NUENDO₂

MEDIA PRODUCTION SYSTEM

PC VERSION

X Built for Mac OS X

● steinberg

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Introduction

This document describes how you can use Nuendo's networking technology to collaborate with other users of Nuendo in a peer-to-peer network.

The "owner" of a project can share it with any number of users via LAN (Local Area Network) connections and/or WAN (Wide Area Network) connections via standard network protocols.

This allows several separate users to work on a project simultaneously and coordinate their efforts, as well as exchange ideas and suggestions.

Using Nuendo to collaborate in a network requires that:

•   All the users have a version of Nuendo that supports the networking technology.
•   All the users' computers are either connected via a LAN, or can be connected via the Internet through IP addresses.

What can I use it for?

The networking technology in Nuendo allows collaboration with, and exchange of, MIDI and audio data – i.e. it is possible to exchange and edit MIDI and audio only. As of this writing, it is not possible to exchange any mixer settings, although it may be in future releases.

Even though the networking technology allows for collaboration via WAN connections over the Internet, it is primarily designed for use in a LAN workgroup.

If you intend to use it for collaboration over the Internet, bear in mind that communication is considerably slower over the Internet, and that there are also other factors (such as security issues and firewall problems) involved which can complicate matters (see below).

About the technology

In addition to TCP/IP, the Nuendo networking technology uses the standard network protocols RCP (Remote Copy Protocol - used to transfer files between systems) and UDP (User Datagram Protocol - primarily used to broadcast messages over a network).

Since the technology uses the standard protocols and calls of the operating system, no special hardware or drivers are required to use it, aside from a working NIC card.

Nuendo uses three ports in your system for establishing communication, broadcasting messages and transferring data between users: UDP port 6990, TCP port 6991 and TCP port 6992. These ports need to be open for network communication to be possible.

Considerations for Internet use

As previously mentioned, the Nuendo networking technology is designed mainly for use in local area networks, but it is also possible to use it over the Internet.

If you intend to use it for collaborating with other users over the Internet however, there are a few things to keep in mind and some system settings you may need to make:

• If a network is to be created with any users connected via the Internet, all users need to know the respective IP addresses of the other computers in the network, and use these to establish the connections.

There may also be issues that need to be resolved regarding firewalls and/or computers connected to the Internet via private subnets. If a computer is protected by a firewall or is in a subnet, the user may need to perform the actions described below.

If your computer is behind a firewall

In a LAN, Nuendo uses the UDP port 6990 to establish communication with the other computers. Over the Internet however, Nuendo does not use this port. Instead, connection and communication is established and handled via TCP/IP messages sent to the TCP ports 6991 and 6992.

This means that the TCP ports 6991 and 6992 must be open on all computers. Firewalls may block messages to these ports, thus making connection impossible. Consult the documentation for your firewall (or operating system) for information about how to open ports – or consult your network administrator.

If your computer is in a subnet that uses NAT

If your computer resides in a subnet that uses NAT (Network Address Translation), *all* computers in the subnet share the same *external* IP address, while the individual computers in the subnet have *internal* IP addresses.

In this case, you must set up a port mapping from the *external* ports 6991 and 6992 to your *internal* ports 6991 and 6992 - i.e. the actual ports on your computer, as opposed to the ports of the subnet.

If computers are in different NAT subnets

If you want to collaborate with users whose computers reside in different subnets that use NAT (as described above), it might be a good solution to set up a VPN (Virtual Private Network). A VPN allows secure communication between networks, using the Internet for transferring data.

It is beyond the scope of this document to go into any details on how to set up a VPN, but make sure that your VPN will act as a single network and that it has the ports 6991, 6992 and, if possible, 6990 open.

Getting started - selecting a user name and basic procedure

The following is a quick summary of how to use Nuendo's networking technology - how to enter a user name, and the basic procedure for sharing a project with other users. In other words; it's a quick guide for quickly getting down to business and sharing a project, but you will probably want and need to read the rest of this document as well for more in depth descriptions of procedures and functions.

If you have made the preparations described above so your computer meets the criteria for communicating with other computers, this is how you quickly go about establishing network communication and share a project with others:

1. Launch Nuendo.

2. Activate the network by pulling down the Network menu and checking the "Active" item.
This establishes network communication and introduces your computer to any computers already present in the network. Your computer now needs to have a unique id to distinguish it (see below).
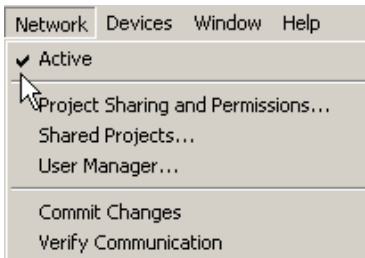
3. At this point, a dialog opens asking whether you want to enter a unique user name to identify your computer in the network.
This is the name that will be displayed in all the network dialogs to identify you to the other users in a network.

• Each user in a network *must* specify a user name, or network name, in order to be identified in the network. You don't have to do it at this point however, since you can do it at a later time if you wish (see).

4. Click "Yes" if you want to enter your user name. If you don't want to enter a user name at this point, click "No".
If you click "Yes", another dialog opens in which you can enter your user name.
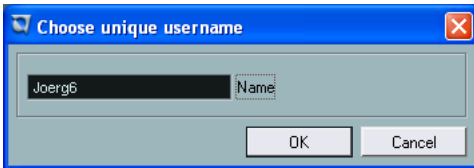
5. Click in the text box, type in a name of your choice and click "OK".
If the network has already been created, the original creator - or administrator - may have already decided on user names for all participants. If so, ask the administrator if he or she has a name for you and enter that. See for more information about selecting user names for other participants.

• If a name you enter is already in use for another computer in the network, a dialog will inform you about this and let you select another name.

6. When you have entered a user name, load or create a project that you want to share with the other users.

7. Open the "Project Sharing and Permissions" dialog from the Network menu, and click in the "Share Project" box to put a checkmark in it.
The project is now shared and all the other users have full access to it. See for more details about sharing projects and what you can do in this dialog.

Now everyone can collaborate on the project, contribute new audio and MIDI data, edit existing data and commit the changes to the other users.

The above procedure is a short and sweet summary of the basic usage, but the Nuendo networking technology offers far more options. You can for instance specify which users in a network should have access to a project, whether they should have complete access or only partial access, and much more.

