BRAINSTORM

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suite6

WHAT'S NEW & USP

Suite 6 is a major release for eStudio, InfinitySet, Aston and Edison. Back in Suite 5 Brainstorm introduced several essential new features, which have been further refined and improved to ensure they meet the market demands and future trends, while keeps us ahead of the competitors. While Suite 5 was all about Unreal and XR, Suite 6 is all about ensuring finesse and reliability, enhancing Brainstorm's compatibility with third-party systems and technologies and ensuring easier and better operation in a variety of workflows.

So, although there are no huge bells and whistles in Suite 6, the new features are essential for user's daily work and represent major changes in the way clients may use our solutions. Following you will find details on the most important features of Suite 6, including the products each feature can be applied to. For more information on existing features please refer to the documents about Suite 5 and previous releases.

FEATURE AVAILABILE IN
InfinitySet
Aston
eStudio

SUITE 6
InfinitySet 6.x and later
Aston 6.x and later
eStudio 18.x and later

FEATURE KEY	
NEW	NEW ON SUITE 6
UPD	UPDATED ON SUITE 6
LTR	AVAILABLE LATER THAN 6.0

Brainstorm reserves the right to alter any specification without prior notice. To ensure up-to-date specifications, please consult with your Brainstorm representative.

GENERAL FEATURES

suite6

Dual GPU Support

NEW

InfinitySet is now compatible with Dual-GPU workstations, which allows to split the rendering requirements between the two GPUs. Sharing rendering opens the door to use one of the GPUs for rendering the Brainstorm engine while the second one can be fully dedicated to the higher Unreal Engine rendering requirements, maximizing performance and improving overall scene quality.

Dual GPU has additional benefits on performance sensitive XR environments. For instance, splitting rendering of the same image when the camera frustrum does not cover the whole of the LED wall. This means that one of the GPUs can be concentrated on the camera view while the other can render the same image with less quality but covering the whole of the LED wall, floor or ceiling, allowing for keeping the ambience lighting of the scene with total accuracy.
Also, Dual GPU allows to reduce hardware costs, as a single workstation can do the work normally assigned to two, while simplifying workflows and scene matching.

SMPTE 2110 Support

NEW

Suite 6 is fully compatible with SMPTE ST 2110, so it can be configured with Video IP-based IO hardware such as Matrox or Bluefish video cards. Other manufacturers like AJA, BlackMagic will be incorporated to the list as soon as their products are deliverable.

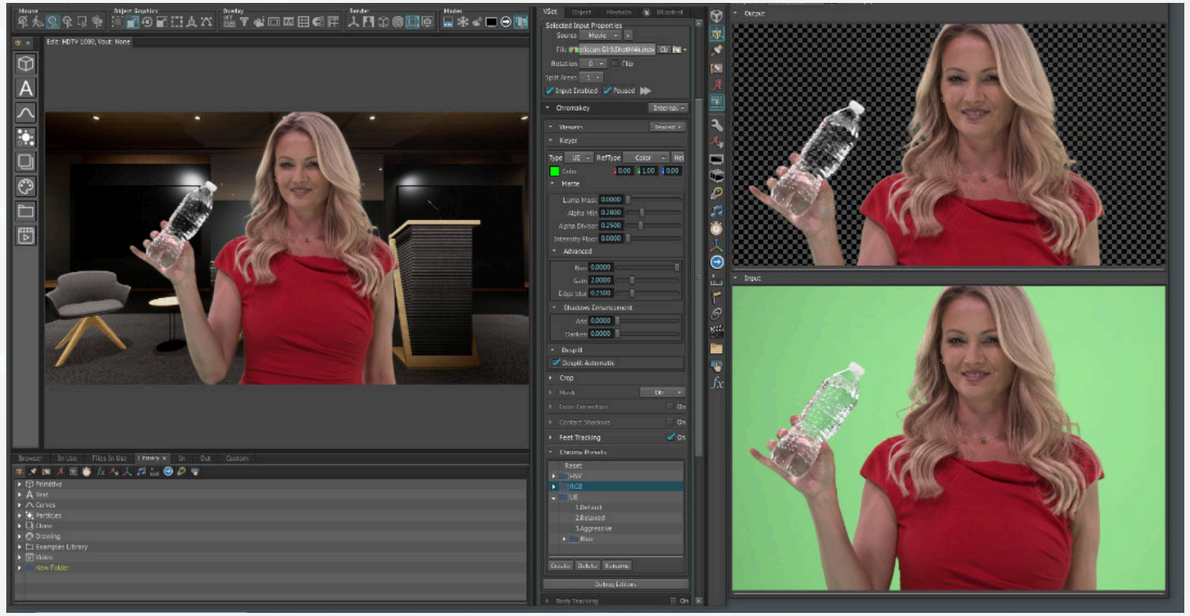
The SMPTE ST 2110 Professional Media Over Managed IP Networks suite of standards is a major contributing factor in the movement toward one common internet protocol (IP)-based mechanism for the professional media industries. The foundation for SMPTE ST 2110 standards is Video Services Forum (VSF) Technical Recommendation for Transport of Uncompressed Elementary Stream Media Over IP (TR-03), which VFS agreed to make available to SMPTE as a contribution toward the new suite of standards. The SMPTE ST 2110 standards suite specifies the carriage, synchronization, and description of separate elementary essence streams over IP for real-time production, playout, and other professional media applications.

