Grading In Pajamas

While many parts of post-production can now be done "on any laptop", grading still takes place in a suite - but does it have to be like this? Wouldn't it be great if you could stream a full quality video signal and not have to send to colorists across the country?

By Bela Beier

Color grading the right way - the 4K Dolby Vision Cinema HDR Grading Suite at the Bavaria. The operator can stream the reference quality video to wherever the client is.

We've heard this question a lot over the last few years and it turns out: there's a solution! Colorfront has created a product and our friends from Pharos (formerly Arri Media), are already using it for real projects! From Maya the Bee to the latest matrix, current projects can be found here: pharos.de.

We sat down with Aaron Kuder, who, as Technical Supervisor Imaging at Pharos, was responsible for the introduction, among other things.

Speaking of:

DP: After two bumpy years, Pharos is now back in full production – did you have to adapt your workflows to the new circumstances?

Aaron Kuder: Definitely. Mainly because of Corona, we had to adapt to the new requirements. We relocated the grading with customers, if they were on site, to spacious suites so that distances could be kept as far as possible. Mobile or home office and remote workflows also presented us with new challenges, especially with grading or approvals. These were and still are the main daily challenges.

DP: So today remote grading and remote QC is "nothing special anymore"?

Aaron Kuder: We started dealing with remote workflows a few years ago. In the case of international projects, approvals were often not only screened on site, but part of the team watched in another country. We were also able to gain initial experience with remote grading in 2017. At the time of Corona we have seen further diversification of these workflows.

Almost home office: The Resolve Grading Suite at Pharos in Berlin Mitte.

In the last year in particular, we have set up and standardized workflows in the dailies and in the quality control area.

DP: And you've already used that on real projects?

Aaron Kuder: Yes, definitely. Since mid-2022, we at PHAROS - The Post Group, have been doing remote dailies grading and quality control regularly in Colorfront's OnSetDailies. For example, our colorist is based in Frankfurt am Main, with our partner MBF Filmtechnik GmbH, and remotely controls a machine at the Munich location. In this workflow, we have already completed four major dailies projects shooting nearby. Since November we have also been doing Remote QC in Colorfront's QC Player. Here, our QC operator sits in the home office and works from home. There she can check all home entertainment formats up to UHD HDR, that are produced in our post production.

DP: Why did you introduce the colorfront streaming tool for this?

Aaron Kuder: In addition to the tools from Colorfront, we also use several stream boxes, especially between Berlin and Munich, but also internationally for remote grading and remote approvals. But what we particularly like about the Colorfront Tools is the integration in all products.
A streaming solution is always integrated in all Colorfront software and you don't need an extra server. Furthermore, the administration and the monitoring of the streams with the Colorfront stream manager (aka broker) is very simple and intuitive. So we are very well equipped with stream boxes and streaming tools from Colorfront to always find the best solution in each individual case.

DP: So the remote work between the Munich and Berlin locations turned out to be working well?

Aaron Kuder: Yes, it has definitely worked for us. For example we can now react easily and spontaneously in the dailies, grading and QC area, and colleagues can work together on a project across branches. In particular, bottlenecks in the dailies, where it is often difficult to estimate in advance how much material will be delivered for a -

working day, can now be compensated for in this way. Our dailies departments are perfectly coordinated so that capacities at the branches can be optimally used. Remote work is not only advantageous for ecological reasons. Business travelers and operative colleagues who are between the locations or commuting to work can be partially omitted and thus save energy, time and money.

DP: So grading is possible in the home office?

Aaron Kuder: In theory, even "grading in your pajamas" is possible from home. The prerequisite for this is, of course, a monitor that is suitable for color grading at this level. We have not yet done a complete final grading with the Colorfront Streaming Server Setup. In addition to the video signal stream which can be output via the streaming player on the client side via a video IO card via SDI, a few more tools are required. We use remote desktop software from the gaming industry for the almost latency-free transmission of the GUI. We use additional software to forward the USB signal from the grading panel from the client computer at home to the actual grading computer on site. So three softwares are running in parallel.

