Nuke Studio - Timeline and compositing under one roof.

Indie, Hiero, Studio –
The Timeline Tools from The Foundry

Nuke and Nuke X are the de-facto standard for nodebased compositing. But even seasoned Nuke artists have often had little or no contact with the closely related review and finishing products. We want to change that a bit with this overview.
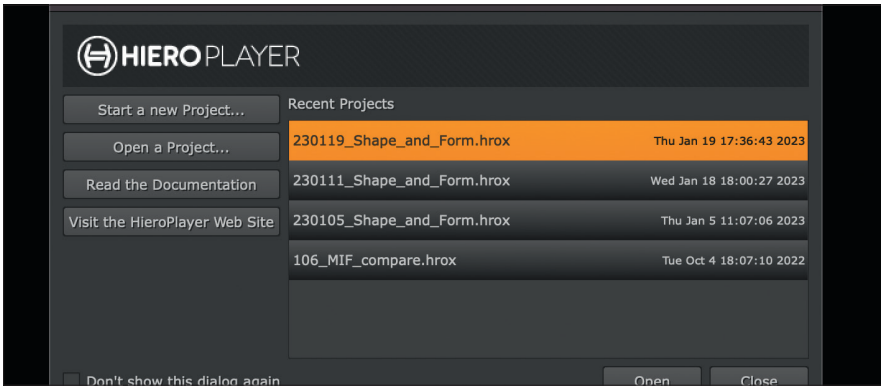
by Christoph Zapletal

Before we dive into feature comparisons, tutorials, application recommendations, and the like, I'd like to share a little story that, although it happened a few years ago, is the hook for this series: I received a relatively last-minute request from a client. He briefly asked if I would also do Nuke, to which I replied "Yes, of course". The booking was then made and I showed up for work the next day to find myself in front of a workstation - with Nuke Studio. After my pulse settled back into more normal levels, I shimmied my way through the next two weeks using the one Nuke Studio tutorial that was available at the time and a lot of „Learn as you earn". In the end, the project got done and I learned two things: First, ask what exactly you're being booked for. Second, learning on the job gets you ahead quickly, but also ages you unnaturally fast.

To make things a little clearer for our readers, let's first take a closer look at the Timeline products. Aside from the full-featured Nuke Studio, there's also Hiero, HieroPlayer and, the newest member of the family, Nuke Indie. With this overview, we will then look at possible areas of application and will not shy away from a comparison with the other finishing tools out there. If you want to go into Media Res afterwards, this article will also include the first part of our Nuke Studio tutorial series.

Meet the Family

Since the various versions of the timeline tools are all closely intertwined, let's approach this round of introductions chronologically. Nuke and Nuke X are great for editing individual shots, but they're not great for managing complex sequences. To address this need, The Foundry launched Hiero in 2011. According to the press release at the time, it was designed as a „scriptable" timeline with a focus on collaboration - what comes across as marketing buzzwords has actually a lot of truth to it, as we shall see later on. Unlike many finishing solutions at the time, Hiero did not rely on its own media management, but worked - like Nuke - with caching. It was supplemented with a GPU-supported vie-

Nuke Studio projects can also be opened in Hiero Player - but you can't edit much...

community had long hoped and wished for. However, instead of using the smaller Nuke or Nuke X products as a base, Foundry took the full NukeStudio toolset and limited it in a few key places so that they could launch it for €449 per year without cannibalizing their own products.

To sum it up: HieroPlayer is the pure review tool that comes with every Nuke license. Hiero is the timeline tool used primarily in larger pipelines by VFX editors. Nuke Studio (and, with some exceptions, Nuke Indie) are then the all-in-one solutions that allow both compositing and editing/finishing. In the following we will talk about Nuke Studio, but if there are any feature limitations or peculiarities that require special consideration, they will be pointed out.

wer, conform and tagging tools and, in later versions, with GPU-accelerated soft effects for the timeline. Its real strength, however, was in managing and distributing shots within a team or facility, and it quickly became a popular tool for VFX editors in the feature film and fiction arena.

Two years later HieroPlayer came onto the market. The name suggests it already: Hieroplayer is designed to allow all artists to review their shots in the context of the project's hiero timeline. Over the years, more and more features like sync sessions or better version control were added, but Hieroplayer might have become really accessible to many artists only in 2021, when Foundry - in the wake of the Corona pan-

demic and at the same time with new collaboration features - provided every Nuke license with active maintenance with a free HieroPlayer license.

While it was already possible to create Nuke scripts from Hiero, the artist could not make any changes directly from Hiero in the comp. This was to be remedied by Nuke Studio, which was introduced in 2014. Basically a Hiero with Nuke X built in, Nuke Studio was meant to be an alternative for smaller studios, but also to make some inroads into the commercial space, which was dominated by Autodesk's Flame at the time.