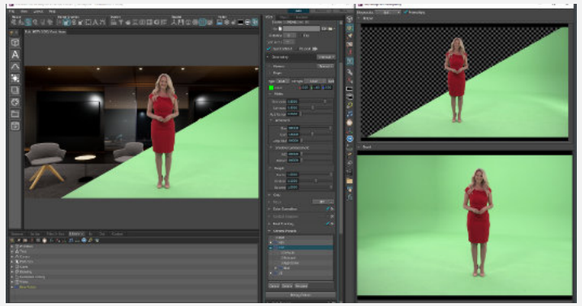
Enhanced Chroma Keyer

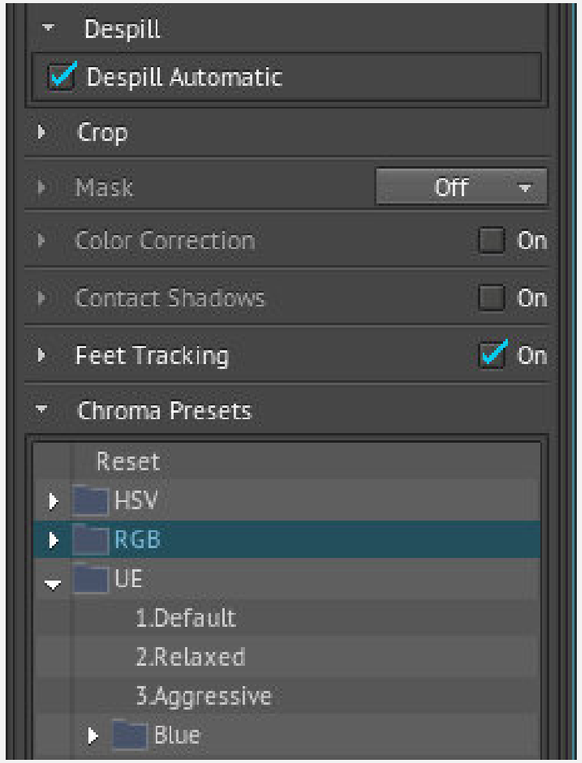
UPD

InfinitySet features an internal, resolution independent Chroma Keyer, supporting controls for main keying in **RGB and HSV color spaces**, **spill** correction, **detail** recovering and talent **colour adjustments**. InfinitySet also creates an **secondary key** for the feet, independent from the main one. This key permits the calculation of the **talent's feet position with improved accuracy**, enhancing FeetTracking and the FreeWalking feature.