On the following pages we will also describe how to join projects shared by others, and describe in detail how you go about working with shared projects, so read on for more information.

Selecting a user name - alternative method

As previously stated, each user in a network needs to specify a unique user name, or network name, in order to be identified in the network.

If you didn't specify a user name with the method described above, or if you need to change it, you can do the following:

1. If it's not already running, launch Nuendo.

2. Open either the User Manager dialog or the Shared Projects dialog from the Network menu.
In the top left corner of both dialogs you will find a Network Name text box.
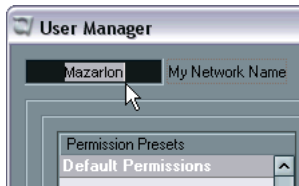
Entering a network name in the User Manager dialog…
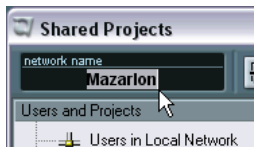
…and in the Shared Projects dialog.

3. Click in the text box, type in a name of your choice and press [Return].
This is the name that will be displayed in all the network dialogs to identify you to the other users in a network.

❒ **Note that the following user names are reserved and can't be used: "Guest", "Administrator", "Admin" and "Anonymous".**

Once you have entered a user name and this has been established in the network, it shouldn't be changed unless absolutely necessary! To use an analogy, this is similar to registering for an Internet service or discussion forum – once you have registered under a specific name, you can't log in under another name, unless you create a new account.

Setting up a network

The following is a description of how to set up a network with both LAN and WAN connections.

• For LAN connections, all computers must be part of the same network and communicate properly.
• For WAN connections, all computers must have a working Internet connection and a public IP address.

If your intended network meets these criteria, follow the procedures described below to set things up.

Setting up LAN connections

If you want to connect to other users via a LAN, you only have to make sure all computers actually use the same LAN, that they are communicating properly via the TCP/IP protocol, and that you have activated the network by checking the "Active" item on the Network menu (see below). If the computers are unable to communicate, contact your network administrator, or consult the network documentation for your operating system.

Setting up WAN connections

If you want to connect to other users over the Internet, you have to open a WAN connection to each. This requires that all users have a working Internet connection and a public IP address. See for information about potential problems with Internet connections and how to remedy them.

WAN connections are set up in the Shared Projects dialog in the following way:

1. Make sure the "Active" item on the Network menu is checked.
This initiates network communication with the other participants.
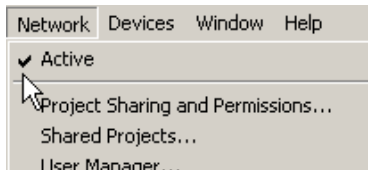
2. Open the Shared Projects dialog from the Network menu.

3. Click the "Add WAN Connection" button in the toolbar.
A dialog appears, requesting the URL – the IP address – of the computer you want to connect to. In other words, you need to know the user's IP address.

The "Add WAN Connection" button.

4. Type in the IP address of the computer you want to connect to and click OK.

An item called "Global IP Network" now appears in the dialog. This lists either the IP address of the computer to which you have connected, or the domain name of its Internet service provider.

5. Repeat this procedure for every user you want to connect to over the Internet.

• **Note that if a computer is dynamically allocated an IP address by its Internet service provider – as opposed to having a permanent IP address – you will have to repeat the above procedure each time the computer receives a new IP address!**

• You can remove a WAN connection by selecting it and clicking the "Remove WAN Connection" button.

The "Remove WAN Connection" button.

• You can remove the entire "Global IP Network" item by selecting it and pressing [Delete] or [Backspace].

This will also remove any existing WAN connections.

Should you be unable to establish a WAN connection, first verify that you entered the IP address correctly. Connection problems may also occur because of the following reasons:

• Your computer and/or the computer you're trying to connect to is protected by a firewall.

See for more information about how to resolve firewall problems.

• Your computer and/or the computer you're trying to connect to doesn't have the necessary ports open.
See for information about which ports need to be open for network communication.

Updating the network information

If all users in a network are online and have entered user names (see), you can do the following to update the network information in Nuendo:

• Open the Shared Projects dialog and click the "Rescan Network" button to update the network information.
This is the button to the far right in the toolbar.

At this point, the following will happen:

• The item "Users in Local Network" should be updated to display a list of all the online users connected via LAN, along with their user names.
• The item "Global IP Network" should be updated to display a list of all the online users connected via WAN, along with their user names.

If a user name reads "Anonymous", this means that the user has not yet entered a user name.

If the user list isn't updated as it should, this is probably because the computers in the network aren't communicating properly. See the "Setting Up" sections above.

• **Information about users that are offline will not be updated.**

Sharing projects

The following is a description of how to set up things up in order to share a project you have created with other users.

When you want to share a project with others, you first decide which users you want to have access to the project, and then specify their read and write permissions to it.

You can use different procedures for setting up a list of users and their read and write permissions:

• You can create a permission preset containing all the settings.
Storing permission presets is practical since they let you quickly and easily apply the same list of users and their permissions to future projects.

• You can set up users and their permissions manually for each project.
This method also allows you to specify permissions for separate tracks in a project, as opposed to the entire project.

• Alternatively, you can let *all* the participants in a network have access to a project, in which case you don't have to make any special permission settings, but instead use the "Default Permissions".

We will first describe all of these methods here, and then proceed to describe how you go about sharing a project.

Creating a permission preset

In the User Manager dialog, read and write permission settings for users can be stored in permission presets. These can then be applied to projects – meaning that if you apply a permission preset to a project, the users will automatically get read and write permissions for it according to the settings stored in the permission preset.

• Read permission allows users to view and play back shared projects or tracks but not make any changes to them.

• Write permission allows users to make any changes to shared projects or tracks.
It is not possible to have write permission without also having read permission.

When creating a permission preset, there may generally be two kinds of situations:

- Users have been established in the network and are online.

- Users are offline and have not been established in the network.

