

# Release Notes for CaraVR 2.0v2

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## Release Date

February 2018

## Qualified Operating Systems

Nuke Version	Platform		
	Mac OS X/macOS	Windows (64-bit)	Linux (64-bit)
10.5v6, or above	10.9 (Mavericks)	Windows 7	CentOS/RHEL 5
	10.10 (Yosemite)	Windows 8	CentOS/RHEL 6
11.0v3, or above	10.11 (El Capitan)	Windows 7	CentOS 6
	10.12 (Sierra)	Windows 10	CentOS 7
11.1v1, or above	10.12 (Sierra)	Windows 7	CentOS 6
	10.13 (High Sierra)	Windows 10	CentOS 7

Other operating systems may work, but have not been fully tested. See the [Nuke Online Help](#) for more information on supported GPUs and other hardware recommendations.

## New Features

This release adds support for Nuke 11.1 on all platforms.

# Feature Enhancements

## C\_Stitcher

This release sees various improvements to C\_Stitcher, including consistent output from render farms, stitching animated rig controls, and minimising differences in output between operating systems.

- BUG ID 312081 - Rendering frames in non-contiguous batches now produces consistent results.
- BUG ID 326748/330103/330104 - Animating rig controls, such as rotation and convergence, now produces consistent results.
- BUG ID 331520 - Stereo sequences with animated keyframes now produce consistent output on render farms.
- BUG ID 333067 - Differences in rendered output between different operating systems are now negligible.

## Other Enhancements

- C\_Tracker: A new **Preview Features** checkbox has been added to the node properties **Settings** tab, allowing you to see how altering the feature controls affects the positioning of features across the image.
- BUG ID 332447 - C\_DisparityGenerator: A new control, **Vectorspace**, has been added to determine how disparity vectors behave at the left and right edges of the image. The control has two modes, **Default (wrapped)** and **Continuous**, which produce vectors for regular Nuke nodes and CaraVR nodes respectively.
- BUG ID 334927/334937 - C\_GlobalWarp: If no keyframes are present, C\_GlobalWarp now adds a new key on the first frame of the sequence.

## Bug Fixes

- BUG ID 225695 - C\_CameraSolver: Undo did not work as expected after deleting a user match.
- BUG ID 282556 - C\_Stitcher: Importing keyframes from another CaraVR node disabled the **Vectors** tab in the **Properties** panel.
- BUG ID 283927 - C\_CameraSolver: In the **Properties** panel, the **Cameras** table did not retain manually animated keyframes.
- BUG ID 312310 - C\_CameraSolver: Saving, closing, and reopening a script containing a solved rig occasionally caused C\_CameraSolver to override all camera controls with the values from the first camera.

- BUG ID 312749 - C\_CameraSolver: Manually generated alpha channels were not automatically recognised by CaraVR.
- BUG ID 321973 - C\_SphericalTransform: **RGB** channels were required by C\_SphericalTransform, even if you were only transforming the **alpha** channel.
- BUG ID 323538 - Write: Scripts containing C\_SphericalTransform and RotoPaint nodes occasionally caused Nuke to reach its memory limit and become unresponsive.
- BUG ID 323724 - C\_GlobalWarp: Matching and warping using automatically calculated analysis keys occasionally stopped user matches working as expected.
- BUG ID 323725 - Reading embedded metadata caused Nuke to crash in certain scripts.
- BUG ID 324262 - Setting the **Preferences > Caching > comp disk cache size** to zero stopped the zoom window in C\_Tracker or C\_GlobalWarp drawing correctly.
- BUG ID 326779 - C\_GlobalWarp: Undo did not work as expected after dragging a camera match in the zoom window.
- BUG ID 328103 - C\_Tracker: The default value for the **Error Threshold** control was too low.
- BUG ID 329852 - C\_RayRender: Rendering disparity did not work as expected.
- BUG ID 330101 - Linux only: Opening a script containing a C\_GlobalWarp node from the command line caused Nuke to crash.
- BUG ID 330550 - Windows only: Transforming the input to a C\_CameraSolver followed by a C\_Stitcher caused Nuke to crash.
- BUG ID 331140 - macOS only: The **rectilinearProjection** keyboard shortcut (**Ctrl+Tab**) did not work as expected.
- BUG ID 331311 - C\_Tracker: Adding a User Track after auto-tracking and solving multiple times caused Nuke to crash.
- BUG ID 331436 - C\_Tracker: Playing back through a tracked sequence caused the zoom window to flicker intermittently.
- BUG ID 331522 - macOS only: Leaving a script idle and then deleting C\_GlobalWarp nodes occasionally caused Nuke to crash.
- BUG ID 331861 - C\_GlobalWarp: Warping frames that were not keyframes did not update the image as expected.
- BUG ID 332435 - C\_GlobalWarp: Setting the Viewer interaction mode to **Camera Matches** on frames with no matches present did not work as expected.
- BUG ID 332447 - C\_DisparityGenerator: Latlong continuity at boundaries was not handled correctly, resulting in artifacts in the occlusion mask.
- BUG ID 332613 - AMD GPUs: C\_Stitcher did not render as expected without a C\_CameraSolver node upstream.
- BUG ID 332986 - C\_NewView: Adding a C\_NewView node to the script without an upstream occlusion mask rendered incorrectly.