In the summer of 2020, Foundry introduced the indie version of Nuke that the

Strenghts and Weaknesses

Nuke Studio simply cannot deny its origins in the film industry. The greatest strength of this software is undoubtedly its high level of integrability into your own pipelines. The buzzword „scriptable" timeline is definitely to be taken seriously. Not only FTrack, Shotgrid, NIM and alike can share their metadata like tags or annotations with the timeline really well and keep them in sync, you can also version renderings from external software relatively easily. It may sound absurd, but one of the software's greatest strengths may actually be the export dialo-
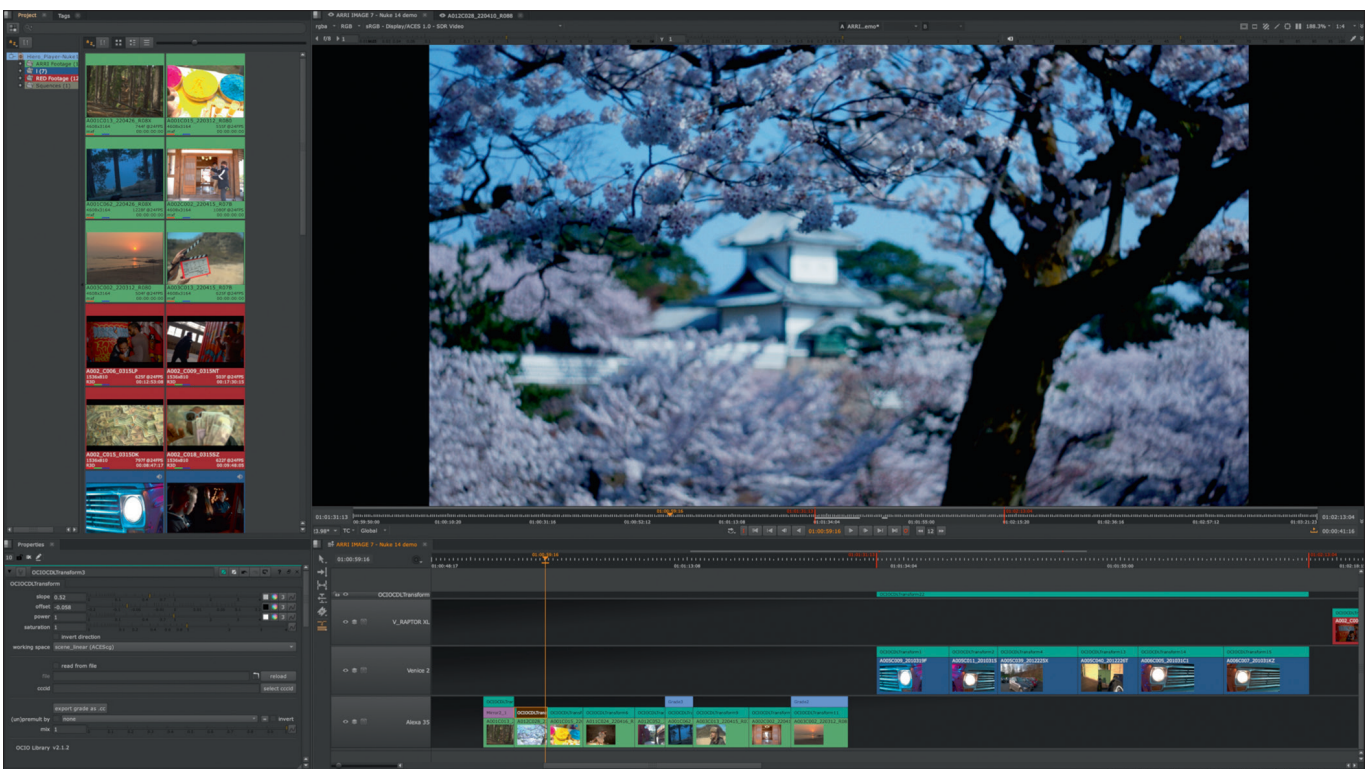
A new sight for some: a timeline in Nuke.

gue. With the right presets, lead artists on a job can distribute shots in pretty much any possible and impossible folder structure, create wips and reviews for any need, and manage even most complex timelines efficiently.

A comparison with Flame, Resolve and Premiere is almost inevitable. And this is where the drawbacks of Nuke Studio's origins in the film industry become apparent. While Resolve has an entire Fairlight panel, Nuke Studio offers virtually no possibility to edit sound, except perhaps to cut it in a rudimentary way. A grading environment like Effects in Flame or Resolve's Color Tab is also missing. What is really a pity: The Conform Tool is really solid, but structurally not designed for many versions. If you expect something like Flame's Connected Conform, you will be disappointed. And if you like Adobe's out-of-the-box mentality that Adobe Bridge brings, you might not fall in love with Nuke Studio right away either. But if shot management, pipeline integration, and teamwork are the focus, Nuke Studio brings features that the competitors are sorely lacking.

The learning curve

Nuke and Nuke X are very complex programs in themselves, but the complexity is spread over many individual nodes and their combination. So if you're used to the clean interface of a fresh Nuke script, you might feel a bit overwhelmed by the timeline with bins, tags and tons of metadata at the beginning. Sure, as a classic compositing artist, you're definitely out of your comfort zone here. But Nuke Studio catches your fall, because there is a lot of familiarity hiding under the hood. From consistently the same shortcuts to the same viewer functionality to familiar concepts like workspaces, the familiarity comes at second glance.

For those who are already familiar with NLEs or finishing systems, the stumbling block is naturally hidden somewhere else. The Keyword is „scriptable" pipeline. Of course, you don't have to be able to script in Nuke Studio to set a dissolve, but when it comes to the token system for more complex exports, for example, even experienced editors will have to break new ground.

All of these hurdles are easily surmountable with a little curiosity and willingness to learn, but you should know what you're getting into. Nuke Studio, with its origins in the VFX pipeline world, comes from a very unusual corner for a timeline-based tool and does some things differently than you're used to.

In Practice

I had the opportunity to test Nuke Studio over several months in my day-to-day work. In doing so, I tested it in a mix of feature and commercial jobs. Since I otherwise use Autodesk Flame as a finishing tool, this was of course the benchmark for Nuke Studio. It was surprisingly easy to get started, precisely because - as mentioned above - many elements were very similar to the classic Nuke tools in their functionality or logic. The conforming was really robust, even with timewarps or not quite perfect XMLs or AAFs. Nuke Studio could handle those really well and offered all tools to be able to intervene manually as an artist if necessary. As already mentioned, however, I missed tools to conform multiple versions in sync or even sequentially. In a time when we often have to deliver dozens of assets in a myriad of formats, something like this should be part of the toolset.