  The following procedure describes how to create a permission preset for a combination of the two situations above:

1. Open the User Manager dialog from the Network menu.
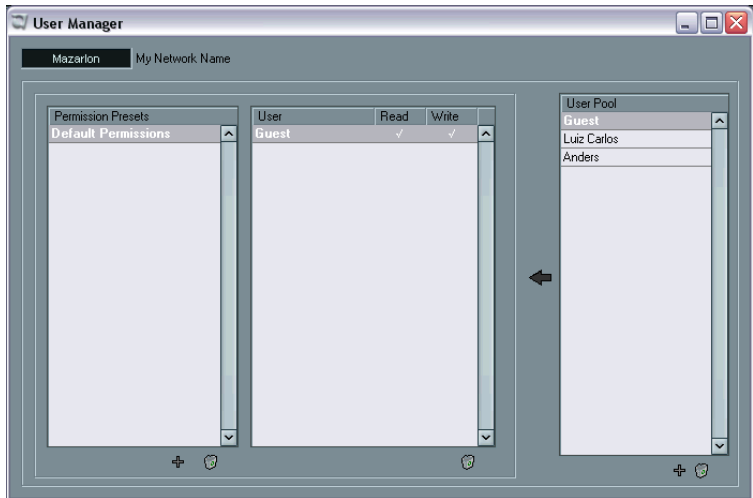
2. Click the "+"-sign below the "Permission Presets" column.
A dialog appears, allowing you to name the permission preset to be created.

3. Type in the desired name and click "OK".
The permission preset is created and added to the list.
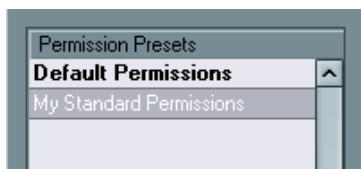
The "User Pool" column to the right lists all the users who have entered a user name and at some point have been online and established in the network. Regardless of whether they are currently online or offline, they are still listed.

However, there may also be instances when you want to add a user who is offline and hasn't been established in the network. In such a case that user isn't available in the User Pool list, but you can still add him or her to a permission preset in the following way:

4. Click the "+"-sign below the "User Pool" column.
A user with a generic name – "User #" – is added to the list.

5. Double click the generic name and type in the desired name.
The user you're adding may have decided on a user name and entered it, as described on , but has been offline and therefore not yet established in the network. In this case, you can enter that name if you know it. Otherwise, enter a name of your own choice and later inform the user about it to let him or her know which name to use.
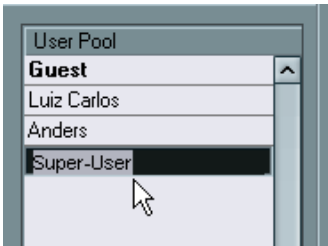
The next step is to add users to the permission preset.

6. Make sure the preset is selected in the "Permission Presets" column.

7. In the "User Pool" column, select the user(s) you want to add to the permission preset.
To select several users, contiguously or non-contiguously, hold down [Shift] or [Ctrl]/ [Command] and click on the user names.

8. When you have selected the user(s) you want to add, click the Arrow symbol to the left of the "User Pool" column.
The users you selected will now be added to the "User" column in the middle of the dialog.

The next thing to do is to define the read and write permissions for the added users:

9. In the Read and Write columns, the read and write permissions for each user can be specified. By default each added user has both read and write permission. If you don't want a user to have read or write permission, make sure the corresponding column is unchecked by clicking in it.
Note that having write permission automatically means to also have read permission.
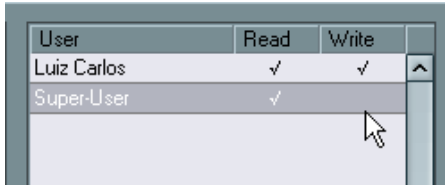
10. When you have added the desired users and specified their read and write permissions, the preset is complete.
The permission preset will now be available for use. See page 22 for information on how to utilize a saved permission preset.

Permission presets apply to entire projects – i.e. when a permission preset is loaded, the read and write permission settings in it are valid for the whole project. You can however also specify permissions separately for each track, which is described on page 20.

• Note that it is also possible to create a permission preset in the Project Sharing and Permissions dialog, as described on page 20.

Removing permission presets and users

Below each column to the right is a Remove button (the trash icon). You can remove one or several permission preset(s) or user(s) (including the "Guest" user – see below) from the respective columns by selecting them and clicking this icon.

About the Default Permissions preset and the Guest user

The "Default Permissions" preset cannot be removed. You can however use it either as is, or you can modify it as you wish by adding and removing users. By default, it contains one user – "Guest" – with both read and write permission.

- If "Guest" is added to a permission preset, anyone in the network can utilize the Guest permissions.
  I.e. if you share a project and have Guest as a user, anyone in the network can join it and have the read and write permissions specified for the user "Guest".

  This means that if you want to share a project with everyone in a network and let everyone have both read and write permission for the entire project, the easiest and quickest way to do this is to use the Default Permissions preset as is.

Setting up users and permissions manually

Instead of creating a permission preset in the User Manager dialog, as described above, you can use the "Project Sharing and Permissions" dialog to manually set up which users should be allowed to share a Project, and what read and write permissions they should have.

- **You can also save the permission settings you make in this dialog as a permission preset (see page 20). However, unlike in the "User Manager" dialog, it is not possible to add users who have not yet been established in the network (see page 14).**

Proceed as follows:

1. Open the "Project Sharing and Permissions" dialog from the Network menu.
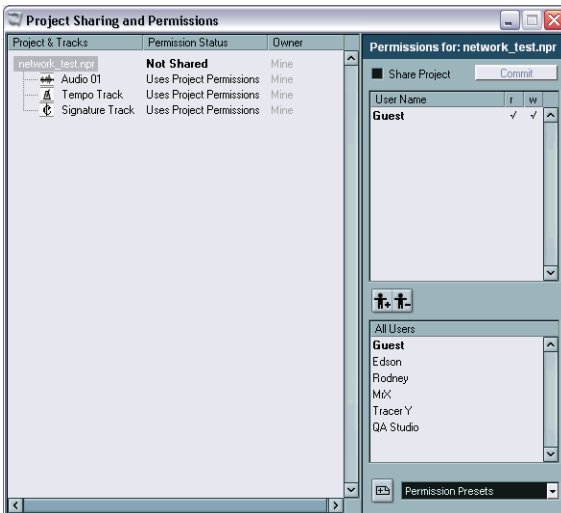
2. In the "All Users" column to the right, select the user(s) you want to share the project with.

