
CINEMA 4D
Release 9
NET Render

NET Render

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Newbury Park, CA 91320
USA

or for the United Kingdom and Republic of Ireland to:

MAXON Computer Ltd
The Old School, Greenfield
Bedford MK45 5DE
United Kingdom

We will also be pleased to provide you with the address of your nearest supplier.

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1 Introduction

Networks … the final frontier … processing power at your fingertips to take your breath away!

CINEMA 4D NET Render answers the needs of today's professional media production industry by providing tools that enable the highest quality computer-generated 3D graphics and animation to be created on demand and to be delivered in time.

Time and cost are prime considerations in the professional market. Even though productions are becoming more ambitious and demanding, the time given over to creating these masterpieces is being reduced constantly.

One way to gain the upper hand in reducing production times is to use multiprocessor systems. Another approach is to work with computer networks. CINEMA 4D NET Render couples these technologies in a unique way.

Multiprocessor programs and network farms have been available for some time now but, for many companies, let alone individuals, their cost has been prohibitive. CINEMA 4D NET Render is THE alternative to expensive conventional solutions. The price of the program itself is attractive and additional costs are minimal. Perhaps you will be using an existing network. Even if you build a network from scratch, you can use conventional computers that even small businesses can afford.

Developed in cooperation with the European Union, CINEMA 4D NET Render can react quickly and dynamically to meet the latest market requirements, due to the parallel nature of its individual work processes. CINEMA 4D NET Render also has unique features such as dynamic load balancing, safe recovery and hot plugin.

CINEMA 4D NET Render contains two types of application: the server program and the client program. Usually you will have just one computer (the server) running the server program and more than one computer (the clients) running the client program. The stages involved in network rendering are simple: first you send your render jobs (i.e. the CINEMA 4D scenes that you wish to have rendered) to the server. In turn, the server passes these scenes on to the clients for rendering. Once the clients have rendered the results (animation files), they send them to the server. You in turn collect the animation files from the server.

Depending on the number of licenses you have purchased with CINEMA 4D NET Render, you are allowed to use that number of clients simultaneously with your CINEMA 4D NET Render server.

The clients are — in contrast to the server application — free. This means you can distribute and install as many clients as you want. For example you can give clients to customers or friends so you can use their computer for rendering too.

✘ *In contrast to the clients, the server application is not free. Distributing the server is illegal (see the End User License Agreement).*

When the time comes you will find updates and additional clients for other operating systems on our web site (www.maxon.net) in the future. Checking this site on a regular basis is therefore suggested.

The intelligent server program distributes the render jobs completely and updates the allocation at regular intervals so that the clients share the work according to their individual progress. This avoids the problem of the slowest computer in a mixed network forming a bottleneck. The intelligence of the server goes a step further: individual clients can be added to or removed from the network at any time, even while a render job is in progress. If, for example, a client is added during a render job, the server redistributes the work to include the new client.

The intelligent server makes for an efficient and dynamic network. At the same time, the net traffic (i.e. the load on the network) is kept to an absolute minimum.

The clients act intelligently as well. For example, if multiprocessor systems are in use, the client program shares the task of rendering each frame among its processors and updates the allocation at regular intervals in a manner similar to the server. One very strong feature of the CINEMA 4D NET Render license is that a multiprocessor machine counts as just one seat. The license agreement refers solely to the number of computers in your network, not the number of processors.

A TCP/IP network serves as the basis of communication between the server program and the clients. Why have we opted for this solution? TCP/IP is manufacturer-independent, it has become more or less the standard for local and national networks and it is available on most platforms, often with direct integration in the operating system. Also using CINEMA 4D NET Render over the Internet is very easy.

Terminology

Let's define some important terminology used throughout this manual:

C4DN	CINEMA 4D NET Render
C4DN server	CINEMA 4D NET Render program configured as server
C4DN client	CINEMA 4D NET Render program configured as client
server	computer from which the C4DN server was launched (not to be confused with the file server for the network — see below)
client	computer from which a C4DN client was started
file server	server for the network (this computer's folders and directories are accessible from both a PC and Macintosh)
job	a CINEMA 4D scene that is to be rendered across the network

The terminology does not consider detailed network structure. This information is not necessary for the operation of CINEMA 4D NET Render.

Requirements

- functional TCP/IP network
- computer with a static TCP/IP address to host the C4DN server
- Internet browser (e.g. Opera, Microsoft Internet Explorer)
- operating system:
  - Mac OS X 10.3.4 or higher
  - Windows 2000 SP 1 or Windows XP
- CINEMA 4D is not required but recommended (if CINEMA 4D is not installed, CINEMA 4D files can only be *rendered*)

A few words on networks

- Both the C4DN server and the C4DN client can be launched from the same computer. However, when there are ten or more computers in the network it is more efficient to designate one of the computers as a dedicated server.
- Any modem or ISDN adapter connected to your computer will attempt to dial out to the Internet each time the C4DN server is started. This occurs with all similar network programs that access TCP/IP. If, and only if, the modem computer also hosts the C4DN server, allocate two IP addresses to the computer — an internal address and an external address. Alternatively, install the C4DN server on a different computer — one without a modem.
- The server and clients will default to port 8080 or 1800. If another server already uses this port, conflicts will occur. You can either quit the server that is currently running or allocate an alternative port address to CINEMA 4D NET Render. Please see the Appendices for more information regarding IP addressing and TCP port numbers. Also refer to the Troubleshooting chapter.

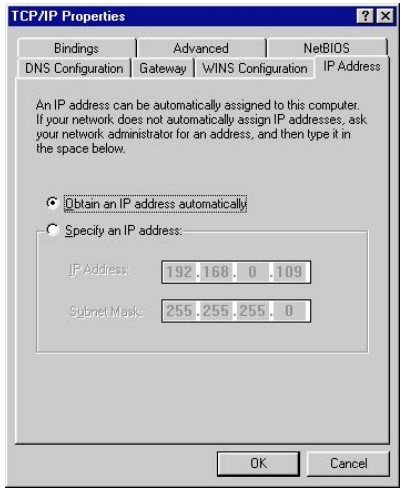
2 Installation

2 Installation and configuration

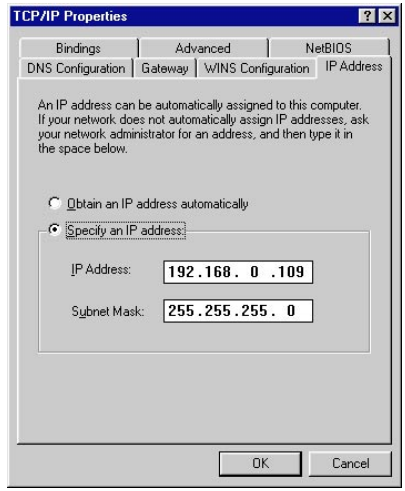
Installing and configuring the C4DN server

1. Decide which computer will act as the CINEMA 4D NET Render server — this does not have to be the fastest machine available. Determine the (internal) IP address for this computer and make a note of it.

➔ *This computer must have a static TCP/IP address. Some computers, especially those that access the Internet through a modem, use dynamic TCP/IP allocation; in such a case we recommend that you install the C4DN server on a different computer.*



Dynamic IP addressing running Windows.



Static IP addressing running Windows.

2. Place the appropriate CD into the CD drive of the computer that will act as the C4DN server.

3. Start the installer from the CD. Choose ‘NET Render Server’ and follow the on-screen instructions.

4. All done. Yes … all done!

✘ *If you plan to give multiple users access to CINEMA 4D NET Render you should read the Security Issues section — look up ‘security issues’ in the index.*

Installing and configuring the C4DN clients

1. Place the appropriate CD into the CD drive of a computer that will act as a client.
2. Start the installer from the CD. Choose ‘NET Render Client’ and follow the on-screen instructions.
3. Start the C4DN client and select Network Settings... from the File menu.
4. Enter the TCP/IP address (see note above) of the server (the computer which hosts the C4DN server) alongside Server address, for example Server address=192.168.0.227
5. Save the file and quit the editor.
6. All done. Yes, again … all done!

➔ *The Appendices include instructions for simplifying the installation and configuration of NET Render on large networks. System administrators should read these notes carefully.*

User Account Basics

Before we really start, some words about managing multiple users.

After installation only one user, with the name Administrator, is installed by default. This user has full access to all files and configuration data. As long as only one person is using CINEMA 4D this is sufficient. But if there are multiple users using CINEMA 4D NET Render at the same time you will want to add individual user accounts. Every person gets a user ID and a password from the administrator. This protects the users from mixing their scenes with other users and also allows you to build an Internet render service. More details can be found in ‘How to administer clients’.

In the server folder you will find the CINEMA 4D NET Render program, its configuration file, server.ini, and also a folder called ‘user’. In this folder there will be a sub-folder for every installed user. These folders are for storing scenes and rendered pictures for the corresponding user.

By default you will find only a single administrator folder. This is the normal folder you will use for rendering if you are a single user (and therefore the administrator). Otherwise, you must use your user folder.

Personalization

You need to personalize the program when starting the C4DN server for the first time.

Please complete all entry boxes correctly, then click on OK. The serial number supplied with your package is valid for three months only; we will send you a final serial number when you register your purchase. If you do not enter your final serial number before the period expires, the server will cease to function.

➔ *Please register promptly with MAXON Computer. Only by registering will you be sent your final serial number. Registration also entitles you to updates, support and information on future developments.*

Starting the client server system

1. Start the C4DN server. A console window appears.

2. Start the C4DN client on all the computers you wish to use. Again, a console window appears.

➔ *This process can be carried out automatically when the computer is started. For Mac OS, place an alias to the C4DN client in System Folder / Startup Items. For Windows, place a shortcut to the C4DN client in your local Start Menu / Programs / Startup folder.*

3. All done … again!

Quitting the client server system

To quit the clients and the server, select Close or Quit from the console window of each program.

Preparing your work

Creating projects

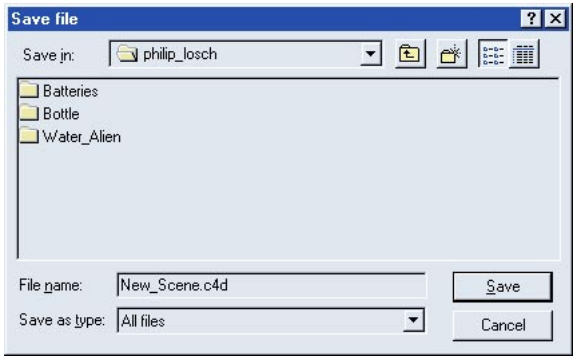
Network rendering is a largely unsupervised affair. This places the onus on you to ensure that each C4DN client has access to all the data it requires.

You should always save your CINEMA 4D scenes using the menu item File > Save Project. Prior to saving, carefully check the settings in the Render Settings dialog (see the CINEMA 4D reference manual). Also, we recommend that you render the scene in the viewport — just the first few lines will do. This will help you confirm that CINEMA 4D really can find all the files.

➔ *When working on a CINEMA 4D scene, it is not necessary to enter a save path for the results (see below for where to find your rendered pictures). But if you have entered a file name (not a complete path) under Render Settings / Save, the results will be named after that name and not after the job name. If you enter a complete path, CINEMA 4D NET Render will use the project's name for naming the frames.*

➔ *The Render As Editor render mode of a CINEMA 4D scene (Render Settings / General) should not be used.*

➔ *If you have disabled the Cancel If Texture Error render option (Render Settings / Options), the job will be rendered to the end, even if some textures are missing.*



In the dialog window, enter the project name under Filename (Windows) or Save as (Macintosh). A folder of the same name will be created in the location selected (see below). This is the location where CINEMA 4D saves all files relating to the project (scenes, textures, shaders, films, etc.). The project name is used later for identifying your render job. Hence you should choose a clear, meaningful name.

✘ *There is a filename length limit of a maximum of 32 characters when saving a project for CINEMA 4D NET Render. Also you should only use the characters A–Z, a–z, 0–9 and the underscore (underline) character. White space or special characters are not allowed.*

You have four choices:

1. You can immediately set the save path in the dialog window to your user folder on the C4DN server — the project will be assembled in this folder.
2. You can save your project locally to your hard disk, then copy the project folder to your user folder on the C4DN server (e.g. via FTP or a file server).
3. You can create a new empty job on the Jobs page. CINEMA 4D NET Render then creates an empty folder named after the job in your user folder on the server. Now copy manually all project files (scene and textures) into this folder.
4. You can create a new empty job on the Jobs page. Now switch to the Details page of the job by simply clicking on its name. Use the Upload function for uploading all necessary project files (scene and textures).

➔ *Method 1 is the quickest option, but method 2 has the advantage that you always have an original copy of your work on your computer. Method 4 is the only possible method when using the Internet for accessing the C4DN server.*

Once all the necessary files are in a central position, you can start the render process. How this works is explained below.

First, though, a few important words on using heterogeneous networks.

Using heterogeneous networks

A so-called heterogeneous network is made up of computers that do not all use the same operating system. For example, MAXON Computer's network includes computers running Windows, Macintosh and so on. Quite a mixture!

