs

With GPU rendering the Render time can be even lower. E.g. Rendering on an NVIDIA RTX GPU will be 4-6 times faster than on an i7.<sup>1</sup>

You don't need a specific license to be able to render on the GPU. Each GPU will just take up 16 of the cores included in your License.

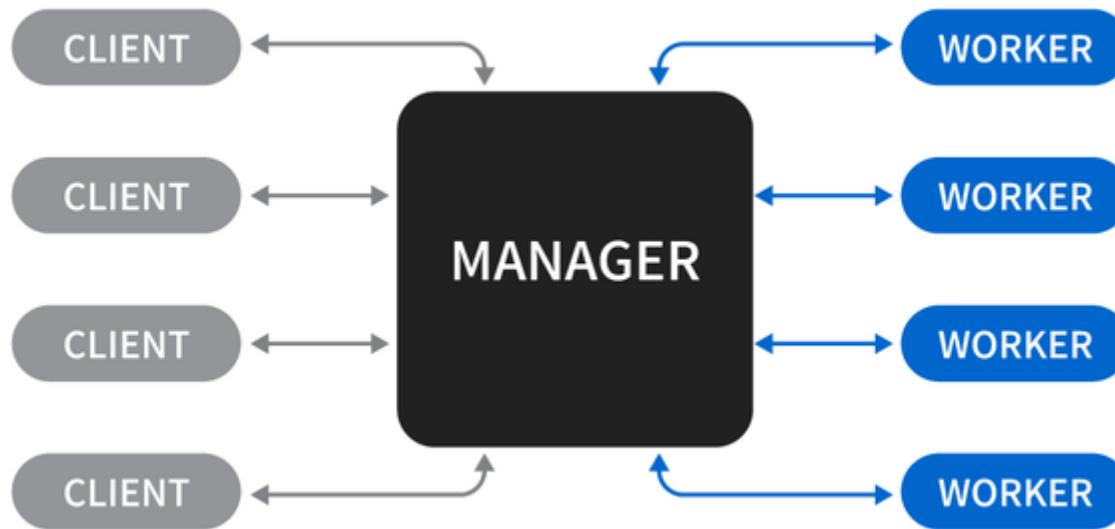
Visit the [GPU Mode](#) page in the KeyShot Manual, for more information about requirements and limitations.

<sup>1</sup> Please note that this is an approximation under optimal conditions. Render times are subject to hardware specs, core count, differences between workers, scene complexity, time scale, multi-tasking, and network traffic.

<sup>2</sup> Please note that Luxion does not sell or rent cores. All computer hardware (i.e. processor cores) is provided by the customer.

## How it works

KeyShot Network Rendering consists of three roles: Clients, Manager, and Workers.  
The figure shown below illustrates the simplest interaction between the roles, where each computer only has one role.



A computer configured as a manager and/or worker can also function as a client. In the manager's case, KeyShot (the client application) communicates internally with the manager service which runs in the background.

It is important to note that there should only be one manager on the network! [Click here](#), if you need to have multiple managers on your network.

The Manager can have both CPU and GPU workers connected, and will assign the tasks of a CPU/GPU render job to the type of workers that are relevant in each case. A worker can be set up to be available for CPU/GPU/both types of jobs if the hardware meets [requirements](#).

<i>Client</i>	<i>Manager</i>	<i>Worker</i>
---------------	----------------	---------------

<ul style="list-style-type: none"> <li>• Sends job requests to the manager (via KeyShot).</li> <li>• Receives completed jobs from manager.</li> <li>• Saves final output to specified location.</li> <li>• Can modify certain configurations of the manager, like users.</li> </ul>	<ul style="list-style-type: none"> <li>• Receives job requests from clients and places them in a queue.</li> <li>• Divides each job into computation tasks.</li> <li>• Assigns tasks to each worker.</li> <li>• Compiles all rendered output into a final image, video, KeyShotXR or configuration.</li> <li>• Sends completed jobs back to clients.</li> </ul>	<ul style="list-style-type: none"> <li>• Receives rendering tasks from manager that it computes.</li> <li>• Sends completed task results back to manager.</li> </ul>
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### Performance Specifics

#### *Bands and Regions*

To understand what's happening when you send jobs to Network Rendering, it's important to know about bands and regions and the differences between the two. When rendering still images, KeyShot divides the Network Rendering jobs into smaller tasks and distributes those to individual workers using two different strategies; bands and regions.

- Bands: In general, bands divides into fewer tasks than regions. The default size of bands is 320 pixels in height x the entire width of the image. In CPU Mode, bands overlap by 10 pixels to smooth certain artifacts that would otherwise appear as discontinuities in the final image.
- Regions: The default size of regions is 320 x 320 pixels. If you think about bands as overlapping rectangles and regions as squares, this might help you visualize what's going on.

Rendering Animation/KeyShotXR/Configurator does not by default use bands or regions. Instead, these renderings are divided and distributed to workers as individual frames.

The following tables show when KeyShot will divide Network Rendering jobs according to bands or regions.

#### *CPU Mode Still Image Rendering*

CPU MODE	Caustics On	Caustics Off	GI On	GI OFF
Interior Mode	BANDS	BANDS	BANDS	BANDS
Product Mode	BANDS	REGIONS	BANDS	REGIONS
Custom Control	REGIONS	REGIONS	REGIONS	REGIONS

#### *GPU Mode Still Image Rendering*

GPU MODE	Caustics On	Caustics Off	GI On	GI OFF
Interior Mode	BANDS	BANDS	BANDS	BANDS
Product Mode	BANDS	BANDS	BANDS	BANDS
Custom Control	N/A	N/A	N/A	N/A

**Note**

You cannot directly dictate whether bands or regions are used when rendering. The selected lighting mode dictates whether bands or regions are used.

## Best Practices, CPU

### Network Rendering Process

The manager receives a job from the Client. It splits the job into tasks that are computed by the workers. When a Worker finishes a task, the rendered pixels are returned to the Manager. When all tasks are completed, the Manager assembles them into the finished image, video, KeyShotXR, or configuration. For still images, the tasks consist of regions of the images, and for animations, KeyShotXRs, and configurations, the tasks are whole frames.

Total job processing time consists of transfer, rendering, and assembling time. The transfer time depends on network connection and file size, rendering time depends on Worker capacity and rendering settings (render passes and layers), and assembling time depends on the Manager capacity and output size (image resolution and number of frames).

### Network Configuration of CPU Workers

The performance of KeyShot Network Rendering is subject to network connection and configuration. To obtain the best results we recommend:

- **To use the same processor type for all computers**
- **To have an equal amount of cores per worker**  
The tasks assigned to each worker are generally of equal size, so if one worker is less powerful than the others it may delay the assembling of the job
- **To maximize the core count but minimize the worker count**  
This will decrease the time spent on transferring the scene to all workers. Also, if the number of workers exceeds the number of tasks of the job, the excess workers will be left idle if no other jobs are in the job queue
- **1 Gbit network interfaces or faster.**

#### *CPU Specification*

The performance of KeyShot Network Rendering is dependent on your CPU specification. To obtain the best results, select high performance processors, e.g. Intel Xeon or AMD Threadripper. See our [Benchmark](#) section in the KeyShot forum for inspiration.

Jobs suited for Network Rendering

As mentioned above, the total processing time of a job in network rendering is dependent on effective transfer, rendering, and assembling time. This is the reason why the following kinds of jobs are best suited for network rendering:

- **Complex scenes**
- **KeyShotXRs**
- **Configurations**
- **Still images where local rendering times exceed 1 hour**
- **Animations, KeyShotXRs, and Configurations where rendering time of each frame exceeds 10 minutes**  
If the rendering time pr. frame is less than that, the transfer time in Network Rendering could make local rendering more efficient.

### Preparing jobs for Network Rendering

If you want the fastest processing time for your Network Rendering jobs, consider the following:

- **File Size** - The file size affects the file transfer time. To minimize file transfer time, keep the BIP/KSP file size low. To minimize the size you can delete all unused items in the scene, such as unused environments, textures etc.
- **Rendering Settings** - Everything you choose to include in the rendering counts. Render passes will increase the amount of data per pixel, and render layers will increase the amount of pixels being transferred.

#### On this page

- [Network Rendering Process](#)
- [Network Configuration of CPU Workers](#)
  - [CPU Specification](#)
- [Preparing jobs for Network Rendering](#)
- [Linearity](#)

## Linearity

In an ideal render farm, doubling the core count cuts the render time in half. To obtain maximum linearity between core count and render time:

- Added CPU Workers must use the same processor (or better)
- computers must have the same core count (or higher).
- Current render times must be greater than 1 hour.
- Number of render tasks must be greater than the current computer count.\*

\*Computer count should not be confused with core count. If the number of render tasks in a job is less than or equal to the current computer count, then adding more computers will not have any effect on the render speed for that job.

## Release Notes

The following page contains an overview of updates for KeyShot 9 Network Rendering.

### 9.2

- Fixed issue where manager could get stuck if job contained a network path
- Fixed issue where Windows clients could not download animations rendered with a Mac or Linux Manager
- Added splitter to allow adjusting panels in worker schedule window
- Now shows render time in seconds

### 9.1

- Support for GPU Rendering.
- Network Configurator now only shows import settings for the current role
- Improved compatibility with older KeyShot versions
- Limit to one Manager on Multi-user systems
- Fixed issues with resolved Worker hostnames in Worker Schedule.
- Fixed issue where 'Pausing' jobs could not be unpaused.
- Fixed an issue where the 'Pause worker' text changed to 'Resume worker', even though it the pausing was cancelled.
- Fixed the Monitor window size being reset when sending a new job.
- Fixed an issue where jobs would get stuck in *Sending*.
- Make sure that remaining time estimate is calculated correctly when pausing jobs.
- Fixed issue where the Monitor crashed when sending job while logged in as a user without permissions.
- Fixed Manager crash when rendering scene with Region Rendering enabled.
- Fixed translation issue in parts of the Network Configurator.

### 9.0

- Support for Parallel jobs
- Network Configurator, UI Rework, including merging the wizard and the network configurator.
- Rename Master/Slave to Manager/Worker
- Add Category to Network rendering Logs
- Handle "out of memory" errors on workers.
- Deactivate/transfer node-locked license
- Inherit valid license from earlier installation
- Bump Port numbers to 4807 and 4808
- General fixes and improvements, including:
  - Fixed bug where Manager would crash when repeatedly sending large masses of jobs to network rendering
  - Fixed bug where Scattering media with Color adjust node as density crashed Linux Workers
  - Fixed bug where wrong region was rendered, when interior mode and network rendering mode are enabled
  - Fixed bug where the worker did not use the selected resource location
  - Fixed bug where NR email reporting crashed the Manager
  - Pausing worker when the worker is already inactive no longer asks you if you would like to finish or abort the current task

#### Relases

- [9.2](#)
- [9.1](#)
- [9.0](#)

## Known Issues

### Keyboard layout in Network Configurator is wrong. (macOS)

#### ✓ Details and workaround

If you are using another keyboard setup than English, you may experience that the Network Configurator switches to another layout, and you can't switch it back to normal.

**Workaround:** If you can't find special characters such as @ in the keyboard layout, write the text in a text editor and copy it into the network configurator.

# Getting Started

## Get KeyShot Network Rendering

You can download the latest version of KeyShot Network Rendering [here](#).

### License

The Manager requires a valid Network Rendering license, but computers functioning as workers and/or clients do not. The License limits how many workers you can use for Network Rendering, by stating how many cores that simultaneously can be active. One GPU counts as 16 cores.

Clients that send jobs to Network Rendering will need a valid KeyShot license. Learn more about [setting up the License on the Manager](#).

### Install

Network Rendering must be installed on all the computers you want to use either as Manager, Workers, or Clients.

When you install Network Rendering on your computer you effectively install the following applications:

1. **KeyShot Network Configurator**: Here you set up the roles of the current computer.
2. **Manager service\***: Handles all jobs and assigns tasks to the available worker.
3. **Worker service\***: Renders the tasks (regions or frames) assigned by the manager.
4. **KeyShot Network Monitor**: Displays the job and worker status, and facilitates sending jobs from KeyShot to KeyShot Network Rendering.
5. **KeyShot Network Worker Tray**: Enables users to visually control how many cores a local worker is allowed to use.

\*Although the Worker and Manager services are installed on your computer, you still need to “turn them on” inside the KeyShot Network Configurator application. When enabled, the Worker and Manager services run in the background.



### KeyShot Network Configurator

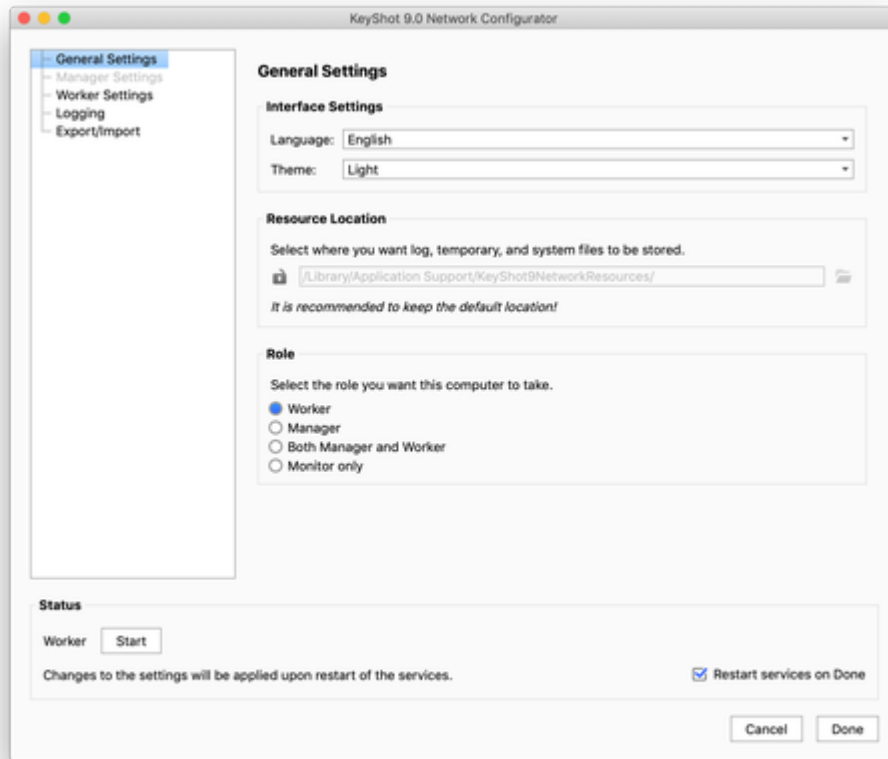
When the Network rendering is successfully installed the Network Configurator will be launched. This will guide you through the configuration of your machine as a *Manager* and/or as a *Worker* - or simply as a Client by selecting *Monitor only*.

#### On this page

- [Get KeyShot Network Rendering](#)
  - [License](#)
- [Install](#)
  - [KeyShot Network Configurator](#)
  - [KeyShot Network Monitor](#)
  - [KeyShot Network Worker Tray](#)

#### In this section:

- [Install](#)
- [Setup](#)
- [Render Over The Network](#)



You can always edit the setup at a later stage, just open the Network Configurator and make your edits.

The following pages in this section will describe the configuration of Manager, Workers and Clients.