I would only recommend pure editing in Nuke Studio to a limited extent. The classic editing tools such as trim, slip and slide are available, but other features that are familiar from Premiere or Resolve are missing, especially a multicam feature. But to make tweaks to an existing edit or to serve a last-minute cutdown to the customer, the toolset is more than sufficient.

The tagging and annotation tools are actually intended for use in tandem with an asset manager - but I've also come to appreciate these features as an individual artist. The ability to create tags yourself at will and to search and filter for them within the project in a meaningful way helps enormously when managing larger projects. The
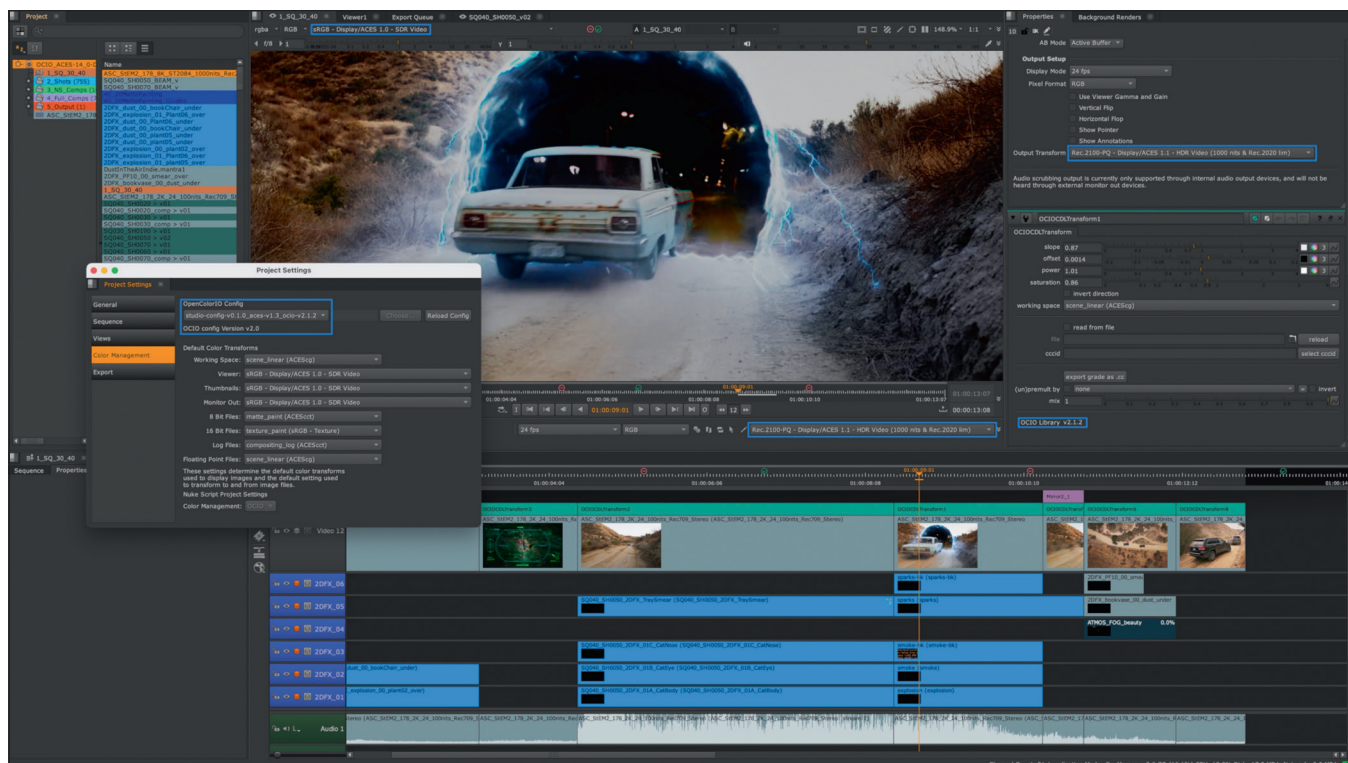
One Happy Family - Nuke Studio, of course, benefits from all the updates that the Nuke product line gets. In this case, support for ACES 1.3.
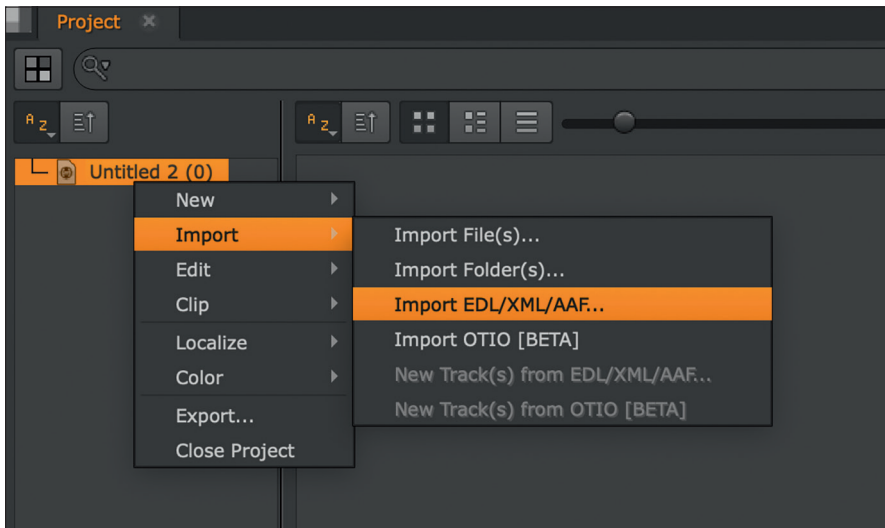
Just one of three ways - right-clicking imports the timeline into our project.

ability to set annotations in Nuke Studio directly in the timeline and then automatically export them to the associated Nuke script has reduced my paperwork and saved me from a careless mistake or two.