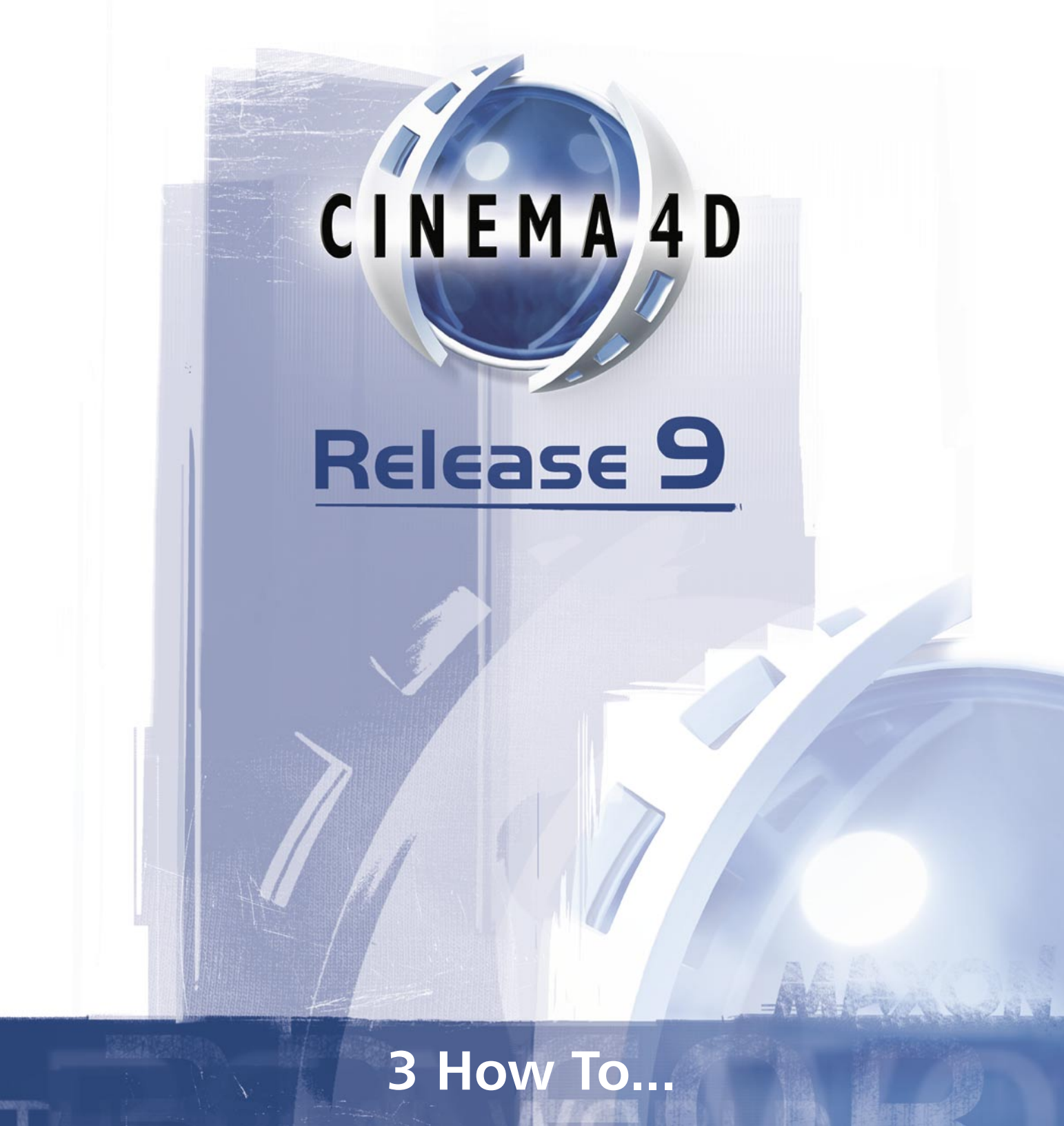
Exactly how all these computers manage to communicate with each other is not of interest to us. What does concern us is that there is a computer, known as a file server, where all the other computers can store their data.

Different operating systems use different conventions. It is important that you are aware of this issue so that you use compatible filenames, paths, picture formats and so on.

What should (or rather must!) you be aware of when creating scenes that, for example, are going to be rendered on both Windows and Mac C4DN clients?

- Do not use special characters in filenames, e.g. \, /, #, :, @.
- Avoid foreign characters such as the German umlaut in filenames. The same applies to textures — check the names for all the textures used by your materials.
- Do not use white spaces in filenames. You can replace these with the underscore (underline) character.
- Limit the length of all filenames and texture names to a maximum of 31 characters.
- Use picture sequences instead of movies for animated textures. A Mac OS client that copes with QuickTime textures may lose the plot with AVI textures.
- Do not use PICT files for textures. Instead, we recommend TIFF or TARGA files.

If there is no file server in your network, you can use your Internet browser to upload and download scenes and rendered pictures (see Upload page). This can be especially interesting in heterogeneous networks and when accessing CINEMA 4D NET Render from outside over the Internet.



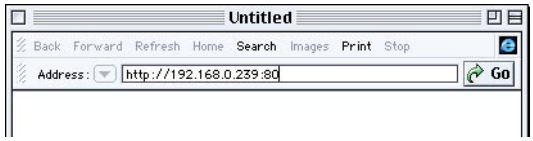
3 How To...

3 How to …

How to render a scene across the network

You've prepared the job, you've started the C4DN server and the C4DN clients and now you're ready to render across the network. When the C4DN server and a C4DN client are started, they have a chat. The client learns where to leave its results and the server knows who it can allocate work to.

1. Start the Internet browser for your operating system.
2. Connect to the C4DN server by typing in the IP address and port number for the C4DN server (http://192.168.0.239:8080, for example) in the Location box (where you would normally enter a URL).

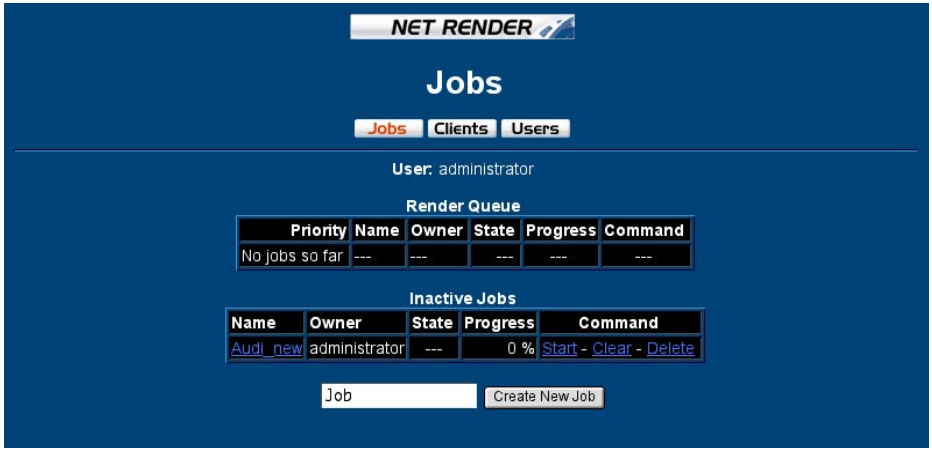


If the connection is established, the CINEMA 4D NET Render Welcome page appears.

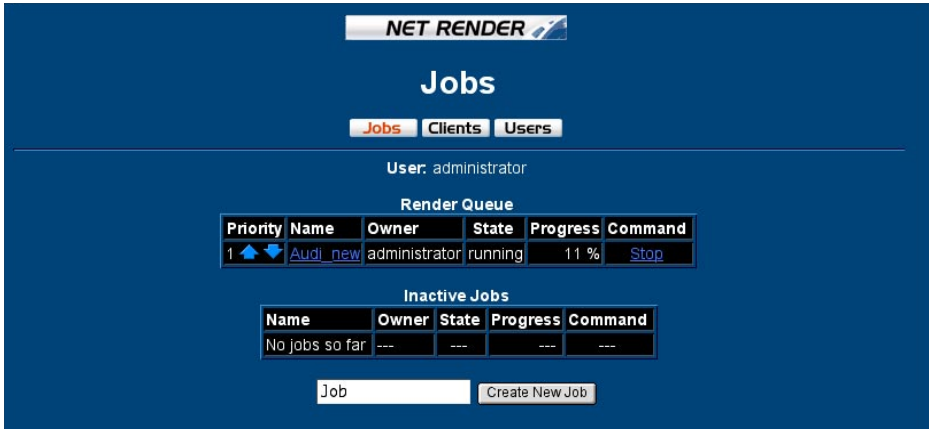
If a connection is not established, please refer to the Troubleshooting chapter for possible causes.

3. Click on ENTER to enter the Jobs page. If there are multiple users configured you will see a dialog asking for your user name and password. You must type them in before you can see the Jobs page. If there is one single user (administrator) you will not see this dialog and you can enter the page directly.

A table appears which lists all your projects in the user folder on the C4DN server. Within the individual columns of the table you will find information about the job name and its current status (State). Your previously uploaded job (see Creating projects) should appear in the Inactive Jobs list.



4. Click on Start (under Command) in the appropriate line of your job. The job moves to the Render Queue list. The C4DN server then automatically starts the rendering.



How to render a still image across the network

Net Render allows you to render not only animations over the network but also still images.

The still image will be broken up into a number of *tiles* — either 9 or 25 depending on which option you choose (more about this later). You might find it helpful to think of each tile as being one jigsaw piece that makes up part of the picture.

The tiles will be distributed over the network and rendered. Once the rendering is complete, you have 9 or 25 files that can be pieced together in an image editor such as Adobe Photoshop to form the still image.

However, before you network render the still image scene, you need to do a little set-up work in CINEMA 4D.

First you set up a special camera called a *tiled* camera. More about this later.

Next, you set up an animation. Yes, you read correctly: an animation! This is because each tile will be rendered as a frame in an animation. So to render an image as 9 tiles you need to set up the scene to animate 9 frames (i.e. to render from frame 0 to frame 8). Or to render an image as 25 tiles you need to set up the animation to render from frame 0 to frame 24.

So how does CINEMA 4D know which part of the picture to render for each frame?

This is where the tiled camera comes in. It will automatically display the correct part of the picture (i.e. the correct tile) for each frame. So at frame 0, it will display the first tile; at frame 1, the second tile and so on.

To net render a still image:

- In CINEMA 4D, load the scene.
- From the Objects > Object Library menu, choose either 25 Tile Camera or 9 Tile Camera depending on whether you want the image to be rendered as 25 tiles or as nine tiles.
- In the Object manager, select the tiled camera if it isn't already selected.
- From the 3D view's Cameras > Scene Cameras menu, choose the camera's name ('camera9tile' or 'camera25tile', depending on which object you chose) to link the 3D view to the camera.
- Move and rotate the camera so that it shows the view that you want rendered.
- In the Object manager, select the camera's XPresso Expression tag. In the Attribute manager, enable the tag's Use Tiling option.
- In the render settings, set the scene to animate from frames 0-8 (if you chose a 9-tile camera) or frames 0-24 (if you chose a 25-tile camera).
- Save the scene and pass it to NET Render (see the previous section: 'How to render a scene across the network'.)
- Once NET Render has finished rendering the tiles, load the tiles into an image editor and piece them together to form the picture.

How to monitor the render job

You can watch the progress of your jobs if you look at the Progress column because this page has an automatic refresh. As soon as the job is complete (progress = 100%) it automatically moves from the Render Queue back to the Inactive Jobs list. Now you can download the rendered data (see below).

➔ *The browser does not have to be open throughout the render process. It is used solely for controlling jobs. The render process runs independently once started.*

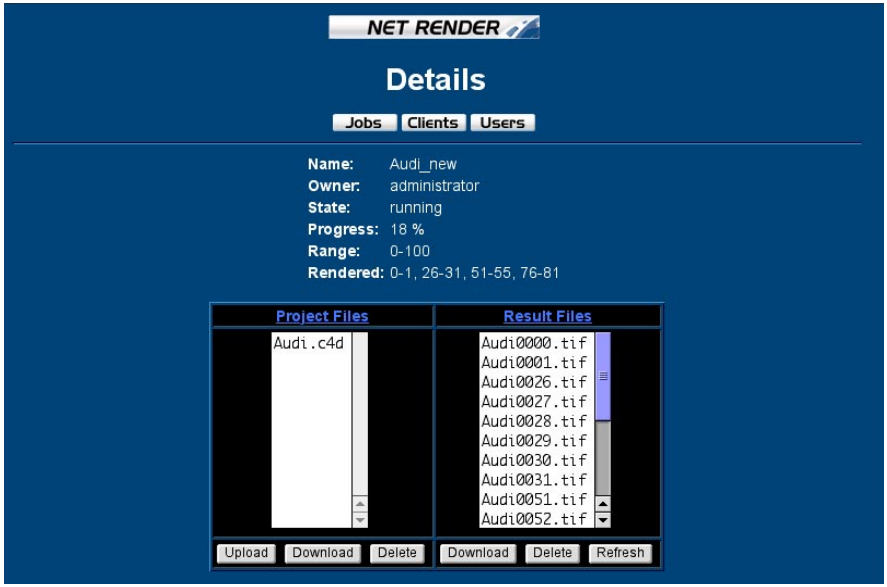
How to locate the results of the render job

Your job has been rendered and now you want to collect the results, but where are they? In the introduction we advised you not to enter a save path in the scene. As a good user, you heeded that advice! Look in your username folder within the user folder in the C4DN server folder. Now look for a folder called results in your project folder. This is where you'll find your rendered frames, all waiting patiently for your attention. Now you can transfer the entire results project folder to the computer you are using for postproduction (e.g. for cutting, compositing, adding sound tracks, etc.). You can also see the list of rendered frames in the browser:

1. Start your Internet browser.

2. Connect to the C4DN server (enter the IP address) and enter the Jobs page.

3. Click on the appropriate job to see the Details page.



You can use the Result Files list to load individual files onto your computer or to delete files from the results folder. To download a file or delete a file, click on the required file in the list, then click on either the Download button or the Delete button respectively.

→ *When you click on the Download button, two things can happen. Either the chosen file will be downloaded immediately or (by default) a new Download page will open up. Which happens depends on the value of the browsertype variable in the server.ini file. You can read more about this in the reference section under Download page and in the appendices under Sections and Variables of the server.ini File.*

How to locate the rendered animation

Fine, but where is my animation, you may ask. Well, CINEMA 4D NET Render renders the animation as single frames by default. Individual frames have significant advantages for postproduction purposes. For one, this avoids problems with integrating alpha channels. Also you will not lose picture quality as can happen with animation codec compression. If there are problems while rendering (hard drive full, missing texture, crash) you can continue the rendering later without any problems. If you use AVI or MOVIE codecs this is not possible.

However, you can choose an animation codec in the render settings of the scene. The server then generates a single animation out of the rendered frames provided that the server has the appropriate codec installed.