On Suite 5, Brainstorm **fully redesigned the keyer's algorithm**, with **improved precision in all color spaces**, while adding new features that facilitate the keying process also for non-expert users. For Suite 6, taking into account the client's feedback, Brainstorm further enhanced the module to include additional features and . InfinitySet and eStudio now include a number of **presets** that create an **automatic, single-click keying** to start with, which can be further refined by tweaking any values as







required. These presets are available for all keying modes.

The new keyer also features an **additional viewer screen** so the key can be **finely adjusted** in full screen or in additional monitors, as desired by the designer, regardless the composed image. This enhanced adjusting screen is coupled with **re-designed menus and re-organized interface**, with r**efined editors and windows**, following many users' requests.

As with the previous keyer, the user can select the **color space** to work with (RGB or HSV/HSL), and as a new feature it allows for creating a **differential chroma key** (called RefImage).

The differential chroma key is made based on real footage of the chroma screen without the talent, which creates a **keying map** which easily discriminates the talent once placed in the chroma set, by looking at the difference between the "empty" chroma and the footage with the talent. By using RefIMage the shadows in the chroma set are more **easily extracted** from the footage.

Regardless using RefImage or not, the keyer is accurate enough to discriminate real shadows which can be **added to the virtual shadows and reflections** the 3D Presenter feature can add to the

talent. Also, the **spill correction** has been enhanced to create an automatic spill depending on the chroma settings. On top of all the above, InfinitySet now includes a **new keying mode** that utilizes the **Unreal Engine keyer**. This opens the door for users that feel comfortable with the UE keyer to take advantage of this technology inside the Brainstorm environment.

Starlight Virtual Lights

UPD

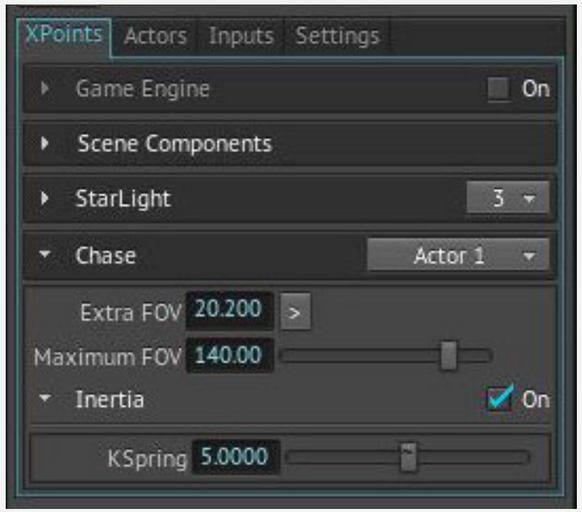
The Starlight feature allows for easily applying **several virtual shadows to the keyed actor**, to simulate **multiple light sources** in the virtual set. Starlight's dedicated interface permits the configuration of the number of spotlights required, their position with regards to the actor, plus their intensity, rotation and where they point to.

By using Starlight, users can drop a number of virtual lights in the set regardless the real lights in the chroma set. The effect is similar to the typical shadows we encounter in sports events where the light sources are not evenly distributed..

Actor Chase

UPD

This feature allows the virtual camera to **automatically follow the actor** by making him/her a point of interest. So, if we have an actor in a chroma screen, and configure him/her as "**Chase**", we turn the keyed actor into the point of interest. Then, if the keyed



talent moves, the virtual camera follows him/her automatically. The settings also allow for opening the **field of view** to the desired framing, and also for including some **inertia**, so the camera will follow the actor's movement more fluidly.

Actor Chase can be combined with the **Actor Base Z** feature, which allows to modify the actor's position, its apparent height in relation to the virtual floor, independently from its virtual shadows. This allows to better match the position of the actor in space while maintaining the correct shadow position.

