Release Notes for Ocula 4.0v2

Release Date

September 2016

Minimum System Requirements

- A version of Nuke 8.0 on:
    - Mac OS X 10.7 (Lion), 10.8 (Mountain Lion), or 10.9 (Mavericks)
    - Windows 7 64-bit and Windows 8 64-bit
    - CentOS/RHEL 5 and CentOS/RHEL 6
- A version of Nuke 9.0 or Nuke 10.0 on:
    - Mac OS X 10.9 (Mavericks) and Mac OS X 10.10 (Yosemite)
    - Windows 7 64-bit or Windows 8 64-bit
    - Linux CentOS/RHEL 5 or CentOS/RHEL 6
- Foundry Licensing Tools (FLT 7.0v2 or later) for floating licences.

Requirements for GPU Acceleration

To take advantage of GPU acceleration on Nuke 9.0 and Nuke 10.0, you must have, either:

- An NVIDIA GPU with compute capability 2.0 (Fermi) or above. A list of the compute capabilities of NVIDIA GPUs is available at www.nvidia.co.uk/object/cuda_gpus_uk.html

> **NOTE:** The compute capability is a property of the GPU hardware and can't be altered by a software update.

With graphics drivers capable of running CUDA 4.2 or above.

- On Windows and Linux, CUDA graphics drivers are bundled with the regular drivers for your NVIDIA GPU. Drivers from April 2012 onward support CUDA 4.2.

    Go to http://www.nvidia.com/Download/Find.aspx?lang=en-us for more information.

- On Mac, the CUDA driver is separate from the NVIDIA graphics driver and must be installed, if you don't have it already. The minimum requirement for CUDA 4.2 is driver version 4.2.5 which can be downloaded from www.nvidia.com/drivers.

> 📝 **NOTE:** We recommend using the latest graphics drivers, where possible, regardless of operating system.

- an AMD FirePro GPU on late 2013 Mac Pro 6,1 and mid 2015 Mac Pro 11,5, running OS X 10.9.3 (Mavericks), or later (see below and the Blink API documentation for caveats on CPU/GPU result consistency on Mac Pros).

New Features and Enhancements

- Ocula is now supported on Nuke 10.0 for all platforms.
- Ocula is now supported on Nuke 9.0 for all platforms.
- Ocula now supports OpenCL processing on late 2013 Mac Pro 6.1, running OS X 10.9.3 'Mavericks', or later.

> 📝 **NOTE:** The output between the GPU and CPU is identical on NVIDIA GPUs. With the addition of support for AMD GPUs on late 2013 Mac Pro, the bit-wise equality between OpenCL GPUs and CPUs generally holds, but for some operations there are limitations to the accuracy possible with this configuration.

> 📝 **NOTE:** OpenCL processing is only available for Ocula in Nuke 9.

Bug Fixes

There are no bug fixes in this release.

Known Issues and Workarounds

- BUG ID 46951 - Late 2013 Mac Pros only: When enabled in Nuke's **Preferences**, all Ocula nodes indicate that 2 GPUs are in use in their properties, when in fact, Ocula nodes only employ 1 GPU at a time.
- BUG ID 46917 - Ocula output may differ between operating systems for scripts containing O_DisparityGenerator, O_ColorMatcher, O_NewView, and O_InteraxialShifter.
- Ocula results will vary between Nuke 9 and Nuke 8 due to the following Blink framework bug fixes in Nuke:
    - BUG ID 44131 - The input range of the exp() function was unnecessarily restricted.
    - BUG ID 44130 - The acos() function was not numerically identical across devices for one particular value.
    - BUG ID 43214 - BlinkScript results did not match the Expression node for sin() and cos().
- BUG ID 43090 - Ocula's ReviewGizmos and Toolsets require standard left and right views to operate correctly.
- BUG ID 42742 - O_Solver: Deleting or manipulating feature matches does not currently create an undo stack.

- BUG ID 42324 - O_Solver: The Viewer doesn't update after enabling downstream nodes with postage stamps enabled.
- BUG ID 41952 - O_Solver: The **Preview Alignment** overlay is not displayed until you mouse-over the Viewer.

Release Notes for Ocula 4.0v1

This is a major new release of Ocula. The nodes have been rewritten to increase the stability and accuracy as well as the ease of use in setting up and quality checking:

- **New algorithms** - the algorithms have been completely re-written producing state-of-the-art levels of accuracy, saving a huge amount of clean-up time in post. Disparity vectors are cleaner and more stable and image rebuilds are sharper.

- **GPU acceleration** - the new algorithms now run on the GPU using BLINK technology to accelerate calculations, producing the same results as the CPU, giving you peace-of-mind when rendering on a CPU farm.

