



MARI

NUKE<>MARI BRIDGE

VERSION 2.0v1

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Rev: March 8, 2013

1 PREFACE

Mari is a creative texture-painting tool that can handle extremely complex or texture heavy projects. It was developed at Weta Digital and has been used on films such as *The Adventures of Tintin: The Secret of the Unicorn*, *District 9*, *The Day the Earth Stood Still*, *The Lovely Bones*, and *Avatar*.

The name Mari comes from the Swahili 'Maridadi', meaning 'beautiful' and carrying connotations of 'usefulness'.

About This Guide

This guide provides you with the basic information you need to get started using Mari and Nuke to fix, enhance or create projection setups.

For further information on Mari and its functions, see the accompanying Mari *User Guide* and Mari *Reference Guide*.

Contact Customer Support

Should questions arise that this manual fails to address, you can contact Customer Support directly via e-mail at support@thefoundry.co.uk or via telephone to our London office on +44 (0)20 7968 6828 or to our Los Angeles office on (310) 399 4555 during office hours.

2 NUKE<>MARI BRIDGE

Introduction

Typically, visual effects involves creating digital environments, adding generated imagery and matte paintings to live action scenes, and creating clean plates by removing blemishes, wires, or rigs from existing footage. Building shots using a combination of these techniques can be a laborious task, especially if there is no effective bridge between applications.

Using the 2D and 3D environment in Nuke has helped speed up this process, but when composite projections need to be extended, blended, or recreated it becomes increasingly complex. Some projections may need to be warped to match other projections, or new projections may need to be created to fill in areas that are completely occluded by objects that have been removed from entire shots. Even when sufficient projection information exists, multiple projections may need to be blended together using paint tools to create a seamless composite.

A typical example of this is with matte painting. Once completed, a matte painting is often imported into a 3D system and projected onto a scenic model (such as a building or landscape). Unfortunately, as the 3D model stretches the painting, the projection only works well from the angle of the projection camera. Fixing this in a 3D system requires the creation of new projections where the stretching occurs and in turn, blending these projections with the original painting for every frame in a shot. Creating new projections in this manner and manipulating them on the fly is both technically and artistically difficult to achieve.

The Nuke<>Mari Bridge offers you a quick and easy way for fixing projection problems, converting projection textures to UV textures, and editing multiple projections in context using the rich and natural toolset of Mari.

Once installed, it's as simple as sending one or more **Project3D** nodes from Nuke to Mari (transferring all of the models, textures and projections in a shot) and using the Mari toolset to fix, enhance, or create projection setups. Once the work is finished in Mari, projection setups are sent back to Nuke where they appear immediately in the node tree.

The Nuke<>Mari Bridge handles all of the data management in the background and links both applications whether they are on the same machine, or on different machines on the same network.

Installation

To install the Nuke<>Mari Bridge, follow these steps:



WARNING: If you have any previous versions of the Nuke<>Mari Bridge scripts installed, please remove them first.

On Linux

1. Navigate to the **Media/Scripts/Nuke** sub-directory of the Mari application directory on your computer.
2. Copy the contents of this folder to the **/home/login name/.nuke** directory.

On Windows

1. Navigate to the **Bundle\Media\Scripts\Nuke** sub-directory of the Mari application directory on your computer.
2. Copy the contents of this folder to the **\Users\login name\.nuke** directory.

On Mac OS X

1. As Mari currently doesn't run on Mac, obtain the contents of the Mari application directory from someone running Mari on a different machine. This directory can be found by navigating to:
 - **Media/Scripts/Nuke** (on Linux) or
 - **Bundle\Media\Scripts\Nuke** (on Windows)
2. Copy the contents of this folder to the **/Users/login name/.nuke** directory.