DP: Have you already used the system for client reviews?
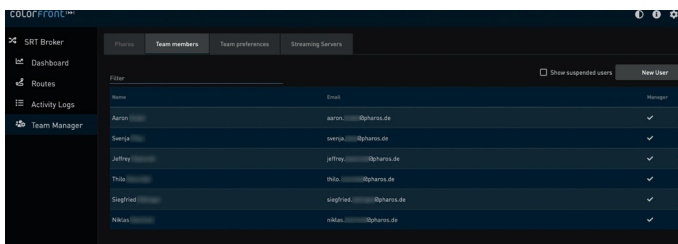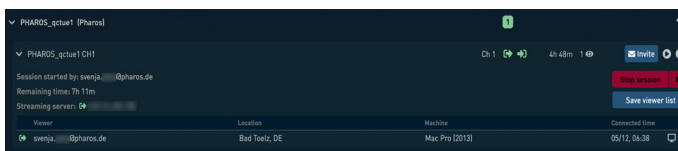
Aaron Kuder: When it comes to the customer, we always need special or individual solutions. Sometimes the customer is at home, sometimes in another post facility or sometimes in a normal cinema. Different solutions are required for each of these applications. For example, we streamed remote grading to an Australian cinema for the cinema animation film "Maya the Bee" or sent the grading of the trailer for Company 3 to the USA for the "Matrix Resurrections" project. It was also very special when the director of a large cinema project could not come to the grading and we spontaneously sent a calibrated monitor and stream box to him in Sweden.

DP: So when you go into a project, how soon is the suite "ready to use"?

Aaron Kuder: The processes for dailies and quality control described above run every day and, so to speak, on demand always "at the push of a button".

DP: And what does everyday work look like with it?

Aaron Kuder: Once the remote route is set up and tested, there are a few more checks. The operator sits down at his remote workstation, starts the three, required software so he or she can start working. The individual solutions require a little configuration in advance in order to create ideal conditions for remote operation.

Almost home office: The Resolve Grading Suite at Pharos in Berlin Mitte

DP: And a very German problem: is the average internet connection sufficient for this? And what kind of data throughput should one expect?

Aaron Kuder: In our experience, a bandwidth of 50 Mbits offers enough headroom to be able to view UHD streams without artifacts. We stream HD in 15mbits and UHD in 35mbits. However, one must note that there will always be a small latency in the video streams. The latencies are due to the cloud connection on the one hand and also depend on the internet connection on the other.

DP: What was the last project you used it on?

Aaron Kuder: Apart from Dailies and Quality Check, there are now various projects in which we have used remote technology or are currently using it. For example, with Markus Goller's new film ONE FOR THE ROAD, which will soon be in cinemas, the director and his team were often in Berlin while our colorist Traudl Nicholson was in Munich, and everyone viewed the graded pictures together on their own screens.

DP: And what was the rest of the pipeline like?

Aaron Kuder: To stay with the ONE FOR THE ROAD project: Pharos put together an "all-round carefree package", so to speak. We created the dailies accompanying the shoot and the LTO backup, media transfer ran via our own cloud software webgate.io, the color grading later on DaVinci Resolve, the sound processing in ProTools, the VFX in Nuke and the mastering in Transkoder.

DP: Let's go back to the beginning: What is the setup and requirements for Colorfront Streaming?

Aaron Kuder: You need Colorfront software with an integrated streaming function or alternatively the streaming server, which can stream a video signal via the Colorfront Cloud independently of the software. This server can be hardware or software-based. The signal is then transferred to the Colorfront Cloud and can be sent to different people by email via a web GUI. Inviting viewers is very easy in the Stream Manager Web GUI, also known as the Broker. The user who receives a link by email then only needs a streaming player and can receive the stream.

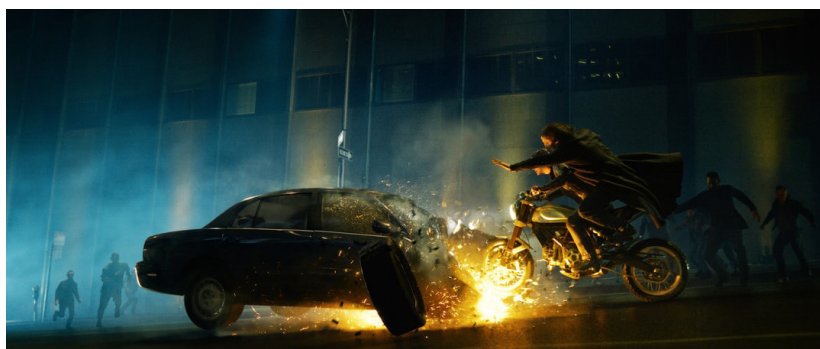**DP: Where were the "starting difficulties"?**

Aaron Kuder: We had to set up our own things on our firewall so that the video signal found its way from our facility to the cloud. The Colorfront support team were very helpful with all setups of the streaming solutions and supported us so that we had the setup ready to go in just a few days.