  See Requirements for GPU Acceleration for more information.

- **Improved tools** - this release also includes major feature updates to reduce iterations and speed-up shot turn-around, making sure fixes are correct first time. New stream-lined controls enable you to easily tune results manually, and Ocula now includes the ability to automate fixes offline using Nuke's python API.

- **Toolsets and QC** - new production tested Ocula templates have been included to push through production footage with new QC tools, making it easy to review corrections to get the best results from Ocula.

See New Features and Enhancements for detailed information on individual tools.

Release Date

June 2014

Minimum System Requirements

- A version of Nuke 8.0 on:
  - Windows 7 64-bit or Windows 8 64-bit
  - Mac OS X 10.7 "Lion", 10.8 "Mountain Lion", or 10.9 "Mavericks"

> **NOTE:** Nuke is expected to function correctly under Mac OS X Mavericks (10.9), but we are seeing UI performance degradation compared to previous OS X versions. We are working on resolving these issues.

  - Linux CentOS/RHEL 5 or CentOS/RHEL 6
- Foundry Licensing Tools (FLT 7.0v2 or later) for floating licenses.

Requirements for GPU Acceleration

To take advantage of GPU acceleration, you must have:

- an NVIDIA GPU with compute capability 2.0 (Fermi) or above. A list of the compute capabilities of NVIDIA GPUs is available at www.nvidia.co.uk/object/cuda_gpus_uk.html

> NOTE: The compute capability is a property of the GPU hardware and can't be altered by a software update.

- graphics drivers capable of running CUDA 4.2 or above.
  - On Windows and Linux, CUDA graphics drivers are bundled with the regular drivers for your NVIDIA GPU. Drivers from April 2012 onward support CUDA 4.2.

    Go to http://www.nvidia.com/Download/Find.aspx?lang=en-us for more information.
  - On Mac, the CUDA driver is separate from the NVIDIA graphics driver and must be installed, if you don't have it already. The minimum requirement for CUDA 4.2 is driver version 4.2.5 which can be downloaded from www.nvidia.com/drivers.

> NOTE: We recommend using the latest graphics drivers, where possible, regardless of operating system.

New Features and Enhancements

O_DisparityGenerator

O_DisparityGenerator has been rewritten from the ground up to provide cleaner, sharper vectors and use GPU acceleration to perform the necessary complex processing, where available. The new vector engine is designed to provide clean separation in depth so that there is no roll-off between foreground and background regions, ensuring that background corrections do not get dragged along with the foreground.

Ocula's O_DisparityGenerator no longer requires O_Solver alignment data by default. The Properties panel **Alignment** control is set to 0 by default, which performs better when detecting changes in vertical alignment with depth. Ocula also performs better with O_VerticalAligner's **Local alignment** mode and produces better results when picture building in O_NewView.

- BUG ID 42056 - A new **Presets** dropdown has been added to automatically adjust the refinement controls depending on your selection.

O_OcclusionDetector

Occlusion detection has been rewritten to make best use of the new clean, sharp disparity vectors. Occlusion regions are now clearly defined in the **mask_occlusion** channel to identify where attention is required.

O_NewView

O_NewView now produces sharper images with greater fidelity to the original footage. O_NewView has been updated to just rebuild one view from the other, including controls to handle occlusion and edge treatment.

• BUG ID 40303 - A new **CleanPlate** input has been added to allow you to supply a background for occlusion filling.

O_ColourMatcher

Colour matching has been rewritten to make best use of the new clean, sharp disparity vectors and to simplify the controls. The matched results now have greater fidelity to the original image, allowing for smaller block sizes to produce more detailed colour updates, while preserving the noise of the source.

• BUG ID 40300 - A new **Stabilise occlusions** check box has been added to the properties panel. When enabled, Ocula uses occlusion data from multiple frames to reduce flickering.

• BUG ID 42719 - A new control, **Correction Scale**, has been added to define the scale of colour matching. Lower values perform very local matching to preserve highlights in the reconstructed image. Higher values use a more global correction, which better preserves the structure of the original image.

O_FocusMatcher

Focus matching has been rewritten to explicitly match high-frequency edges between views. O_FocusMatcher now looks and feels more like O_ColourMatcher and no longer has issues with ringing, pixel shifts that change parallax, and correlated noise when compared to Ocula 3.

• BUG ID 22995 - A new **Stabilise occlusions** check box has been added to the properties panel. When enabled, Ocula uses occlusion data from multiple frames to reduce flickering.

O_Solver

A new **Key Sequence** button has been added to automatically analyse the source and place keys where a change in camera alignment is detected.