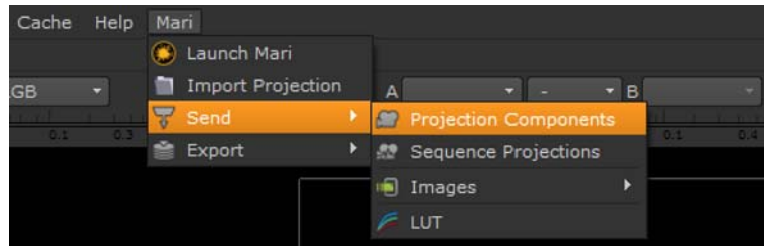
NOTE: If the **.nuke** folder already contains a file called **menu.py**, please open this file and paste the text from the **menu.py** file (from the sub-directory mentioned in step 1) anywhere into this file.



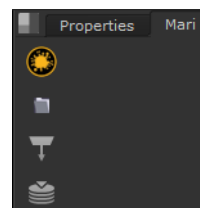
TIP: These files can be installed anywhere in your **NUKE_PATH**, however the **.nuke** folder is convenient for most users. If multiple copies of the scripts are installed in multiple folders in your **NUKE_PATH**, you may encounter problems. Please ensure that only one copy of each script is present.

Once this has been done, the following items appear in the Nuke UI when launched:

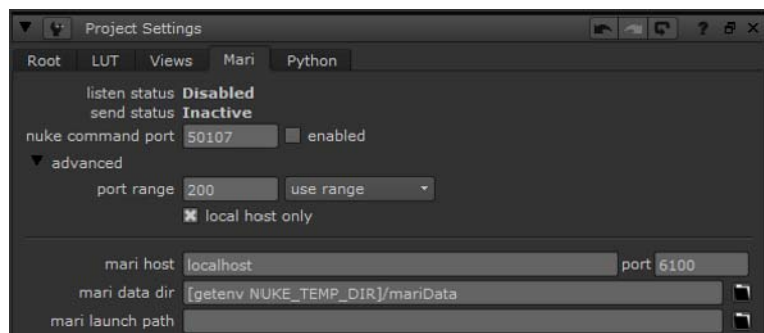
- A **Mari** menu item:



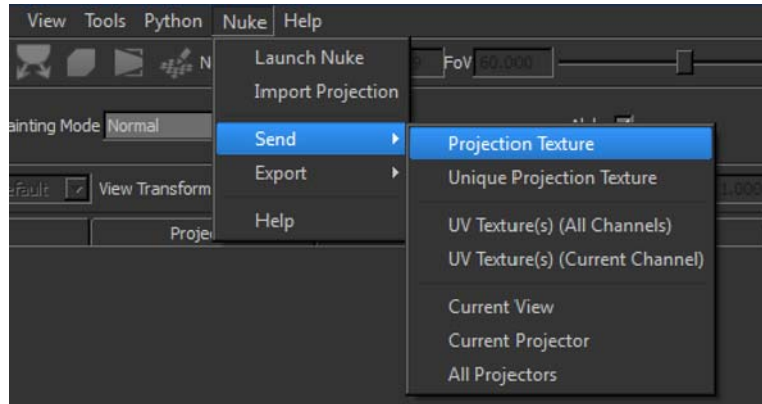
- A **Mari** tab in the **Content** menu. This is accessed by right-clicking on the toolbar and selecting **Pane > Mari** from the dropdown menu:



- A **Mari** tab under **Edit > Project Settings**:



In addition, a **Nuke** menu item is now available in the Mari UI:



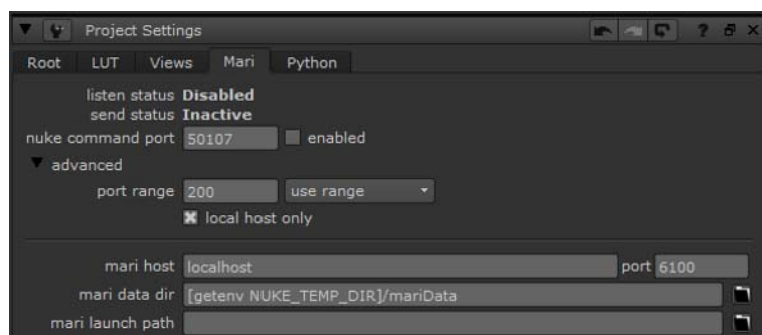
Connection Setup

Before we can send a projection to Mari, we need to establish a connection between the two applications.