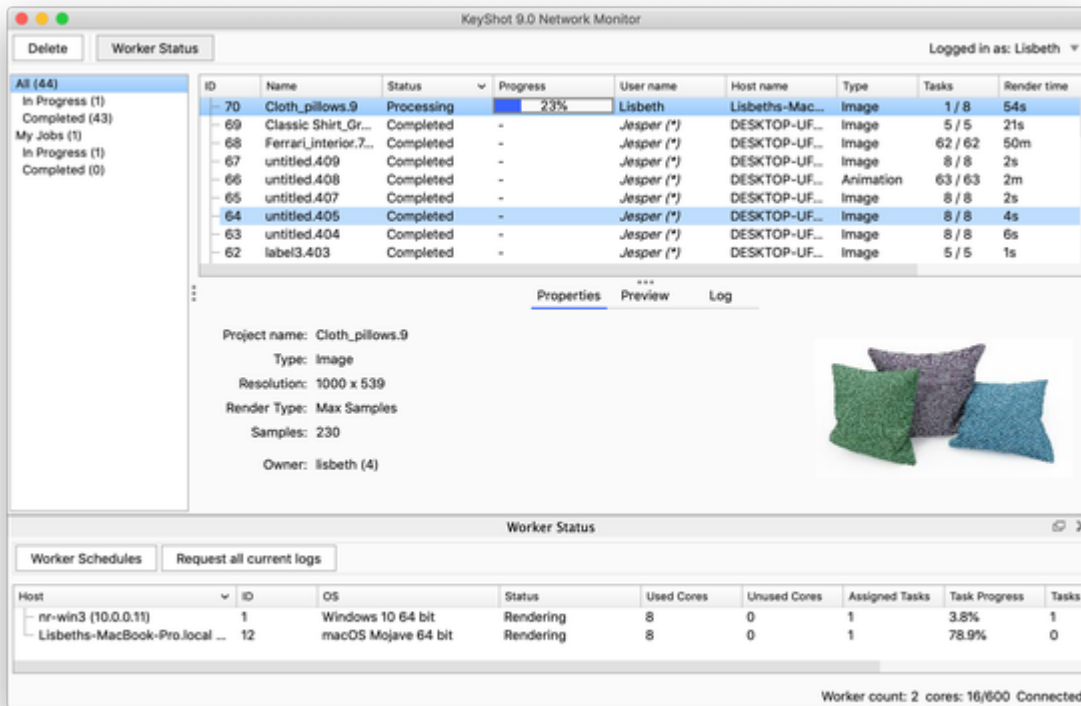
#### Note

Please note that it is recommended to only have one computer in your network configured as the Manager, especially if using Manager Auto-detection.



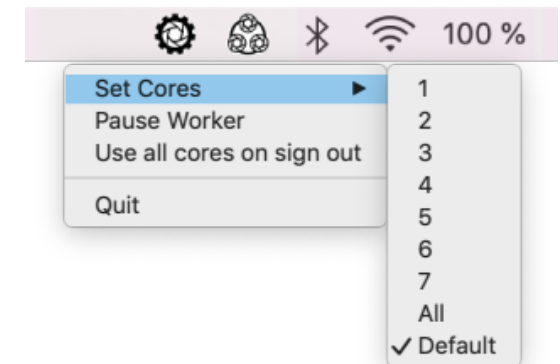
### KeyShot Network Monitor

After configuring your services, KeyShot Network Monitor enables you to connect your client computers to the Manager. It gives you an overview of all jobs in a queue, and gives you access to all the [Monitor features](#).



## KeyShot Network Worker Tray

If your computer is configured as a worker you will see the KeyShot Network [Worker tray](#) widget on your Task bar on Windows or Menu bar on Mac (this can be disabled in the Configurator). Its function is to set the number of cores that the worker service utilizes for rendering jobs.



# Install

## Download

KeyShot Network Rendering can be downloaded [here](#).

## Install on Windows

When you have downloaded the installer, launch it and follow the prompts. During the install process you will meet following topics:

**Folder location:** By default Network Rendering will be located in Program Files and Network Resources in the Documents folder. You can change these if necessary.

Note that if Controlled folder access is enabled for the Resources folder (after installation), the PC won't be able to use Network Rendering. So you need to add the Manager/Worker services to the allowed apps in the Windows security settings.

**Enable firewall access:** if you have a firewall, you need to enable access for NR services in the firewall settings. Otherwise the communication to /from Manager/Worker won't be possible. Auto-update, Multi-casting and Auto-detection will also be impacted by the firewall.

When You have completed the Installation the Network Configurator will be launched. This is where you can configure your computer as client /worker/manager. Click [here](#) for more information.

## Install on macOS

When you have downloaded the installer, launch it and follow the prompts.

If you have a firewall you will need to enable the *Setup Firewall Rules* in the installation type step. This will allow KeyShot Network Rendering to pass the firewall which is necessary for the communication to/from Manager/Worker as well as Auto-update, Multi-casting and Auto-detection.

When You have completed the Installation the Network Configurator will be launched. This is where you can configure your computer as client /worker/manager. Click [here](#) for more information.

## Install on Linux

KeyShot Network Rendering has been verified on:

- Ubuntu 16.04 and Ubuntu 18
- Other distribution with glibc version 2.23 or later
- Linux kernel version 2.6.32 or later

You can either install KeyShot Network Rendering via the Terminal or via the Linux UI. For setup via the Terminal follow the steps described in the readme file, which is included in the download package. Otherwise, follow these steps:

### 1. Download

Download the install package and save to a local drive, e.g. the *Documents* folder.

### 2. Unpack

Launch the terminal and unzip the .zip file

## On this page

- [Download](#)
- [Install on Windows](#)
- [Install on macOS](#)
- [Install on Linux](#)

### Also see

- [Silent Installation](#)

```
luxion@ubuntu:~$ cd /home/luxion/Documents/  
luxion@ubuntu:~/Documents$ unzip keyshot_network_rendering_linux64_9.2.  
xx.zip
```

### 3. Install

Run *setup.sh*

```
luxion@ubuntu:~$ cd /home/luxion/Documents/keyshot_network_9/  
luxion@ubuntu:~/Documents/keyshot_network_9$ sudo -E ./setup.sh
```

4. **Set up.** Double click *Run Configurator* and set up the services. See the following pages for step by step explanations of the settings.

- [Worker Setup](#)
- [Manager Setup](#)

## Silent Installation

You or your IT department may wish to do a KeyShot Network Rendering silent install, i.e., unattended installation. This is especially useful for unattended deployment onto servers. Please note that service setup is still required. To set up your manager or worker services, click [here](#).

### Windows

The following arguments are supported:

- `/s` - Silent installation.
- `/D=<path>` - Set the program files destination. *This must be placed at the end of the command line inside quotations.*
- `/config=<path>` - Import settings from file.
- `/license=<path>` - Install license from file. If a license exists it will be overwritten.
- `/resources=<path>` - Sets resource path and copies existing license, config, and database, if present.
- `/manager` - Enable manager service.
- `/worker` - Enable manager service.
- `/mh=<host>` - Sets manager host the worker will connect to (also enables worker service).
- `/mp=<port>` - Sets manager port the worker will connect to.

Example of silent installation that will enable a worker and have it connect to "10.0.0.50" with default port:

```
keyshot_network_rendering_win64_9.x.x.exe /S /mh=10.0.0.50
```

Unattended uninstall:

```
C:\Program Files\KeyShot9 Network Rendering\uninstall.exe /S
```

### macOS

Use the following approach to silently install KeyShot Network Rendering on macOS:

```
sudo installer -pkg keyshot_network_rendering_mac64_9.x.x.pkg -target /
```

In order to pass options to the installer, create the file `/tmp/ksnr9-silent-install.sh`

The file should fulfill the following conditions:

1. It must be owned by the user running the silent install

### On this page

- [Windows](#)
- [macOS](#)

2. It must not be writable by group
3. It must not be writable by other

The preferred file permissions are `-rw-r--r--`.

In the `*.sh` file the following syntax is used :

```
export option=value
```

For example, to enable a worker service that connects to a manager at IP Address "10.0.0.50" include the following line in your `*.sh` file:

```
export LUX_NR_MANAGER_HOST=10.0.0.50
```

The following options are supported:

- `LUX_NR_RES_DIR=<dir>` - Sets resource path and copies existing license, config, and database, if present.
- `LUX_NR_CONF_PATH=<path>` - Import settings from file.
- `LUX_NR_LIC_PATH=<path>` - Install license from file. If a license exists it will be overwritten.
- `LUX_NR_MANAGER=1` - Enable manager service.\*
- `LUX_NR_WORKER=1` - Enable worker service.\*
- `LUX_NR_MANAGER_HOST=<host>` - Sets manager host the worker will connect to (also enables worker service).
- `LUX_NR_MANAGER_PORT=<port>` - Sets manager port the worker will connect to.

*\*To disable Manager/Worker leave this option out (e.g. `LUX_NR_MANAGER=0` will **not** disable the manager).*

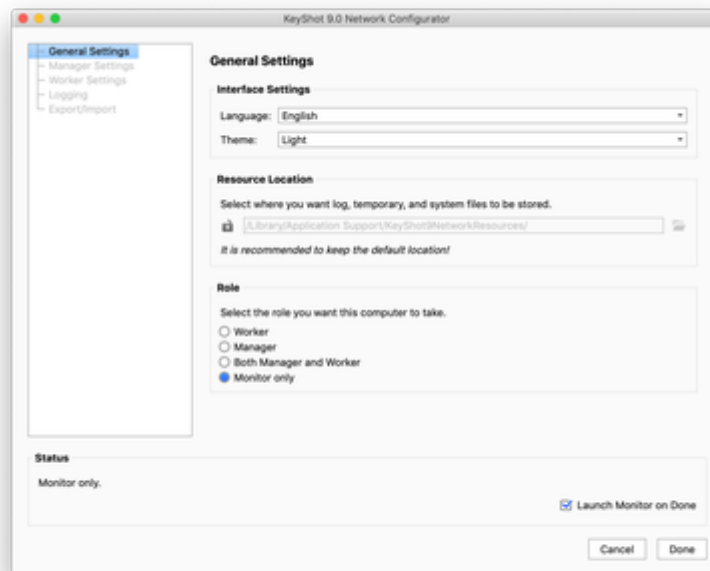
## Setup

Once the Network Configurator is installed, it will launch automatically

and you can choose which role you want your computer to have in Network rendering.

When Network rendering is installed, your computer will be able to connect to a manager and display the queue in the Monitor. See the [Network Monitor](#) page for more information.

### General settings



### On this page

- [General settings](#)
  - [Interface settings](#)
  - [Resources Location](#)
  - [Role](#)
  - [Status](#)
  - [Role Specific settings](#)

Also see:

- [Manager Setup](#)
- [Worker Setup](#)
- [Client setup](#)

### Interface settings

You Start out by selecting the *Language* and *Theme* color both of the Network Configurator and the Monitor

### Resources Location

KeyShot Network Rendering creates a Resources folder where it stores log information, system and temporary files. If necessary you can change the location of the resources folder, but it is not recommended to do so.

## Role

All computers with Network Rendering and KeyShot installed can send jobs to the manager on the local network. If the computer doesn't have KeyShot installed, it can still be a part of Network Rendering in one of the following roles:

- **Worker** - Your computer will be rendering jobs delegated by the manager. Visit the [Worker Setup](#) page for more information.
- **Manager** - Your Computer will serve as the hub for the Network Rendering - It handles jobs sent from clients, splits them up in tasks which are delegated to the workers, and when the tasks are returned from the workers it assembles them to images, animations etc. Visit the [Manager Setup](#) page for more information.
- **Worker and Manager** - A computer can have multiple roles, as mentioned all computers with Network Rendering and KeyShot can send jobs to Network Rendering. But it can also serve both a Manager and Worker. Visit the [Worker Setup](#) and [Manager Setup](#) pages for more information.
- **Monitor only** - If you only want to be able to administer the queue or to send Jobs to Network Rendering, all you need is the Monitor. Visit the [Client setup](#) page for information on how to connect etc.

## Status


The Status panel in the bottom of the window informs you about the current state of Network Rendering on your computer - what role it has and whether the service is running/needs to be restarted. It also lets you manually start/stop services in case you don't want the service to automatically *Restart services on Done*.

## Role Specific settings

The list in the left pane of the window leads to the relevant settings for the selected role. The default values of those will in most cases be sufficient for running KeyShot Network Rendering, and if you are happy with those, just press Done and start Rendering.

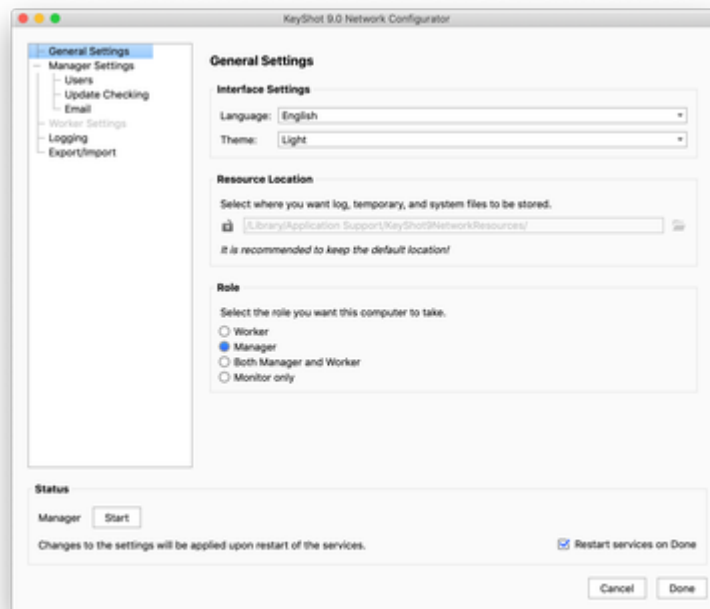
If you have KeyShot you are now ready to [Render Over The Network](#).

## Manager Setup

If you want your computer to serve as Manager on your network you select the Manager Role (or *Both Manager and Worker* if you also want it to contribute to the rendering force) in the Network Configurator 

### Setting up the Manager

Launch the Network Configurator on the computer where you want to set up/edit the manager.



### General Settings

#### Interface Settings

Select the *Language* and *Theme* color both of the Network Configurator and the Monitor

#### Resources Location

KeyShot Network Rendering creates a Resources folder where it stores log information, system and temporary files.

Default location of the Resources folder:

### On this page

- [Setting up the Manager](#)
  - [General Settings](#)
    - [Interface Settings](#)
    - [Resources Location](#)
    - [Role](#)
    - [Status](#)
  - [Manager settings](#)
    - [License](#)
    - [Connection Settings](#)
    - [Job Settings](#)
  - [Users](#)
    - [Enable user system](#)
    - [Permissions](#)
  - [Update Checking](#)
  - [Email](#)
    - [Enable email notifications](#)
    - [SMTP Settings](#)
  - [Logging](#)
  - [Export/import](#)

### Also see

- [License](#)
- [Get a TLS certificate](#)

- **On Windows:** `C:\Users\Public\Public Documents\KeyShot9NetworkResources`
- **On Mac:** `/Library/Application Support/KeyShot9NetworkResources`
- **On linux:** `/var/local/share/KeyShot9NetworkResources/`

If necessary you can change the location of the resources folder, but it is not recommended to do so.

To change the location of the Resource folder click the lock icon to enable editing and browse to the chosen location.

### **Role**

Select the *Manager* Role. Now the relevant settings for the Manager are available in list in the left of the window.

If you are happy with using the default settings for the manager, you can actually skip the rest and finish the Network configurator here.

### **Status**

The Status panel in the bottom of the window informs you about the current state on the manager, you can start it manually or set it to be restarted automatically when you finish the Network Configuration. If you are editing the settings of a manager that is already running, this will let you know when a restart is necessary

In the Network Configurator you can set up your computer as a Network Rendering Manager.

### **Manager settings**

#### **License**

You only need a license for the manager, this limits the number of worker cores that can be used at any given time, but it does not limit the number of users that can send jobs to Network Rendering.

There are 2 different types of licenses for Network Rendering

- **License File** - the license file is located on the computer acting as manager.
- **Floating License** - the license is handled by a license server which the manager connects to.  
This is the license type you need if you want to have [Multiple Managers](#) on your network.