New OnDemand Lineup

The control and playout management applications of Brainstorm have been unified under the "OnDemand" label, converting them into HMTL applications that run on a web browser. The original OnDemand for Aston, plus the WebControl and the EdisonWeb are now Aston OnDemand, InfinitySet OnDemand and Edison OnDemand. Each of them keeps its own characteristics and feature set, but share the naming, look&feel and icon concept, identifying them as playout and management applications.

Aston OnDemand is the playout application of choice for Aston, a flexible yet powerfulplayout solution that fits perfectly in any broadcast environment regardless of its complexity, allowing the playout and immediate broadcast of Aston graphics and templates, and edit them on the fly if required, or even control Aston projects when embedded in InfinitySet.

OnDemand provides operators with a flexible toolset to create rundown lists, modify them on the fly, and delve into the details allowing individual editing of elements such as graphics, videos and on-air shots, and then playing them out to air.

Aston OnDemand is a powerful playout application that enables the easy management and playout of complex graphics templates in any order and combination, for broadcasters who require more than a simple run- down system. Aston OnDemand has the ability to operate in multiple modes, making it the ideal tool for any playout situation: live sports, channel branding, gameshows, news, tickers, election graphics and many more.

InfinitySet OnDemand has evolved from WebControl to not only control the playout InfinitySet, but also scene setup, chroma key and much more. Developed with flexibility in mind, it can sit on the InfinitySet workstation or alternatively in a remote computer, separated from the workstations, allowing for the remote control of virtual sets, camera presets, actions, transitions, or graphics directly from its GUI. The Web Control interface can be accessed using a **standard web browser**, and provides as such an easy-to-use interface, accessible not only from desktop computers, but also from **tablets**. WebControl main features:

- **Replacement for an InfinitySet Player** remote workstation, including the Remote control of most InfinitySet features:
  - » WebControl can trigger **predefined Camera Presets.**
  - » Camera parameters and positions can be **controlled directly** from the Web Control interface.
  - » Direct adjustment of **Chroma key settings** from the WebControl interface.
  - » Management and **control** of **InfinitySet's playlists** directly from the WebControl. Additional media can also be added to existing playlists from the resources folder.
- **Trigger Actions** when present, so users can control the pre-defined Actions buttons.

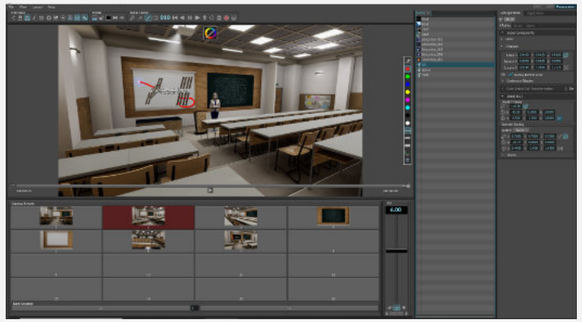
- **Control of several InfinitySet** workstations via Ethernet .
- Can sit in the same workstation of the InfinitySet or in a separate computer, and connect to one or several InfinitySet workstations, read their project's configuration and load the for its controlling, in sync with the software mixer.
- Allows for **full editing of Forms**. The user-customizable Form interface is fully accessible from the Web Control interface, allowing the user to control their custom interfaces as if they were inside of InfinitySet
- **Remote launching of InfinitySet.** Web Control, when paired with the ADM software and license, can launch InfinitySet remotely, on all configured render engines.
- Users can create **Custom Setups**, which can include all or only select render engines for use, allowing for the creation of show/production specific setups that the operator can choose from.

Presentation Module

Storytelling goes far beyond the news realm, even up to the point that we can consider almost any program, show or news story a presentation of any sort.

Following the **experience of Edison PRO**, Brainstorm's application for the easy creation of live events and any kind of presentations, the company has developed a dedicated module to help creating such presentations but with the highest possible quality, that in Suite 5 is available for InfinitySet, eStudio and Aston. This means that the essential features of Edison (drag-and-drop operation, slide control, etc.) can be directly available in the mentioned Brainstorm products.