Nuke

When Mari is launched from inside Nuke or a command is sent to Mari via the **Mari** menu or toolbar, Nuke's command port is automatically enabled. To manually set this, or adjust other settings related to the **Nuke<>Mari Bridge**:

1. Click **Edit > Project Settings > Mari**.
The Project Settings tab for Mari displays.



2. Check **enabled** and set the **command port**. When enabled, Nuke listens to Mari on the specified command port.



NOTE: Only one Nuke session can listen on the given port number. If the port number is already in use, Nuke attempts to listen on another port number within a range starting at the given port number. To change this behavior, click **Edit > Project Settings > Mari > advanced** and adjust both the **port range** and **use range** settings.

3. If both Nuke and Mari are running on the same computer, you should leave the **mari host** field blank, and ensure **local host only** is checked. If they are running on separate machines, enter the machine name or IP address of the computer running Mari here and uncheck **local host only**. These settings are automatically set when a command is successfully sent from Mari to Nuke.



NOTE: Checking **local host only** tells the application to only listen for connections from the local machine. This can prevent accidental connections from different machines and is therefore more secure, but this must be turned off when you want to use the Nuke<>Mari workflow across the network.

4. Enter the port number that Mari is set to receive commands on in the **port** field. This number should match the Mari **Command Port** number set in the **Scripts** section of the **Mari Preferences** dialog. This value should only be changed if the default is already in use by another application. This is automatically set when a command is sent from Mari to Nuke.
5. Set the **mari data dir**. This field specifies the location of the directory used for the data rendered and exported from Nuke and Mari.

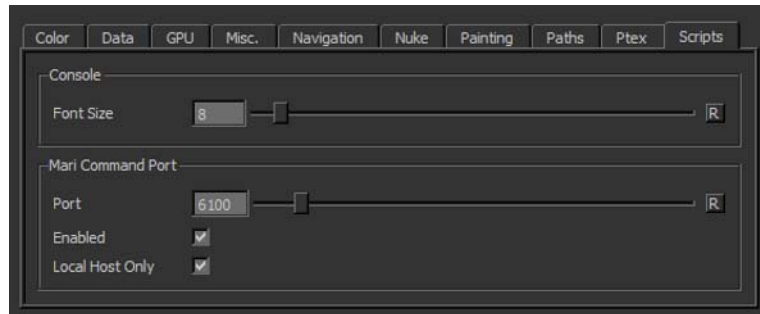


NOTE: The settings for connecting Nuke to Mari are stored separately in each script.

Mari

In Mari, there are a number of settings that we need to check before we can receive commands from Nuke.

1. Under **Edit > Preferences > Scripts** ensure that the **Mari Command Port** is **Enabled**. The default **Port** number should only be changed if it is already in use by another application. This number should match the port number set in Nuke under **Project Settings > Mari**.



2. As with the Nuke connection setup, if both Nuke and Mari are running on the same computer, ensure **local host only** is checked. If they are running on separate machines, uncheck this. Refer to the [Note](#) in the previous section for more information.
3. In the **Mari Preferences** dialog, click on the **Nuke** tab.
4. Enter the machine name or IP address of the computer running Nuke in the **Nuke host** field. If both Mari and Nuke are running on the same computer, you should leave this field blank. This is automatically set when a command is sent from Nuke to Mari.
5. Enter the port number that Nuke is set to receive commands on in the **Port** field. This number should match the Nuke **command port** set in Nuke under **Project Settings > Mari**. This value should only be changed if the default is already in use by another application. This is automatically set when a command is sent from Mari to Nuke.