Visit the [License](#) page for a detailed walkthrough on setting up the license.

In the bottom of this section you can always see the current state of your license, as well as the cores limit and remaining days on the license.

#### **Connection Settings**

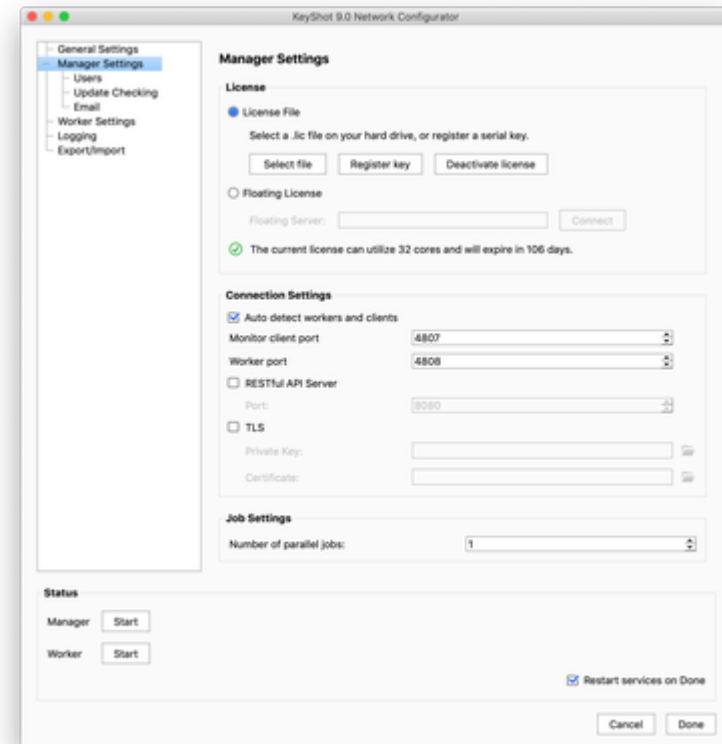
- **Auto detect workers and clients** - When auto detect is enabled, workers and clients on the network will automatically connect to the manager. If not enabled you will need to enter the manager's IP and port information in their respective connection settings.
- **Monitor Client port** - the default port for connecting monitors to the manager is 4087
- **Worker Port** - the default port for connecting workers to the manager is 4087
- **RESTful API Server** - When enabled you can get info about your Network Rendering setup, as json data.
  - **Port** - Set your custom port, the default is 8080

- **TLS** - Enable this if you want to encrypt/secure communications between manager and client systems. Visit the [Get a TLS certificate](#) page for more information.

### Job Settings

The Job Settings enables you to allow multiple jobs to be processed at the same time.

When set to 1, the manager will only start a second job if there is an excess of workers available for the current amount of tasks. This can result in situations where all workers are assigned to one large job, and less heavy jobs are waiting while that job is in progress. With parallel jobs the Manager will be able to start multiple jobs - making everything flow more smoothly. The individual jobs may have longer render times, but the overall queue will be processed faster.



### Users

#### Enable user system

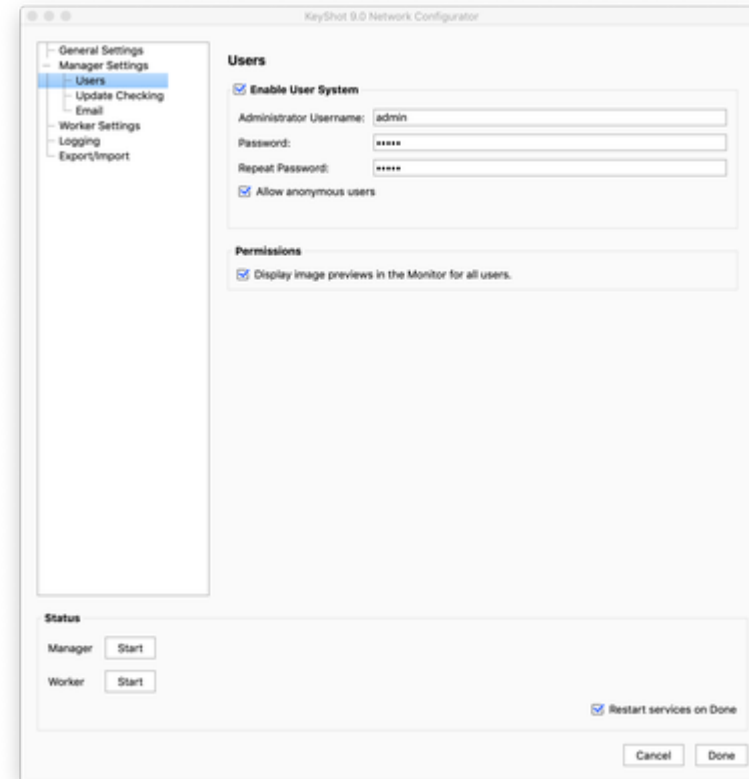
The User System enables you to control who can see/access what in the Monitor.

- **Admin username/password** - You need to set up an admin user for when *User System* is enabled on the manager. The Admin will be able to create [Users](#) in the Monitor. By managing users, the administrator controls who can [submit](#), [download](#), and/or [delete jobs](#).
- **Allow Anonymous Users** - when enabled anyone with access to the Network can send jobs to rendering and view the monitor, even if they don't have a user. Visit the [Users](#) page for more info.

#### Permissions

In addition to the User System you can set up limits to the content that is shown in the Monitor.

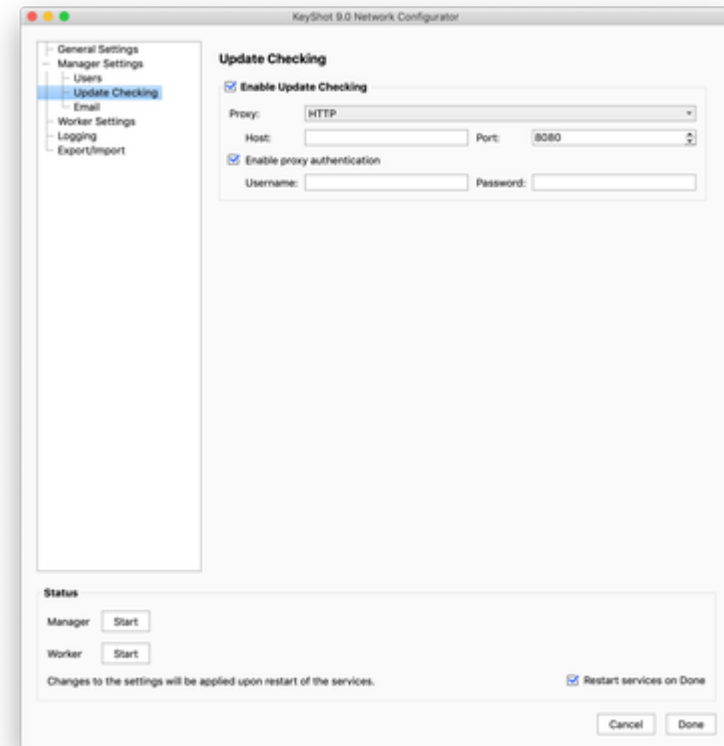
- **Display image previews in the Monitor for all users** - when enabled, everyone can see the image preview of a finished job. Otherwise it will only be visible to the owner of the job and users with permission to download jobs.



### Update Checking

When *Update Checking* is enabled, the Monitor will check online for software updates every time it is launched, or when you log on to your computer. This setting is enabled by default.

- **Proxy**: Select the type of proxy you want to use:
  - **No proxy/Automatic proxy detection** - you don't need to enter anything further.
  - **HTTP/SOCKS v5** - Enter host and port. 8080 is the default port.
- **Enable proxy authentication** - enable this if your setup requires authentication.
  - **Username/password** - Enter the username and password for the proxy authentication.



## Email

### ***Enable email notifications***

When email notifications are enabled Network rendering will notify the admin email in the selected situations.

Users who have entered their email in the account settings (in the monitor) will receive an email when a job is completed.

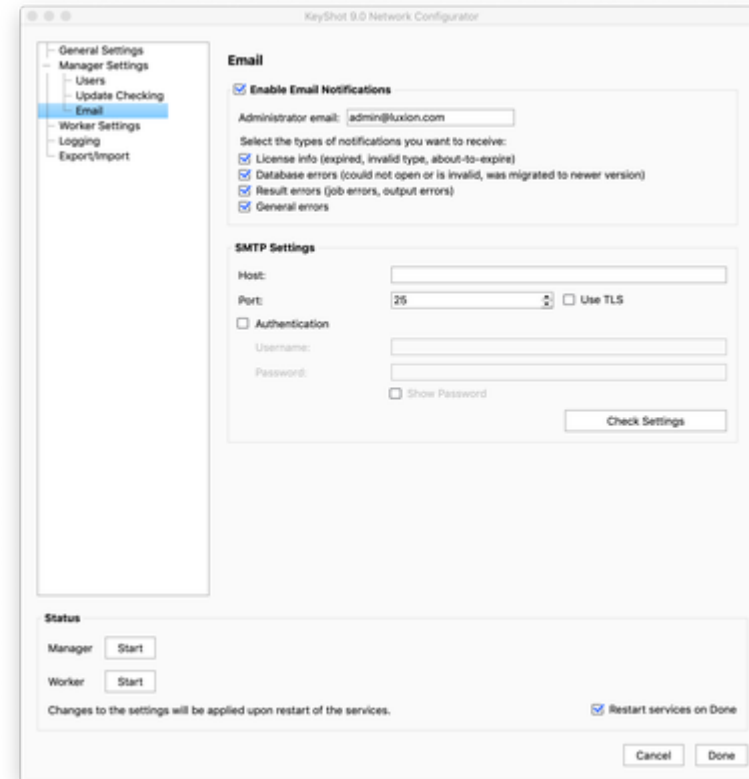
### ***SMTP Settings***

In order for the email notifications to work you need to connect a mail account for the outgoing mail

- **Host/Port** - Fill in Host and Mail Client Port. You can find this information in your email client settings.

- **TLS** - You can enable TLS/SSL or leave it unchecked. If you do enable it, make sure to use ports 465 or 587.
- **Authentication** - Enable and fill in your username and password for the outgoing mail.
- **Check settings** - The Configurator will check your email settings and provide you with a confirmation message.

Please consult your IT department for any troubleshooting when setting up SMTP.



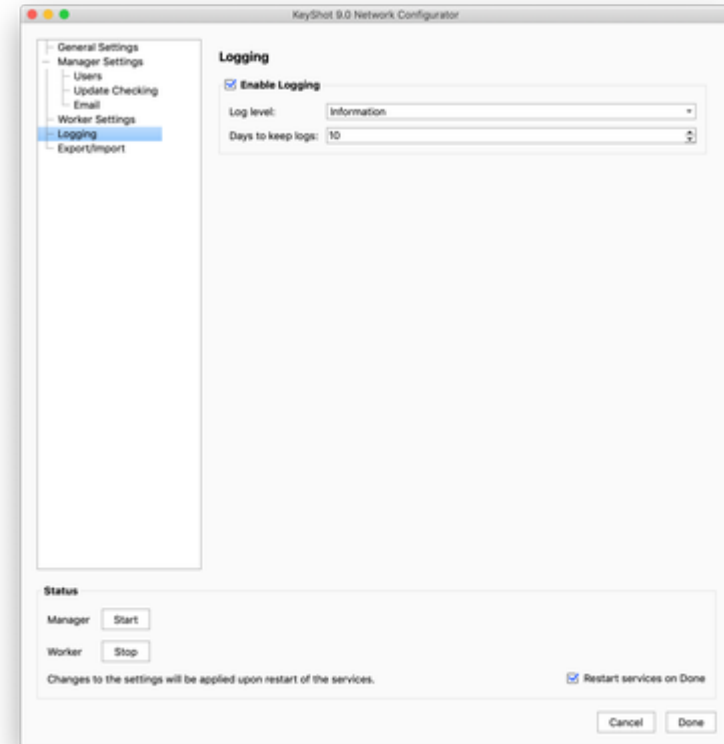
## Logging

The log files keep track of Network Rendering state, information, and potential errors. If you enable logging on your manager you can select which incidents you want logged and how long to keep the logs. The Logs will be stored in the Resources folder (as set in the general settings). And they can be viewed in the Monitor

. To enable logging, click on “logging” in the KeyShot Network Configurator and check the “Enable logging” option.

- **Log Level** - Choose at what level to record logs from: (Choosing a higher log level will record all other log levels below it)
  1. **Trace** - shows all types of log messages.
  2. **Information** - no trace but shows warnings, errors, and fatals.
  3. **Warning** - no trace and information, but shows warnings, errors, and fatals.
  4. **Critical** - no trace, information, and warnings, but shows errors and fatals.
  5. **Fatal** - no trace, information, warnings, and errors, but shows fatals.

- **Days to keep logs** - Set a cutoff time for saved logs. Any logs that pass the set time frame will be deleted.



## Export/import

If you need to move your Network Rendering installation or simply want to reuse your current settings when upgrading, you can export User Accounts and/or Settings and import them on the new computer.

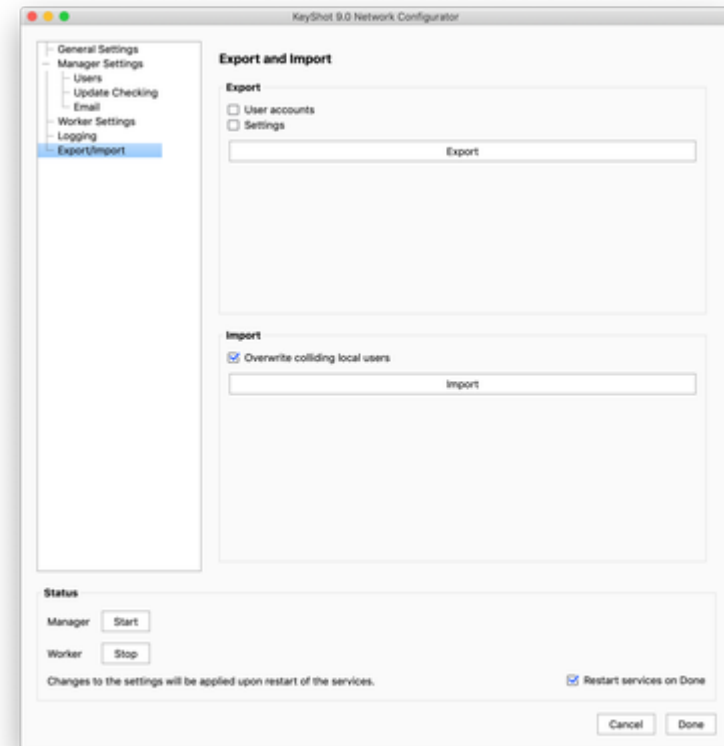
- **Export** - Select what to export, press export and select a location for the exported zip file.
  - **User Accounts:** When enabled the export will include all user accounts on the manager. This includes username, privileges and email - no job history will be exported.
  - **Settings:** When enabled the export will include the network configurator settings as well as any worker schedules that have been created while connected to the manager.
- **Import** - Press import and select the .zip file. Notice that the location of the Resources folder will not be applied from the imported settings. If you have enabled User System before importing, the local admin will remain as the "super administrator" of the Manager, the imported admin will be created as a regular user, with admin privileges (or, if they have the same username, it will be discarded).

Note that if you are importing settings and users from a Network rendering 7 or prior, all users will have to recreate their passwords.

- **Overwrite colliding local users** - If there are already users on the manager you are importing to, you can select whether or not to overwrite the ones that have the same username. When enabled it will overwrite the current user with the settings and mail from the imported. When unchecked, it will skip the ones in the import file.