All users in the network that have entered user names and are established in the network are listed, along with the default "Guest" user (see page 17). To select several users, contiguously or non-contiguously, hold down [Shift] or [Ctrl]/[Command] and click on the user names.

3. When you have selected the user(s) you want to share the project with, click the Add User button above the column (the left button).

The selected users are added to the "User Name" column in the middle of the dialog.

4. If you want to remove a user, select the user name in the middle column and click the Delete User button (the right button).

The user is removed from the "User Name" column. You can select and remove several users at once. You will probably want to remove the "Guest" user if you don't want everyone in the network to have full access to the project.

5. In the leftmost "Project & Tracks" column, make sure the top item (the project name) is selected.

This way, the settings you make affect the entire project, rather than separate tracks.
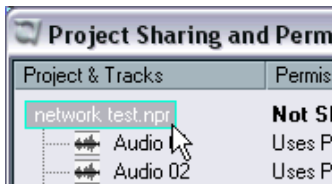
6. Define the project read and write permissions for the added users, by checking and unchecking the Read and Write permission columns ("r", "w") as desired.

Note that having write permission automatically means also having read permission.

The settings you have now made are valid for the entire project.

This dialog however also allows you to specify read and write permissions separately for each track, as opposed to the entire project. This is described on .

Saving the settings as a permission preset

If you have manually added users and set up their read and write permissions for the project in the "Project Sharing and Permissions" dialog as described above, you can create a permission preset based on the settings you have made:

1. Click the "+" icon to the left of the "Permission Presets" menu in the bottom right corner.
A dialog appears, allowing you to name the permission preset.

2. Type in the desired name and click "OK".
The permission preset is saved and added to the menu. You can now also access this preset in the "User Manager" dialog, as described on page 14.

Setting up permissions for separate tracks

The "Project Sharing and Permissions" dialog also offers the possibility of specifying read and write permissions separately for each track in the project, if you so wish.

To make permission settings on a track basis, do the following:

1. In the "Projects & Tracks" column, select the track(s) for which you want to make separate settings.
As you can see, the right part of the dialog now only contains a checkbox and the text "Override Project Permissions".
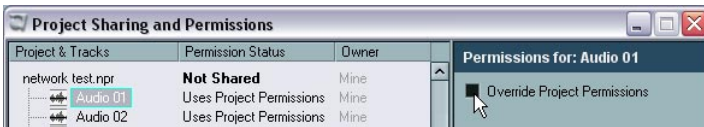
2. Click in the box to put a checkmark in it.
The dialog changes again, and in the left column, you can see that the text "Uses Project Permissions" for the track(s) has now been replaced with the text "Overrides Project Settings" in red.
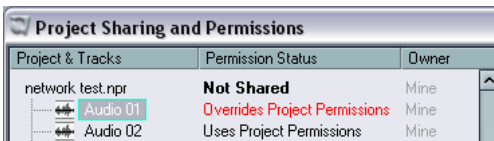
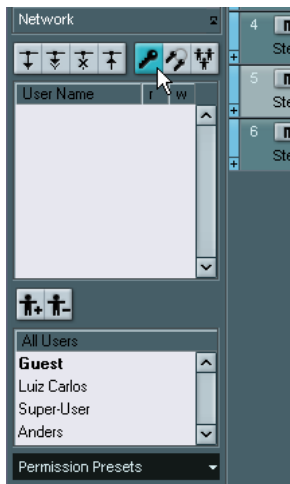**3.** Add users and specify their read and write permissions for the track(s) in the same manner as described on .

4. When you are done, select the top item (the project name) in the "Project & Tracks" column again.

Note that permission settings for separate tracks are not saved in a permission preset. You can however use permission presets in conjunction with separate track permissions, by first loading a preset with the project permissions (see) and then making settings for separate tracks.

• **It is also possible to make separate track permissions in the project Inspector. Selecting a track in the Track list, opening the Network section in the Inspector and clicking the "Override Project Permissions" button (the key symbol) makes it possible to make read and write permission settings for the track directly in the Inspector.**
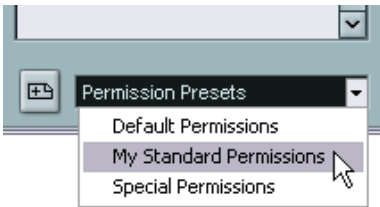
Loading a permission preset

As previously mentioned, a permission preset contains information specifying which users should be allowed to share a Project and their read and write permissions for it.

To load a permission preset for the active project, proceed as follows:

1. Open the "Project Sharing and Permissions" dialog from the Network menu.

2. In the bottom right corner of the dialog, click anywhere in the text box to open a pop-up menu.
   The menu lists all available permission presets.

3. From the menu, select the permission preset you wish to use.
   As you can see, the users defined in the permission preset are now listed in the User Name column, and their read and write permissions are displayed.

   You can now either use the settings of the loaded permission preset as they are for the shared project, or you can make manual adjustments on a project or track basis (see page 18).
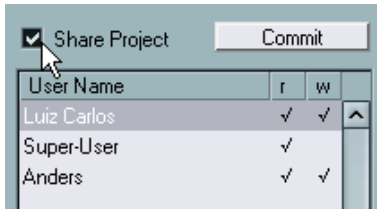
Sharing a project

When you have set up all the users and their permissions – i.e. loaded a permission preset and/or manually added users and specified their permissions for this particular project – it's time to actually share the project.

This can be done in two different ways:

In the "Project Sharing and Permissions" dialog

1. If it is not already active, activate the network by checking the option "Active" on the Network menu.
Select the item and click to put a checkmark beside it.

2. Open the "Project Sharing and Permissions" dialog from the Network menu.

3. Put a checkmark in the "Share Project" box by clicking in it.
The project is now shared and available to the users you have specified.

- To revoke sharing of the project, uncheck the "Share Project" box.

- You can at any time make changes in this dialog, i.e. add or remove users and change permissions, and then update the shared project accordingly for all users by making the desired changes and clicking the "Commit" button.

- **If you just want to share a project with full read and write access for every user in the network, the easiest way to do this is to just click "Share Project" without loading any permission preset or manually setting up users.**
The is provided you haven't made any changes to the "Default Permissions" preset. The reason is that the default permissions (with only the user "Guest") grant all users full access (see page 17).