You are now ready to exchange data between Nuke and Mari.

Workflow


Sending a projection setup

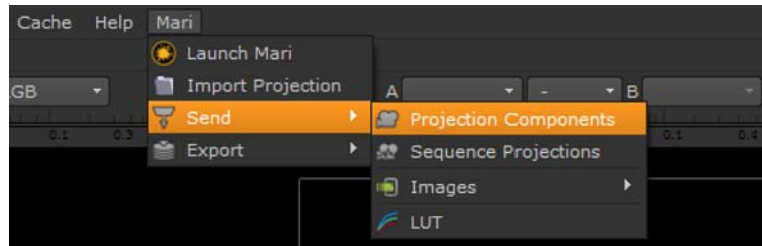
To send a Nuke projection setup to Mari follow these steps:

1. Select the Project3D node and the Geometry node that the projection is applied to, or select multiple nodes at once to send to Mari.



NOTE: If you want to merge the Nuke projection with a Mari project that is currently open, and the required geometry is already part of that project, you don't need to select the Geometry node.

2. If Mari is not already running, select **Mari > Launch Mari** or click on the Mari icon in the **Mari** panel to launch it.
3. In Nuke, select **Mari > Send > Projection Components** or click on the Send icon  in the **Mari** panel.



This pre-renders the texture to the location specified in **mari data dir**. The name of the pre-rendered file is derived from the node name and the current frame. If you sent the texture to Mari before, you are asked if you want to overwrite the file. If you choose **No** the existing file is used.



NOTE: You can also opt to export the projection instead of sending it to Mari using the Nuke<>Mari bridge. To export:

1. In Nuke, select **Mari > Export > Projection(s)...** or click on the export icon  in the **Mari** panel.
2. Set a directory location in the **Export Mari Projection** dialog.
3. In Mari, select **Nuke > Import Projection** and choose the file in the **Load Nuke Projection** dialog to import the projection into Mari.

This lets you send files between the two applications without a socket connection.



NOTE: When exporting files to disk in Nuke, an **.nmb** extension is assigned (for Nuke<>Mari Bridge). When exporting from Mari, an **.mnb** extension is used (for Mari<>Nuke Bridge).

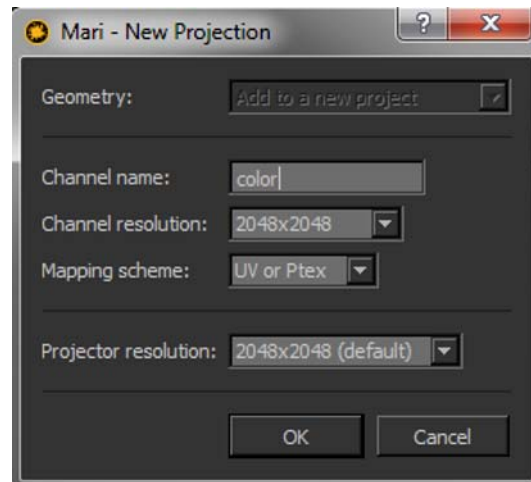
Sending or importing projections to Mari

Once the projection has been sent or imported into Mari, follow these steps to set up the projections in your project:

1. If there is no project open in Mari, the script creates a new project and asks you to create a channel for your projection. In the **Mari - New Projection** dialog, you are prompted to enter a **Channel name**, set the **Mapping scheme**, provide a **Channel resolution** and finally, choose the **Projector resolution** for the new channel.



NOTE: Ensure that you don't compromise the incoming image's resolution by choosing a texture size that is too low.



If you already have a project open (for example, if you are re-importing the projection), you are asked if you want to apply the incoming projection to the current project or open a new project.