→ *Generating a single animation out of frames normally uses double the amount of hard disk space. Keep in mind that — depending on the operating system — the maximum file size is limited to 2 GB. This sets a severe limit on the maximum animation length. If you take, for example, a resolution of 640x480 pixels and 30 frames per second, the 2 GB limit is reached after only 50 seconds of animation.*

✘ *Ensure that any special codecs required by your video hardware are installed on the server; otherwise, these compressors cannot be accessed and a logical error will occur. CINEMA 4D NET Render will use the first one that it finds – which might not be the one you want. But do not worry, the individual frames which were rendered previously are preserved on the server. None of these pictures are lost. Refer to the Troubleshooting chapter to find how to easily reassemble an animation without re-rendering every single frame.*

✘ *If you want to render alpha or depth channels you are limited to one or the other because the communication between client and server is limited to sending a single frame with optional integrated channels at a time.*

How to clean up things

Once a project has finished (and does not need to be rendered again), you can delete the corresponding job folders within your user folder. Alternatively, you can delete the job from within the browser by clicking on Delete (under Command) on the Jobs page. After a confirmation page the whole job with all files and folders will be deleted form the server. Always consider the advantages of making backup copies.

→ *As a safeguard, the files are not automatically deleted after rendering. Take care!*

How to troubleshoot when there are no results

Presumably there were problems during the render phase. It's time to look for the causes.

1. Start your Internet browser and go to the Jobs page.
2. Check to see if your job is still in the Render Queue. In this case the job is still running and not yet finished.

➔ *If the job seems to be taking longer to net render than it should, perhaps a colleague with higher priority has pushed a job to the front of the queue ahead of your job. We will explain how job priority is handled in How to administer users.*

3. Your job is perhaps already in the Inactive Jobs list and has the status error. If so click on the job name to get to the Details page.

   On this page you will see a detailed error text. Possible error causes include: missing textures, wrong texture names, complete network crash, no storage space available for the results, no write permission on the server (to the CINEMA 4D NET Render folder).

   Once you've removed the problem cause, start your job again (click on Start on the Jobs page). Rendering resumes from the point at which the problem occurred — none of the previously rendered pictures are lost.

   An error in the scene file (e.g. incorrect settings, missing textures, etc.) could also be responsible for the lack of results. The following section tells you what to do in this instance.

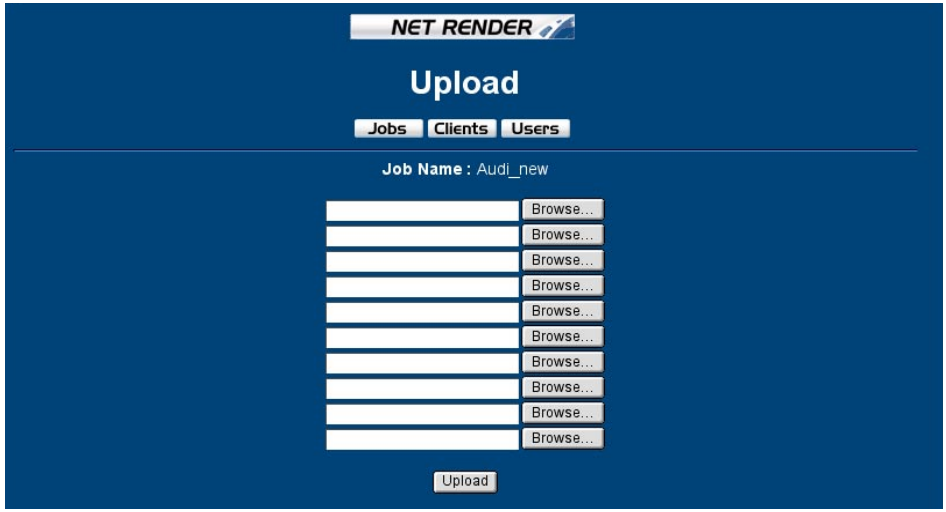
How to update projects

Imagine this scenario: You have forgotten to add some plants to your garden scene. The render was a disaster! Or perhaps you rendered out a preview at a resolution of 160x80 pixels, and you now want to render the final project in full PAL or NTSC resolution. In both cases the scene needs to be edited in CINEMA 4D (either plants need to be added or the Render Preferences adjusted). But what now? Do you have to create the project again from scratch? Do you have to upload all those files (maybe 140 MB altogether) to the server again? Guess what …

There is a neat function ready to help in these instances when just a few files need to be transferred to the server.

1. Start your Internet browser and go to the Jobs page.
2. Click on the name of the job that should receive the rendered file(s); this switches to the Details page.

3. Click on Upload. A new page appears.



This enables you to upload up to 10 files to your project folder.

4. Click on the Browse button and use the dialog window to select the required file. Confirm your selection by clicking on OK.

   The file that you selected appears in the text box next to the Browse button.

5. Repeat step 4 until all the files to be uploaded are selected.

6. Click on the Upload button.

   The files will now be uploaded into the job folder on the server.

➔ *If you wish to upload more than ten files, you must repeat the upload process. You cannot upload more than ten files at a time.*

7. After that go back to the Details page and delete all old frames (IMPORTANT! otherwise nothing might happen) by clicking on Clear.

8. Now go to the Jobs page and restart the job by clicking on Start. The job will appear in the Render Queue and will be rendered again.

➔ *You can also delete individual frames from the Project Files list or download individual frames to your computer. First select the file concerned in the list. To delete the file from the server, click on Delete. To download the file to your computer, click on Download.*

How to work with job priorities

Suppose that the situation is as follows: you've prepared a project and now you want to render a preview. You've uploaded everything to the server (e.g. with the name Urgent), but you've just noticed that five other previously uploaded jobs are already waiting to be rendered … You need to jump the queue so that you get the preview back today. You need to move your job to a higher position in the list.

1. Go to the Jobs page.

   You can see the Render Queue. The job with the highest priority is the one at the top of the list. The priority decreases as you move down the list.

   One of the jobs is already being rendered (status running) and many others are waiting for rendering (status waiting). Your newly created job is by default at the bottom of the list.

2. There are two arrow icons next to the job priority, one that points up and another that points down. You use these icons to move the job up or down the list, which will raise or lower the job's priority respectively.

   Click on the arrow that points up which is next to your new project.

   The display is updated. Notice how your job has moved up one column.

3. Keep clicking on the arrow that points up until your job reaches the required position.

The job that was being rendered before the priorities were changed will be stopped as soon as the new project gets a higher priority. All its clients will stop rendering and every frame in process will be aborted (for now). When the new, high priority, job is finished, the clients will continue with the previous job. Not a single frame will be lost.

As a general user (as opposed to the administrator) you can only switch priorities within your own jobs. If you're using a rendering network together with other colleagues, you should contact the render administrator to move your urgent job above the others.

➔ *You can use the arrow that points down to allocate a lower priority to a job.*

How to abort jobs

Imagine this scenario: you have started to render a job but notice in the job control that you are working with the completely wrong settings (e.g. perhaps you forgot to turn on shadows). Do you have to wait patiently for the project to be rendered and then try again? Of course not! You can abort the current render job.

1. Go to the Jobs page. You will see your job in the Render Queue.

2. Click on Stop in the appropriate line.

   This automatically moves your job to the Inactive Jobs list. There you can modify the job (see How to update projects) or delete it completely. As far as the server is concerned, it has finished the task and is already working on the next job.

How to work dynamically with clients

Imagine you started several render jobs over the weekend that use all of the computers in your firm's network. Monday morning arrives, but the rendering is still in progress. A colleague needs his or her computer back!

Although your colleague could use the computer even while it renders (other applications can run parallel to the render task), rendering is a processor-intensive task. If your colleague wants to use an application that is also processor-intensive (e.g. a spreadsheet or a graphics program), the computer may become frustratingly slow to use.

Losing just one client is of no great consequence if you have plenty of computers in the network. CINEMA 4D NET Render allows you to remove clients from the network at any time. Clients can also be added to the network as required.

To remove a computer from the render network, simply quit the client program on that computer (menu File / Quit).

The client will ask you to confirm that you wish to quit. If you proceed to quit, the frame that the client was rendering is lost, but this frame will be rendered later by another client. This method enables clients to be removed immediately from the network.

➔ *You will not immediately see the correct client number on the Clients page if you are starting additional clients or closing clients. The update takes about one minute because the C4DN server has to check if the TCP/IP link is just dead or if a running client has really left the rendering network.*

If you try to quit the C4DN server in the middle of a render job, the clients keep on rendering their local job (in frame sequence) and will save the rendered frames locally on the client's hard drive until either the local job is finished or the hard drive is full. After that they stop working.

The clients will receive new local jobs when the C4DN server is started again. But before that, the C4DN server will collect all previously rendered and locally stored files from all clients in the network.

➔ *The C4DN server distributes the work optimally so that none of the C4DN clients are left idle. All clients are kept busy. However, a new job will not be started until the old one is finished.*

How to troubleshoot worst-case scenarios

We won't ask you to imagine yourself in the following situation. Instead, pretend it's all happening at a rival studio: the cleaning lady is tidying up around the office one evening. She can't find an empty socket for the vacuum cleaner, so she pulls out a plug … in one fell swoop the server or a client disappears from the render network. Power-cuts, operating system crashes and the like have reduced many a grown man or woman to tears.

CINEMA 4D NET Render takes a number of precautions to minimize your loss in these worst-case scenarios, so with luck your handkerchiefs and tissues will remain dry. Let's take a closer look at what can happen (to your rival studio, of course).

A C4DN client is no longer present.

If a client is removed suddenly, the frame that the client was rendering is lost. However, the server will recognize that the client has been lost and that the client is unable to finish rendering the frames it was allocated. The server then distributes the task of rendering these frames to other clients. The end result is that not a single frame is missing from the animation. A little time was wasted on the one frame that was lost, since it had to be rendered again by another client, but the cost is minimal.

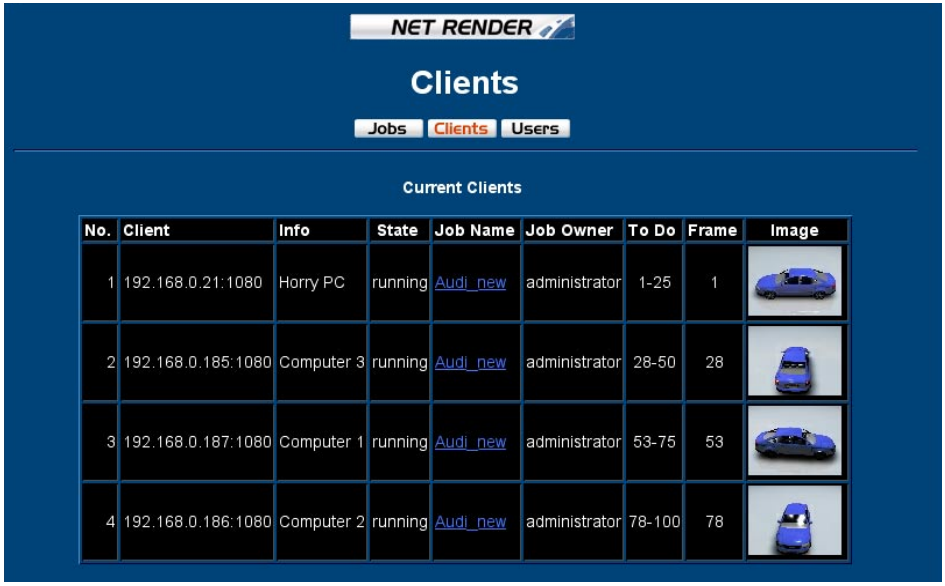
The C4DN clients are running locally on computers in the network. The C4DN server is no longer present.

The sudden loss of the server is traditionally the worst thing that can happen to a network, yet CINEMA 4D is again able to minimize the damage. If the server is lost, the clients simply continue to render their frames. The clients save these frames in their local results folder. This process continues until either the job is finished or until there is no free space on the local hard drive.

If the server is restarted, it remembers that a job was in progress before its untimely departure. The server checks to see which frames are missing and then fetches all the frames that were stored on the clients during its absence. If the job is still incomplete, the server redistributes the remainder of the job. If the job is done, the server begins the next job. So if the server does go down, no frames are lost. The real loss is one of time (suppose the server were to crashe while you were away on holiday …).

How to administer clients

Clicking on Clients takes you into the client control. Depending on your access rights you will see all clients (administrator) or only some of them. Perhaps surprisingly, the main use of the client control is to monitor all the computers working on the render job. In terms of administration, there is little to be controlled here. But this page is very useful to see live what is happening in the network and how fast the clients are.



No.	Client	Info	State	Job Name	Job Owner	To Do	Frame	Image
1	192.168.0.21:1080	Horry PC	running	Audi_new	administrator	1-25	1	
2	192.168.0.185:1080	Computer 3	running	Audi_new	administrator	28-50	28	
3	192.168.0.187:1080	Computer 1	running	Audi_new	administrator	53-75	53	
4	192.168.0.186:1080	Computer 2	running	Audi_new	administrator	78-100	78	

The table contains important information about the progress of the render job. Details are given in the Clients page section.

How to administer users

Only the administrator is able to configure new users or delete old ones. If you are a normal user and you want to change your name or password you should contact the administrator. If you are an administrator please look in the Users Page section in the Reference for details.

How to modify the web pages

The web pages of CINEMA 4D NET Render are so simple that you can easily change them according to your taste. You can do this by either modifying the HTML code manually or use a dedicated program like GoLive or Dreamweaver. This is mainly interesting if you want to install an Internet Rendering Service with your own look and feel.