DP: "Video review in the best quality" - what display devices have you used for remote review?

Aaron Kuder: In the home entertainment grading suites we usually work with the Sony HX310 or Sony X300, and in the grading cinemas with appropriately professional digital projectors. With remote grading, it depends on what is available at the "remote place". These are often Sony PVM monitors or current consumer OLED TVs.

DP: And do you want to expand that in the future?

Aaron Kuder: Yes, definitely! Working in this way means comfort and location-independent work for customers, fewer business trips for employees and easy work balancing across branch boundaries.

Performance

Remote Control Status:	Disabled	CPU Utilization:	32.56%
Stream Connection Status:	Connected	Playback:	23.98 fps
Encryption Status:	Unsecured	Packet loss rate:	1.04 %
Stream Type:	UHD 444 10bit 0Mbps	Lost/Drop/Fixed:	543/0/543 pkts
Stream Quality:	Realtime	Bandwidth:	33.55 mbps
Performance:	Realtime	RTT:	0.36 ms
Video IO Type:	HD 23.98 Off	CQ/DQ:	68/00
Video IO:	No IO card	Remote src/res readahead:	79 / 12
		A/V mux delay (1s peak):	0 ms
		Source:	srt://live-budapest.colo..d:8888
		Encryption state:	Unsecure
		Project:	
		Timeline:	
		Remote state:	playing / 00:08:37
		Version (remote/local):	0 / 48221
		Gui Dropframes:	0

HDR   00:08:37:22

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Colorfront Streaming Player: showcasing a stream.

STREAMING via the BROKER

DP: In comparison to non color-accurate streaming", how is the necessary compression handled?

Aron Jaszberenyi: Streaming Server uses state of the art NVidia NVENC encoding for the reference quality 4K 10-bit 4:4:4, HEVC video compression with low latency, making it ideal for live streaming applications.

DP: Where are the datastreams going?

Aron Jaszberenyi: Streaming through Colorfront's Advanced Streaming
Gateway allows you to stream to multiple concurrent clients with easy firewall traversal. Streaming Server is a dedicated 1RU appliance. The hardware-less Mini does not require any external hardware, it can run on the host application, so the NLE, color grading, VFX compositing, sound mixing etc. Windows or Mac laptop/workstation.

DP: Would it be possible to add more streams, in a very high resolution?

Aron Jaszberenyi: Streaming Server provides so far four (4), concurrent channels of reference quality 4K video, each with up to 16 channels of audio, forensic and
visible watermarking, Colorfront Engine dynamic range/color-space conversion, burn-ins, 256-bit AES encryption etc. All in a 1RU box. High frame rate, stereo 3D, 8K are all possible.

DP: Currently you are streaming through web and Apple devices, are there any other OS-versions planned in the near future?

Aron Jaszberenyi : Streaming Player provides reference quality streaming on various devices. Apple TV 4K to HDR OLED prosumer displays, XDR MacBook Pros, iPad Pros, iPhones etc. Some clients with proper HD-SDI
video output to cinema projectors, reference monitors etc.

DP: What does the broker service do?

Aron Jaszberenyi: Broker is a serverless
invitation system, where authenticated users can connect servers with clients, to send secure email invites, manage sessions, and monitor streams. Colorfront's Advanced Streaming Gateway allows multiple viewers to watch the same stream.