In the "Shared Projects" dialog

1. If it is not already active, activate the network by checking the option "Active" on the Network menu.
   Select the item and click to put a checkmark beside it.

2. Open the "Shared Projects" dialog from the Network menu.

3. Click the "Share Active Project" button.
   This will open the "Project Sharing and Permissions" dialog, to let you verify that all permissions are OK before sharing. You can then share the project in that dialog as described above. When the active project is shared, it appears in the "My Shared Projects" folder.

The "Share Active Project" button.

• To revoke sharing of a Project, select it in the "My Shared Projects" folder and click the "Unshare Selected Project" button.


The "Unshare Selected Project" button.

Deactivating a shared project

If you are sharing a project and want to stop working on it, you do this by deactivating the network. When you deactivate the network during work with a shared project, the other users will be disconnected from it. However, *sharing* will not be revoked (as described above) unless you specify it – meaning that the next time you connect to the network, the project will still be shared, allowing the other users to join it without you having to make permission settings and share it all over again.

• To deactivate the network, pull down the Network menu, select the item "Active", and click to make sure it is *not* checked.
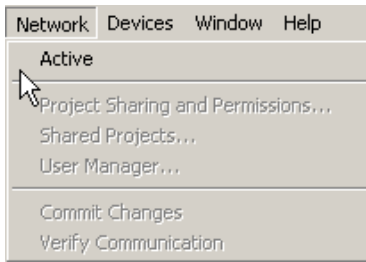
• A dialog will then appear, asking you to confirm that you want to disconnect the network, and whether you also want to revoke sharing of the project.
All the users will then be disconnected from the project. If you choose *not* to revoke sharing, the project will still be shared when you connect to the network again

• To reactivate the network, check the item "Active" on the Network menu again.
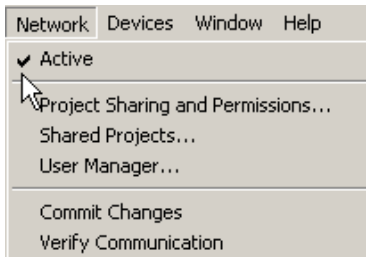
- A dialog will then appear, asking you to confirm that you want to re-connect the network, and whether you also want to share the active project.
  All the users with whom you previously shared the project will now be able to join it again.

About the project folder

When you're sharing a project, you have to decide whether the project folder for it should be located on your local hard disk, or – if you're sharing the project over a LAN and have access to a common file server – if it should be located on the server.

You should consider the following:

- If the project folder is located on your hard disk, the files it contains will be copied to the other users' hard disks, and their project folders.
  This way, work on the files will be done locally on each user's computer, and the updated files are then copied to the other users' hard disks.

- If you have access to a file server and place the project folder and its contents on it, the other users *must* specify this folder as the project folder when they join the project.
  In this case, the project files will not be copied to the other users' hard disks, but are instead accessed directly on the server. Working on the files directly on a server may be slower compared to working on them locally. On the other hand, the files will not have to be copied to each user's hard disk every time they are updated.

- If the network contains any users connected via WAN, you *must* keep the project folder on your hard disk.
  This is because the WAN users will not be able to access the project folder if it is located on a file server in your LAN.

Joining projects

The "Shared Projects" dialog lets you join projects shared by other users in the network.

This dialog lists all the established users in the network, and any projects they are sharing. For you to be able to join a project, the user sharing it must be online and have given you read and/or write access.

To join a project, do the following:

1. Connect to the network by checking the option "Active" on the Network menu.
Select the item and click to put a checkmark beside it.

1. Open the "Shared Projects" dialog from the Network menu.
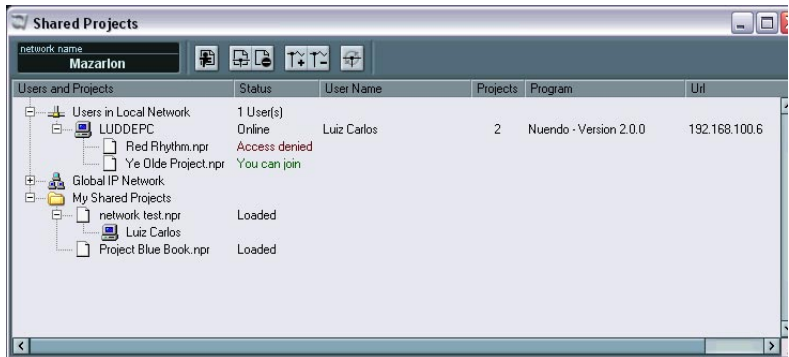
2. If necessary, first click the "Rescan Network" button (the rightmost one in the toolbar).
By clicking this button, you instruct Nuendo to scan the network for any updated information about online users and/or shared projects, and refresh the Shared Projects dialog accordingly.

• The item "Users in Local Network" lists all the established users in a LAN.

• The item "Global IP Network" lists all the users with whom you have established WAN connections (see).

3. If there are plus-signs beside these items, this indicates that they contain lists of users that can be displayed. Click the plus-signs to display the users.

4. If a user is sharing projects, this is indicated by a plus-sign beside the user name. Click the plus-sign to display a list of the projects shared by this user.

If there are shared projects you can join, these are indicated by the text "You can join" in green.

5. To join a project, select it and click the "Join Project" button (or just double click the project name in the list).
A dialog appears, allowing you to specify the project folder.

The "Join Project" button.

6. Select a project folder.
There may be two cases which require different approaches:

• If you are connected over a LAN, the owner of the project may have decided to keep the project files in a special, common project folder on a server. If this is the case, you will need to specify this folder as the Project folder.
• If the owner of the project keeps the project files in a project folder on his or her own hard disk, select a local folder on your hard disk. In this case, the project files will be copied to the project folder on your hard disk.

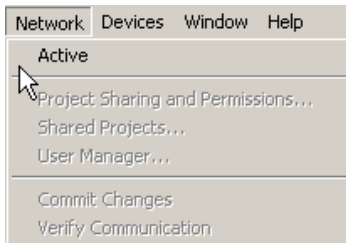See for more information about the project folder in shared projects.