You can change the graphical elements or place additional elements. Also you can use frames. But you have to take care of the following. At some places in the HTML code there are variables hidden in comments. CINEMA 4D NET Render replaces them automatically with the appropriate data when the page is accessed. Look at the HTML code for the table of current clients:

```
<TABLE BGCOLOR=BLACK BORDER=1>
        <TR>
                <TH ALIGN=RIGHT> <FONT COLOR=WHITE>No.      </TH>
                <TH ALIGN=LEFT>  <FONT COLOR=WHITE>Client   </TH>
                <TH ALIGN=LEFT>  <FONT COLOR=WHITE>Info     </TH>
                <TH ALIGN=CENTER><FONT COLOR=WHITE>State    </TH>
                <TH ALIGN=LEFT>  <FONT COLOR=WHITE>Job Name </TH>
                <TH ALIGN=LEFT>  <FONT COLOR=WHITE>Job Owner</TH>
                <TH ALIGN=CENTER><FONT COLOR=WHITE>To Do    </TH>
                <TH ALIGN=CENTER><FONT COLOR=WHITE>Frame    </TH>
                <TH ALIGN=CENTER><FONT COLOR=WHITE>Image    </TH>
                <!— clientlist —>
        </TR>
</TABLE>
```

You will see that the comment <!— clientlist —> contains the variable name ‘clientlist’. This variable will be replaced by the real table data while running CINEMA 4D NET Render.

If you delete this comment you will only see the headline of the table but no entries. Always make changes on backup copies of the original files!

Alternatively you can copy this comment to other places on the page. Then you will see the table data at several positions on the page.

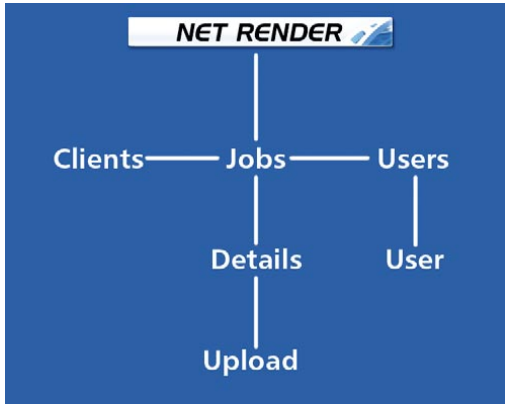
4 Reference

4 Reference

As previously mentioned, CINEMA 4D NET Render is controlled via HTML. One advantage of using HTML is that it is platform-independent. A further advantage is that HTML makes it possible to access the render network from home (or from anywhere else in the world, for that matter) via the Internet. In the previous chapter we introduced you to the functionality and operation of CINEMA 4D NET Render with the help of case scenarios. Over the following pages you will find a short description of all the functions on each HTML page, making this section a good reference tool.

General Issues

The site structure of the CINEMA 4D NET Render server is very simple and clearly arranged to give you easy access. On all pages you will find the name of the page in the title. Below you will find links for all other pages available, so that you can jump to them directly.



The administrator has additional access to the User page. In the following you will get a description of all pages in detail.

Welcome Page

You will see this page every time you access the server for the first time. If you find this page annoying just use bookmarks to jump directly to one of the child pages.

If you click on the ABOUT link you will see copyright information for CINEMA 4D NET Render and MAXON Computer's address. To login to the server, either click on the CINEMA 4D NET Render logo (the ball in the center of the page) or click on the ENTER link. Depending on your configuration there are two different login processes:

1. There is only one user configured — the administrator (default) — without any password. You will then see the Jobs page directly without any dialog.
2. You have configured multiple users and want to login as administrator or one of the users. A dialog will open and ask you for the user name and password. If you enter the correct data you will then see the Jobs page.

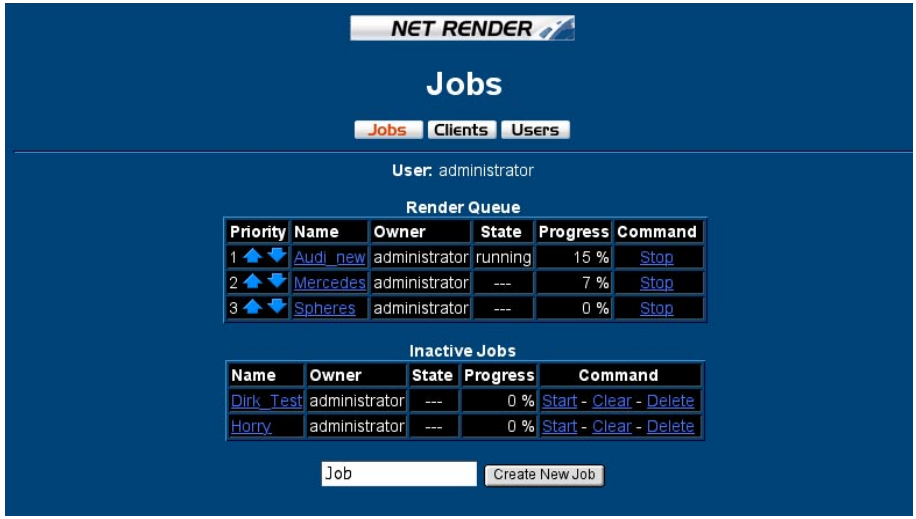
➔ *Your browser normally will keep this login information in memory so you do not have to type it in again and again when accessing other pages. But if you quit your browser and start it again the information is lost (for security reasons) and you have to re-enter the information.*

Jobs Page

Here you can control all the jobs waiting to be rendered. Among other things, the Jobs page can be used to add new jobs manually, allocate priorities or have a specific job displayed.

This page will be refreshed automatically after some seconds (see The configuration file for details).

In the upper part detailed information about the project is shown.



Render Queue

The table shows a list of all jobs on the server that are currently being rendered or waiting. You can compare the functionality of this section with the printer spooler of your operating system. There you can also start, stop or delete print jobs.

If any error occurs during rendering the job will be stopped and moved from the Render Queue into the Inactive Jobs list. There you can manually inspect the job and check what has gone wrong.

Priority displays a number allocated to each job. The jobs are processed one after another, starting with the job whose priority is 1.

You can use the arrow buttons to the right of the priority number to change the sequence in which the jobs should be rendered. You can move a job up or down the list. The job at the top of the list will be rendered first, and the job at the bottom of the list will be rendered last.

If you move a job that is currently being rendered (the one with State set to running) down, the rendering will stop immediately. All frames currently being rendered by clients will be lost. But of course all previous finished frames are kept.

If the rendering starts again (either because of a changed priority or because it moves to the top of the queue) only the missing frames will be rendered.

Name defines the name of the job. Clicking here takes you to a specific control page for the job (see Details page).

Owner displays the name of the user to which the job belongs. If you are logged in as a normal user you will of course see only your jobs. Only if you are administrator will you see all jobs of all users.

State defines the status of the current job. The possible states are:

State	Meaning
waiting	The job is waiting to be rendered.
running	The job is currently being rendered.

Progress displays a value between 0% and 100% showing how much of the total scene has been rendered so far. A value of 100% means that the rendering is complete and the job automatically will be moved to the Inactive Jobs list (see below).

Command If you want to remove a job temporarily or finally from the render queue just click on Stop. The job will then be moved to the Inactive Jobs list. But of course you can at any time put it back in the render queue. Only if you delete a job will it finally disappear from all lists and also the data will be deleted from the server.

Inactive Jobs

Here you can define new jobs, prepare them (uploading the scene file and all necessary textures) and download the frames of a finished job.

➔ *If an error occurs during rendering, the job will be stopped immediately. It will be moved from the Render Queue to the Inactive Jobs list. There, by clicking on the name of the job, you can have a detailed look at what has happened.*

Name see above.

Owner see above.

State defines the status of the current job. The possible states are:

State	Meaning
– – –	Nothing special happened.
error	An error occurred during the job.

Progress see above.

Command Click on Start to move the job to the Render Queue. It will appear at the end of the list.

Click on Clear to kill all previous rendered frames. This is useful when the job had an error while rendering or if you want to re-render the scene with modified render settings.

If you click on Delete you will physically remove a job from the server. In this case all scene data (scene, textures, etc.) and all rendered results will be deleted irretrievably. Of course you will be given the chance to change your mind first.

Create New Job

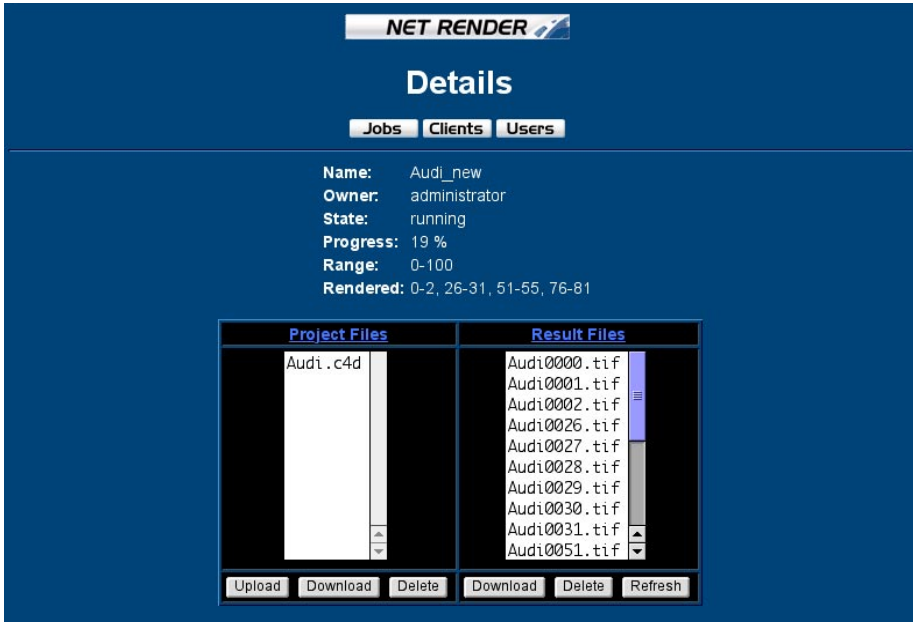
Below the list you will find a text field where you can enter the name of a new job. After clicking on Create New Job you will get a new job with this name in the Inactive Job list. You then need to fill this with the scene to be rendered.

To do this, either you have direct network access to your user folder on the server and you copy your scene directly into the appropriate sub-folder named after the job or you click on the job name and enter the Details page. There you can upload the files manually.

The same restrictions for user names hold for naming jobs because the job name will be used for naming the job folder so there is a limit of maximum 31 characters. Also you are allowed only to use the characters A–Z, a–z, 0–9 and the underscore (underline) character. White space or special characters are not allowed.

Details Page

Clicking on a job name in the job list (see above) takes you into the job control. This is where you can control a specific job. Among other things you can monitor the render progress, transfer files individually or, in the case of an error, check the error message to find the cause.



Detailed information about the job is shown at the top of the page.

Project Files

This list will show you all files on the server that belong to the job. To look at or save a file (e.g. a texture), select the entry in the list (click on the name) and click on the Download button.

➔ *When you click on the Download button, two things can happen. Either the chosen file will be downloaded immediately or (by default) a new Download page will open up. Which happens depends on the value of the browsertype variable in the server.ini file. You can read more about this in the reference section under Download page and in the appendices under Sections and Variables of the server.ini File.*

To delete a specific file from the server (e.g. a texture that is no longer required), select the entry in the list (hold down the left mouse button and click on the name) and then click on the Delete button.

You can add missing files manually by clicking on Upload (see Upload page).

Result Files

All rendered frames are collected by the server and will be displayed here. Since this page does not do an automatic refresh you should click on Refresh/Reload from time to time to see the actual list of files.

To look at or save a rendered frame, select the entry in the list (hold down the left mouse button and click on the name) and then click on the Download button.

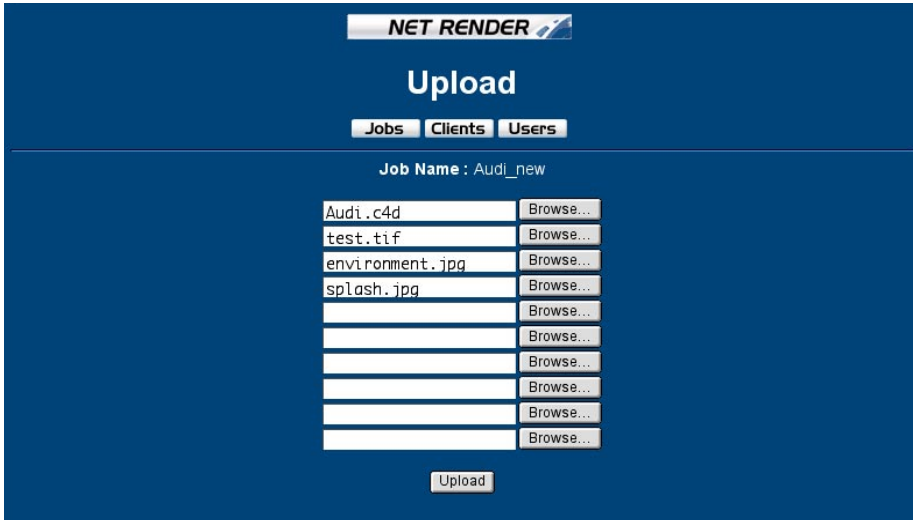
➔ *When you click on the Download button, two things can happen. Either the chosen file will be downloaded immediately or (by default) a new Download page will open up. Which happens depends on the value of the browsertype variable in the server.ini file. You can read more about this in the reference section under Download page and in the appendices under Sections and Variables of the server.ini File.*

To delete a specific frame from the server select the entry in the list (hold down the left mouse button and click on the name) and then click on the Delete button.

To delete all frames from the server click on Clear on the Jobs page.

Upload Page

This page lets you transfer up to ten files at a time to the current job. This is useful, for example, if you have forgotten a texture or if you have edited the scene since last uploading it. If you are accessing the server over the Internet this is the only way to send data to the server.