The Presentation module builds into InfinitySet an **additional**



interface, which simplifies the setup and display of the different **assets** that integrate the presentation/show: slides, pictures, movies, PDF or PPT presentations, 3D objects and many more, including Aston projects and forms. Aston material can include its StormLogic and also the input data to be updated manually or via external sources, providing additional flexibility. Users can drag and drop files as those mentioned above to configure a rundown, a list of elements, which can be controlled directly by the presenter and sent to air, inserted in the 3D virtual set or manipulated if required.

On top of the existing features in InfinitySet, the Presentation Module also allows for **downloading Edison's free, ready to use assets** such as screens, pointers and many other, including complete templated projects, that greatly facilitate and complement the presentation abilities of the system. The GUI also displays in a simple list the following items, which confirm all that is required for the presentation:

- **Effects**. Additional effects for the supporting material (slides, etc) to be displayed, such as halo, tray, etc.
- **Chroma Keyer.** Uses Brainstorm's internal chroma keyer to key out the camera input.
- **Scene**. Details the crosspoints and the displays where the assets are shown.
- **Template properties.** Defines the animation for the slides and assets when they are shown, such as In/Out properties, positions, sizes, animations...

The presentation can be contained within a display, which can be part of the set, purpose built or taken from any of the specific libraries available for download. The individual slides and objects of the presentation can be extracted from the display to highlight them as AR objects in the set.

On top of that, and by having full access to NDI IO, the Presentation Module allows for including **remote signals from applications such as Zoom or Teams** and **integrate** them directly in the virtual set, allowing for easily created **immersive presentations** that can be run with a clicker directly by the presenter. **Remote webcams** can also be shown in the virtual environment to create **live conversations** that go far beyond what the standard conferencing applications provide. Of course, higher quality camera signals, including green screen shots, can be also sent via Zoom or Teams to create **live tele-transportations of talents** with total ease.

This Module can also use **Unreal Engine projects**, opening the door for using photorealistic backgrounds which can be created for a specific presentation or downloaded from the Unreal marketplace. As the plugin runs on a fully configured InfinitySet workstation, the performance should be similar to that of the standard InfinitySet with Unreal Engine. As the Presentation Mocule is built on top of InfinitySet, it can take advantage of the rest of InfinitySet's features, allowing to toggle between the Edit and Presentation modes, and not interfering with normal operation. When selecting Edit, the system behaves like a standard InfinitySet.

The Presentation Module allows to directly control InfinitySet or Aston by using a **clicker, StreamDeck** or similar device, which triggers the different slides or objects in the project, allowing presenters to drive the event without any operational knowledge on Brainstorm, further separating creation from playout.

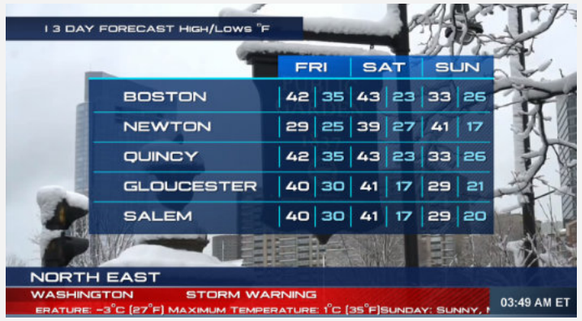
Enhanced Layers, Scripting and External Data Link

UPD

Stack is a functionality of the Layers feature that allows to compose a single image (output) by combining different renders. On Suite 6, this feature has been enhanced so the canvas where the stack is composed can be of any size (depending on the hardware and outputs) and **aspect ratio**. This means that users can compose any type of output regardless its aspect ratio, allowing for filling in large LED walls, real or virtual, with a Stacked Layer output, even with multiple **Aston stacked layers**.

This is especially useful in live shows or events, where the dimensions of background LED screens, and especially their shape or aspect ratio, are quite different than the standard broadcast aspect ratio of 16:9. However, with the increased usage of LED walls of any size and shape in broadcast for news, sports or shows, being able to compose an output by using different renders and objects by using just a single workstation, it simplifies the workflow and adds functionality.