#### Note

The export will include the settings currently running on the manager. If you have made changes to the Network Configurator Settings you need to restart the configurator before exporting.



## License

You only need a license for the Manager. The License limits the number of worker cores that can be used at any given time, but it does not limit the number of users that can send jobs to Network Rendering.

There are 2 different types of licenses for Network Rendering

- **License File** - the license file is located on the computer acting as Manager.
- **Floating License** - the license is handled by a license server which the Manager connects to. With this license type it is also possible to have [Multiple Managers](#) on the same network.

### Using License File

1. Launch KeyShot Network Configurator on your manager.
2. Go to the Manager Settings.
3. Select *License File* in the *License* section.
4. If you have a license key, click *Register Key* and fill out the form. Your network license should activate automatically. Otherwise, click *Save license request*, save the text file and email it to [license@luxion.com](mailto:license@luxion.com) for manual activation.
5. If you already have the license file, click *Select file*, Browse to your license file and click *Open* to select it.
6. Your license file installed. The license text shows you how many cores the workers (combined) can use for Network Rendering and when the license will expire. Note that 1 GPU will count as 16 cores.

### ***Deactivating a license***

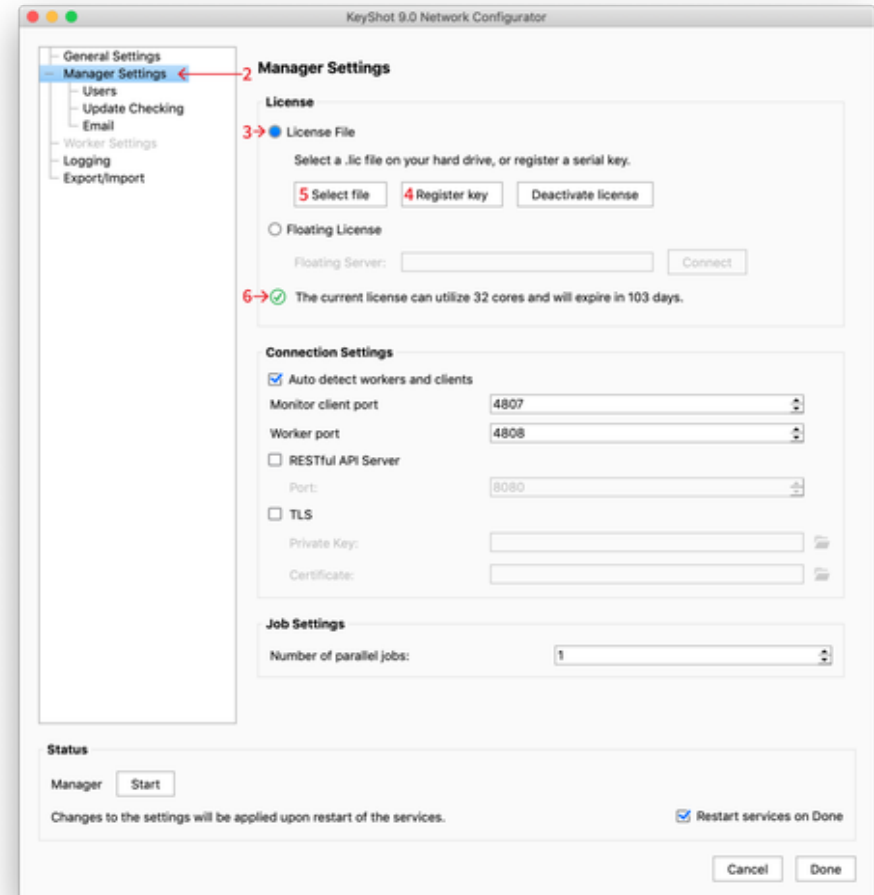
In some cases you may need to move your license to another computer. In such cases you can click *Deactivate license*, move the .lic file to the other computer and follow the steps above to set up the license on the new manager.

### ***Replacing The License File***

If you have received a new license file from us, you may easily replace the old license and update your Manager service. Just follow the steps above. Notice that if a user has KeyShot Network Monitor is open, while replacing the license file, it will briefly lose connection to the manager (the manager needs to re-start). When prompted, check your Monitor connection settings and click *Apply*. The client-manager connection will come back up.

### On this page

- [Using License File](#)
  - [Deactivating a license](#)
  - [Replacing The License File](#)
- [Using Floating License](#)
  - [Replacing the Floating License](#)
  - [Multiple Managers](#)



## Using Floating License

(Windows and Mac only)

If you don't already use Luxion License Server for your keyshot licenses you can follow this guide to install the [Luxion License Server](#).

1. Launch KeyShot Network Configurator on your Manager.
2. Go to the *Manager Settings*.
3. Select *Floating License* in the *License* section

4. Enter the hostname or IP Address of your license server. If the server uses another FlexLM port than the standard (27000) you need to specify the port number, followed by the “@” sign and the server’s hostname/IP (e.g. 27000@KeyShotServer.local). Click Connect.

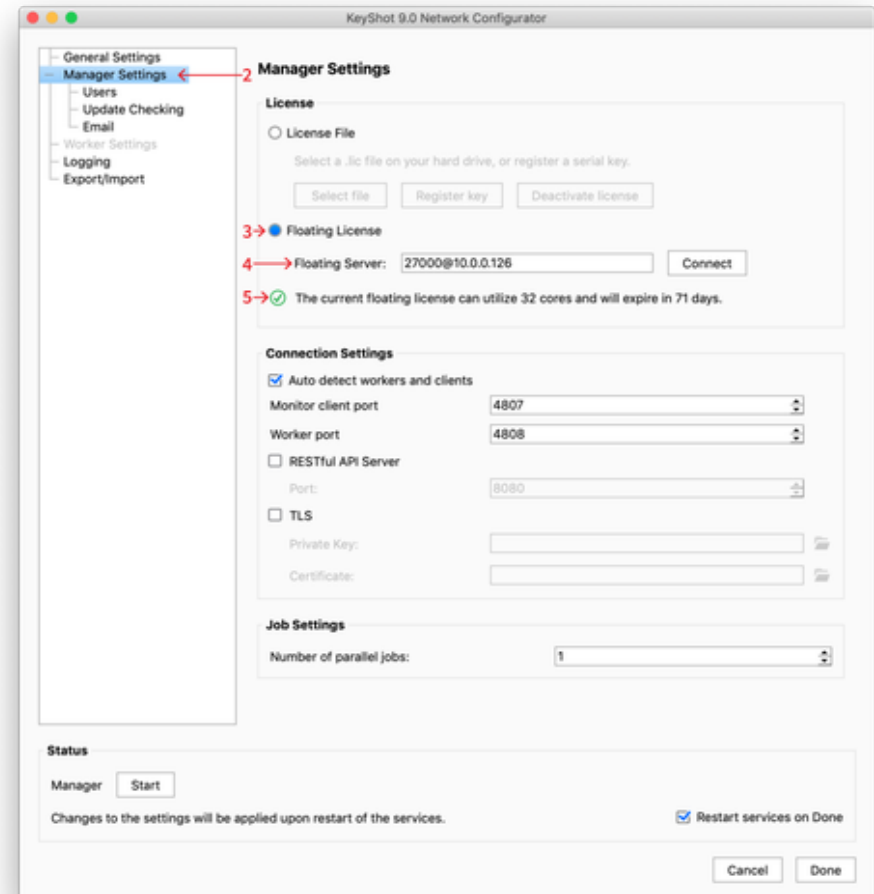
5. Your license had been installed. The license text shows you how many cores the workers (combined) can use for Network Rendering and when the license will expire. Note that 1 GPU will count as 16 cores.

### Replacing the Floating License

If you have received a new floating license from us you need to replace it in the [Luxion License Server](#). There is no need for updating it in the Network Rendering Configurator, as the License Server will handle everything.

### Multiple Managers

With the floating license you have the option of having multiple managers on the network - learn more [here](#).



## Get a TLS certificate

If you want to increase the protection of your creative assets, you may want to encrypt the Network rendering communication. This can be done via TLS, see how in the [Manager Setup](#).

There are three ways to get a TLS certificate: buy one via a certificate authority, get a free one via [Let's Encrypt](#), or create a self-signed certificate.

### *Buy certificate*

There are many places to buy. Here are a few:

- [GoDaddy](#)
- [DigiCert](#)
- [RapidSSL](#)

### *Free certificate via Let's Encrypt*

[Let's Encrypt](#) is a certificate authority that creates free certificates that are just as secure as the ones you can buy.

The easiest way to get started is by following the instructions for their [Certbot](#).

### *Create self-signed certificate*

It is required to have [OpenSSL](#) installed.

Open a terminal and write the following to create private key file "key.pem" and certificate file "cert.pem" (both in the [X.509](#) format):

```
% openssl req -newkey rsa:4096 -nodes -x509 -keyout key.pem -out cert.pem
Generating a 4096 bit RSA private key
.....++
.....++
writing new private key to 'key.pem'
-----
You are about to be asked to enter information that will be incorporated
into your certificate request.
What you are about to enter is what is called a Distinguished Name or a DN.
There are quite a few fields but you can leave some blank
For some fields there will be a default value,
If you enter '.', the field will be left blank.
-----
Country Name (2 letter code) []:.
State or Province Name (full name) []:.
Locality Name (eg, city) []:.
```

## On this page

- [Buy certificate](#)
- [Free certificate via Let's Encrypt](#)
- [Create self-signed certificate](#)
  - [Trust Certificate](#)

```
Organization Name (eg, company) []:.  
Organizational Unit Name (eg, section) []:.  
Common Name (eg, fully qualified host name) []:127.0.0.1  
Email Address []:.
```

Note that the value of the fields is not important except for the "Common Name", which must be the IP or domain name used by the Monitors to connect.

Put the real IP in place of "127.0.0.1".

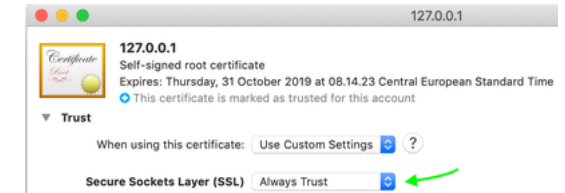
### **Trust Certificate**

If the following error, or similar, is given when trying to connect to the Manager, it's necessary to state that you trust the certificate:


*Error: Connection error: The root CA certificate is not trusted for this purpose*

On macOS, double-click the certificate file and add it to the "login" keychain. Click "My Certificates" in the left pane and find the item with the domain name or IP you input above. Double-click that item and set it to "Always Trust" for "Secure Sockets Layer (SSL)".

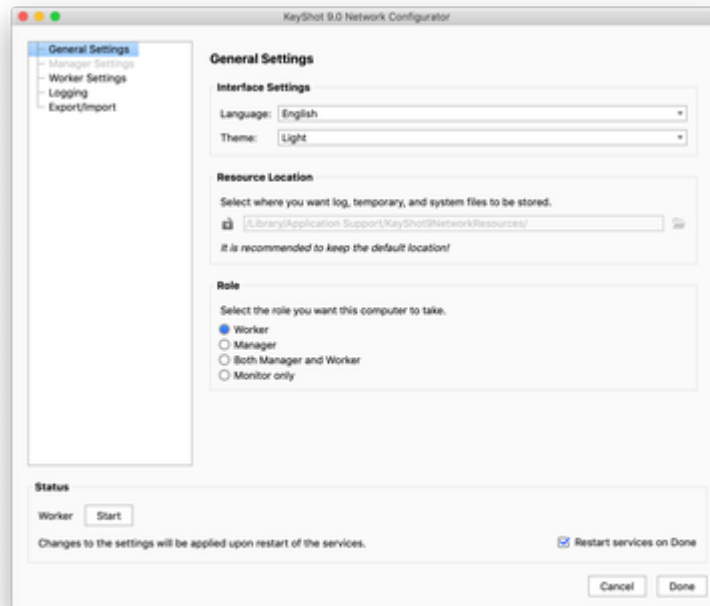
Note that the certificate must be downloaded to the computer first and imported into the local certificate key store (on macOS you just need to double-click it).



## Worker Setup

If you want your computer to serve as a worker on the network, you can enable this in the  KeyShot Network Configurator. When you enable worker mode, you will need to set the manager hostname and worker Port, Process Priority and the Allowed Cores.

Once you have the worker set up you can log into the Monitor and set the [Worker Schedules](#). If you are also using the computer for other things you can use the [Worker Tray](#) widget to limit the number of cores or pause the worker temporarily.



### On this page

- [Setting up the Worker](#)
  - [General Settings](#)
  - [Worker Settings](#)
  - [Logging](#)
  - [Export/import](#)

### Also see

- [Worker Schedules](#)

### Setting up the Worker

Launch the Network Configurator on the computer where you want to set up/edit the worker.

#### General Settings

**Interface Settings** - Select the *Language* and *Theme* color both of the Network Configurator and the Monitor

**Resources Location** - KeyShot Network Rendering creates a Resources folder where it stores log information, system and temporary files.

Default location of the Resources folder:

- **On Windows:** *C:\Users\Public\Public Documents\KeyShot9NetworkResources*
- **On Mac:** */Library/Application Support/KeyShot9NetworkResources*

If necessary you can change the location of the resources folder, but it is not recommended to do so.

**Role** - Select the Worker Role. Now the relevant settings for the Worker are available in list in the left of the window.

If you are happy with using the default settings for the worker, you can actually skip the rest and finish the Network configurator here.

**Status** - The Status panel in the bottom of the window informs you about the current state on the worker, you can start it manually or set it to be restarted automatically when you finish the Network Configuration. If you are editing the settings of a worker that is already running, this will let you know when a restart is necessary

## Worker Settings

**Connection Settings** - Here you set up how the worker connects to the manager. With the default settings the worker will auto-connect to an manager on the same network.

- **Manager Hostname** - Specify which manager the worker should connect to.
- **Worker Port** - Set the port for the worker-manager connection. This should match the port set in the [configuration of the manager](#) - the default worker port in KeyShot 9 is 4808.

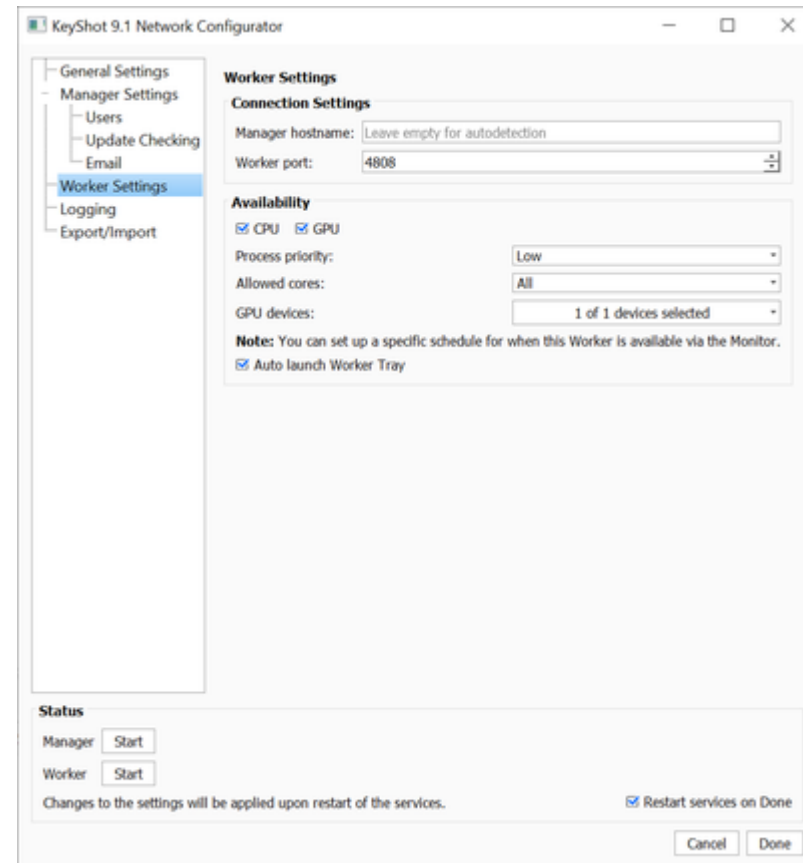
**Availability** - If you are using the Computer for other purposes besides Network Rendering you may want to limit the availability.