7. When you have selected a project folder, the project and the files are copied to you hard disk (unless you're working on a server, as described above).
If you have access not to the entire project, but only separate tracks, only the tracks for which you have read or write permission will be loaded.

Disconnecting from projects

If you have joined a project and want to stop working on it, you do this by deactivating the network. When you deactivate the network during work with a shared project, you will disconnect from it. However, you will still have access to the project in the future as long as the owner shares it with you. The next time you connect to the network, the project will still be shared with you (unless the owner has changed the permissions) and you can join it again.

• To deactivate the network, pull down the Network menu, select the item "Active", and click to make sure it is *not* checked.

```
Network  Devices  Window  Help
  Active
  Project Sharing and Permissions...
  Shared Projects...
  User Manager...

  Commit Changes
  Verify Communication
```

• A dialog will then appear, asking you to confirm that you want to disconnect from the network.
You will then disconnect from the project.

• To reactivate the network, check the item "Active" on the Network menu again.

```
Network  Devices  Window  Help
✓ Active
  Project Sharing and Permissions...
  Shared Projects...
  User Manager...

  Commit Changes
  Verify Communication
```

• A dialog will then appear, asking you to confirm that you want to reconnect to the network, and whether you also want to load the project you last worked on.
If the project is accessible on the network, you will rejoin it and all the project files will be loaded (see below).

Rejoining a previously saved project

If you have previously joined a project and saved it in a project folder on your hard disk, you have access to it on your hard disk and can work on it "offline" if you wish. However, you will still need to join it again - either via the Shared Projects dialog or by reactivating the network (as described above) - to commit your changes to the other users, as well as receive any changes made by them. I.e. you can't just load it as with an "ordinary" project to establish network connection again.

However, when you rejoin a project you have previously worked on and saved, a dialog will appear asking whether you want to load the previously saved project or not.

Regardless of which you select, any changes to the project performed by other users since you last worked on it will be transferred and the project will be updated accordingly for you.

Note:

• If you choose to load the previously saved project, only the items that have actually been changed by other users since you last joined the project will be transferred.
Items in the project that haven't been changed will not be transferred.

• If you choose *not* to load the previously saved project, the project and all its files will be copied to your hard disk again, regardless of whether they have been changed or not.
If you select the same project folder you used the last time, the existing files in it will be overwritten.

• If you have worked on the project "offline" and saved it, you should choose to load the saved project, since otherwise, the changes you have made will be unavailable and you can't commit them to the other users.

Working with shared projects

The following are some general descriptions about the common pro-
cedures for working with shared projects over a network.

Any user who has write access to the project or separate tracks in it
can make changes and commit these to the other users. The commu-
nication and transfer of updated files is handled mainly in the Network
section for each track in the Inspector.

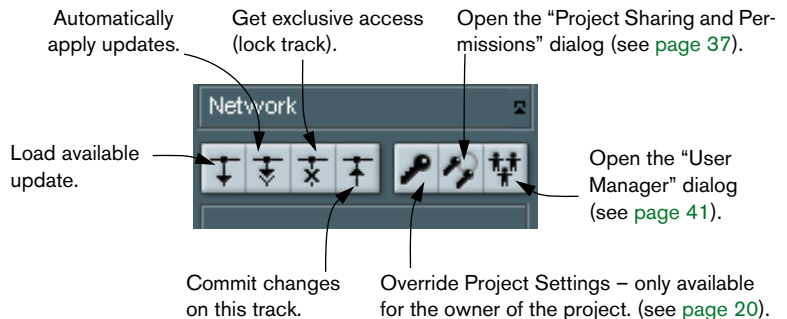The permission status of a track is indicated in the Inspector as follows:

• If the Network tab in the Inspector is *red*, this indicates that you have both
  read and write access to the track, and can make changes to it.

• If the Network tab in the Inspector is *green*, this indicates that you have only
  read access to the track, and can't make changes to it.

The Network section contains a host of controls which are used for a
number of network related functions for the track:

Automatically apply updates.

Get exclusive access (lock track).

Open the "Project Sharing and Per-missions" dialog (see page 37).

Load available update.

Open the "User Manager" dialog (see page 41).

Commit changes on this track.

Override Project Settings – only available for the owner of the project. (see page 20).

• In addition to the above, the Network section also displays the user name of
  the owner of a project you join.

- **Note that you can also customize Nuendo so that the four main network control buttons (update, auto update, lock and commit) are available in the Track list. This is done in the Track Controls Settings dialog. Please refer to the Nuendo Operation Manual chapter "Customizing" for instructions on how to do this.**

The network controls in the Track list.

Committing changes

To a track

When you have made changes to a track, proceed as follows to commit them and make them known to the users in the network:

1. Open the Network section for the track in the Inspector by clicking its tab.
   If you have set things up so that the commit button is available in the track list, as described above, you don't have to use the Inspector.

2. Click the button "Commit changes on this track".
   The changes are committed to the network.

- **Note that for the owner of a project, this is also the way to update permission settings made directly in the Inspector (see).**

To a project

If you have made changes to several tracks, or made other project changes, you will probably want to commit all changes at once:

- Pull down the Network menu and select "Commit Changes".
   The changes are committed over the network. Note that there is also a button for this function available in the Project window toolbar. However, this is not visible by default. Refer to the Nuendo Operation Manual chapter "Customizing" for information about how to customize the toolbar, if you want to make this button visible.

❐ **Please note that each time you commit a change to a track or project, network activity is initiated, slowing the network down. Depending on the speed of the network, it may take some time before the changes are distributed to all users and work can continue, so commit changes sparingly and only when necessary.**

Loading changes

When other users have made changes to a track and committed them over the network, the "Load available update" button in the network controls for the corresponding track will light up in blue to indicate that you can load the changes and update the project.
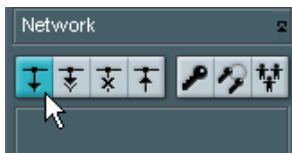
The "Load available update" button is located in the Network section of the Inspector. However, when working with shared projects, you will probably want to customize Nuendo so that it is also available in the Track list (as described above), since this makes it somewhat easier to get a visual overview of when committed changes are available.

You can use two different methods to load available changes to tracks over the network:

• Click the "Load available update" button in the Inspector or the Track list.
This will load the available update for the track.