The stacked layers that compose the final output can have **different sizes and aspect ratios**, and are **mapped in the output canvas**. Users can also create **interactions** between the layers, such as dedicated **blending modes**, movements, etc., meaning it is possible to create, using Aston, bespoke outputs that fill in a LED of any size and aspect ratio with animations, scenes, data-driven graphics, and any other design, plus including the StormLogic to add transitions between them.



SCRIPTING AND EXTERNAL DATA LINK

Brainstorm products, and Aston is no exception to this, have traditionally excel in connecting to external data sources. Such external data can then be internally linked to graphics or objects, and be automatically updated in the template in real time as the values change.

Brainstorm can connect to virtually any external data source, including Excel, XML, ODBC or RSS, and also other formats like CSS or XMP. Once the data are in the software, we can directly add spreadsheet-like formulas so operations like re-order, average, and many other can be performed to the original data, preventing the need to alter the original source.

On top of the spreadsheet formulas, users can include Python scripting to allow for more complex requests to improve the data presentation. Brainstrom does not require an SDK to include scripting, as the interface itself creates an internal value for each available editor and converts it into Python directly in the UI, which allows for simpler scripting to be performed without any programming background. This works by using the concept of ITEMSET>ITEMGO, that creates simple scripting in a way somehow similar to applications like IFTTT (IF This Then That).

HTML5 Playout Support

NEW

Aston OnDemand now features HTML5 playout support, which allows its integration in HTML newsroom control systems (NRCS) for graphics management and playout.

HTML5 Newsroom Support

NEW

Although this feature is not directly related to Suite 6, it represents a major breakthrough for Neuron, as it opens the path to abandon ActiveX developments in favor of HTML5. With HTML5 support, Brainstorm opens up the door to compatibility with any web-based NRCS applications. Examples of this integration are **Octopus Newsroom, Etere Nunzio or Snews Arion**, while other NRCS are on its way to be included in the list of available newsroom integrations.

As this feature goes in line with the industry trends for NRCS, existing partners such as Octopus are already using HTML5 to integrate Neuron with their most advanced and updated product line, resulting in more opportunities for the end users to decide which technology to adopt, while opening the door to further workflow flexibility. This enables Octopus users to send and receive graphics for their rundowns through MOS objects. Within the Octopus interface, users can preview graphics before adding them into the rundown. Real-time updates facilitate navigation through the rundown seamlessly while accessing all linked graphics instantly.

UNREAL ENGINE WORKFLOW

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Unreal Engine 5.3 Support

NEW

Suite 6 is fully compatible with Unreal Engine 5.3, including all the features of such version like Lumen, Nanite or MetaHuman.

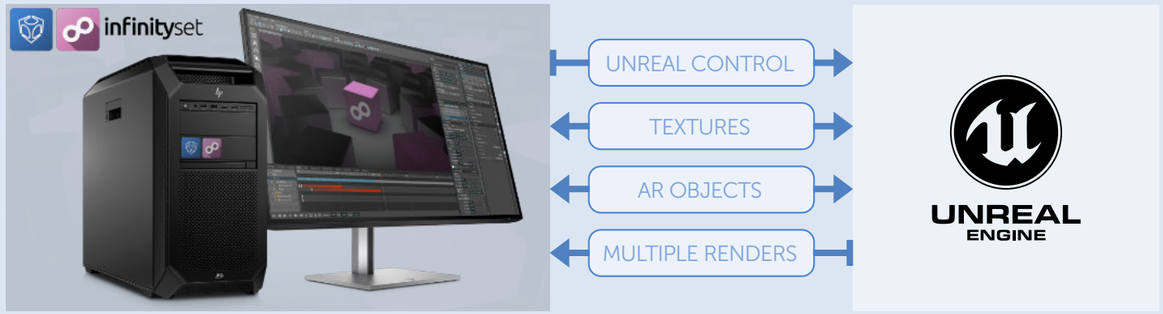
Unreal Native workflow

The original approach with the Combined Render Engine meant that InfinitySet did not work as an Unreal Engine (UE) native application, while competitors claim they are Unreal-Native, meaning their applications work directly into the Unreal Engine.