DP: The waveform can also be streamed – are you planning on adding any other scopes?
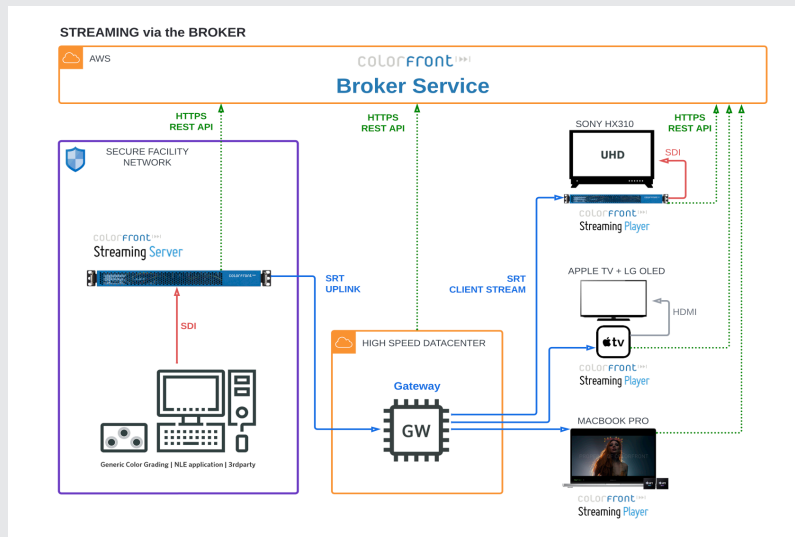
Aron Jaszberenyi: Colorfront Streaming Player has an audio level meter to monitor the loudness of up to 16 channels of audio. Colorfront developed AJA HDR Image Analyzer, stream image and waveform/analyzer and some clients have asked for the ability to analyze the original SDI source. Broker is a serverless invitation system, where authenticated users can connect servers with clients, to send secure email invites, manage sessions, and monitor streams and can connect servers with clients, to send secure email invites, manage sessions, and monitor streams.
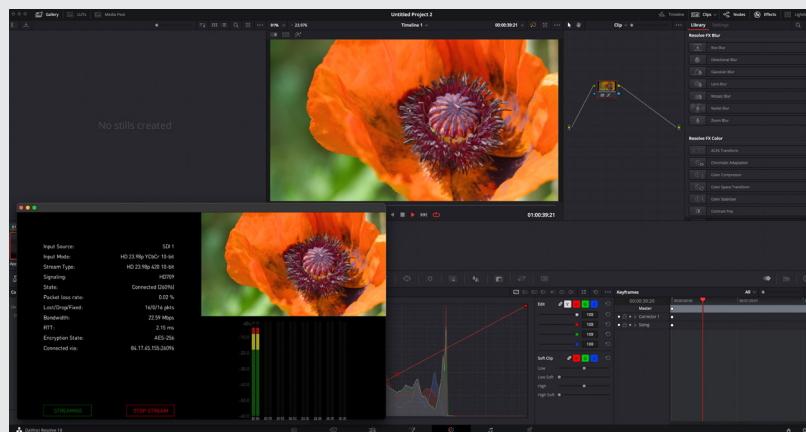
Colorfront's Advanced Streaming Gateway also allows multiple viewers to watch the same stream.
Colorfront Streaming Player has an audio level meter to monitor the loudness of up to 16 channels of audio.

Colorfront developed AJA HDR Image Analyzer, stream image and waveform/analyzer. Some clients have asked for the ability to analyze the original SDI source and Stream Dolby Atmos object-based audio.

We also developed our own Static metadata that identifies Source Gamma and Colorspace.

As an example, if a creative want to work in with Cinema Gamma (2.6) with a P3 D65 Gamut and white point, we have an end to end color system that identify the source stream for the player to display proper colors on screen that may not support the source ColorSpace and Gamma. Plus, if it's needed we could support HDR10+.

DP: When we look into the future: What are the features that the streaming viewer might have in 10 or 15 years?

Aron Jaszberenyi: Camera to cloud work flows will allow more and more productions to get their footage from set to post production via the cloud.
A lot of the manual tasks of data management, meta data logging, sound sync, appling color grades etc will be automated, so productions will spend less time on data management and more time on creative tasks.
Standardized Color managed pipelines such as ACES will help speed up editing and color grading with our software that automates a lot of the tasks normally done by hand. Automated workflows make it easy to manage
your data and keep everything in sync.

For more information visit;
colorfront.com