However, the biggest light bulb moment I had was with the export dialog: I would almost call this a double-edged sword. On the one hand, it is incredibly powerful, because everything is possible here, from exporting a work-in-progress QuickTime to complex publishing or updating of a timeline within an arbitrarily organized folder structure, including the corresponding annotations, render folders and nuke scripts with already integrated toolsets. For all this to work well, however, you have to deal with it in depth. Especially the token system, but also the aforementioned tags play a crucial role here and I strongly recommend to get familiar with these systems before you start working on a running project. If you look at Resolve's Deliver tab with colorful preset icons, Nuke Studio's Export window is the exact opposite.

A truly collaborative feature is Sync Reviews, which has been integrated as a beta since version 12 and as a finished feature with version 13. Here, multiple versions of Nuke Studio, Hiero and Hiero Player can be synchronized and thus control the timeline together. The advantage over reviews in asset managers or – mind you - via Microsoft Teams and co. is obvious. Each artist has - either via the network or via localized files - access to the material in its full resolution, and it is also played on his workstation. Only the playhead is synchronized, so synchronized reviews without compression artifacts are finally possible. Furthermore, annotations can be scribbled toge-

ther and everyone can see the cursor of the other participants. So a virtual „No, look, I mean here" is absolutely possible.

For a compositing artist who is already using Nuke and wants to move towards a Supervisor or Lead Artist Position, Nuke Studio is the logical choice. They will probably find their way around faster than they initially thought and will not have to compromise in terms of modifying their own pipeline and way of working, firstly because they stay in the same product family, and secondly because Python is more tightly integrated than probably any other software. This is definitely true in large facilities, but smaller studios or freelancers can also take advantage of these qualities. Especially the latter could find a much easier entry with Nuke Indie.

On the other hand, those who take the „studio" in Nuke Studio too literally and expect a finishing system that covers all trades, including grading and audio, will not be happy here, as mentioned at the beginning. That's not to say that you can't compensate for these shortcomings by roundtripping - Nuke Studio's open structure makes that absolutely possible, just not „out-of-the-box".

The Interface

Gray, divided into panels and tabs, that's how we know Nuke and that's how Nuke Studio presents itself to us now. The Properties Panel and the Viewer also look largely the same as in the compositing appsTwo things are new to us though: The Project Panel - here we'll spend a lot of time on something you didn't have to worry about in Nuke before : Media Management. And

then, of course, there's the Timeline, familiar from just about every app from Resolve to Premiere to Flame, and yet absolutely new territory for the classic Nuke artist.

If we now click on the Menu Bar and select the „Workspace" tab, we see that although the concept of workspaces has been adopted from Nuke, in Nuke Studio we have completely different defaults here. Instead of „Scripting", „Animation" or „Large Node Graph", Nuke Studio comes with presets for „Conforming", „Finishing", „Reviewing" and so on. However, thanks to the same underlying structure, these are just as customizable as we're used to. If we now click through the individual workspace presets, we see sometimes more, sometimes less changes in the UI until we get to the compositing preset - here we get the layout we are probably most familiar with. But we don't get too comfortable here, after all, new things await us. In Hiero we will miss this option, after all the integrated compositing is the difference between Hiero and Nuke Studio.

So back to the „Finishing" preset, which is the default that Nuke Studio starts with. For the sake of clarity, we won't be customizing the interface for this workshop, but instead we will be switching between the Workspace presets - after that, of course, everyone is free to customize the interface to their needs, this isn't Resolve after all.

Before we explore the user interface further, however, we need some footage, otherwise the viewer will remain black and the media panel empty. For conforming, Nuke Studio supports EDLs, XMLs or AAFs.
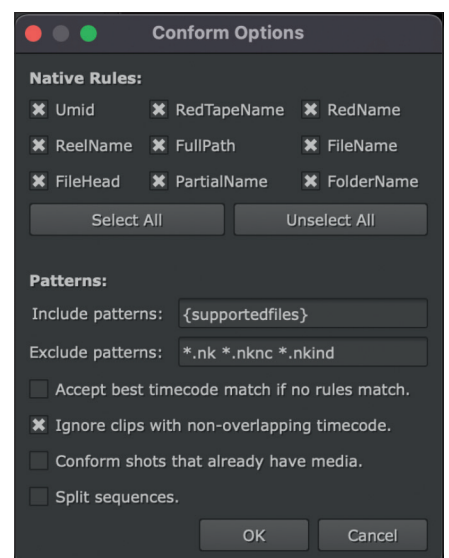
If the timecode alone does not suffice, Nuke Studio offers enough possibilities to match the material correctly.

So via the Menu Bar, a right click in the Media Panel or drag and drop into the viewer we can import our timeline into Nuke Studio.

The edit is now displayed in the timeline, but without any linked footage. To import this, it is best to switch to the „Conforming" workspace - either via the Menu Bar or the Shift-F1 shortcut. In this new layout we get a new window in the center left - the Spread Sheet. Something else changes: Our Project Panel, which was empty until now, now contains an object - our Timeline. With a double click on the same icon, our Spread Sheet comes to life. More precisely, with every single edit of our timeline, information about the media status (at the moment everything is still offline), reels, shot names, ins and outs - and above all this a button with the name „Match Media". When we click this, a familiar Nuke browser appears, allowing us to specify a folder from which

our missing media will be searched for. Any subfolders will be included in this search, but depending on the complexity of the project and the file structure, this may take longer. Once we have selected the folder, our Conform Options will now appear - so depending on the project, we can specify the metadata rules which the conform should adhere to. In addition to the selectable „Native Rules", you can use „Include Patterns" to limit the search to certain file types, for example, by entering „*.MOV" to search exclusively for Quicktime movies. You can also exclude certain file types, by default these are all types of Nuke scripts. But if you want to keep proxy files out of the conform, you can certainly do this with an appropriate pattern.