Adding and aligning user matches in O_Solver is now more accurate with the addition of a zoom window and single click workflow to create user matches while viewing an image difference. Hotkeys have been added to toggle the display between the left view and right views or display a mix of both views. You can now click **Delete Auto Matches** and solve the camera alignment with only user matches.

If you have an interactive licence (ocula_i and nuke_i), O_Solver can now be executed from the terminal. You can execute multiple frames, using Nuke's standard expressions and Python scripts, to automatically set up Ocula trees and render corrections without the use of Nuke's interface. You can also set user matches using Python.

O_VerticalAligner

The O_VerticalAligner workflow has been streamlined, allowing you to perform several alignment calculations using a single node in a fixed order. New controls have been added to enable you to fix plate scale and offset, change the filter used to transform pixels, and output a **vaSTMap** channel containing uv data for use in an STMap node.

- BUG ID 21783 - All alignment options have now been incorporated into a single node to make it easier to select and choose the best alignment correction.
- BUG ID 41700 - A new **Zoom to prevent black in frame** control has been added to correct areas pulled from outside the bounding box after vertical alignment.
- BUG ID 42857 - You can now automate the setup of a CornerPin for a range of frames without having to manually create the required analysis frames.

O_VectorGenerator

O_VectorGenerator has been rewritten from the ground up to provide cleaner, sharper vectors and use GPU acceleration to perform the necessary complex processing, where available. The new vector engine is designed to provide clean separation in depth so that there is no roll-off between foreground and background regions.

O_MultiSample

A brand new node, O_MultiSample, has been introduced. O_MultiSample uses the **channels** controls and **Sample** and **Mask** inputs to expand the sampled channels to fill the image or **Mask**. This node can be used for different tasks, such as:

- Expanding colours into black regions when aligning a plate.
- Removing and in-filling colour corrections at unreliable pixels.
- Painting corrections into disparity/motion vectors at unreliable pixels.

Toolsets

Several pre-built Node Graph templates have been added to automatically set up Nuke and Ocula to perform certain tasks. The toolsets, accessed from **Ocula 4.0** > **Toolsets**, provide example node trees with Backdrops to isolate various parts of the workflow and StickyNotes containing important information.

- **FullPipeline** - creates an entire workflow pipeline from reading in your stereo source, through various precomp steps to add the required disparity and corrections, to reviewing corrections before handing off to the next stage of post.
- **InputReview** - a simple pre-processing Node Graph to read in your source and check colour and alignment.

- **Output Review** - a simple post-processing Node Graph using the StereoReviewGizmo to performing some depth correction review.
- **Precomp_Alignment** - creates a section of the FullPipeline toolset dealing with aligning views and rendering out the results.
- **Precomp_Disparity** - creates a section of the FullPipeline toolset dealing with creating disparity and rendering out the results.
- **Precomp_PlateMatch** - creates a section of the FullPipeline toolset dealing with colour and focus matching and rendering out the results.

QC Tools

Ocula now includes a new quality control gizmo, DisparityReviewGizmo, located in the Ocula tool bar. The existing StereoReviewGizmo has been rewritten to make it quick and easy to review colour and alignment at different depths, review flicker and changes in depth, and bake out transforms to line up views for detailed review.

Miscellaneous

- The End User Licensing Agreement (EULA) that accompanies all The Foundry products has been amended. Please see the Ocula installer or *Appendix D* in the *Ocula User Guide* for more information.
- BUG ID 35608 - Ocula did not fail to render from the command line when there was an interruption in licence serving. In Ocula 4.0, if there is an interruption between the licence server and Ocula, rendering aborts with an exit code of 1. You can use the **--cont** command line argument to force Ocula to continue rendering on failure, producing black licence failure frames rather than aborting the whole render.

Bug Fixes

- BUG ID 25662 - Ocula 3.0v4: Setting the O_FocusMatcher **Defocus** size above 1 resulted in blank frames.
- BUG ID 30715 - O_Solver: The Viewer hotkey **M** (Matte overlay) clashed with the **Display** mode hotkey.
- BUG ID 39910 - **Mask** inputs ignored the **stereo offset** control and split shapes in Roto nodes.
- BUG ID 41688 - O_VerticalAligner: The bounding box was not updated after alignment corrections.
- BUG ID 42867 - O_Retimer: Retiming in **Timing** > **Speed** mode did not compute the retimed sequence length correctly.

Known Issues and Workarounds

- BUG ID 43090 - Ocula's ReviewGizmos and Toolsets require standard left and right views to operate correctly.
- BUG ID 42742 - O_Solver: Deleting or manipulating feature matches does not currently create an undo stack.

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