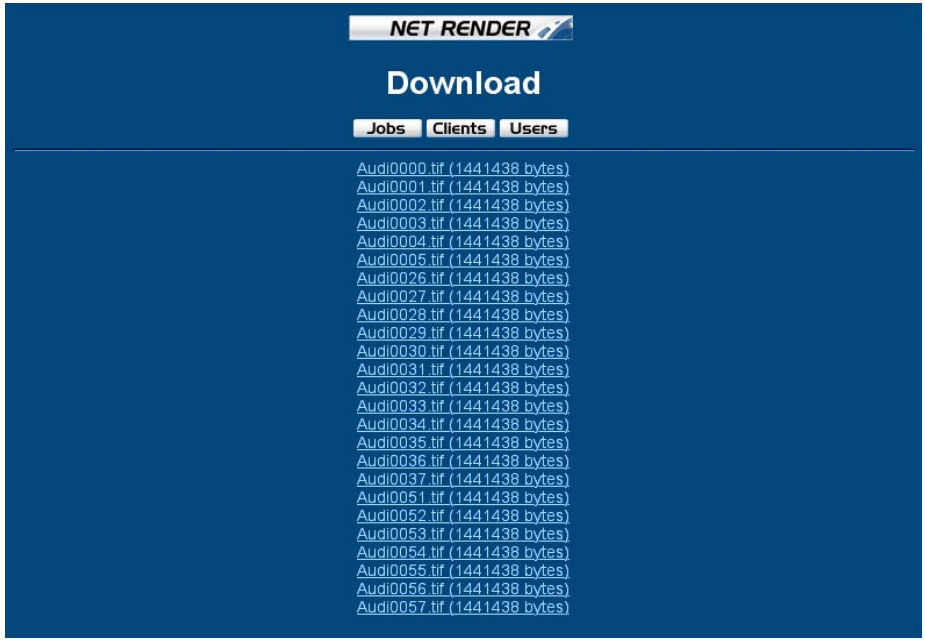
You can select a file in one of two ways:

1. Enter the location and the filename directly in the text field.
2. Click on the Browse button. A file selection window opens. Select the file, then leave the dialog by clicking on OK (or Open, or … depending on the operating system you are using).
3. You can start the upload process by clicking on the Upload button.

➔ *If you wish to upload more than 10 files, you must repeat the upload process. You cannot upload more than 10 files at a time.*

Download Page

During our work with the many different Internet browsers, we've learned that some programs do not adhere too closely to the defined HTML standards; for example, when downloading files from lists. Sometimes it works with one or the other browser, sometimes it works with one or the other operating system. Because of this behavior we've defined a special variable in the server.ini file (see appendices). If the variable browsertype is set to 1, a file will be downloaded directly from the Result Files list. If this variable is set to 0 (Zero), a new page appears – the Download page.



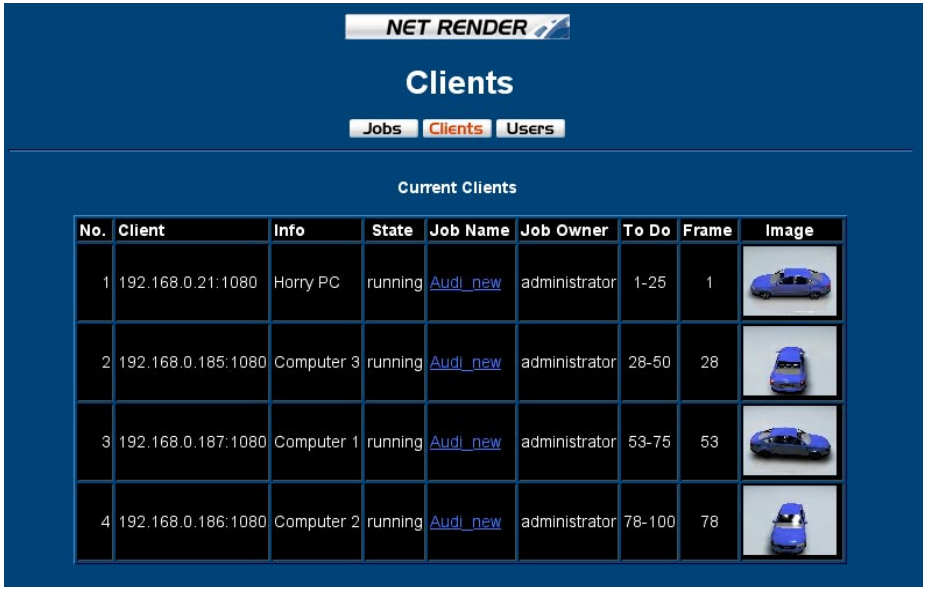
On this page, all files from the results folder of the active job are listed. It's a list made out of simple HTML references (links). In addition you can see the size of each file in bytes. To download a file into your browser, simply click on a link. As an alternative you can use the browser's Save link as command. (Read more about this in the documentation that comes with your browser.) By default, the Download page will be forced, meaning the variable browsertype is set to 0.

It is recommended that you change the variable to 1 only if you are not using Microsoft's Internet Explorer. However, if you encounter problems, switch the variable back to 0.

Clients Page

This page contains detailed information about the clients installed in the render network. As with the Jobs page the administrator sees all clients but a normal user sees only the clients he is allowed to use.

➔ *This page will be refreshed automatically after some seconds (see The configuration file for details).*



No. is a number that was assigned automatically to the client (the client started first gets number 1 and so on).

Client contains the client's TCP/IP address.

Info contains optional information about the client, for example the name of the computer the client is running on.

State describes the current status of the client. The following states are possible:

State	Meaning
waiting	The job is waiting to be rendered.
running	The job is currently being rendered.
error	An error occurred during the job.

Job Name is the name for the CINEMA 4D scene.

Job Owner specifies the name of the user who controls the job.

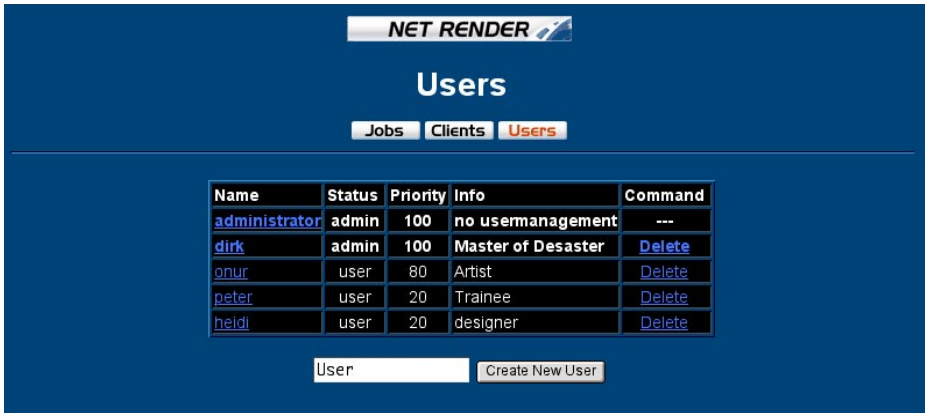
To Do specifies the range of frames that the C4DN server has asked the C4DN client to render.

Frame is the number of the frame that the client is currently rendering.

Image shows you an image of the frame that the client is rendering. This preview is updated at regular, frequent intervals rather than constantly, in order to reduce the strain on the network.

Users Page

Only if you have administrator status can you go to the Users page. There you will see all configured users in a list. The list also displays additional information such as passwords and priorities.



To create a new user, first enter his or her name into the text field below the users list (to the left of Create New User). Make sure that this name is unique (not already a known user). Then click on the Create New User button. This works in a similar way to creating a new, empty job.

✘ *The same limitations apply here as for job names. There is a username length limit of 31 characters. Also you should only use the characters a–z, A–Z, 0–9 and the underscore (underline) character. White space or special characters are not permitted.*

You can delete a user at any time by clicking on Delete in the Command column.

If you click on the user Name you are able to change the account data:

Administrator Shows if the user has extended rights (yes—checked) (e.g. for deleting other users) or if she is just a normal user (no—unchecked).

Password You should always use a unique password and communicate it to the user using a safe method (verbally, by FAX, encrypted email).

Priority Here you can give users different priorities according to how quickly their jobs should move to the front of the queue (do not confuse this with the priority of user jobs). Users with a high priority are preferred to users with a low priority and therefore have their work rendered more swiftly. You can choose any value between 0 (lowest priority) and 100 (highest priority). By default the administrator has a value of 100 and every user a value of 50.

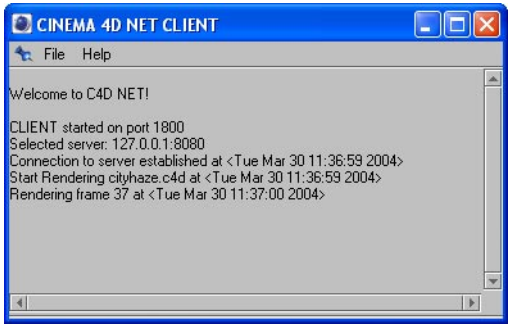
When installing an Internet rendering service you could for example configure the priority according to the basic payment. Users paying a premium would be allocated a higher priority and would receive their work more quickly.

Info Here you can specify additional data for your own purpose, for example info=My best paying client.

➔ *You cannot rename the user name later, for internal reasons. But, if this is necessary, just create a new user with the new name and delete the old one.*

✘ *You should read the Security Issues section carefully when configuring multiple users — look up 'security issues' in the index.*

Console Window



This window appears when starting CINEMA 4D NET Render. From the File menu you can edit your Network Settings and view the installed plugins. In the window you can see several messages; for example, the progress of the actual scene the user is rendering. It is used mainly for checking if the program is running after an installation. In general you should use your web browser for checking the jobs and clients because it is much easier and you can see more information.

5 Appendices

5 Appendices

The configuration files

These important files named server.ini or client.ini are for manually configuring CINEMA 4D NET Render. For the server the file may contain additional data about all configured users. The configuration files are ASCII text files and can be opened easily with any text editor. Do not use an office application like Word because it normally destroys the original file by converting it into its own file format. Usually Notepad for Windows or TextEdit for Mac should be sufficient. The easiest way to make changes to the server.ini or the client.ini files is via the Network Settings in the C4DN console.

The structure of the configuration files is similar to that of the .INI files from Windows and should be easy to understand. The documents are divided into several sections. Each section starts with a name in square brackets, for example `[settings]`. Then the data section follows. In each line you can set variables. Comments start with a semicolon.

➔ *If there is an error in the file, CINEMA 4D NET Render shows an alert box with the line number of the error.*

This is an example for the client.ini file:

```
; Client Settings

[settings]
serveraddress = 192.168.0.227
serverport    = 8080
password      = maxon
priority      = 1

clientaddress = 0
clientport    = 1800
clientinfo    = "ZZ's Dungeon"
```

server.ini has additional information about configured users. An example could look like this:

```
; Server Settings

[settings]
serveraddress = 0
serverport    = 8080
password      = maxon

refreshtime   = 20
timeout       = 60
clearpics     = 0
showalljobs   = 0
```

```
browsertype    = 0

; User Management

[admin]
name           = Administrator
password       = Hello_Password
info           = "Programmer"
priority       = 100

[user]
name           = Guest
password       =
info           = "Test Account"
priority       = 0

[user]
name           = pablo_picasso
password       = paloma
info           = "Artist"
priority       = 50
```

In this example there are multiple sections. You can see that there is an administrator account as well as two additional user accounts with the name Guest and pablo_picasso. The user Guest has no password at all and therefore can be accessed from everybody; logically he is given the lowest priority possible!

You will get a detailed explanation of every section on the following pages.

General Rules

- comments start with a semicolon
- you can define only one section or variable per line
- for assigning a value to a variable use the '=' operator
- you can assign text directly to a variable; you need to enclose the text in double quotes only if you want to use white space for separation of words. Example `name=test_user` but `name="test user"`
- unless stated otherwise all sections and entries are necessary
- the order of the variables in a section as well as the order of the sections is not important

Sections and Variables of the client.ini File

[settings] (Client network settings) Section

In this section you can specify the TCP/IP information.

serveraddress (*Server address)* – Specifies the TCP/IP address of the computer running the C4DN server so the client knows where the server is located.

➔ *This is normally the only value you have to configure manually.*

serverport (Server port) – Specifies the port number of the computer running the C4DN server. A default of 8080 is used.

password (Password) – This is a security measure. Only if the password of the server and of the client match will the server send data to be rendered to the client. The default is 'maxon'. You will find further information in the server.ini appendices in the following chapter.

clientaddress (Client address) – Specifies the TCP/IP address of the computer running the client. Normally the Client is configured to react to all messages and therefore the default value is 0 (use all addresses). But if you have multiple TCP/IP addresses installed on your local machine you can instead specify a particular address. The C4DN Client then ignores messages from other addresses.

clientport (Client port) – As soon as you want to have multiple clients running at the same time on one machine you have to give them individual port numbers that they do not interfere. You could, for example, use the numbers 1800, 1801 and 1802 if using three clients on a single machine. If you additionally want to run the server application, the port number of the clients must be different from the server's port number.

➔ *Normally you should not start multiple clients on a single computer because this lowers the overall performance.*

If you have a server machine with multiple CPUs and Windows running on it you can optimize the overall performance by assigning a single application to specified processors, for example Server = CPU 0 and Client = CPU 1, by using the Task Manager.

clientinfo (Client information) – Here you can specify additional information about the client itself, for example the name of the computer the client is running on.

priority (Adapt thread priority) – If the client is behaving strangely, try enabling this option. This may be necessary in rare cases.

More entries are not necessary for a client.

Sections and Variables of the server.ini File

[settings] (Server network settings) Section

In this section you can specify the TCP/IP information.

serveraddress (TCP/IP address) – Specifies the TCP/IP address on which the C4DN server listens. Normally it reacts to messages from all addresses. Therefore the default value is 0 (=all addresses). But if the computer has multiple TCP/IP addresses you can assign a specific one. The C4DN server then ignores messages from other addresses.

serverport (Port) – Specifies the port number of the computer running the C4DN server. The default value is 8080.

password (Password) – This is a security measure. Only if the password of the server and of the client match, will the server send data to be rendered to the client. The default password is maxon. You may want to set a password if you want to prevent anyone from having access to the files. Just imagine you receive a confidential project from a customer; if someone knows your server's IP address she just has to start a client with this address and the server will start uploading the scene and textures onto that computer as soon as the job is ready to be rendered.

refreshtime (Refresh time in seconds) – Some pages (Jobs page, Clients page) have an automatic refresh to show you the actual data. If you find the time between refreshes too short or too long just change this value (20 means 20 seconds).