- BUG ID 334329 - C\_Tracker: Enabling the Viewer proxy mode button disabled the zoom window and feature tracks.
- BUG ID 334915 - C\_CameraSolver: Selecting existing matches while performing a new match caused Nuke to crash.
- BUG ID 334916 - C\_GlobalWarp: Matching and warping downstream of a C\_Tracker displayed FrameRange errors on the command line.
- BUG ID 334917 - C\_DisparityToDepth: The **Left View** and **Right View** controls were inverted.
- BUG ID 334926 - C\_GlobalWarp: Merging constraints did not merge the **Start** and **End** values of all constraints.
- BUG ID 334929 - C\_GlobalWarp: Enabling proxy mode in the Viewer could cause constraint lines to continue outside the bounding box in the camera views.
- BUG ID 334931 - C\_GlobalWarp: Adjusting a control for multiple constraints with different values at the same time did not update the control correctly.
- BUG ID 334934 - Nuke 10.5 only: C\_GlobalWarp's zoom window label was incorrect.
- BUG ID 334939 - C\_GlobalWarp: Selecting a constraint point in the Viewer did not highlight the constraint in the **Properties** panel.
- BUG ID 334940 - C\_GlobalWarp: Constraints could not be edited after undoing or redoing actions.
- BUG ID 334943 - C\_GlobalWarp: Constraints controls could not be animated.
- BUG ID 334944 - C\_GlobalWarp: The positioning of the Constraints right-click context menu was imprecise.
- BUG ID 334974 - C\_NewView: Adding a C\_NewView node to the script without upstream disparity channels caused Nuke to crash.

## Known Issues and Workarounds

### Installation

Windows only: Delete the CaraVR version folder, if it exists, prior to installation. The folder resides here:

```
C:\Program Files\Common Files\Nuke\<nuke_version>\plugins\<caravr_verion>\
```

For example, if you're installing a new version of CaraVR 2.0, delete this folder before installation:

```
C:\Program Files\Common Files\Nuke\<nuke_version>\plugins\2.0\
```

### Stitching

- Projections in Nuke's 3D system expect rectilinear footage, which is inherently limited to a 180° field of view. As a result, C\_CameraSolver's manual 3D workflow, which relies on projections, only

projects the central 180° from material shot on wider lenses, such as the Nokia OZO.

- BUG ID 311032 - C\_Stitcher: Differences are visible between GUI renders with AMD GPUs when rendering out multiples of the same footage.
- BUG ID 232523 - C\_ColourMatcher: **Gains** control keyframes for multiple cameras in the Curve Editor are not recognised as keyframes.
- BUG ID 226177 - C\_CameraSolver: Horizon edit mode does not work when a camera is selected in the **Properties** panel **Cameras** table.