2. Mari sets up:

- objects in the **Objects** palette for each Geometry node sent or exported from Nuke,
- projectors in the **Projectors** palette for each Project3D node sent or exported from Nuke,
- the channel that you specified in the **Mari - New Projection** dialog in the **Channels** palette, and
- all the sent or imported cameras, created as layers in the specified channel's layer stack, with masks to help blend projections together.

Depending on the complexity of the projection being sent or imported into Mari, this may take some time.

3. Images are also imported into the **Image Manager** to keep track of the projection textures sent or imported into Mari.

Sending or exporting projections to Nuke

Once you have finished your texture work in Mari, you have several options to send the data back to Nuke. You can use one of the following. In Mari:

1. Select **Nuke > Send > Projection Texture** to unproject the texture through the current projector. The texture is rendered to the Mari data directory and the filename is based on the name of the projector that it is unprojected from.

Once the texture has been written to disk, Nuke creates a Read node. This Read node should be connected to the Project3D node, replacing the original texture with the new texture from Mari.

2. Select **Nuke > Send > Unique Projection Texture** to unproject the texture through the current projector, like **Projection Texture**. However, it saves the unprojected texture with a unique file name to ensure that it does not overwrite (or is potentially overwritten by) any other version of the texture that is sent to Nuke.
3. Select **Nuke > Send > UV Texture(s) (All Channels)** to export a set of UV textures from all channels in the **Channels** palette to the Mari data directory. The filename is based on the object (which in this case is the original Geometry node that you sent to Mari) and the channel name. The channels are flattened for export.

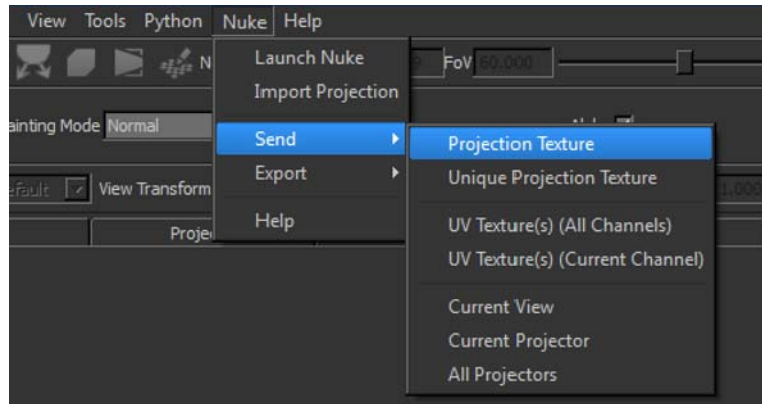
Once the texture has been written to disk, Nuke creates a Read node. Since this is a UV texture and not a projection texture, you need to connect it directly to an ApplyMaterial node instead of the Project3D node.

4. Select **Nuke > Send > UV Texture(s) (Current Channel)** to export a set of UV textures from the current channel in the **Channels** palette to the Mari data directory. The filename is based on the object (which in this case is the original Geometry node that you sent to Mari) and the channel name.

Once the texture has been written to disk, Nuke creates a Read node. Since this is a UV texture and not a projection texture, you need to connect it directly to an ApplyMaterial node instead of the Project3D node.

5. Select **Nuke > Send > Current View** to create a projector of the current view in Mari (Perspective View only) and send it to Nuke along with the unprojected texture. In addition to the Read node, an additional Camera node is created that represents Mari's canvas at the time of the export.
6. Select **Nuke > Send > Current Projector** to send the current projector in Mari's **Projectors** palette to Nuke along with the unprojected texture. In addition to the Read node, an additional Camera node is created that represents Mari's canvas at the time of the export.
7. Select **Nuke > Send > All Projectors** to send all projectors in the **Projectors** palette to Nuke along with their unprojected textures. In

In addition to the Read node, a new Camera node is created that represents Mari's canvas at the time of the export.