- **CPU/GPU** - Here you can select what type jobs the worker should be available for. The Worker can be one or both, . The GPU option will be disabled if the GPU does not meet requirements - see below.
- **Process Priority** - This will set the priority of the worker service in the computer, this is relevant if you are also running other applications on the computer. In which case a low priority will let the other applications use what they need of the available CPU resources first.
- **Allowed Cores** - If you have enabled use of the CPU for Network Rendering, you can set the default number of cores that are made available for Network Rendering. If you need to limit it temporarily, you can do it via the [Worker Tray](#).
- **GPU Devices** - If you have enabled use of the GPU for Network Rendering, and you have multiple GPUs you can select which are made available for Network Rendering. If you need to limit it temporarily, you can do it via the [Worker Tray](#).
- **Auto Launch** (\*not available for Linux Workers) - By default, all computers serving as Network Rendering workers will have the [Worker Tray](#) running. You can find it in the Task menu on Windows and the menu bar on Mac. In cases where you do not want the users to be able to easily limit/pause the cores you can disabled this.

### GPU Requirements

GPU raytracing in KeyShot 9 supports **NVIDIA GPUs built on Maxwell microarchitecture and supports CUDA Compute Capability 5.0 or later found in the Quadro M6000 or GTX 980 and above.**

We recommend:



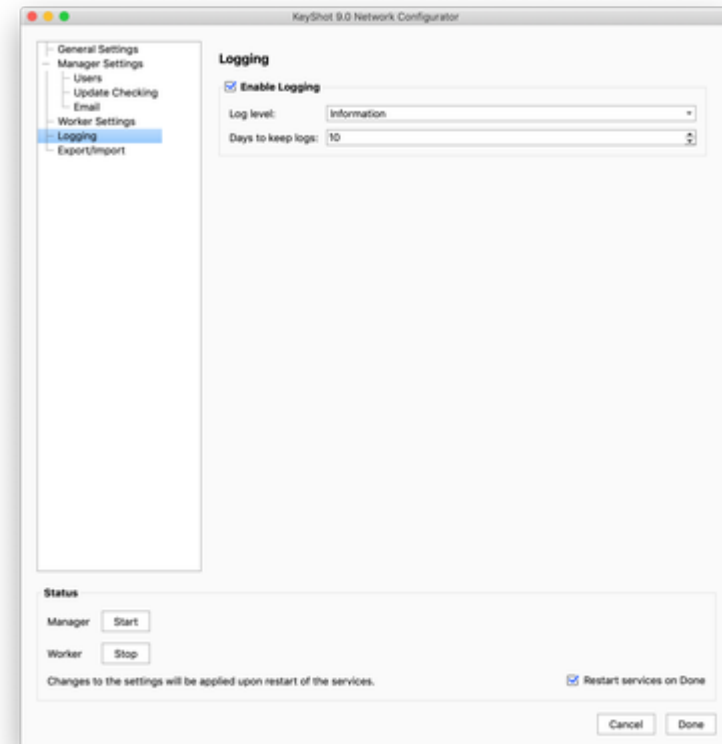
- Graphics cards on the [NVIDIA RTX](#) platform with a minimum of 8 GB memory.
- Driver Version: For both KeyShot GPU on both Quadro and GeForce we recommend version **441.66**.

## Logging

The log files keep track of Network Rendering state, information, and potential errors. If you enable logging on your worker you can select which incidents you want logged and how long to keep the logs. The Logs will be stored in the Resources folder (as set in the general settings). And they can be viewed in the Monitor

. To enable logging, click on “logging” in the KeyShot Network Configurator and check the “Enable logging” option.

- **Log Level** - Choose at what level to record logs from: (Choosing a higher log level will record all other log levels below it.)
  1. **Trace** - shows all types of log messages.
  2. **Information** - no trace but shows warnings, errors, and fatals.
  3. **Warning** - no trace and information, but shows warnings, errors, and fatals.
  4. **Critical** - no trace, information, and warnings, but shows errors and fatals.
  5. **Fatal** - no trace, information, warnings, and errors, but shows fatals.
- **Days to keep logs** - Set a cutoff time for saved logs. Any logs that pass the set time frame will be deleted.



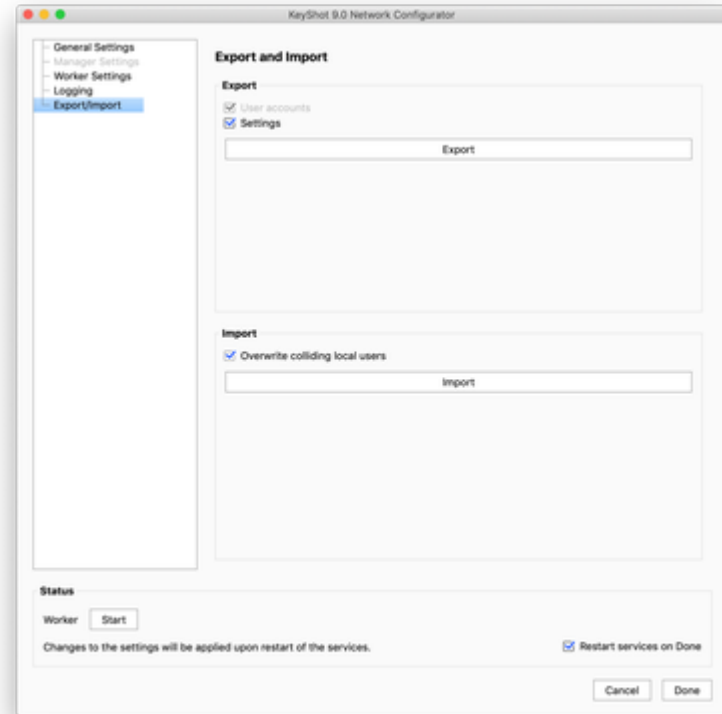
## Export/import

If you need to move your Network Rendering installation or simply want to reuse your current settings when upgrading, you can export User Accounts and/or Settings and import them on the new computer.

- **Export** - The export will include the network configurator settings.
- **Import** - Press import and select the .zip file. Notice that the location of the Resources folder will not be applied from the imported settings. And no user settings will be imported.

**Note**

The export will include the settings currently running on the worker. If you have made changes to the Network Configurator Settings you need to restart the configurator before exporting.



## Worker Schedules

By default, a worker is active when connected to the manager. The worker schedules inside KeyShot Network Monitor offer control of when each worker will be active or inactive. Network administrators can setup the *Worker Schedules* by logging into his/her account from any manager, worker, or client computer. Learn more about [users](#).

The Worker Schedules window shows a list of worker computers along with each individual worker's weekly schedule. The schedule is made up of red and green blocks. Green means active, while red means inactive. An active worker will use its processing power for rendering while an inactive worker will not use any of its processing power for rendering.

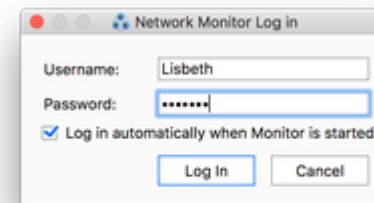
### On this page:

- [How To Set A Worker's Schedule](#)

## How To Set A Worker's Schedule

### 1. Log In

Inside KeyShot Network Monitor, click *File > Log in* and enter your administrator credentials.

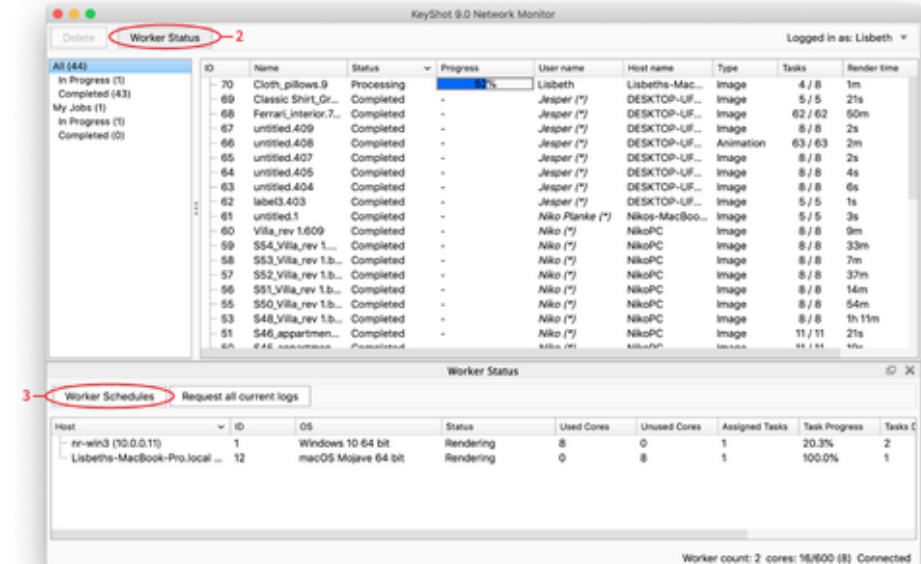


### 2. Show Worker Status

If the Worker Status panel is not visible Click *Worker Status* to display it.

### 3. Launch worker schedule manager

Inside the Worker Status panel, click *Worker Schedules*.



#### 4. Select Worker

Select the worker you want to set up a schedule for in the top list. Now you can either choose to use a preset schedule or create your own.

#### 5. Worker Schedule Presets

The worker schedule comes with two presets:

- Always Active
- Non Work Hours - This will make the worker inactive Monday to Friday, between 8am and 5pm (8:00-17:00).

#### 6. Custom Schedules

You can also create your own schedule based on your rendering and processing needs. For example, you may want a worker to become active during lunch hour. Click the 1-hour blocks to toggle active/inactive.

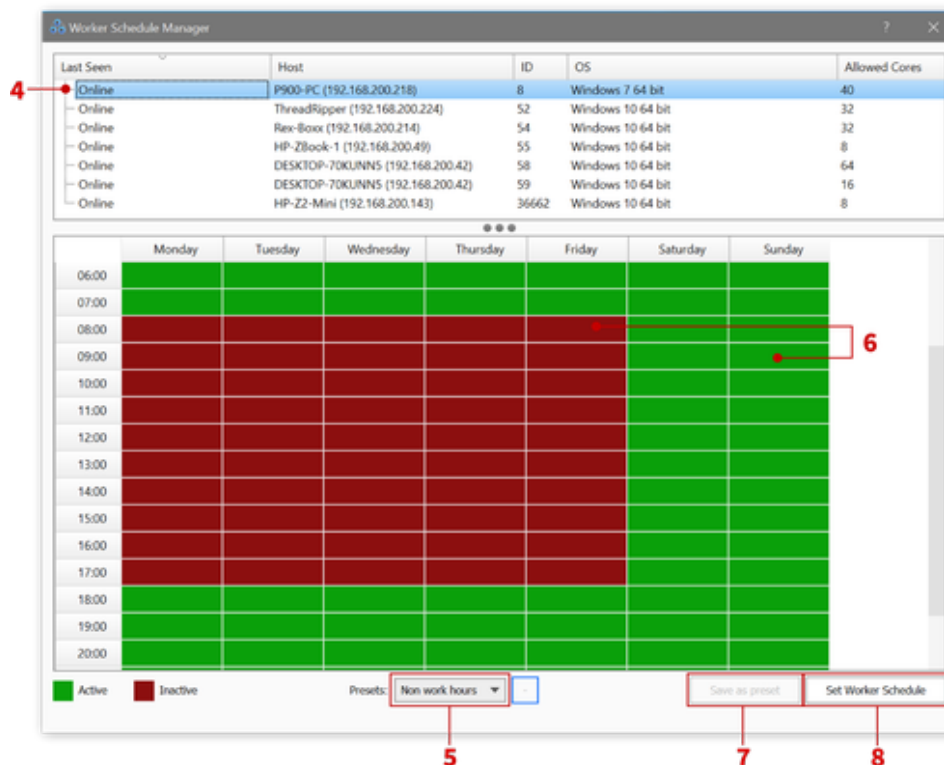
#### 7. Save your custom preset (optional)

Once you have set up your schedule, you can click *Save as preset* to save a custom preset.

Name your preset and click *OK*. You may now select this preset from the Presets drop-down (5).

#### 8. Apply Schedule

Click *Set Worker Schedule*. Your worker schedule is now set!



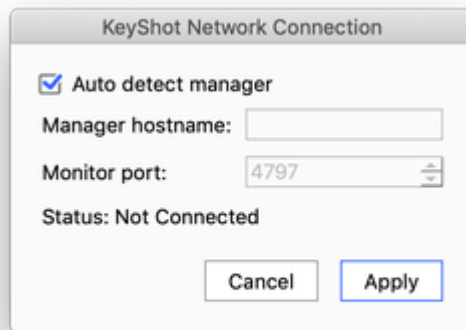
## Client setup

Anyone on the network with KeyShot Network Rendering installed can connect to the Manager and view the queue via the Monitor. If you have the right user privileges, you can [administer users](#), reorder the jobs of the queue, and download and delete [jobs](#).

In order to submit jobs to Network Rendering you need to have KeyShot installed.

## Installation

Download and install Network Rendering from [here](#). Upon installation the Network Configurator is automatically launched - Simply select *Only Monitor* and you are ready to go. The Monitor will automatically be launched when you finish the Network Configurator.



## Establish Connection

In the Monitor under *File > Connection Settings* you can specify the connection method.

By default, the connection is set to *Auto-Detect* and connect to the Manager. But you can also disable auto-detecting of the Manager and enter a *Manager hostname* and the correct *Monitor port* number, if you need to connect to a specific manager.

## Also see

- [Log In/Out](#)
- [Handling Jobs](#)
- [Managing Set up Users](#)
- [Clear the Monitor Queue](#)

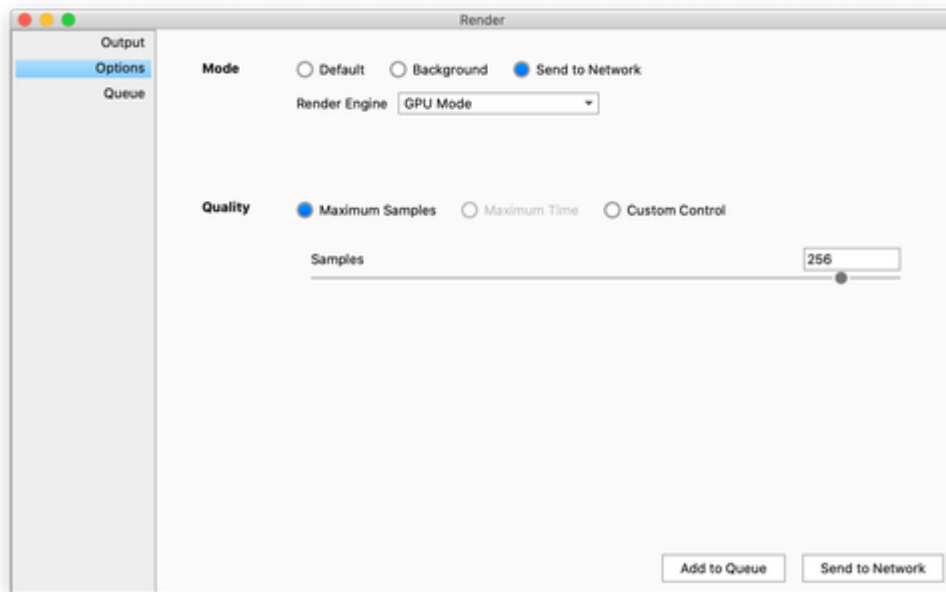
## Render Over The Network

Once the [client configuration](#) is complete and KeyShot Network Monitor is able to connect to the manager, you will be able to send your render jobs to the network. In the instructions below we assume that KeyShot is installed on your client computer.