If we take this opportunity to click through our now hopefully already well-populated Timeline, we will see how the cor-

responding entry in our Spread Sheet is selected for each edit - and this works in both directions, by the way. Ergo: If I select a certain event in my spread sheet, the corresponding clip in the timeline will be selected.

Depending on how cleanly the editorial has worked, such a conform can work right away or you have to go through missing clips one by one in several steps. In this case, it is advisable to select problematic clips as described above, either in the spread sheet or in the timeline, and then click on Match Media again and adjust the Conform Options accordingly or - if nothing else helps - select the clip manually. Of course, we still have the option of importing clips individually into our Project Bin via „Import Files", but we should wait with that until we are a bit more profound with the Timeline Tools ourselves. If there are still gaps in the conform, we shouldn't be too bothered by them, since the whole thing still has to stand up to comparison with the offline reference anyway. And, this should also be mentioned here, any graphics or CG renders that our conform may contain will also be missing at this point.

The Project Bin

Now that we finally have some material in our software, let's take a look at the Project Bin (Top Right). Our project will still be named „Untitled" here, a fact that painfully reminds us to save now. Projects are saved as *.hrox, i.e. Hiero Project Files, and are therefore fully compatible with Hiero and Hiero Player. Of course, this does not apply to the non-commercial and indie versions, where the project files are encrypted and therefore only exchangeable within the respective products.

To save we can either use the Menu Bar and the „File" tab and then select the option „Save Project As (Untitled)" or use the shortcut Ctrl-Shift-S (Cmd-Shift-S on the Mac) and save the project in the appropriate place. The new project name is displayed at the top right of the bin and if we select it now, we can look under the hood of our project a bit via the Menu Bar and the „Project" tab via „Edit Settings". With five subgroups, the whole thing is quite manageable. Under „General" we can define a project directory - interesting if pipelining plays a role or if the project is to be moved frequently. The Poster Frame is purely a preset and determines whether the first, middle, last or any other frame is used as a thumbnail for the proxy display in the Project Bin. Under Sequence, we can specify
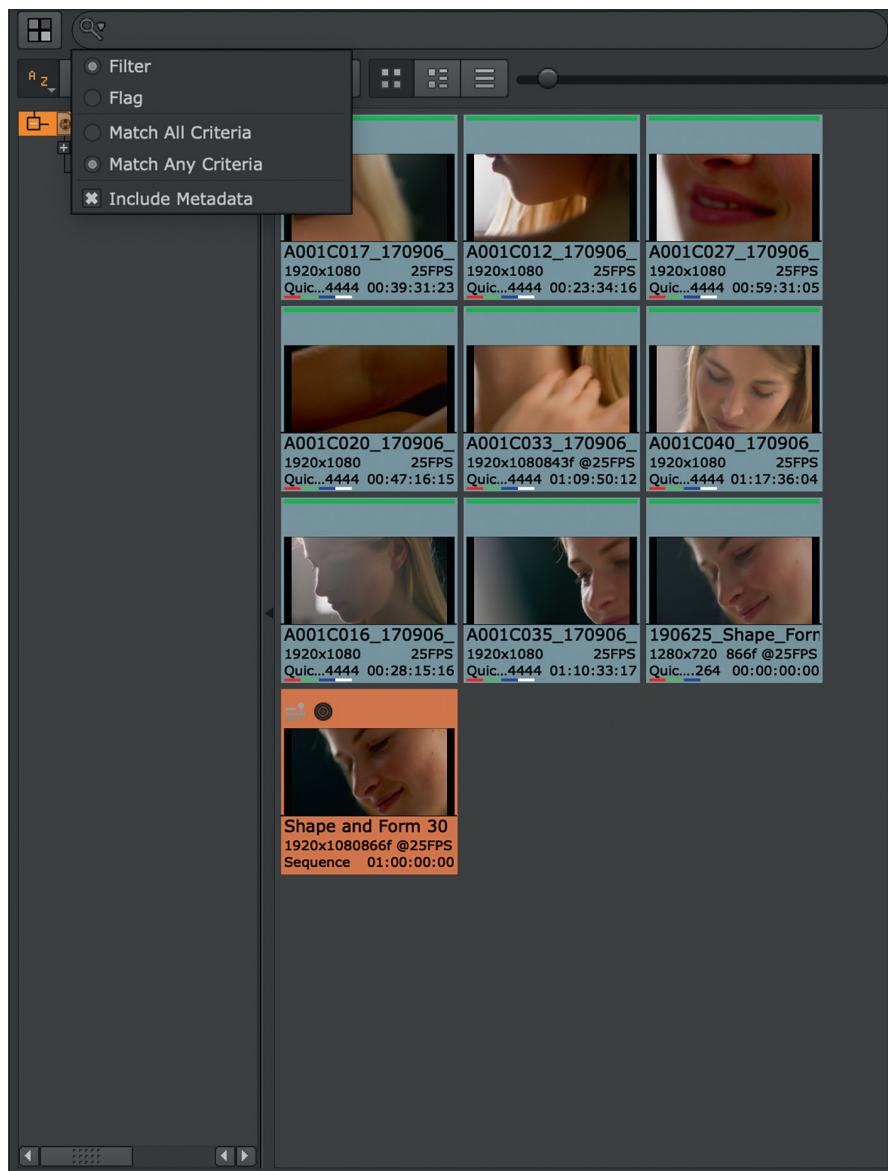
The more complex the project, the more time you will spend in search.
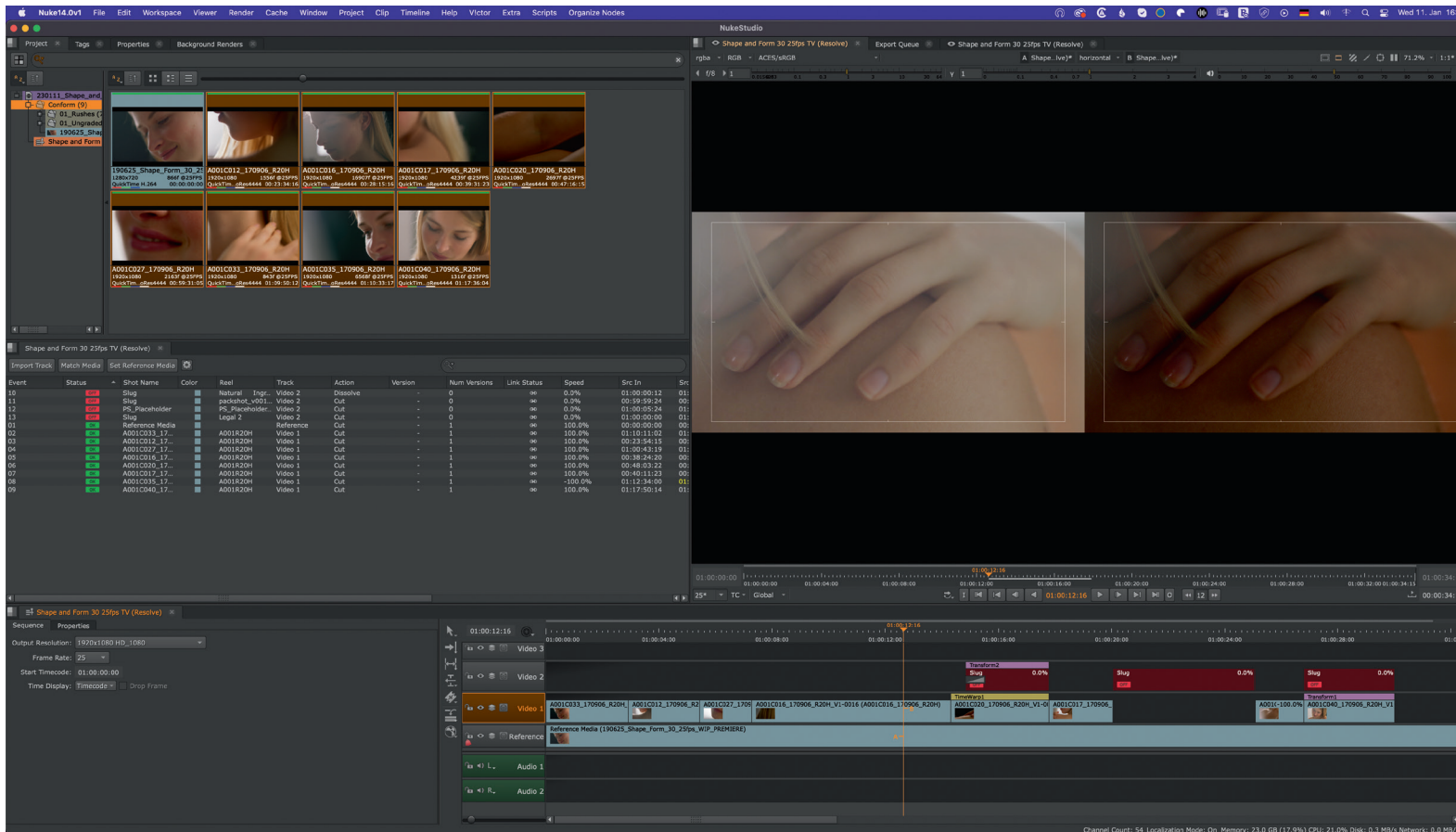
Hält unser Conform auch dem Reference-Vergleich stand?