## Preview

- HTC Vive headset support on Mac OS X/macOS and Linux does not currently support lens distortion.
- Windows only: Although CaraVR supports both SteamVR (OpenVR) and the Oculus Runtime for the Oculus Rift headset, we recommend selecting only one during a single session. Switching between the two outputs can cause the Oculus Rift to render black frames with the current version of SteamVR.

If you require both SDKs on your machine, please set the `FN_CARA_VRCOMPOSITOR_QUIT` environment variable to 1, which forces SteamVR to restart when you switch between outputs.

For more information on setting environment variables, see the Nuke [Online Help](#).

- Windows only: If you're using a headset on multi-GPU machines, ensure that the device is connected to the GPU that handles the monitor output not the internal computation.
- When using the Oculus Rift CV1 on Windows, we recommend using the official Oculus Rift SDK rather than SteamVR.

We recommend using the OculusVR Runtime instead of SteamVR wherever possible, as SteamVR is currently less stable for CaraVR operations.



**NOTE:** Closing SteamVR while Nuke is running with an HMD as an active Viewer causes Nuke to close. To avoid this, save and close Nuke before closing SteamVR.

- When using the Oculus Rift CV1 on Linux, be aware that:
  - Unlike the Oculus DK2, the CV1 displays black until you turn it on inside Nuke's Viewer settings.
  - The CV1 does not appear in the list of available screens in Gnome/Kde, it is displayed with the supported devices in Monitor Output.
  - When you initially turn on Monitor Output, all available monitors display black for a few seconds as the OS adjusts to the new configuration.
  - The CV1 remains on until you close Nuke, which causes all available monitors to display black for a few seconds as the OS adjusts to the new configuration.
- On Mac OS X, with the EoL official Oculus SDK installed, the monitor out plug-in cannot open the device as the SDK locks it. Possible workarounds include uninstalling the SDK, or preventing the

OVRServer running at startup, using the launchctl load/unload commands (you can read about the specifics and implications of working with Mac OS X launchd [here](#)).

- On Windows, the monitor out plug-in routinely notifies about the health and safety implications of use of the Oculus headset. This is a function of the SDK and in newer versions (such as the one we employ) cannot be suppressed or shortened.
- Many facilities lock down USB access for security, which impacts Oculus Rift support. Some customers found that authorising devices using a udev rule allowed them to use the DK2 on both CentOS 6 and CentOS 7, while still blocking USB storage devices. Thanks to Digital Domain for the following example:

```
ACTION!="add", GOTO="deauthorize_end"

SUBSYSTEM!="usb", GOTO="deauthorize_end"

TEST!="authorized", GOTO="deauthorize_end"

## make hubs deauthorize all devices by default

TEST=="authorized_default", ATTR{authorized_default}="0", GOTO="deauthorize_end"

## whitelist specific devices

ENV{ID_VENDOR_ID}=="2833", ATTR{authorized}="1", MODE="0777"

LABEL="deauthorize_end"
```

## Miscellaneous

- Nuke Write nodes, when writing multi-view **.exr** files, only write out the set of channels present in the first view for all the other views. For example, if you write out the C\_Stitcher's output, because there's only rgba in the rendered **main** view, the individual camera views do not output their vector channels.

To work around this, insert a vector channelset in the first view, even if it contains no data, using the AddChannels node.

- BUG ID 309986 - Frame Server: Rendering 360 stitches through the Frame Server renders duplicate frames.

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11.0v3, or above	10.11 (El Capitan)	Windows 7	CentOS 6
	10.12 (Sierra)	Windows 10	CentOS 7

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## New Features

### C\_GlobalWarp

A new node, C\_GlobalWarp, has been added to rapidly produce a preview stitch using metadata, passed downstream from a C\_CameraSolver, to help minimize ghosting in overlap regions. C\_GlobalWarp adds controls to adjust a stitch to line up key features and allows you to add constraints to reduce warping on known straight lines in the rectilinear input images.

See [C\\_GlobalWarp](#) for more information.