### How to send a job to the network

1. Open your scene in KeyShot.

2. Open the Render dialog - It can be launched from the toolbar , via the *Main menu > Render > Render* or the hotkey Ctrl+P (Windows) or Cmd+P (Mac).



3. In the Options section select *Send to Network*.

4. Select *Render Engine* - You can submit jobs to Network Rendering in either CPU or GPU mode. If your computer is capable of rendering both the default choice will be *Inherit from Real-time View*. Note that some materials/textures are not supported in GPU mode - [learn more](#).

5. Select the the rest of your render settings (visit the [KeyShot Manual](#) for more details) and confirm by clicking the *Send to Network* button. If there are no workers, using the same Render Engine, connected to the manager you will get a warning letting you know, so you can choose to switch mode or make sure appropriate Workers are made available to the Manager.

KeyShot will sync with KeyShot Network Monitor. Your job will be transferred to the manager computer and it will be added to the network queue. Anyone successfully connected to KeyShot Network Monitor will be able to see the list of jobs in the queue.

### On this page

- [How to send a job to the network](#)

**Tip:**

You do not need to be connected to the network while the job is being rendered. The images will be stored on the manager. Next time you connect to the manager, with the same user and computer, your finished jobs will automatically be downloaded to the given location. If you log into the monitor on another computer you can manually download your jobs. [Learn more](#).

If you are unable to send jobs to the network, you can contact Luxion Customer Support at [support@luxion.com](mailto:support@luxion.com) for further assistance.

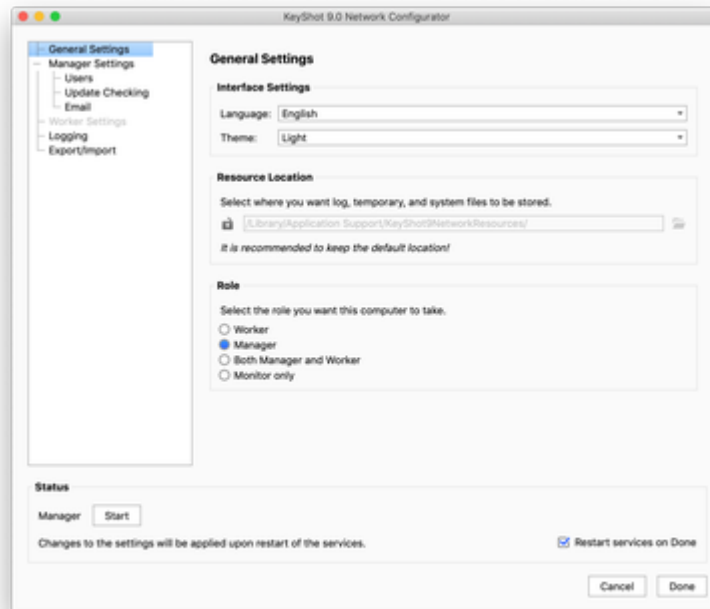
## User Interface

Network Rendering has 3 applications where you can interact with the service: KeyShot Network Monitor, KeyShot Network Configurator and the KeyShot Network Worker Tray. This section contains a brief user interface overview.

- [Network Rendering Configurator](#)
- [Network Monitor](#)
- [Worker Tray](#)

# Network Rendering Configurator

KeyShot Network Configurator allows you to configure your computer as a Manager, Worker, and/or Client.



## On this page:

- [Settings list](#)
- [General Settings](#)
  - [Interface Settings](#)
  - [Resources Location](#)
  - [Role](#)
  - [Status](#)

## Settings list

This overview shows you the settings relevant for the current role of the computer. Each setting is defined in the following pages:

- [Manager Setup](#)
- [Worker Setup](#)
- [Client setup](#)

## General Settings

### Interface Settings

- **Language**
- **Theme** - defines the theme for the Network Configurator, The Monitor and the Worker Tray

### Resources Location

KeyShot Network Rendering creates a Resources folder where it stores log information, system and temporary files.

Default location of the Resources folder:

- **On Windows:** *C:\Users\Public\Public Documents\KeyShot9NetworkResources*
- **On Mac:** */Library/Application Support/KeyShot9NetworkResources*
- **On linux:** */var/local/share/KeyShot9NetworkResources/*

If necessary you can change the location of the resources folder, but it is not recommended to do so.

### **Role**

Select the role you want the computer to have in the Network Rendering setup.

### **Status**

The Status panel in the bottom of the window informs you about the current state on your computer, you can start services manually or set them to be restarted automatically when you finish the Network Configuration.

The Status panel is present on all steps of the Network Configurator. And will continuously inform you about errors and when changes to a service will require a restart.

## Network Monitor



KeyShot Network Monitor allows you to interact with the network manager, workers, and view/administrate jobs in the queue.

When your computer is connected to a Manager you can find the Monitor icon in the Task menu (Windows) or the Menu bar (macOS)

### Main Menu

In the Main menu you have following options:

#### File

- **Connection Settings** - By default your computer will connect via auto-detect. But you can also specify the manager you want to connect to in the Connection settings.
- **Hide** - if you don't want to see the monitor, you can hide it. You can always bring the Monitor back via the Monitor icon in the Task menu (Windows) or the Menu bar (macOS)
- **Quit** - close the monitor. This will not quit the manager/worker services.

#### Edit

- **Download** - Download job.
- **Move up/down** - Reorder the queued jobs
- **Delete** - Delete the selected job(s).

#### Help

- **About** - Displays version information (this menu item is located in the *KeyShotNetworkRendering* menu on macOS).
- **License Information** - will display license information from the manager you are connected to.
- **Manual** - Links to this manual.
- **Check for updates** - Check if there are updates for your Network rendering installation.
- **Auto-update** - Keep the installation up to date.

### Monitor window

1. **Delete** - Delete your render jobs. Administrators may delete any job. Visit the [Set up Users](#) page for more information about user privileges.
2. **Worker Status** - Show/Hide *Worker Status* panel (7).
3. **Login account** - Displays the logged in user's name. Visit the [Log In/Out](#) page for more information.
4. **Jobs filter** - Select *My Jobs* or *All* from the sidebar area. You may also filter either of these

### On this page

- [Main Menu](#)
- [Monitor window](#)

by jobs that are *In Progress* or *Completed*.

5. **Render job queue** - Lists all render jobs submitted to the network. Visit the [Jobs](#) page for more information about handling jobs.

For the best performance we recommend clearing the queue regularly. [Learn more](#)

6. **Details** about the selected job

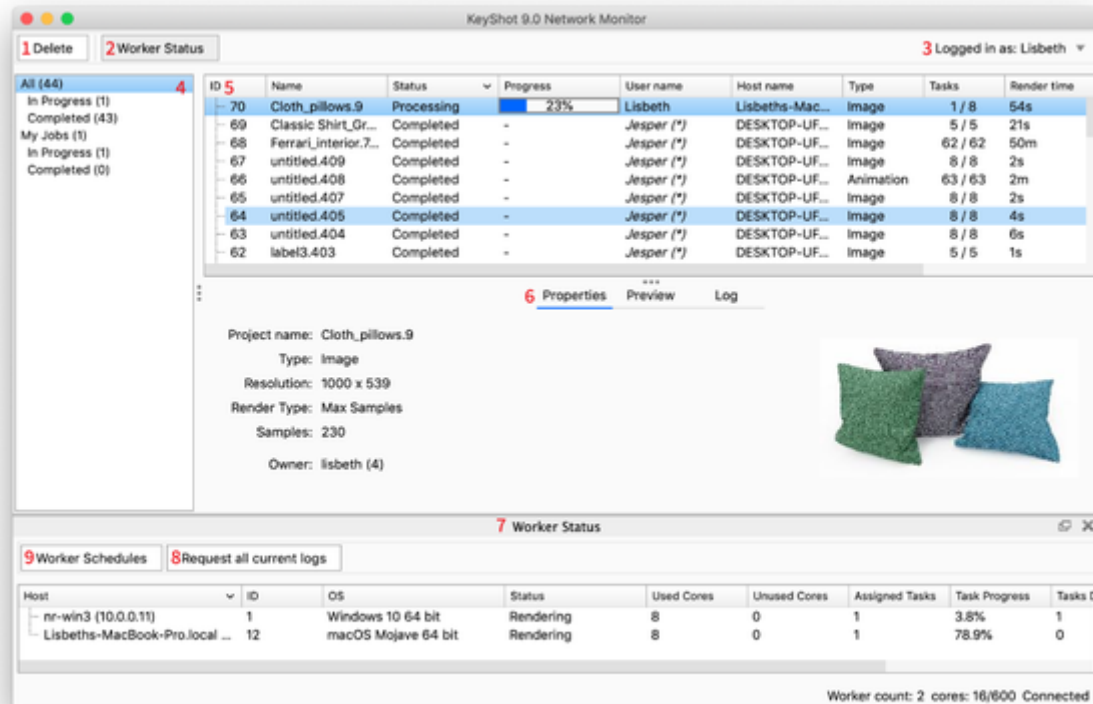
- **Properties** - Displays render job name, type of render, and owner. As well as a small thumbnail of what is rendering/rendered.
- **Preview** - Displays image rendering progress.
- **Log** - Lists all events related to the job.

7. **Worker Status** - Shows connected workers, available/allowed cores per worker, and the assigned regions. Possible status are shown below:


- **Ready** – the worker is connected and is ready to render.
- **Updating** – currently updating software; not available for rendering.
- **Receiving** – currently receiving job data for the task to render.
- **Rendering** – currently rendering.
- **Sending Results** – sending results back to the manager.
- **Failed** – if the worker fails 3 times it will be made inactive, waiting for an admin to take a look at the situation.

8. **Worker Schedules** - Show/Hide worker schedules toggle. Worker schedules determine when a worker is active or inactive. Visit the [Worker Schedules](#) page for more information.

9. **Request all current logs** - Download a ZIP file containing logs for all connected workers. You can also right click a worker to access the logs for that specific computer. Visit the [Get Logs](#) page for more information.



## Worker Tray

When the worker service is running on your computer the  *Worker Tray* widget can be found in the Task menu on Windows or the Menu bar on Mac.

The Worker Tray widget gives you the option of pausing or limiting the amount of cores used for Network Rendering. This is useful if you are making your work PC available as a worker, but still need to use it some of the time.

If your computer is available for Network Rendering with both CPU and GPU, it will be seen as 2 workers. This means that you can pause/limit the resources individually.

### CPU Worker

#### *Set Cores*

The overall amount of cores that are made available for the manager is defined in the Network Rendering Configuration, but you can override that setting here and limit how many cores that are available.

#### *Pause CPU Worker*

Here you set the worker to paused, making it temporarily unavailable for the manager.

### GPU Worker

#### *Set enabled GPUs*

If you have set up your Worker with multiple GPUs you can set a temporary limit to which GPUs are available for Network Rendering.

#### *Pause GPU Worker*

Here you set the worker to paused, making it temporarily unavailable for the manager.

### Both

#### *Use all cores on sign out*

When this is checked all resources will be available for the manager while the user is signed out, but the machine is still running (not hibernated). The feature will default to the set number of cores when the user logs in again.

### On this page

- [CPU Worker](#)
  - [Set Cores](#)
  - [Pause CPU Worker](#)
- [GPU Worker](#)
  - [Set enabled GPUs](#)
  - [Pause GPU Worker](#)
- [Both](#)
  - [Use all cores on sign out](#)

Set Cores ▶

Pause CPU Worker

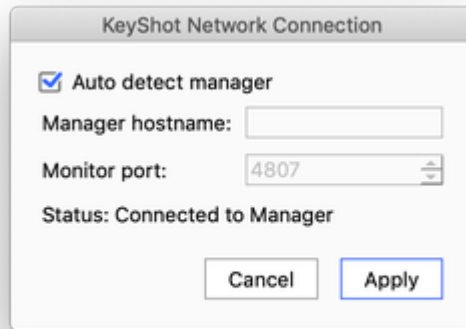
Set enabled GPUs ▶

Pause GPU Worker

Use all cores on sign out

Quit

## Connect to the Manager



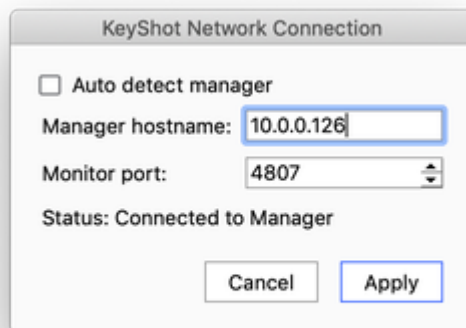
### On this page

- [Auto Detect Manager](#)
- [Manually Connect to Manager](#)
- [How To Change The Port Numbers](#)

### Auto Detect Manager

By default Network Rendering is set up to Auto detect manager and workers/clients.

Worker and manager will just have to have the same port numbers specified in the Network Configurator and when you connect the Monitor you only need to keep the Auto-detect option checked, when you connect. You find the connection dialog in the Monitor menu *File > Connection Settings...*



## Manually Connect to Manager

If Auto Detect is not enabled, or your network operates with Multiple Managers you can specify the Manager in the Connection Settings.

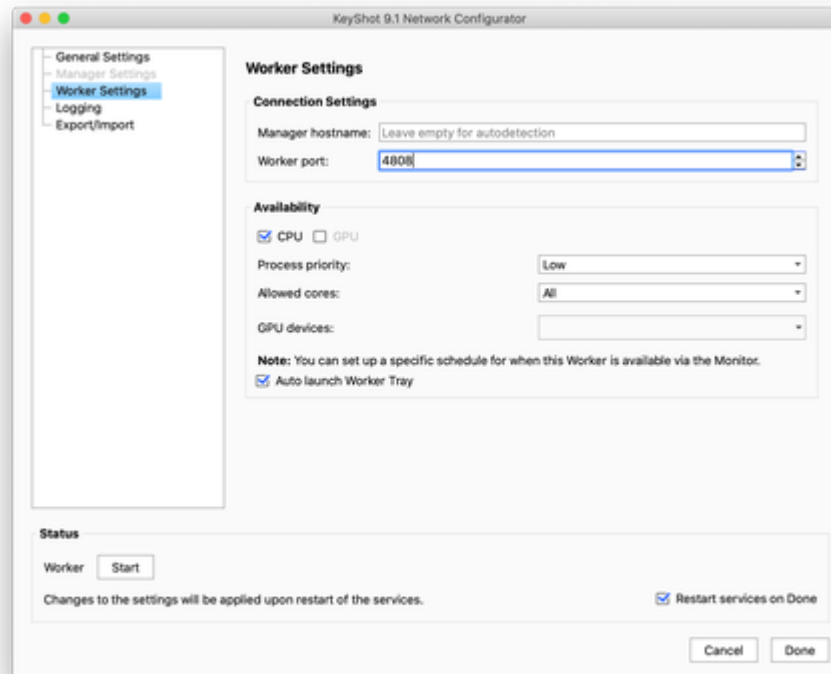
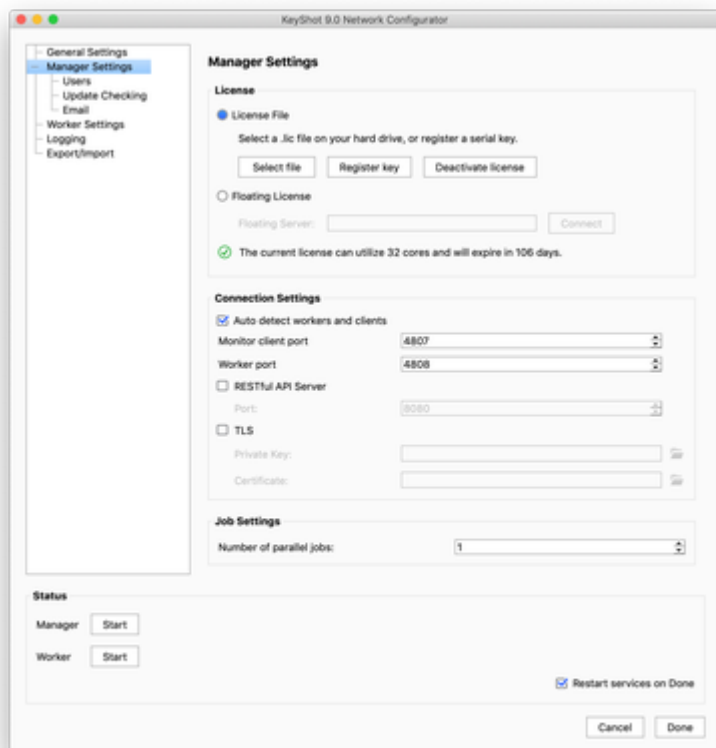
Disable *Auto detect manager* and fill in the manager hostname (or IP Address) as well as the port number.