presets for new objects or timelines generated in Nuke Studio - knowing full well that, in case of doubt, they will always be overwritten by the metadata of the XML or AAF being imported. Stereoscopy enthusiasts will find what they are looking for in the Views options. The color management options are not only reminiscent of those of the classic Nuke, they are actually the same. This means that if, for example, an ACES workflow has already been set up under Nuke with the help of OCIO (see dp 06:22), this will automatically be adopted by Nuke Studio as well. The Export Presets allow you to define a preset for an export directory outside of your own project structure - certainly interesting if you have a dedicated media server or larger project structures.

But back to Project Bin itself. As we are used to from Nuke, we can - if desired - bring each individual panel into full screen mode by pressing the space bar. On the left, we always retain our project structure, in which we see our bins and our timeline(s) listed hierarchically. Depending on the selection, the display on the right side will then change as well. Attention: Unlike many other apps, the thumbnails in the Project Bin cannot be shuttled - if this were a full-blown editor, this would be quite inconve-

nient, but for our finishing purposes this can actually be quite helpful to identify clips quickly and consistently. No, for shuttling we need a viewer here, we'll get into that later. The Project Bin is really more of a place to manage and, most importantly, tag and filter our media. The left side is still relatively clear with the options of an ascending or descending alphabetical search, but the right side offers a lot more. Under the „A-Z" icon there are options to sort by all kinds of metadata, from media status to fps to color (the color assigned to the clip, not the color space). In addition, display as thumbnail, as thumbnail with extended metadata and as pure list view are available. For both thumbnail options there is a slider for the size of the thumbnails. The nice thing: The sorting options selected here are persistent for the respective bin. For example, you can choose a large view for the graphics to immediately see the differences, whereas you can sort the rushes with small thumbnails by ascending timecode.