• Click the "Automatically apply updates" button in the Inspector or the Track list for one or more tracks.
This way, all changes committed to the track(s) by other users will be automatically loaded without requiring your intervention.

There is also a special method for loading changes made to the tempo and signature tracks, as well as loading new tracks:

• Click the "Update Mastertrack and create new tracks" button in the Project window toolbar.
This button lights up in blue to indicate that there are changes available. Click it to have any new tracks and any changes made to the tempo and signature tracks loaded.
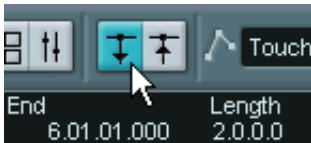
The "Update Mastertrack..." button is not visible in the toolbar by default. If you want it to be visible, you need to customize the toolbar to show the Network controls, as described in the Nuendo Operation Manual chapter "Customizing".

• **Note that you can undo an update! If you have loaded an available update, you can select "Undo Net Update" from the Edit menu. Similarly, you can "undo the undo" by selecting "Redo NetUpdate".**

Locking tracks

If you have write permission for a track and want to prevent other users from making changes to it, you can lock it for your own use only.

• Click the "Get exclusive access" button for the track in the Inspector or the Track list.
The track is locked for your exclusive use. When a track is locked by a user, the "Get exclusive access" button lights up in blue.

• To unlock a track, click the "Get exclusive access" button again so it is no longer lit.

The owner of a project has the possibility of unlocking a track, regardless of who locked it:

1. When the owner clicks the "Get exclusive access" button for a locked track, a dialog appears.
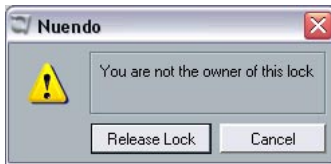

2. Select "Release Lock" to unlock the track, or "Cancel" to leave the track locked.

About network communication problems

In any network, occasionally, connections may be lost.

Whenever network communication with a participant fails, Nuendo will automatically initiate a communication verification process, and attempt to re-establish the lost connection:

• When Nuendo performs the verification process, a window appears, showing a status bar for its progress.

• After the verification process, a dialog will appear.
This lists the results of the verification process. Nuendo may either have been able to restore communication through the process, or still be unable to communicate with some participant(s). The dialog will list each participant with whom communication still failed (as in the illustration below).
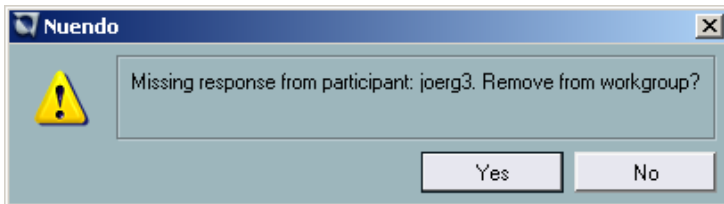
At this point, you will have to decide whether to remove the participant(s) from the network or not:

• If you suspect the communication problems are temporary, select "No" and wait to see if communications are restored.
You can then later manually perform the verification process if you wish (see below).

• If you believe the communication problems are more severe, for instance if the participant(s) have experienced a system or network crash, select "Yes".
The participant(s) will then be removed from the network until able to rejoin again.

If the verification process does not solve the problem, the communication problems are probably of a more serious nature and may require re-configuration of the network settings (see page 10).

• **Note that you can initiate the verification process manually as well. If you experience communication problems and the process doesn't start automatically, select "Verify Communication" from the Network menu.**

The Network dialogs

To round off this document, we will provide a break-down of the three Network dialogs and their contents.

The Project Sharing and Permissions dialog
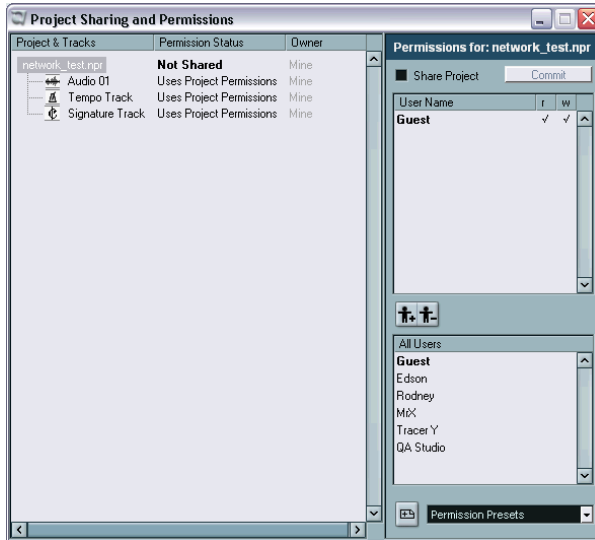
This dialog is where you specify the user permissions for the active project before sharing it, either on a project basis, a track basis or both.

The dialog is dominated by three lists:

• **The Projects & Tracks list.**
This lists all the tracks in the project, including the Tempo track and the signature track. Furthermore, it displays the permission status for each track – "Uses Project Settings" or "Overrides Project Settings". Also, the owner of the project/track is listed in the Owner column.

• **The User Name list.**
This displays all the users that are allowed to share the project, and their read and write permissions. Users can be added either manually from the All Users list, or by loading a permission preset. You can remove users from this list by selecting them and clicking the Delete User button below the list (the right button).

- The All Users list.
  This lists all the users that have entered user names and been established in the net-
  work. To add a user to the User Name list, select it and click the Add User button
  above the list (the left button).

  In addition, the dialog contains the following:

- The Share Project checkbox and the Commit button.
  By clicking the Share Project box, you share the project over the network. Click the
  Commit button when a project has already been shared and you have changed its
  permission settings.

- The Permission Presets menu.
  This menu in the bottom right corner allows you to select and load a permission preset.
  Also, by clicking the button to the left of the menu, you can save the permission settings
  you have made in this dialog as a preset.

- Finally, the dialog contains a checkbox called "Override Project Per-
  missions", which is only available when a separate track is selected in
  the Projects & Tracks list.
  By clicking this, you specify that the track should not use the project permission
  settings.