## How To Change The Port Numbers

The Default port numbers are

- 4807 to connect monitor and manager.
- 4808 to connect worker and manager.

We recommend keeping default port values. If you need to change the ports anyway you can do that in the Network Configurator. Make sure to change it on both [Manager](#) and [Workers](#).



## Log In/Out

You can log into your user account via the KeyShot Network Monitor from any manager, worker, or client computer.

Logging into your network account allows you to download and/or delete your completed [jobs](#).

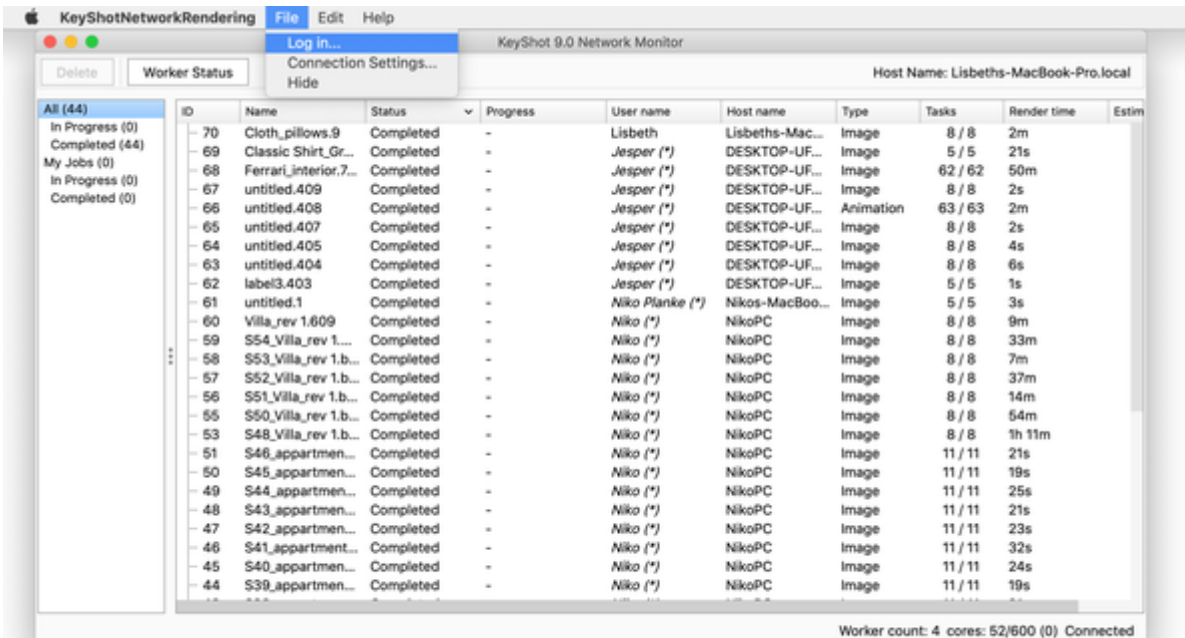
If you need to be able to download/delete all jobs, [manage user privileges](#), and [edit worker schedules](#), these privileges can be added to your account by an administrator.

### On this page

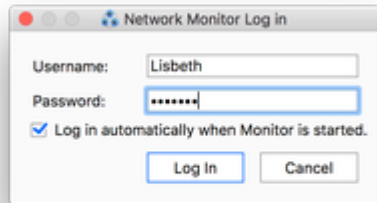
- [How To Log In](#)
- [Anonymous users](#)

## How To Log In

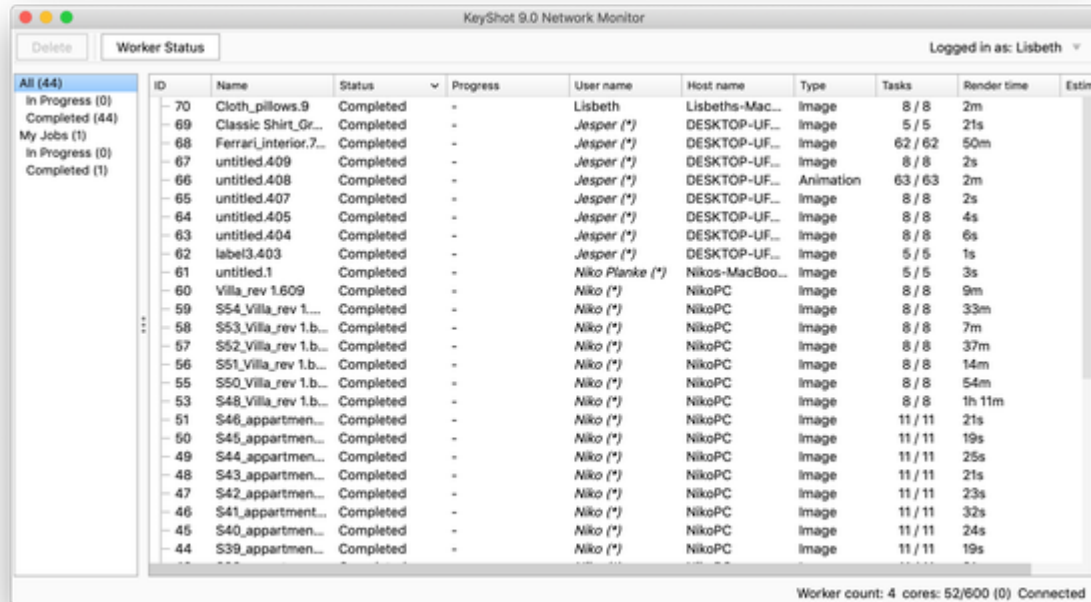
1. Launch KeyShot Network Monitor and go to *File > Log in...*



2. Type your username and password. If you want to be logged in whenever the monitor is connected to a manager, be sure to check *Log in automatically when Monitor is started*.



3. Click *Log In*. Your name will appear at the top right corner inside the KeyShot Network Monitor window. Similarly, you will find *Log out* in the File menu.



## Anonymous users

Depending on the [Manager Setup](#), anonymous users may be allowed to submit jobs for rendering.

You are considered an anonymous user as long as you have not logged in. An anonymous user may only download jobs that he/she created as long as these jobs were sent from his/her current client computer.

## Set up Users

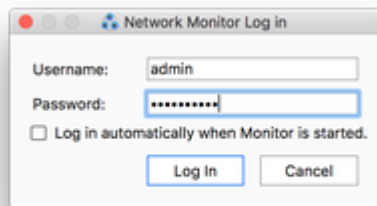
If *User System* has been enabled on the manager (view the [Manager Setup](#) to learn more), users can log into their accounts from any computer on the network via the Network Rendering Monitor. Network administrators may access the user management system, add or remove accounts, and change privileges for each account.

In the instructions below, we assume that you have set up administrator credentials on your [manager](#).

### How To Add/Remove Accounts

#### 1. Log In

Launch KeyShot Network Monitor, click *File > Log in* and log in with your administrator credentials.

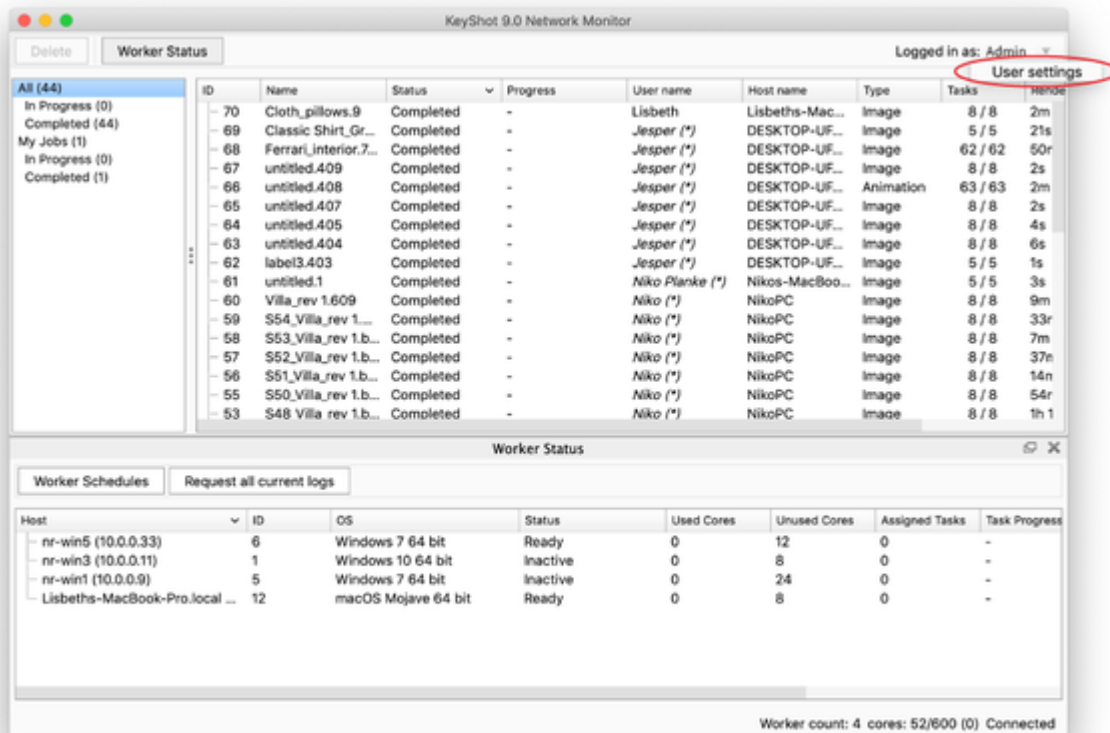


#### 2. Open User Settings

In top right corner of the monitor you can now see that you are logged in. Click the triangle next to your username and select *User settings*.

#### On this page

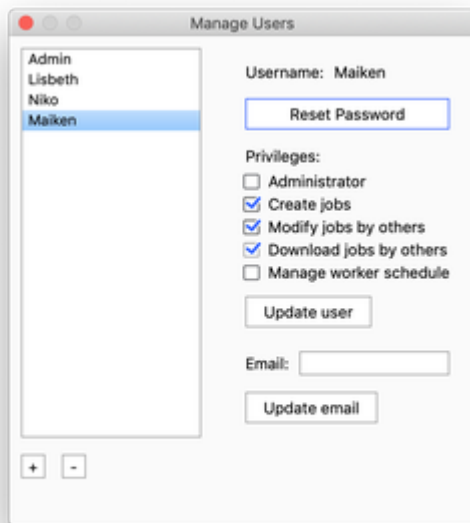
- [How To Add/Remove Accounts](#)
- [How To Change Account Privileges](#)
- [User Privileges](#)
- [Anonymous users](#)



### 3. Add or remove user

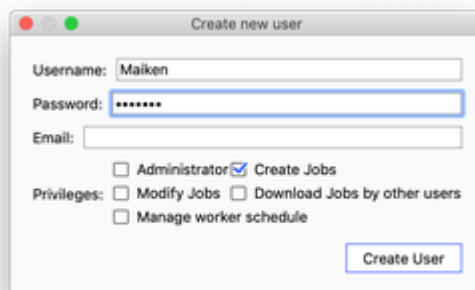
Click the Add (+) button to add or Remove (-) to remove a selected account.

**Note:** The main administrator, created in the Network Rendering Configurator, can not be removed.



#### 4. Set up new user

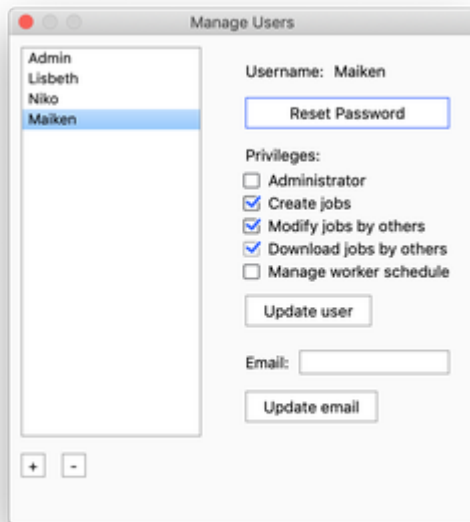
When adding an account, fill in the appropriate information, assign privileges, and click *Create User*. Now the respective user can log in using his /her credentials.



### How To Change Account Privileges

1. Select the account and enable/disable privileges.

If the [Get Email Notifications](#) are enabled and the email is filled, the user will get a notice when a job is completed.



2. Click *Update User* and close the user system dialog when finished.

## User Privileges

- **Administrator** - The user can do all of the things below, as well as add/remove users.
- **Create Jobs** - The user can send jobs to Network Rendering.
- **Modify jobs by others** - The user can change priority, pause, and delete jobs by others.
- **Download Jobs by others** - The user can download all jobs.
- **Manage worker schedule** - The user can set up/edit [Worker Schedules](#)

## Anonymous users

If *Anonymous Users* has been enabled in the [User System & Security](#) section of the Network Configurator on the manager, you do not have to be logged in to be able to send jobs to Network Rendering. In this case, the computer from where the job is submitted will be listed as the user.

"Anonymous jobs" can only be deleted/downloaded from the computer that submitted them, unless you are logged in with administrator privileges.

# Jobs

The Queue in the Monitor shows you the waiting, in progress and finished jobs.

You can log into your user account on any computer that is connected to the manager via the Monitor. Logging into your network account allows you to download and/or delete your completed jobs. If you submitted the job, without being logged in, you have to access the Monitor on the same computer, to be able to download/pause etc. the jobs. [Users](#) can be given additional privileges so they can download and/or delete all jobs, [manage user privileges](#), and [edit the worker schedule](#).