Using Unreal Engine as the only renderer for all the elements in the scene allow such competitors to use **all the possibilities UE provides**, especially when new versions of the engine are released, with little development. However, this also implies they are **constrained to the UE features**, and especially in complex scenes or in live production, they have to rely on the game-oriented workflow of UE which lacks flexibility in real life productions. Since Suite 4, InfinitySet can also take advantage this **UE-native behaviour**, effectively having the **same performance within UE** than other competitor applications, but with the added benefits of using the Brainstorm environment.

Before Suite 4, the Combined Render Engine (CRE) used UE as a background, placing the talents and graphic elements over the rendered background as required, and keying the elements that need to be placed in front of the talents/AR objects. UE projects can in-distinctively be background or foreground within InfinitySet, and with **100%-pixel accuracy guaranteed.** This opens up the door to create **AR with Unreal Engine** with total ease. Unreal Engine can now be used in **different Crosspoints** (TrackFree, Track AR and TrackVR), and the InfinitySet itself configures the Unreal Engine project depending on the Crosspoint type, automatically deciding how and where the UE project will be used. In this sense, if we open a UE project in TrackVR, InfinitySet understands it must be a background, and arrange accordingly. Using TrackAR, InfinitySet will automatically place the Unreal objects on top of the live camera view.

UNREAL ENGINE NATIVE WORKFLOW



The implication is that each camera can ask **different instances to the UE project**, which opens the door to having more than one simultaneous UE renders (hardware dependant). As a side effect, becoming UE-native means we can support the latest version of Unreal Engine (5.3 at the release of Suite 6), including any new functionality it might include, like real-time Ray Tracing with Nvidia. Already since Suite 4, Ray Tracing has the same value and possibilities as with the other mentioned UE-native products, as Brainstorm can use Unreal Engine as the only renderer, if required. **Now, Suite 6 shows an even tighter integration with Unreal Engine**, and also allows for including UE objects within the InfinitySet world (see later in this chapter).

UnrealControl (UC)

UPD

UnrealControl is a module that allows to **directly control Unreal Engine from InfinitySet's own interface**. UC not only can see any blueprints, but also objects and properties in the UE project, and even control them directly from InfinitySet, which results in a new, unique and **revolutionary workflow** that does not require to previously prepare blueprints for every action in UE. This is made via the **Property Picker feature** within **UC**, that effectively can select, control and edit any object and properties of the Unreal Engine project without the need for creating blueprints.