NOTE: You can also opt to export the projection instead of sending it to Nuke using the Nuke<>Mari bridge. To export:

1. In Mari, select any of the seven options from the **Mari > Export** menu.
2. Set a directory location in the **Export Nuke Projectors** dialog.
3. In Nuke, select **Mari > Import Projection** and choose the file in the **Load Mari Projection** dialog to import the projection into Nuke.

This lets you send files between the two applications without a socket connection.



NOTE: When exporting files to disk in Nuke, an **.nmb** extension is assigned (for Nuke<>Mari Bridge). When exporting from Mari, an **.mnb** extension is used (for Mari<>Nuke Bridge).

Sending a sequence projection setup

In addition to sending a single projection setup, Nuke can also export multiple snapshots of an animated projection to Mari. This can be used for painting clean plates by combining multiple frames of an image sequence and projecting them through the match-move camera at their respective frames.

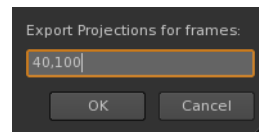
This workflow is the same as **Sending a Projection Setup**, with the exception of a **Frame Range** dialog that asks for the frames that the snapshots should be taken from.



NOTE: When planning to return a UV texture from Mari for a Geometry node, you should uncheck the Geometry node's **Image Aspect** checkbox at this stage. If you don't, the image size changes when plugging in the UV map later on, causing a line-up error.

To send a Nuke Sequence Projection Setup to Mari, follow these steps:

1. Select the Project3D node and the Geometry node that the projection is applied to.
2. Click **Mari > Send > Sequence Projections**.
3. Enter the frame numbers in the **Frame Range** dialog.



4. Like before, if there is no project open in Mari, the script creates a new project and prompts you to specify a channel for your projections. You are prompted to enter a **Channel name**, set the **Mapping scheme**, provide a **Channel resolution** and finally, choose the **Projector resolution** for the new channel.
5. Once your projections have been imported, Mari creates separate projectors for each frame in the sequence.
6. Proceed with the necessary texture work and, following the steps outlined in [Sending or exporting projections to Nuke](#), send the data back to Nuke.

Sending image nodes

You can also send any number of Read nodes directly from Nuke to Mari. To do this, select the Image nodes you want to send in Nuke, click **Mari > Send > Images** and choose from one of the following options:

- **All Read Nodes** — To send all Read nodes in the Node Graph.
- **Selected Read Nodes** — To send only the selected Read nodes in the Node Graph.
- **Selected Nodes** — To send all Read nodes in the Node Graph. These appear in the **Image Manager** in Mari.

Sending a Lookup Table (LUT)

To ensure that images in Mari look the same as they do in Nuke, Nuke's current Viewer LUT is approximated in a 10-bit 1D LUT and sent to Mari as

a viewing LUT. If you change the **viewerProcess** menu in Nuke's Viewer, you can update Mari's viewer LUT accordingly by clicking **Mari > Send > LUT**.

Using the Nuke<>Mari Bridge over a Network

To use the Nuke<>Mari workflow between different machines on the same network, ensure that both machines have access to the folder where the shared data is stored. This means that the Mari data directory, under **Project Settings > Mari > advanced > mari data dir** in Nuke, should be set to a shared drive that both machines have access to.

Both computers must be able to access the folder with the same path — for example, two Linux machines might access a shared folder called **/mnt/netshare/Temp**. In this case, no further changes need to be made and the workflow should function correctly.

If the two machines access the shared folder through different paths — for example, **/mnt/netshare/Temp** on a Linux machine and **\\server\netshare\Temp** on a Windows machine — then some adjustments must be made. The simplest way to account for these differences is to set up symbolic links between directories so the paths match. Your system administrator can help you with this.

File paths sent from Nuke on Windows to Mari on Linux may still need some modification, as the Windows paths generally start with a drive letter such as **C:**, which Mari on a different OS does not understand. An additional Python function, **mari_bridge.filenameFilter**, is available to help translate paths when sending files from Nuke to Mari. You can override this function in Nuke to modify paths as required.