## C\_Tracker

C\_Tracker has been redesigned to simplify and accelerate the process of stabilisation and match-moving. C\_Tracker runs on the GPU, where available, and adds automatic tracking in 360 stitches. You can then use the existing user-defined tracks workflow to lock stabilisation to particular regions.

See [C\\_Tracker](#) for more information.

## C\_DisparityGenerator

C\_DisparityGenerator has been rewritten to utilise the quality of Ocula's disparity vectors in CaraVR. CaraVR now includes a gizmo tool, C\_DisparityToDepth, designed to convert disparity to a depth map. Depth maps can be useful in compositing when you're placing 3D objects in a scene.

See [C\\_DisparityGenerator](#) for more information.

## C\_NewView

A new node, C\_NewView, has been added to simplify and accelerate 360 corrections in stereoscopic stitching. C\_NewView brings the quality of Ocula's view rebuilding to CaraVR by incorporating the improved disparity vectors from the C\_DisparityGenerator node. C\_NewView also computes occlusion in stereo camera pairs automatically.

See [C\\_NewView](#) for more information.

## C\_StereoColourMatcher

A new node, C\_StereoColourMatcher, has been added to ensure left and right stereo views are consistent for a comfortable viewing experience. C\_StereoColourMatcher brings the quality of Ocula's colour matching to CaraVR by incorporating the improved disparity vectors from the C\_DisparityGenerator node. C\_StereoColourMatcher also computes occlusion in stereo camera pairs automatically.

See [C\\_StereoColourMatcher](#) for more information.

# Feature Enhancements

- BUG ID 231514 - C\_Tracker: You can now zoom the tracker window by holding **Shift** and then clicking and dragging in the Viewer widget for the selected track.
- BUG ID 317812 - C\_DisparityGenerator: Calculated vectors are now cached to avoid unnecessary re-rendering.

## Bug Fixes

- BUG ID 230483 - C\_ColourMatcher: Matching colour after a OneView node produced NaN errors.
- BUG ID 244959 - Toolsets: The **Google Jump Depth To Points** toolset was connected incorrectly if more than one toolset was created.
- BUG ID 270799 - CameraTracker: Disabling **Export** > **Link output** caused CaraVR node creation to fail with a **global name 'indexes' is not defined** error.
- BUG ID 275292 - C\_CameraSolver: Copying and pasting values between C\_CameraSolver nodes did not work as expected.
- BUG ID 305670 - C\_RayRender: Render results from C\_RayRender were clipped when compared to Nuke's RayRender node.
- BUG ID 311032 - C\_Stitcher: Differences were visible between GUI renders with NVIDIA GPUs when rendering out multiples of the same footage.
- BUG ID 311040 - C\_Stitcher: Differences were visible between Frame Server renders when rendering out multiples of the same footage.
- BUG ID 315732 - C\_Stitcher: Connecting a Viewer to a C\_Stitcher with no input displayed a misleading error message.
- BUG ID 315772 - C\_RayRender: Connecting a Viewer to a C\_RayRender node with no CaraVR licence displayed a misleading error message.
- BUG ID 315809 - Linux only: Connecting a C\_Stitcher to a C\_CameraSolver and then clicking **Match** in the solver properties caused Nuke to crash if no NukeX licence was found.
- BUG ID 315812 - macOS only: Connecting a C\_Stitcher to a C\_CameraSolver without first solving the cameras displayed a kernel error in the Viewer.
- BUG ID 315976 - Toolsets: Viewing the PreviewStitch node in the **Full Pipeline** toolset caused Nuke to crash.
- BUG ID 316419 - C\_ColourMatcher: Selecting **Latlong** projection from the C\_CameraSolver was not interpreted correctly by C\_ColourMatcher.
- BUG ID 317941 - C\_RayRender: The node label for C\_RayRender was incorrect.
- BUG ID 317984 - C\_Tracker: The **Global** frame range setting was not always respected.
- BUG ID 318025 - C\_Tracker: User tracks could only be added to one C\_Tracker node when there were multiple instances in the script and their **Properties** were open.