What also deserves a closer look: The search function within Project Bin: If we take a look at the magnifying glass, we can see that there are some interesting options hidden here: for example, metadata can be

implemented directly into the search and „and" as well as „or" searches can be performed via the choice between „Match any Criteria" and „Match all Criteria". Particularly practical is the choice between „Filter" and „Flag". With „Filter", all non-matching results are simply not displayed, while with „Flag" they are marked in red.

Let's jump back to the Spread Sheet. Next to the „Match Media" button we´ll find „Set Reference Media". Again, the Nuke File Browser pops up and we can select our reference, which is then created as a separate Reference Track in our Timeline. If we now want to view it „solo" in the viewer, we have two options: Either we click the A-Buffer above the Gamma slider in the viewer and select the Reference Track there, or we select the track (not the clip) with the Reference, i.e. below the Timecode in the timeline and press the „1" button - just as if we wanted to look at a Node in Nuke in the viewer. The big difference: In the Node Tree we can chase ten inputs into a viewer, in the Timeline Environment there are only two - which is completely sufficient for an A/B comparison between Conform and Offline. Therefore, just for fun, click on the „Video 1" track and hit „2" - and we have a wonderful split screen. If we now click on
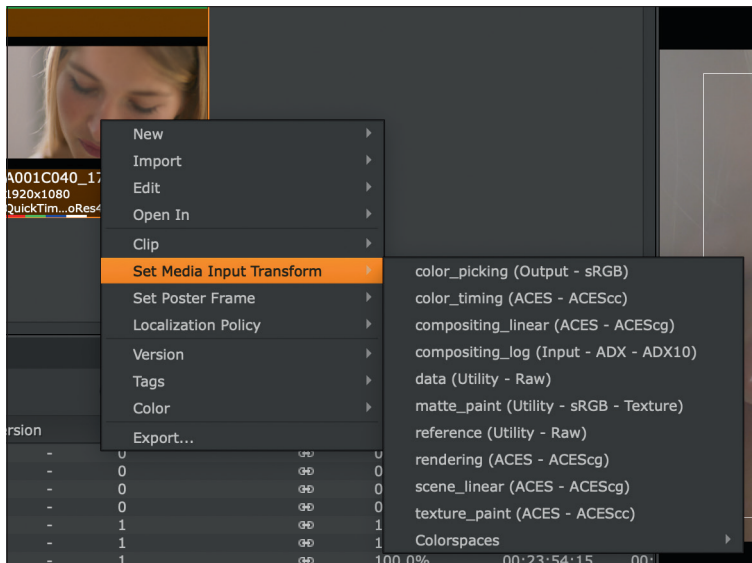
In an ACES pipeline, our media transforms look like this.

so that we can refer back to it at any time. That's why Nuke Studio also has the concept of a dedicated Shot Name. You can see this Shot Name even now, because it's already the very first thing on every clip in the Timeline. Only the name behind it in the brackets is the clip name - but since we haven't renamed the shot name yet, it's identical to the clip name at the moment.

With „F" we can frame the timeline in its entirety while our cursor is over it. Now we can Shift-click on all the Plates on the Base Track of our Timeline and right-click and choose „Editorial" to select „Rename Shots".

The window that appears now gives us various options to name our shots, from a simple Rename, where every selected clip would get the same name, to the possibility to automatically adjust upper and lower case, to change parts of the name via Search and Replace, to a „Sequential Rename", i.e. the possibility to assign a name with a continuously increasing shot number. This is what we want. Depending on your taste or your requirements, you can enter a prefix and use hashtags to assign the number of digits. In addition, you can assign a first shot number - very interesting for late additions to the edit - and a value by which the shot number should be incremented. The default is Shot 10 and an increment of 10, which should correspond to the standard in many pipelines.

When we are satisfied with our pattern, we can confirm the whole thing with „Rename Shots" and - lo and behold - now we have a wonderful string of Sh_0010, Sh_0020, etc. - or whatever our sequence should look like. In any case, the whole thing is clearer and more unambiguous than A001C035…

the „under", which is located between the A and B buffers, we can select various display options for our comparison - including some that are not available in Nuke, such as the „horizontal" variant, where both clips are simply next to each other. No matter which split we take, we can now shuttle through our timeline and see if everything fits. If it doesn't fit - relax. We'll get to how we fix all this later.

And in case someone loses track of which track we actually see where: A small A and a small B on the timeline playhead directly show which track goes into which buffer. And one thing that might be noticeable right now and that we want to fix as soon as possible: Incorrectly assigned Color Spaces. So if either the reference or the actual footage is not displayed as it should be, then please select the corresponding clips in the Project Panel (In the Timeline or in the Spread Sheet, we are not offered the

option and right-click to select „Set Media Input Transform" instead of „Color"). The options displayed in the menu depend, of course, on the Color Management we have previously defined in the Project Settings.

If you clicked incorrectly while assigning the buffers, you will have figured it out already: With a click in the name of the track, this can also be changed. It is highly recommended to keep everything tidy here and to name the tracks accordingly, because all this will be the basis for our later export. In most cases, the „Video 1" track will contain the Plates, so let's name it just that - „Plates".