If you do not want to have an automatic refresh at all use the value 0. Then you have to manually do the refresh by clicking on the Refresh or Reload button of your browser.

timeout (Timeout in seconds) – From time to time the server checks to see if all clients logged in are still part of the network. The timeout value allows the server to detect inactive clients; if *timeout* seconds have passed without the client responding to the server, the client will be considered disconnected and removed from the clients list. Frames that still need to be rendered will be distributed amongst the other clients. Possible reasons for the absence of a client could be a network failure or just that the client has quit. The default for timeout is 60 seconds.

clearpics (Delete pictures after assembling) – As described in the How to… section you can render ready-to-use animations under certain circumstances. With the clearpics option you can decide whether a previously rendered sequence of frames should be deleted after the finished animation is compiled (enter 1) or not (enter 0). The default is 0; the pictures will not be deleted automatically.

➔ *You will need twice as much free space on your hard disk (space for the individual frames and for the complete animation) if you create a ready-to-use animation because the frames will only be deleted after the task is complete.*

showalljobs (Show all jobs) – Usually, as a user you only see your own jobs – assuming you are not the administrator. If the value of this variable is set to 1 all users will see all jobs. By doing this you may get a better idea of how long it will take before your own job is rendered. The default value is 0; only the administrator sees all jobs of all users.

➔ *This is for monitoring purposes only. As a normal user you can only affect your own jobs (e.g. stop the processing, delete them, rearrange them etc.) not the jobs of other users.*

browsertype (Browser supports direct image download) – This variable can have two values. If it is set to 0 (the default), when you click on the download button on a job's details page, a separate download page appears. If it is set to 1, all files will be downloaded into the browser directly from the result files list.

➔ *It is recommended that you set this variable to 1 only if you are not working with Microsoft's Internet Explorer. Also switch it back to 0 whenever you encounter problems with download.*

[admin] Section

This section defines the administrator account. This section needs to be there at least once because running CINEMA 4D NET Render without any administrator makes no sense.

name – The unique user name of the administrator.

✘ *The user name will be used for naming the users folder, so it should contain a maximum of 31 characters. Also you are allowed only to use the characters A–Z, a–z, 0–9 and the underscore (underline) character. White space or special characters are not permitted.*

password (optional) – The encrypted password for the administrator. After the installation he has no password. So without any login (=entry of user name and password) from the start page you will proceed directly to the job page. If you have multiple users installed you should immediately configure a password for the administrator account to protect it from others. You can do this from the Users page if you have started the C4DN server. Every user then has to login with user name and password to access his or her user folder.

info (optional) – Here you can specify additional data for your own purpose, for example `info="My best paying user"`. This information will be displayed on the web page of the user administration.

priority (optional) – Here you can give users different render priorities (do not mix this up with the priority of user jobs). Jobs for users with a high priority are rendered prior to jobs for users with a low priority and therefore effectively get rendered more quickly. You can choose any value between 0 (lowest priority) and 100 (highest priority). By default the administrator has a value of 100 and every user a value of 50.

When installing an Internet rendering service you could for example configure the priority according to the basic payment. Users paying a premium would be allocated a higher priority and would receive their work more quickly. But if you do not have any additional users configured besides the administrator itself you should not have to worry about this value.

[user] Section

This section is for configuring an additional user so you can have multiple user sections.

➔ *You can configure this data much more easily by using a browser and accessing the user administration web page.*

name, password, info, priority – These variables are identical to those described in the `[admin]` section. The only difference is that they are for the specified user.

Using Plugins and Modules

In contrast to textures and shaders, plugins and modules are not automatically distributed to the clients. So if a scene needs a special plugin or module you have to install this plugin or module manually on all clients. For each client make a new plugins or modules folder in the client folder and copy the plugin or module into the appropriate folder.

✘ *Please read the plugin or module license agreement carefully and contact the plugin or module publisher when you need multiple licenses for using it with CINEMA 4D NET Render.*

Installing and Configuring for Large Networks

If your network has a file server, you can simplify the install process. Simply copy the CINEMA 4D NET Render folder to a directory on the file server.

- The C4DN server and C4DN clients can be allocated to as many other computers as you like.

➔ *Each client (including any modules used in the scene) must be installed on its own computer and started from there. Don't start the clients from the file server.*

➔ *For heterogeneous networks it is best to create separate CINEMA 4D NET Render folders for each operating system (Windows, Mac OS).*

➔ *The network's file server is not related to the C4DN server. CINEMA 4D NET Render will function even without an installed file server.*

Security Issues

If you are system administrator (not the CINEMA 4D NET Render administrator) and if you are installing the access privileges and user accounts on the file server you should give each user full access only to his own CINEMA 4D NET Render user folder.

✘ *Under no circumstances should a user be able to access the file named server.ini from the server folder because he will find there all user IDs and passwords. Usage of unauthorized access in local networks causes at best some headache but when connecting CINEMA 4D NET Render to the Internet you must be aware of these important security issues.*

It is best that you give access only for the user folder and hide and protect all other folders — mainly the server folder — from user access. This is very important if using CINEMA 4D NET Render in conjunction with the Internet. Additionally you should always configure passwords for all users. User access without any password is hard to control.

➔ *CINEMA 4D NET Render is not able to create and control user accounts on the file server for you because this depends on the operating system and network configuration.*

IP Addressing

An IP address is a 32-bit number stored in four bytes (4 * 1 byte = 4 * 8 bits = 32 bits). It is usually displayed as four decimal numbers separated by periods (full stops). Each of the values can, in theory, hold a value between 0 and 255 inclusive. The numbers 0 and 255 are generally reserved for special purposes, so all in all, 254 values are available.

For IP classification purposes, networks are divided into five classes (A, B, C, D and E) depending on the size of the network and the number of computers connected:

- Class A networks have the subnet mask 255.0.0.0.
  This supports up to 254 networks with a maximum of 16,387,064 computers per network.
- Class B networks have the subnet mask 255.255.0.0.
  This supports up to 64,516 networks with a maximum of 64,516 computers per network.
- Class C networks have the subnet mask 255.255.255.0.
  This supports up to 16,387,064 networks with a maximum of 254 computers per network.

These values are theoretical maximums. Some IP addresses are reserved for special tasks. Numbers that begin with 192.168.xxx.yyy belong to a special block that does not occur in the real Internet. All IP numbers beginning with these digits are filtered out by the routers and ignored. Numbers beginning with 192.168 are for networks with a gateway (a computer that interfaces between the company's internal and external TCP/IP network). This gives you the freedom to install a class B or several class C networks within your company. Each computer has a further special IP address: 127.0.0.1 which specifies itself. This address is often termed a 'localhost'.

Usually your Internet service provider allocates you explicit IP addresses. These are addresses that can identify your computer unambiguously across the Internet. These addresses play a secondary role in an intranet and are only of interest to the gateway computer, the so-called gate to the world. As a rule, this gateway has more than one IP address (at least one internal IP address in addition to the external address). For more information check related literature under the terms multi-homing, gateways or firewall.

TCP port numbers

One might think that all you need is a globally explicit IP telephone number. Well yes, but …

Thanks to multitasking, computers these days are now in a position to send and receive data on more than one Internet connection. Without some form of control the data packets would become mixed together. It is for this reason that the control information for a TCP data packet also contains a reference to a port.

Ports are not physical connections to the computer. Rather, ports are simply numbers ranging from 0–65535. Each computer eavesdrops on behalf of the ports for their port numbers in the network. Only when the first data packet with a recognized port number shows up are communications sent directly to the port in question.

Two computers can only have several conversations at once if each conversation has its own port number (the port number is included in the TCP packets). Without ports you wouldn't be able to have an FTP download running on your machine at the same time you browse the web via HTTP.

Some port numbers are reserved for specific uses. These port numbers are often termed *well-known* ports. Some of the well-known ports are listed in the table below.

If you find that a standard port number is already in use, you need to find an alternative. You should never use a value less than 1024 as the alternative port — always use values greater than 1023. The first alternative value for web servers is port 8080. You need to add the port to the IP address when you type it in the browser's Location box. The port is separated from the IP address by a colon. For example, a valid entry could read: 192.168.0.144:8080

You can find more information on this in the Troubleshooting chapter.

Port	Description
20	FTP Server (Data)
21	FTP Server
23	Telnet Server
25	Mail Server
53	DNS Server (Domain Name Service)
80	Web Server
110	POP3 Server
119	News Server
6667	IRC (Internet Relay Chat)

With CINEMA 4D NET Render, the communication is at port 8080. So in the browser always give the port in the form of 'xxx.xxx.xxx.xxx:8080'.

Problems can arise if another web server is running on one of the computers in the render farm. For example, installing Microsoft Frontpage always installs a web server (i.e. the Microsoft Personal Web Server). You can read how to overcome this scenario in the Troubleshooting chapter.

➔ *The combination of the IP address and the TCP port number is referred to as the Socket. The two parts are separated by a colon, e.g. 192.168.0.144:8080. A socket represents a unique TCP/IP address, whereas an IP address itself is insufficient. The port number does not need to be entered for the well-known ports (see above), but it is present in the TCP/IP packets themselves. Computers always send sockets to each other. These sockets use a programming concept that is also found in the Winsock DLLs under Windows. These Libraries are very important for TCP/IP running under Windows and they tend to be susceptible to manipulation. You'll find more about that in the Troubleshooting chapter.*

Installing and Configuring a TCP/IP Network

Although CINEMA 4D NET Render is straightforward to install, the reality is that some users will not be able to set up CINEMA 4D NET Render by themselves. This will probably have nothing to do with CINEMA 4D NET Render — setting up TCP/IP is not easy. In order to give you some assistance in this difficult area, here is an attempt at a very basic rundown of creating a TCP/IP Ethernet based network that doesn't connect to the Internet. But, please, if you continue to experience problems talk to a network expert or your network administrator — we cannot give support for networking in general.

Almost every TCP/IP network starts out the same … and, once you start, they go in wildly different directions. The more machines you add and the more different types of machines on the network, the uglier it gets.

➔ *The following explanation covers a basic setup of a TCP/IP network. It is very general and may not cover all situations. This does not cover setting up a network that is connected to the Internet. Such a network is beyond the scope of this document.*

Hardware Considerations

You will need a TCP/IP network. Most are based on Ethernet of which there are many types of installation (nowadays the most common are 10BaseT, 100BaseT and 10Base2). Typically, to install an Ethernet network you will need one Ethernet card per computer and, for 10/100BaseT, an Ethernet hub with a minimum of one port per computer. You will also need Cat-5 standard cables for 10/100BaseT or Thinnet cabling for 10Base2.

Install the Ethernet cards, one per computer (please refer to the instructions that come with the cards). Plug one end of a Cat-5 cable into the Ethernet card and the other end into the Ethernet hub. Repeat this procedure for each machine. Number your computers from 1 to x where 'x' is the number of machines you will connect. Which machine gets which number is not important but write this down, you'll need it later.

➔ *Some Macintosh computers come with built-in Ethernet, so the cabling is all you have to do.*

➔ *If you want to connect only two computers there's no need for a hub. You have to buy a special cross cable from your hardware dealer. Just plug this cable into the Ethernet cards.*

Configuring TCP/IP under Windows

Windows 2000/XP

In Windows 2000/XP go to Control Panel / Network Connections or Control Panel / Network and Dialup Connections. (If this is missing refer to the Windows 2000/XP documentation or go to Microsoft's website at www.microsoft.com for help.)

Go to your Local area connection and select Properties. Select the TCP/IP protocol from the list. If the TCP/IP protocol is missing from the list refer to the Windows documentation for how to install this protocol.

Firstly, check use the following IP address. Then set the IP address to 192.168.0.x where ‘x’ is the number of the machine you’re working at. You wrote the number down earlier, didn’t you? Set the subnet mask to 255.255.255.0.

Click on OK until you’re back on your Windows desktop.

Configuring TCP/IP under Mac OS

Mac OS X

On Mac OS X go to the System Preferences and select Network. In the Network preferences choose show: Built-in Ethernet. Below, choose Configure Manually.

Set the IP address to 192.168.0.x where ‘x’ is the number of the machine you’re working at. You wrote the number down earlier, didn’t you? Set the subnet mask to 255.255.255.0.

Click Apply Now. This should give you a functioning Ethernet-based TCP/IP network. Please remember that the above instructions are meant to serve as a very basic guide; if you have any difficulties, please contact a local networking consultant as the intricacies of a TCP/IP network are beyond the scope of these instructions.

Support

What if neither the manual nor your own tests can resolve a problem? It is time to contact the Technical Support department. MAXON Computer is more than happy to help you solve your difficulties. We would like to help you as effectively as possible, so please try to follow these guidelines:

- **Please contact MAXON Computer in writing, preferably by email.**

  Although we have telephone lines, programs as complex as CINEMA 4D NET Render can rarely be solved over the phone in a matter of minutes … and Murphy's Law (If something can go wrong it will) dictates that our telephone lines will be busy just when you happen to call. If our lines are busy, we are supporting other customers — please show understanding for this.

- **Please keep suggestions or orders separate from support questions, otherwise your inquiry is likely to disappear in one of our departments.**

  One reason why this might happen is that we must keep a copy of your order for the tax office. Once your order has been processed, the paperwork is promptly filed away and is next seen by the auditor.

- **If you send us a fax, please do not expect an answer within five minutes.**

  Other customers need support too and we deal with support questions on a first-come, first-served basis. We work hard to ensure that you, our customer, receive a speedy and efficient support service.

- **Please include your telephone number and times when you will be available on this number.**

  Sometimes we need to ask you for further information.

- **Please state your serial number and program version number.**

  You can find these details in the CINEMA 4D About/Info dialog.

- **Please list your hardware configuration.**

  I have a Macintosh/PC is insufficient information.

  Please tell us about any system update or new hardware drivers that you may have installed.

  If you have Internet access, please use the support form on our web site.

- **Please send us example scenes if possible.**

  "The program doesn't work". We cannot possibly solve the problem based on this information alone. After all, we have tested CINEMA 4D NET Render extensively without meeting problems.