The Shared Projects dialog
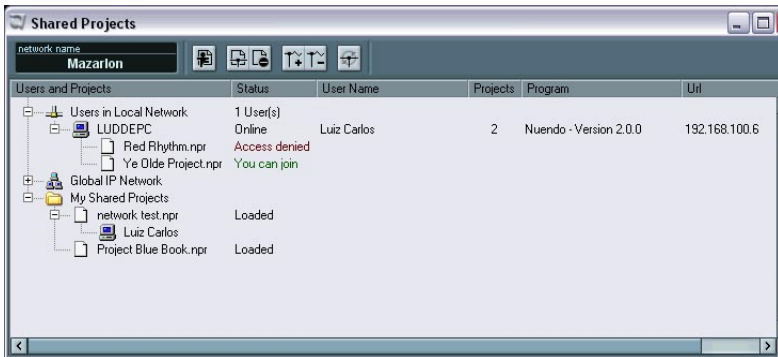
This dialog lists all the identified users and shared projects in the net-
work. It lets you share your own projects as well as join projects
shared by other users. Furthermore, the dialog offers the possibility of
connecting to WAN (Wide Area Network) users.

The users and projects are listed hierarchically in the following categories:

"Users in Local Network"

This item lists all the identified users in the Local Area Network and any projects they are sharing.

• The plus-sign beside the item can be clicked to display a list of the established users in a LAN.

• If a user is sharing projects, this is indicated by a "+" sign beside the user name.
Click the "+" sign to display a list of projects shared by this user. Displayed with each shared project is a list of which users are currently sharing it.

"My Shared Projects"

This folder contains a list of all projects you share over the network.

• If you have shared projects, you can click the plus-sign beside the folder to have them displayed in a list.
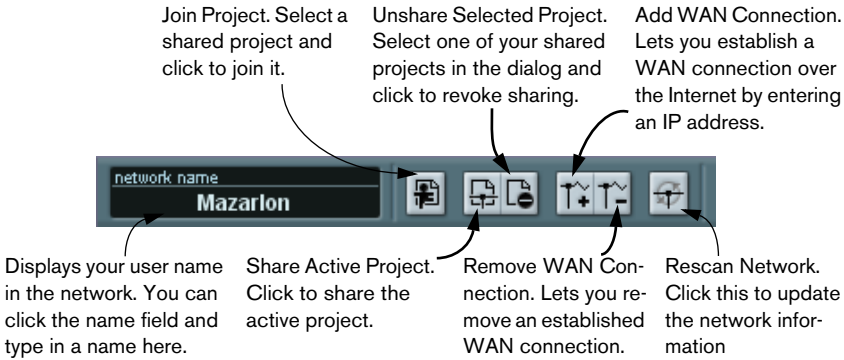Displayed with each shared project is a list of which users are currently sharing it.

"Global IP Network"

This item first appears when you open a WAN connection, and lists all the users connected through WAN. This works just like the "Users in Local Network" item, meaning that you can click the plus-sign beside the item to display the list of users, and the plus-sign beside the user names to display any projects they share.

• You can remove the "Global IP Network" item by selecting it and pressing [Delete] or [Backspace].
This will also remove any WAN connections.
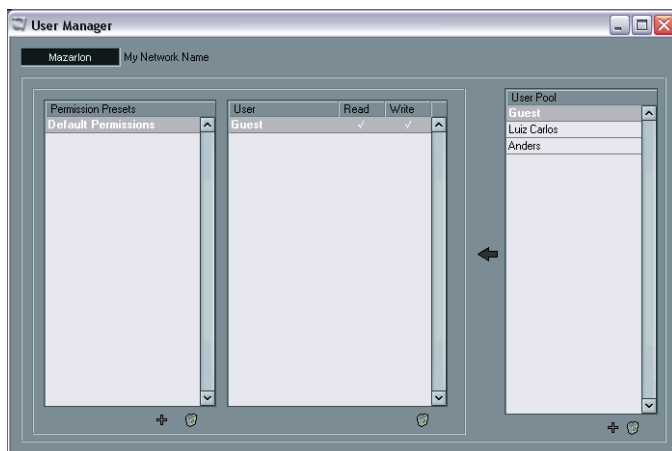
The toolbar

The toolbar contains the following items:

Join Project. Select a shared project and click to join it.

Unshare Selected Project. Select one of your shared projects in the dialog and click to revoke sharing.

Add WAN Connection. Lets you establish a WAN connection over the Internet by entering an IP address.

Displays your user name in the network. You can click the name field and type in a name here.

Share Active Project. Click to share the active project.

Remove WAN Connection. Lets you remove an established WAN connection.

Rescan Network. Click this to update the network information

The columns

The columns in the main list display the following information:

Column	Description
Users and Projects	Displays a list of all the established users and any projects they share. The names displayed are the workstation names in a LAN, or the domain names for WAN connections.
Status	The status column displays how many users are established in the network and their online/offline status. For shared projects, this column displays whether you can join a project (denoted by the text "You can join" in green), or not (denoted by the text "Access denied" in red). Furthermore, the column displays the number of participants in each shared project.
User Name	Displays the user names for the established users in the network. If the name "Anonymous" is displayed, this means that the user is online but has not entered a user name. If it reads "Unknown", this means the user is offline and has not been established in the network.
Projects	This displays the total number of projects a user is sharing.
Program	Lists which Nuendo program version a user is working with.
URL	Displays the IP address of the user.

The User Manager dialog

This dialog lets you set up lists of users, define their read and write permissions and save the settings as a permission preset. The presets can then be loaded in the "Project Sharing and Permissions" dialog, letting you share a project with the settings of the permission preset.

• "My Network Name" in the top left corner displays your user name in the network. You can click in the name field and type in a name.

• The Permission Presets column to the left displays a list of all the available presets.
  To add a preset, click the plus icon below the column. To remove a preset, select it in the list and click the trash icon.

• The User column in the middle lists all the users that should be included in a selected permission preset, and their read and write permissions.
  Users are added to this list from the User Pool list. You can remove users from this list by selecting them and clicking the trash icon below the column.

• The User Pool column to the right lists all the users that have entered user names and are established in the network.
  To add a user to the User column, select it and click the arrow button to the left of the list. To add a user that has not yet been established in the network, click the plus icon below the column. To remove a user name from the list, select it and click the trash icon.

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