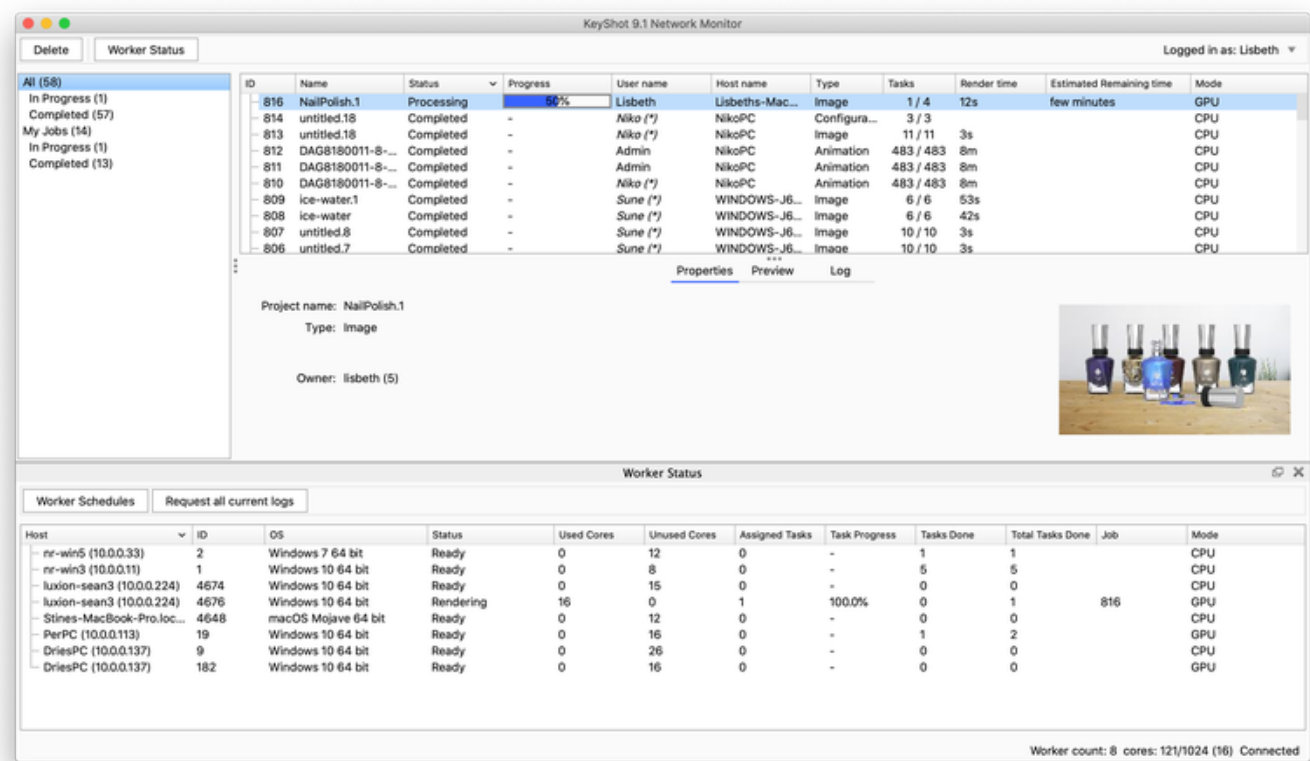
The filter on the left of the monitor will enable you to quickly find your jobs.

## Job Order

Jobs will generally be processed in the order they were submitted. Users with the right privileges can change priority of jobs (see details below). The Order can also be impacted by the capability of the Workers and the load of jobs. A Worker can only process jobs matching their [Render Engine setup](#) (CPU/GPU), so if there are few GPU Workers but many GPU jobs the CPU jobs may seem to be processed faster. In the Queue you can see details of each job, including the *Render Engine* of a job.

### On this page

- [Job Order](#)
- [Change priority on a job](#)
- [Download a job](#)
- [Delete a job](#)
- [Pause a job](#)



## Change priority on a job

To move a job up/down in the queue order, simply right-click the job and select *Increase priority* or *Decrease priority*.

**Note:** If a change in priority moves a processing job down in the queue, the current tasks in process will be finished, but no new tasks will be started on that job, until tasks from jobs with a higher priority are done.

## Download a job

You do not need to be connected to the network while the job is being rendered. The images will be stored on the manager. Next time you connect to the manager, with the same user and computer, your finished jobs will automatically be downloaded to the given location. If you log into the monitor on another computer you can manually download your jobs.

To download a job, simply right-click the job in the queue and select *Download*.

**Note:** If you have sent the job to the manager anonymously (without being logged into the monitor), you can only download it from the same computer as it was uploaded from. If you want to download it from another computer you will need to be logged in with the appropriate privileges.

## Delete a job

To delete a job, or a selection of jobs, select the job(s) in the queue and click the delete button or right-click the job and select *Delete*.

## Pause a job

You can also pause jobs that are processing. In this case the current tasks will be finished and the job won't be resumed until it is unpaused. You find the pause/unpause options when you right-click a job.

## Get Email Notifications

In order for Network Rendering to be able to send notification, you must *Enable Email Notifications* in the Network Configurator, Email Settings on the manager.

There you need to enter an Admin email and set up an email account for outgoing mail. Visit the [Manager Setup](#) page for more information.

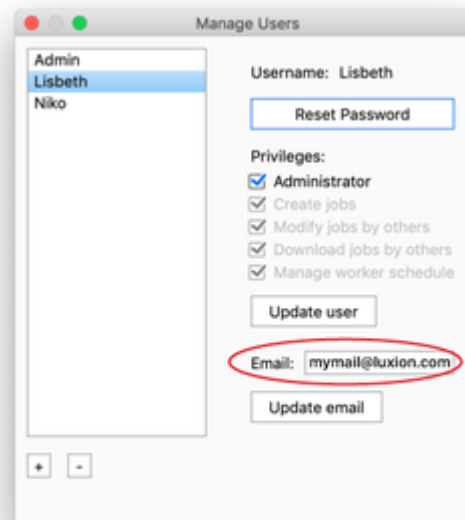
### Administrator notifications

When Email Notifications are enabled, the administrator can select which notifications he/she wants e.g. when a license is about to expire or when there is an error in the system.

### User notifications

#### On this page

- [Administrator notifications](#)
- [User notifications](#)



Users of Network Rendering can also get notified when a job is finished/failed. This requires that the user is logged in, while submitting the job. And that they have added an email in their user settings.

Add email address to user settings

1. Log in to the Monitor *File > Log In*
2. Click arrow next to your username in the top right corner of the monitor and select *User Settings*
3. Select your user in the list
4. enter or edit the email address associated with your user



## Clear the Monitor Queue

The Manager stores information about all completed jobs, which will be displayed in the Monitor queue.

We recommend that the queue is cleared regularly as a large amount of jobs in the queue may impact performance.

An administrator can clear the queue in 2 ways:

**Via the Monitor** - Select the jobs in the queue and press Delete (or right-click and select delete). This will remove the jobs completely from the manager.

**Directly on the Manager computer** - delete the jobs via the on the manager.

1. Access the computer acting as the Network Manager.
2. Launch *KeyShot Network Configurator* and click *Stop* next to the Manager, in the *Status* section
3. Open your file browser and browse to **KeyShot Network Resources > Manager**.
  - Default location on Windows: *C:\Users\Public\Public Documents\KeyShot9NetworkResources*
  - Default location on Mac: */Library/Application Support/KeyShot9NetworkResources*
4. Delete all sub-folders in the Manager folder. These are all the jobs in the queue (done and in-progress).
5. Go back to the *KeyShot Network Configurator* and restart the Manager or click *Done* while *Restart services on Done* is enabled.

# Get Logs

If Logging is enabled for the worker/manager, you can access logs via the monitor. The log files keep track of Network Rendering state, information, and errors.

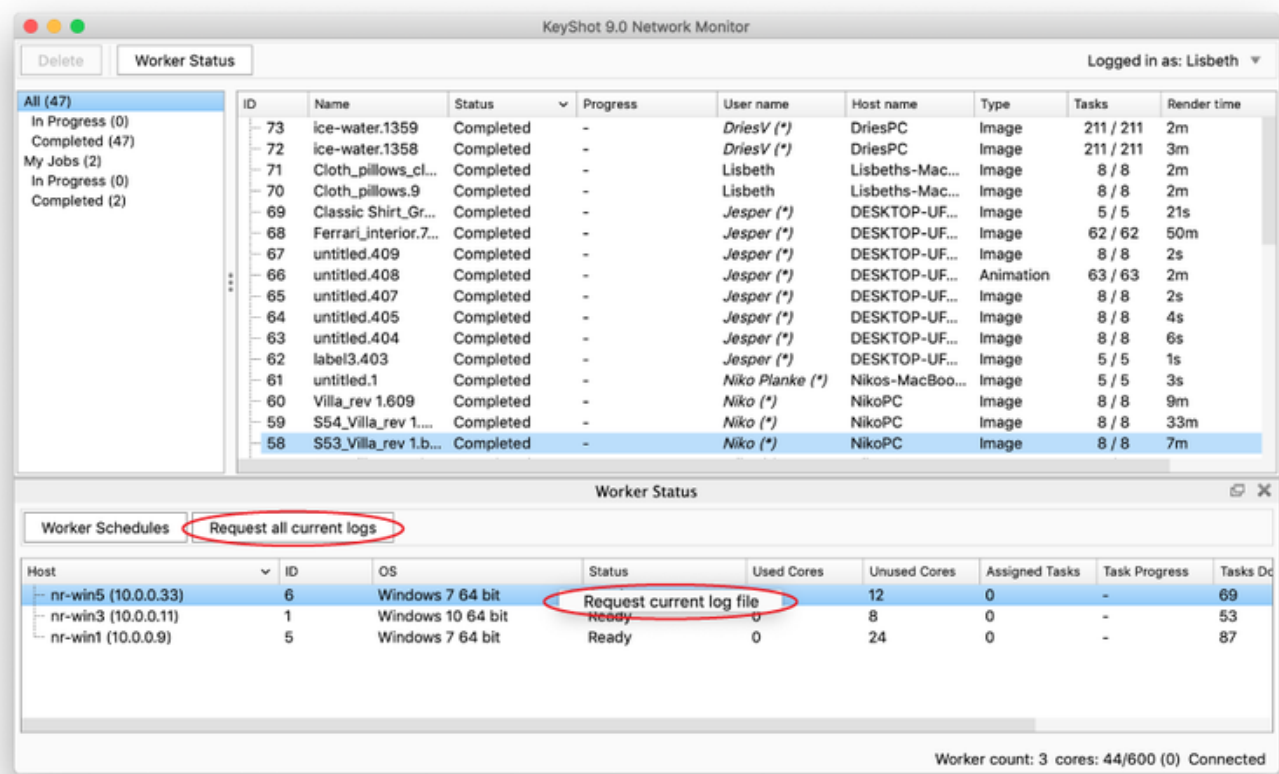
To enable logging, launch the KeyShot Network Configurator on the [worker/manager](#) and enable it in the Logging settings. Here you can also select which incidents to log and for how long the logs are stored.

## Access logs

Logs can be accessed via the monitor. Click the *Request all current logs* button or right-click the worker, you want logs from, and select *Request current log file*.

### On this page

- [Access logs](#)





## Limit Worker Availability

If your computer is available for the network as a worker, but is also used for other things you may want to limit the availability for Network rendering.

This can be done in 2 ways:

1. Limit the amount of CPU cores/GPU's available for the network rendering
2. Limit when the worker is available

### Changing the number of cores

#### CPU

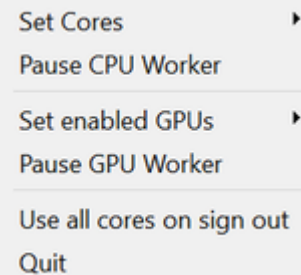
The worker service is by default set to use **all** of your processor cores. To lighten the load, you can release some cores on your worker. The core limit can be set in 2 ways:

- **Default limit:** You can set up a default limit in the [Worker Setup](#) in the Network Rendering Configurator
- **Temporary limit:** The [Worker Tray](#) widget enables you to set a temporary limit or pause your worker entirely. Please note that the worker service will revert to its default settings when you restart the computer.


#### GPU

The worker service is by default set to use **all** available GPUs. If you have Multiple GPUs you may want to reserve some power for other things. You can select which GPUs are available for Network Rendering in 2 ways:

- **Default limit:** You can set up a default limit in the [Worker Setup](#) in the Network Rendering Configurator
- **Temporary limit:** The [Worker Tray](#) widget enables you to set a temporary limit or pause your worker entirely. Please note that the worker service will revert to its default settings when you restart the computer.



### Setting limitations in the Worker Tray

1. Log into your worker computer and find the  Worker Tray widget, it is located in the taskbar on Windows and in the menu bar on Mac.
2. Right-click the Worker Tray widget and select *Set Cores/Set enabled GPUs*.

#### On this page

- [Changing the number of cores](#)
  - [Setting limitations in the Worker Tray](#)
- [Limiting the times when the worker is available](#)
  - [Pausing the Worker Service from within the Worker Tray](#)

3. Change the number of cores or which GPUs are available. The worker service will restart in the background. Once it restarts, the worker will reconnect to the network.

### Limiting the times when the worker is available

If you need all the power of the computer, for something other than Network Rendering, during parts of the day you can limit when the worker is available for Network Rendering.

- **Default limit:** In the Monitor you can set up a Worker schedule where you can limit the hours where the worker is available. Visit the [Worker Schedules](#) page for more info.
- **Temporary limit:** In the Worker Tray you can pause the worker.

### Pausing the Worker Service from within the Worker Tray

1. Log into your worker machine and find the Worker Tray widget, it is located in the taskbar on Windows and in the menu bar on Mac.
2. Click *Pause Worker*.
3. Select *AbortTask* when prompted.

#### Note

Note that it is possible to configure the [Manager](#) in a way that does not allow Workers to access to the Worker Tray. If this is the case you cannot temporarily limit/pause the Worker's availability for Network Rendering.

Changing the Worker Schedule requires the right user privileges. If you don't see the Worker Schedule button in the Monitor, ask your administrator to grant you permission or to set up an appropriate schedule for your computer.

# Multiple Managers

Generally having one Manager on the network is the way to go. This Manager will have access to all cores allowed by the license, and all connections with workers and clients can be established by auto-detection.

But in some cases you may need to have multiple managers - maybe group A must not be able to see what group B is working on and vice versa.

## Setting up multiple managers

### License

If you have a floating [license](#) you can have multiple managers. These will be sharing the number of cores allowed by your license. Follow the same setup procedure as you would normally do (see [Manager Setup](#)) and refer to the same license server on all managers.

### Connection

The key difference from one manager setups is, that you can not use *Auto-Detect* in the connection settings. You must set a fixed host in the connection settings for both [workers](#) and [clients](#).

### Limit access

If you want to limit who can send jobs to the different managers, you can enable the User system on each manager (see [Manager Setup](#)). This way only registered users can access the Network Rendering on that specific manager.

#### On this page

- [Setting up multiple managers](#)
  - [License](#)
  - [Connection](#)
  - [Limit access](#)

# Update Your Software Version

Manager, Workers, and Clients should all run the same version of KeyShot Network Rendering.

After an update, the Manager will automatically update connected Workers, but each Client (Monitors) will need to be updated individually.

## Update the Manager and Workers

If Update Checking is enabled, the update service in the monitor will let you know when a new version is available. But you can also check for updates via the *Main menu > Help > Check for Updates*.

1. Update the Manager - on the computer acting as Manager you can update KeyShot Network Rendering in one of the following ways:

- Download and install the latest KeyShot Network Rendering update from <https://www.keyshot.com/resources/downloads/>
- Launch the *Network Rendering Monitor* and Click *Update* in the update dialog.

2. Launch *KeyShot Network Configurator* on your Manager.

3. Press *Close and restart services*. Your Manager will re-start and all existing workers services will be automatically updated.

## Update Clients (Monitors)

Clients need to be connected to a Manager in order to receive information about updates. As soon as your Client is connected to a Manager, the Monitor will check if your client is running the same version as the Manager - if they are not, you will be asked to update and given an update link. As mentioned above you can also always download and install the latest version from <https://www.keyshot.com/resources/downloads/>.

For help updating your network, you can contact Luxion Support at [support@luxion.com](mailto:support@luxion.com)

### On this page

- [Update the Manager and Workers](#)
- [Update Clients \(Monitors\)](#)