- **Please reduce the size of your example scenes as much as possible.**

  If, for example, the problem only occurs on the hubcap of a car model, the rest of the car model is of no use to us. Please delete all information in the scene that is not required to demonstrate the problem. By simplifying the scene, you help us to identify the problem more quickly.

- **Please include specific details on the procedure you have tried (but please don't write a ten-page novel — it has been done!).**

  I created an object and then I went into the raytracer and … (see above).

- **Please include rendered pictures and/or screen shots if they help to demonstrate the problem.**
- **Please describe which settings you used in any relevant settings windows.**
- **Please tell us which programs or system extensions you have running at the same time as CINEMA 4D.**
- **Error messages usually appear if the program crashes. Please tell us the exact message.**

  Windows lists many details in addition to the program error report. These extra details are about as helpful as the famous Macintosh error: "The application unknown has unexpectedly quit because an error of type 1 has occurred".

- **If you have Internet access, please look for the solution in the Frequently Asked Questions (FAQ). There is a good chance that you'll find the answer there.**

  You can find the FAQ in the support section of our web site.

- **Please note that we cannot do your projects for you!**

  "I've enclosed a CD including textures and models. Please animate this for me in the following format so that I can play it smoothly from my video card."

  Don't laugh — we really do get such requests. Services of this kind are beyond the bounds of technical support.

- **Please do not be concerned if there is a slight delay before we respond.**

  Sometimes even we need a little time to solve problems. Also, we may need to consult with the programmers, which again takes time.

Glossary

42	1. The extension for the MAXON Computer GmbH Technical Support hot line; 2. The answer to all questions.
application	Another name for program.
browser	1. A program for controlling and viewing files; 2. A program that displays HTML pages or accesses the Internet.
C4DN	CINEMA 4D NET Render.
C4DN client	CINEMA 4D NET Render client program — renders frames.
C4DN server	CINEMA 4D NET Render server program — controls and distributes the render jobs.
client	A computer upon which a C4DN client program was started. A client uses the services provided by a server by sending network information and commands that will be processed by the server.
codec	A codec compresses information such as pictures, animation or sound. Information is sometimes lost through the compression process (e.g. pictures develop artefacts), the extent of which depends on the type and quality of the compressor used.
DNS	Domain Name Server. Converts a meaningful name (e.g. www.maxon.net) into an IP address.
download	The transfer of programs or files from another computer to your computer - the opposite of upload.
FAQ	Frequently Asked Questions. A list of questions and answers to help you troubleshoot.
file server	The network's server. This is a computer that, in addition to other qualities, can be accessed both by PC and Macintosh computers.
firewall	A software or hardware-based system for protecting unauthorized access to your firm's internal network from the outside world (e.g. via the Internet). Computers protected by a firewall are invisible to external computers.
FTP	File Transfer Protocol. A protocol used for controlling the transfer of files.
gateway	A computer that interfaces between the firm's network and the Internet. The gateway usually has more than one TCP/IP address (at least one internal and one external address).
header	Information at the start of a file containing general, often important information. An analogy is the address at the head of a written letter.

home page	The page you are meant to see first when accessing a website. The home page usually has links to other pages on the same website.
HTML	HyperText Markup Language. The language in which web pages are written. HTML documents can include texts, pictures and even links to other websites.
HTML browser	See web browser.
HTML file	A text file containing HTML data. You can load and view HTML files in a web browser.
HTTP	HyperText Transfer Protocol. Protocol used for transferring web pages across the Internet.
hyperlink	Hypertext Link. See link.
Internet browser	See web browser.
intranet	A company's internal network. Internal networks are based on Internet technology and protocols. An intranet can be connected to the Internet, though this is optional.
IP	Internet Protocol. A means by which data is transferred over the Internet. See also TCP and TCP/IP.
IP address	A unique identification number for a computer that enables it to communicate with other computers via TCP/IP. An IP address consists of four numeric characters in the range of 0 to 255 separated by dots, e.g. 207.159.139.136.
ISP	Internet Service Provider. This is a company that provides you with Internet access. Your ISP usually issues you with your external IP address.
job	CINEMA 4D scene that has been submitted for network rendering.
link	A link is often text (usually underlined), a graphic or an icon on a web page that does something useful when you click on it. Clicking on a link often loads another HTML document, though links are also used to carry out many other functions such as to select a file to download or to launch another application.
log file	A log file stores useful information about a program's activities. The log file can be useful for troubleshooting in particular.
network	Two or more computers that are connected and are able to communicate with each other.
port	A number that is attached to an IP address. Two computers are able to have several communication channels open at the same time by using a different port number for each channel.
protocol	A set or rules adopted by computers so that they can communicate with each other.

proxy	A server that stores commonly accessed data. This enables you to access that data more quickly than by accessing the computer where the original data is stored.
server	Computer on which the C4DN server was started (not to be confused with the network's file server). Generally, a computer that processes the information from clients and distributes these tasks.
socket	1. Combination of an IP address and a port number; 2. Programming concept.
TCP	Transmission Control Protocol. A means by which data is transferred over the Internet. See also IP and TCP/IP.
TCP/IP	A suite of communication protocols. TCP/IP is the standard used by computers to communicate with each other over the Internet.
upload	The transfer of programs or files from your computer to a server — the opposite of download.
URL	Uniform Resource Locator. An Internet address.
user interface	The user interface enables you and the computer to communicate with each other. This encompasses the visual appearance of the program and the manner and ease with which you obtain and enter information.
web browser	A program for reading HTML documents locally or via the Internet.
web page	HTML file on a server that can be displayed in a web browser. Web pages can contain text, pictures and links.
website	Server that hosts one or more HTML pages that can be accessed via the Internet.

6 Troubleshooting

6 Troubleshooting

No connection to server

If you have managed to install CINEMA 4D NET Render without a single problem, give yourself a pat on the back! What in theory sounds very simple (If the network functions, CINEMA 4D NET Render works) is in practice not always so. There are mountains of literature dedicated to solving network problems. Take a trip to your local bookstore if you need convincing.

Perhaps the most common problem is when no connection can be established between the C4DN server and C4DN client, or C4DN server and administrator. There are more potential causes here than there are grains of sand in the desert. Therefore we can only suggest general troubleshooting procedures:

1. Check the network connections. Can you access all the other computers from the file server? Are the cables and physical connections okay?
2. Check the installed network services. Is the TCP/IP configured correctly? Is port 8080 already in use? Do you need to communicate with the remaining computers via a firewall?

We can certainly give you more specific advice for some of the most common causes of problems on the following pages.

Port 8080 already in use

If, when you start the server or client, port 8080 is already being used by another application, an error message will appear to alert you to this.

There are two possible solutions:

a) Change the standard port for the Internet web server. Use a port number above 1024, since most numbers below this are used by standard services. You could, for example, try port 3128 if it is free.

b) Change the standard port for the C4DN web server.

- Go to the server network settings and enter a new port number in the Port field.
- Go to the client network settings and enter a new port number in the Server port field.

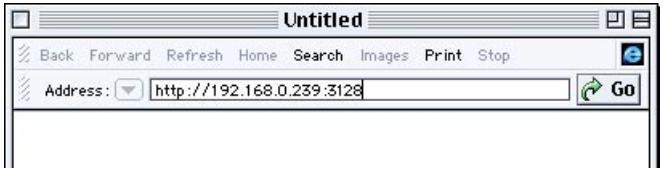
➔ *If you have installed the C4DN client locally on several computers, you must alter the client.ini files on all these computers.*

You can use any free port number you like. The value must be between 0 and 65,535, but should always be higher than 1024.

If you have defined a port other than 8080 for CINEMA 4D NET Render, you must also enter the socket into the Location box in the browser. For example, if you are using port 3128 you should enter the following into the Location bar:

192.168.0.239:3128

You can bookmark this address to save you having to constantly enter the new socket.



Modules are missing on the server and clients

If your project uses one or more CINEMA 4D modules such as Advanced Render, MOCCA or Dynamics you must ensure that these modules are also installed on the server and clients in the Modules folder.

When modules are missing on the server and clients, you may sometimes see strange error messages appear. So if you see an error message appear that doesn't make much sense, check that you've installed all the required modules.

Another possibility when modules are missing is that the scene will be rendered without effects that are specific to the missing modules.

Only three clients are rendering

If you have an unlimited clients license but only three clients are rendering, you probably need to enter your unlimited clients serial number into the Net Server program.

To enter your serial number:

- Run Net Server and choose Help > Personalize. Type your serial number into the text box labelled 'CINEMA 4D'.

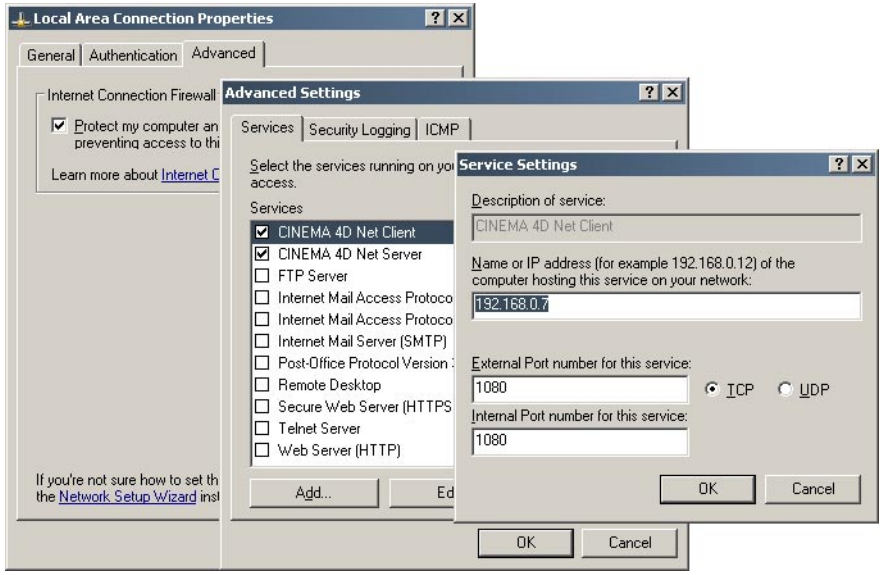
Firewall issues / access denied messages

If you get ‘access denied’ messages after clicking Start in the server to distribute the files, perhaps a firewall issue is to blame.

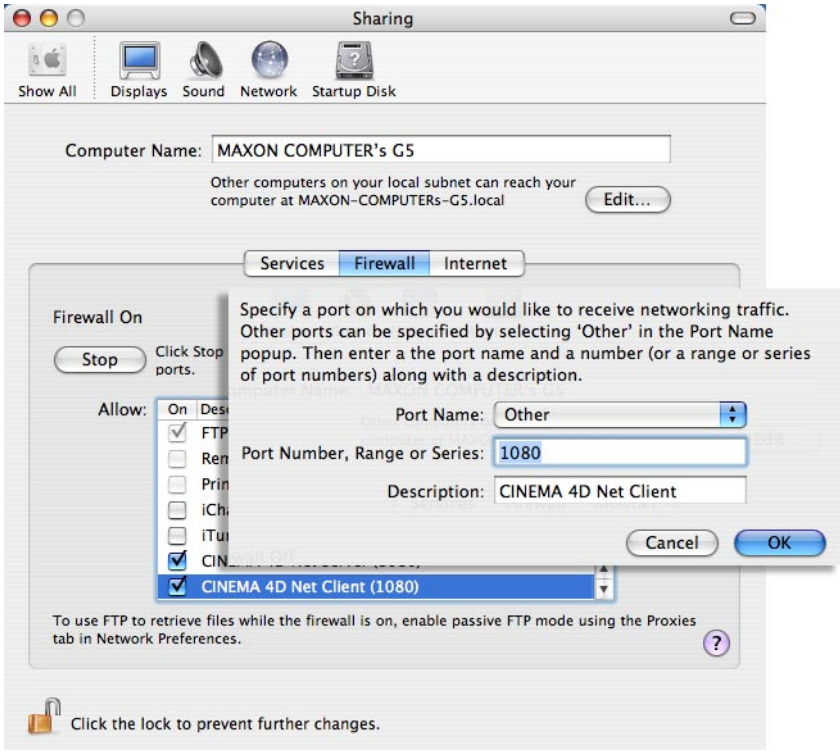
Administering firewalls is beyond the scope of this manual as well as beyond the scope of our technical support services. However, you may find the following general advice helpful. If you are still unable to resolve a firewall issue, please consult your system administrator.

There are two solutions:

1. Switch off the firewall. Warning! This may be a security risk; ask your system administrator for advice.
2. For each client, open up your firewall settings and add port 1080 for the client (or whatever port number you are using if you’ve changed from the default). For the server, open up the firewall settings and add port 8080 for the server (or whatever port number you are using). The exact steps you need to take here will depend on which OS version and which firewall software you are using.



Example firewall settings for Windows.



Example firewall settings for the Mac.

Troubles caused by ISDN cards and Internet software

One possible cause in particular is often overlooked, catching users out because something has been changed subtly. Some ISDN cards or Internet access programs install their own versions of the Winsock DLLs . Some of these may be less than 100% compatible to those provided by Microsoft. This can disturb the smooth flow of data within CINEMA 4D NET Render (even if the Internet connection is still fine). In the worst case, these DLLs can prevent a connection between the C4DN server and C4DN client.

In any case, something is wrong. Before you take your complete system apart, install the server on another computer and see if you have administrative access to the C4DN server from all possible entry points. If not, try installing the server on all other computers one by one. This is well worth a try — more often than not, you'll find a computer that is fine.

If the above didn't help, reinstall the network services. If that fails, we recommend a complete reinstall of your operating system. Before reinstalling the operating system be sure to remove all add-on hardware that is not absolutely essential to operate the computer.