To keep things even more in order let´s give our individual clips dedicated shot names, because the clip names that an ARRI or RED assigns aren't exactly very legible. However, it's obviously important to continue to keep that clip name in our timeline
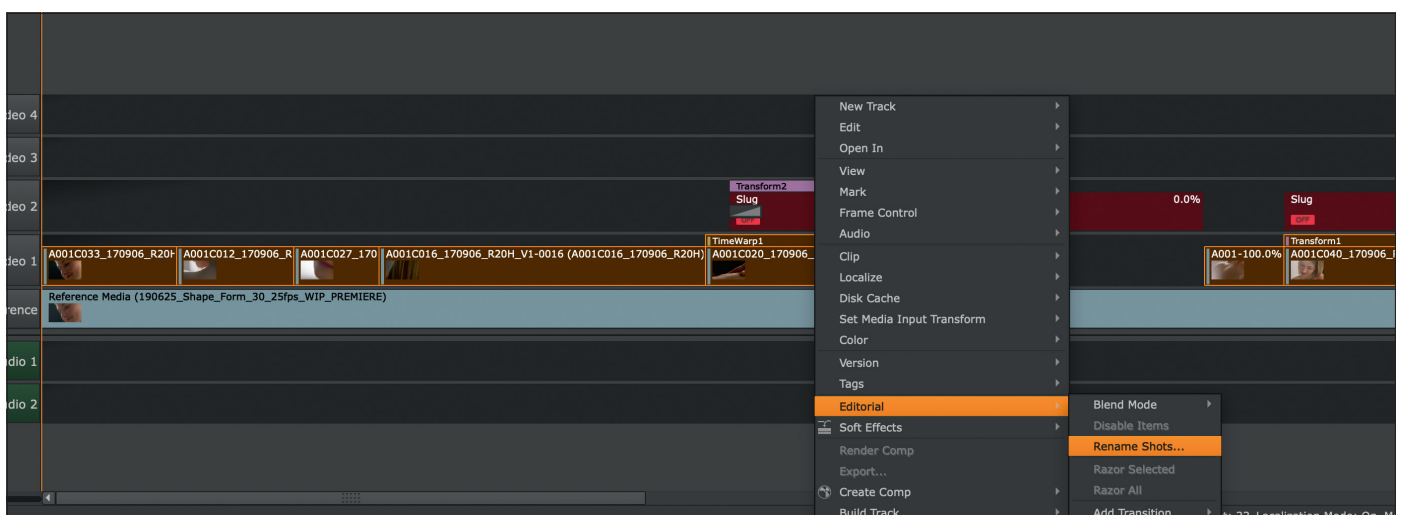
Let's bring some more order to our Timeline.
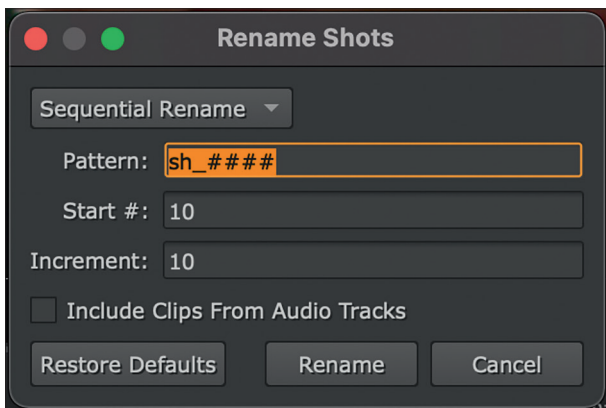
For starters, the „Sequential Rename" is exactly what we need.

Now, of course, it would be extremely helpful to have all the edits on our reference, because we might want to export the matching offline reference to each shot as well. Here, too, the right-click in the Editorial menu has something to offer us, namely the option „Copy Cuts". The best way to understand this window is really as an instruction to Nuke Studio to be read from top to bottom. First we are asked what should be copied - we don't have any soft effects yet (except for possible timewarps or similar from the editorial) and we haven't tagged anything yet either. But we would like to copy not only the actual cuts, but also the shot names that have just been distributed, so that everything belongs together nicely. So we set a checkbox at „Copy Names" and deselect „Copy Soft Effects" and „Copy Tags". Next, Nuke Studio wants to know from which track we want to copy the cuts - since we named the track „Plates", we select this track in the „From" pulldown. Under „To" we can now set the checkboxes on all tracks that are to receive the cuts from the „Plates" track and the names that go with them - for us it should only be the „Reference" track for now, so set the checkbox accordingly, confirm with „OK" and there you go, shot names and cuts are passed on to the Reference track.

That's it for the first part of our workshop – in the next issue we will focus on Tagging, Editing and – yes – some comping as well. Stay tuned! ›ei
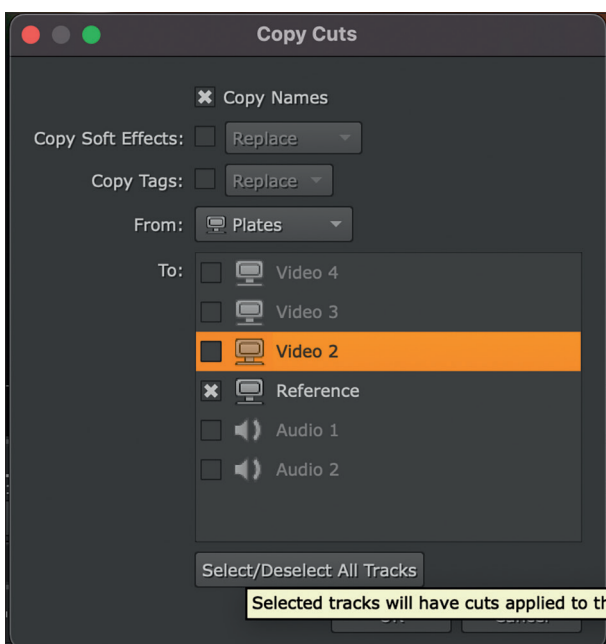
Christoph Zapletal has been working as a freelance compositing artist and VFX supervisor in Hamburg for several years. He has worked with Autodesk Flame as well as The Foundrys Nuke on various commercial and feature film projects. He is also a lecturer for fxphd and at the HFF Munich.
More info at: **www.christophzapletal.de**