If at last you get a connection in the C4D network, try reinstalling the add-on cards one at a time in their order of importance (using the latest drivers, of course). If the connection fails after installing one of these cards, please contact the hardware manufacturer of the card. If the hardware is fine, continue to install the software (e.g. Internet access programs). Once again, install the programs one by one and keep testing as you go. As you can imagine, this is a laborious process, but it is often necessary. We hit these problems too …

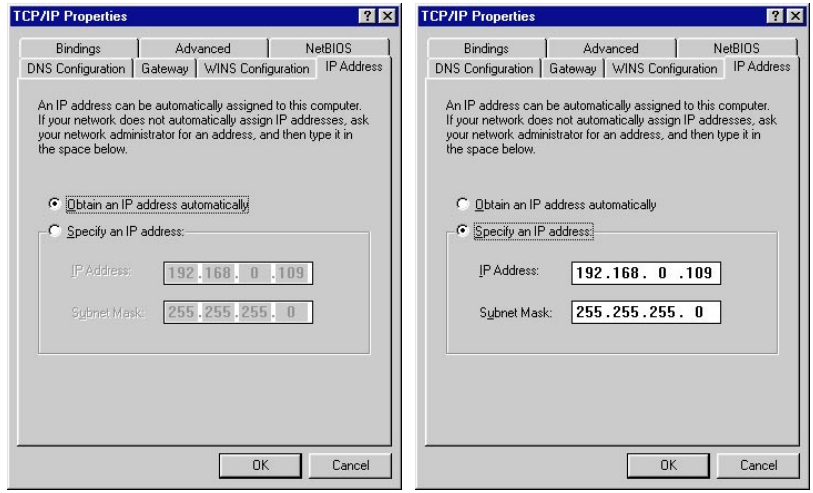
Dynamic TCP/IP address

Often you have to use dynamic TCP/IP addresses, especially when you're connected to the Internet through a modem. In this case your computer gets its individual TCP/IP address from your provider the moment you connect. The address is dynamic in the sense that you'll be issued a different one almost every time. If the C4DN server is installed on such a machine, no client can connect to it, because the server always uses a (usually unknown) different TCP/IP address. You have several alternatives:

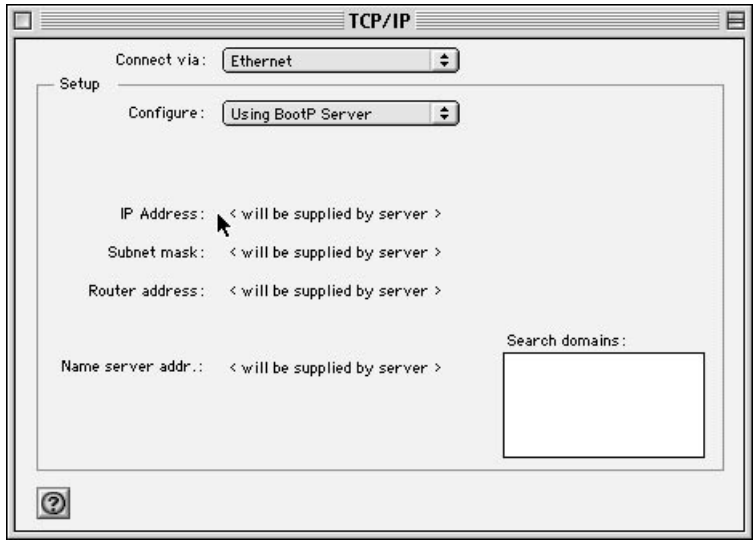
a) Install a second (static) TCP/IP address on that computer. If you're not sure how to do this, please contact your operating system manufacturer. The bad news is that this is tricky to set up. Not only is it often poorly documented, but also it can generate further problems.

b) Switch from dynamic to static TCP/IP addressing (see pictures below). We do not recommend this solution either. This would mean switching back and forth every time you wanted to surf the Internet.

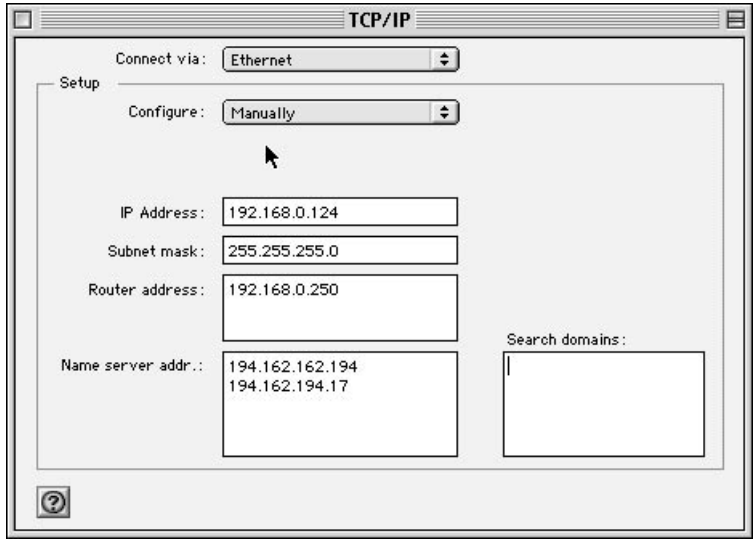
c) Perhaps the simplest way to eliminate the problem is to install the C4DN server on a different machine, one with a static TCP/IP address.



Running Windows: on the left dynamic and on the right static addressing.



An example of dynamic addressing running Mac OS.



An example of a static addressing running Mac OS.

Inaccurate calculations

One common feature of heterogeneous networks is that they usually involve computers with FPUs (floating point units) that work to varying degrees of mathematical accuracy. This can lead to rendering inconsistencies such as particle streams being calculated in very different positions on different machines. Unfortunately, we cannot tell you when these inaccuracies will arise, nor can we tell you how severe the deviations will be. However, CINEMA 4D solves the problem (at least with particles) by allowing you to bake the particle stream prior to rendering. Please see the CINEMA 4D reference manual for a description of this function. We recommend that you make always a quick preview before the final render.

Interaction with Radiosity/Caustics

You may experience problems when rendering radiosity or caustics over a network, due to processor variations. Incidentally, this difference between processors is the reason why Dynamics scenes must be baked prior to network rendering.

You can, however, render radiosity and caustics without problems using NET Render provided that you are using saved solutions and that the server has access to these.

Your network rendering choices for radiosity/caustics are:

1. Stochastic mode chosen in the radiosity settings. You should obtain good, consistent results, although increase the Stochastic Samples value (Radiosity page) if the image is grainy.
2. Do not use the Object Animation radiosity mode. This mode is not suitable for network rendering because the solutions cannot be saved. The animation will flicker wildly.
3. Radiosity mode set to Standard or Camera Animation. First you will need to calculate and save the solution in CINEMA 4D — for example, set Prepass Size to 0, enable Save Solution, set Antialiasing to None (Antialiasing page), choose a small Resolution (Output page) and then render. Afterwards you must ensure that the saved solution file is accessible to the server. You'll find the solution file in the scene's folder under 'illum/xxx_name_xxx.gi'.

   In the Standard mode a separate solution will be saved for each frame in the animation. Naturally, these saved solutions will take up more space the longer the animation is. If you want to save time by not using saved solutions in Standard mode, flickering is likely unless you set the radiosity settings very high. This is a general limitation of GI; it is not a limitation of NET Render itself.

Before rendering with CINEMA 4D NET Render, set Recompute to Never. CINEMA 4D NET Render will then access and use the saved solution, or report an error if it could not find the saved solution.

Much of the above applies to caustics: if you are using saved solutions you must make these accessible to the server. You'll find the saved solutions in the scene file's Illum folder; these will be named 'xxx.c4d.cs'. In the scene file that you are going to net render, set Recompute to Never.

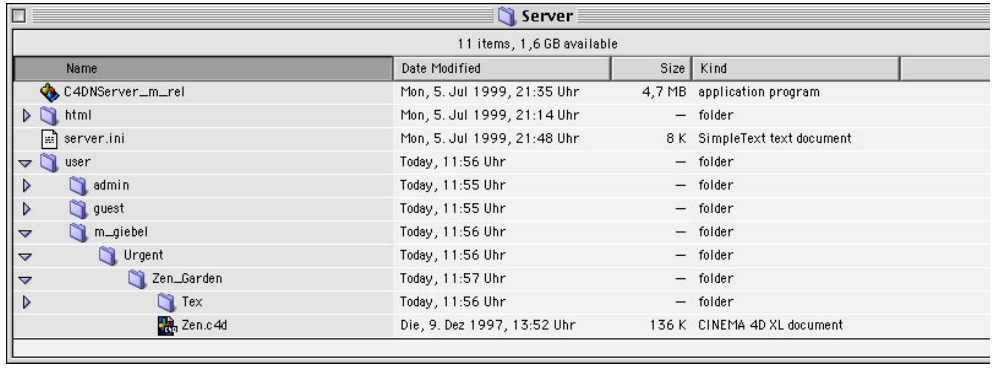
Animations are not rendered

As you will have read in the How to… section of the reference manual, CINEMA 4D NET Render allows you to build up complete ready-to-use animations, under certain circumstances. However if, say, the codec is missing, it is possible that the final animation does not appear. In this case, CINEMA 4D NET Render will help you as best it can. You should:

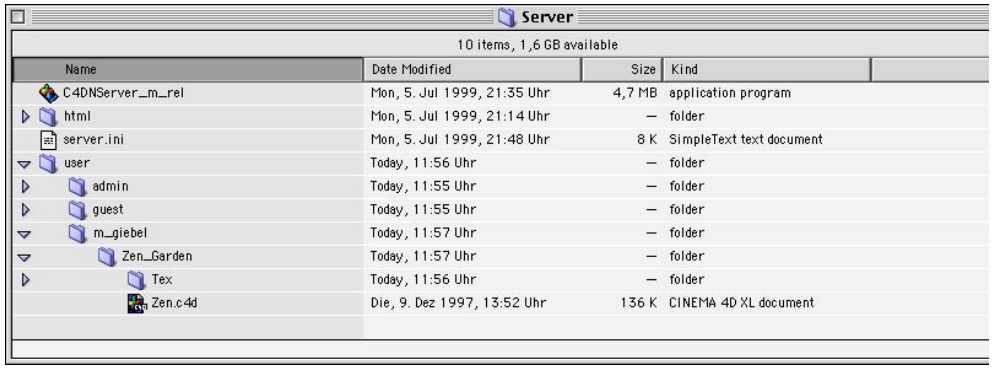
1. Determine the cause of the problem (usually it's the codec) and correct your scene accordingly.
2. Upload the changed scene (effectively new render preferences) into the appropriate job on the server as described in the How to … section.
3. *Do not (!)* delete the already rendered single frame pictures from the result folder.
4. Start the job again. The C4DN server recognizes that all the frames of the project are already there, and just completes the final animation. The single frames do not need to be rendered again. This saves a lot of time.

Scenes are not rendered

If everything is fine with the scene itself, you might have been a little over-enthusiastic during upload. Perhaps you created an empty job from the browser's administration pages and let CINEMA 4D save the project there. In such a case the folders will be nested one too deep. For the following, incorrect, example let's assume you had created an empty job called Urgent. Then you let CINEMA 4D save a project called Zen_Garden into that job folder. The folder hierarchy would look as follows:



The scene cannot be found by the C4DN server and thus will not be rendered. So, let CINEMA 4D create your project directly in your personal user folder, or copy it there via a file server. The correct folder hierarchy should be as follows:



The computer freezes

Sometimes, when there's a C4DN client or server running, it may happen that your computer refuses to act upon your input; it's frozen. There can be many reasons for this behavior. In the following, we'll show you some steps you can take that will help to avoid such problems:

- On many computers there's a so called power management system running. This will shutdown a machine after a certain amount of apparent user inactivity (no mouse or keyboard input etc.). If programs (such as the C4DN server or a client) are running in the background it can happen, after such a shutdown, that there's no way to wake the system up. So:

  Switch off any power management on your computer before you start either a C4DN client or the C4DN server.

- As you can read elsewhere in this troubleshooting guide, if the operating system runs out of memory almost anything can happen to a computer.

  Switch on virtual memory on all computers running C4DN, the more the better.

✘ *If your computer does lock up or freeze, you should perform a reboot from scratch (not just simply eliminate the task responsible). It is highly likely that the TCP services have been scrambled and the forced quitting of a task won't solve the problem completely. In fact, if you do not reboot your computer, some strange things may happen.*

Miscellaneous notes

- If the server runs under Mac OS, QuickTime movies will be assembled instead of AVIs. Clients running under Mac OS will render PICT frame sequences instead of BMPs. If the server runs under Windows, AVI movies will be assembled instead of QuickTime movies. Clients running under Windows will render BMP frame sequences instead of PICTs … assuming the scene file contains the corresponding render settings.
- If you're using textures or texture movies, that can be processed only under a specific operating system then, in a heterogeneous network, the scenes will be rendered only by the clients which can do so.
  Imagine a scene that contains QuickTime and PICT textures. This scene will be rendered only by clients running under Mac OS. All Windows clients will abort with an error and continue with the next job.
- If you're using QuickTime textures in a CINEMA 4D scene on the Macintosh, ensure that the movie is flattened (meaning that all data is in the data fork, not split between data and resource fork). Otherwise the texture cannot be transferred.
- On a Macintosh, system dialogs (e.g. the one telling you of a server shut down) freeze the whole system while they are unanswered by the user. Even the C4DN client cannot then render.

  Before you leave a render unsupervised you should load a system configuration (using the control panel Extensions Manager) in which you have switched off anything that could cause such a problem e.g. AppleShare. (Remember that CINEMA 4D NET Render depends only on TCP/IP …)
- During rendering, CINEMA 4D NET Render creates BodyPaint 3D (B3D) files and sends them to the clients. B3D is used because at time of writing it is the only known format that supports both 16-bits per channel and multi-passes. The B3D files will be deleted automatically once rendering has been completed.
- CINEMA 4D NET Render is unable to generate AEC files — you must generate the AEC file manually using the Save button. Save the AEC file in the same folder as the multi-passes, otherwise After Effects will be unable to find the multi-passes when you import the AEC file.

Limitations

- Although NET Render can write RLA and RPF files, they won't contain any 3D data.
- Animations are limited to a maximum frame number of 9999.

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