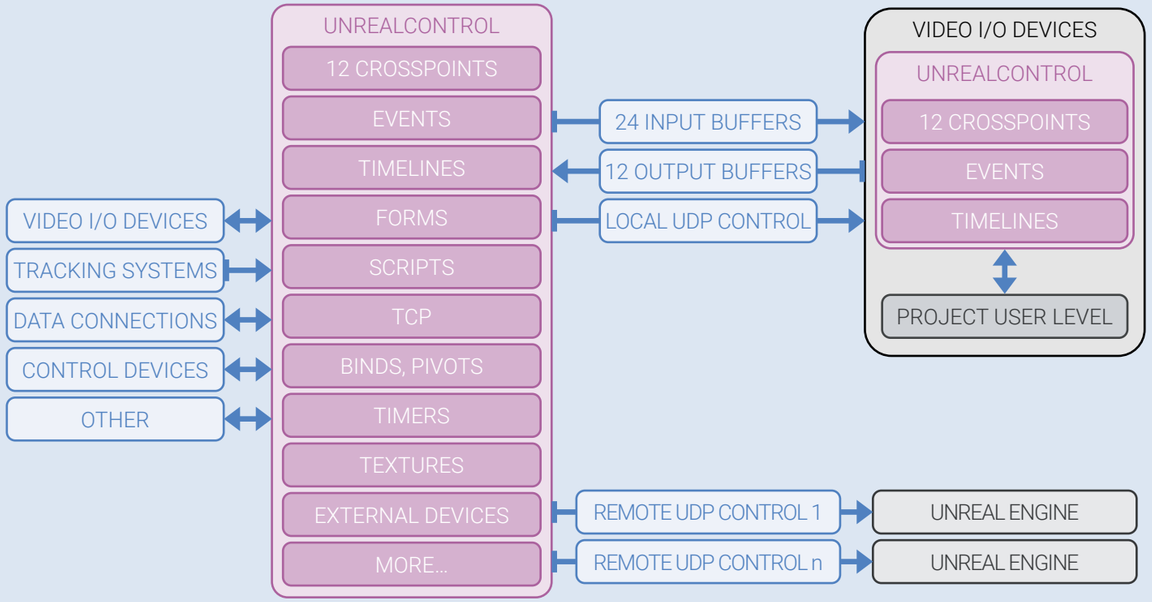
With UnrealControl users can create **limitless instances of any**

object in Unreal Engine, which can be **recalled at any time**, even from playout applications like OnDemand. Other competitors, including the so-called Unreal-native, cannot achieve such level of control, as they can only see blueprints and do not make instances. Likewise, InfinitySet can directly **receive textures with alpha** channel or even **full objects** from Unreal Engine to **integrate in a virtual or augmented reality environment**.

So, being able to receive objects from Unreal Engine, InfinitySet users can create **AR content using Unreal projects directly in the Brainstorm environment**, therefore taking advantage of all the features of the Brainstorm engine, including data-driven graphics, forms, text management, broadcast workflow compatibility, and much more. UC can even transfer Aston projects directly to UE, including external video, Crosspoints, objects and textures.

So, effectively, **InfinitySet is Unreal Engine-native**, if we want to, and also adds a **user-friendly, live production-oriented control interface**. With Suite 5 users can achieve **anything** Unreal Engine provides, in a workflow fully integrated into UE, but with the many added benefits of including the **experience** of Brainstorm in broadcast and film graphics, virtual set and augmented reality production. This workflow allows users to achieve the highest rendering performance possible, adding superior scene photorealism, and native Ray Tracing implementation.

UNREALCONTROL INTEGRATION WITH UNREAL ENGINE



Enhanced Compositor

NEW

Compositor is a feature of InfinitySet that simplifies the integration of real video feeds (such as keyed characters) within an Unreal Engine scene. Compositor blends the UE features with Brainstorm's unique TrackFree™ capabilities, so for instance virtual elements can drop realistic shadows over real elements.

As Compositor converts a video feed into a geometry within Unreal, this opens the door for more flexible and realistic integration of virtual and real objects, including reflections, shadows, transparency and refractions, to name just a few. It also allows for advanced UE features like Lumen or Bloom to affect the video elements seamlessly.

Unreal Engine AR Objects within InfinitySet worlds

UPD

As mentioned before, with Suite 4 InfinitySet opened the door to include UE objects as **layers** for AR creation, which was a step forward towards a full integration with UE, but still lacked the flexibility required by content creators when facing AR projects using UE objects.

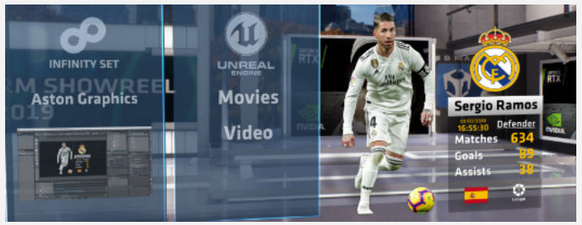
Since Suite 5, **InfinitySet could integrate UE objects** directly, pixel and color accurate, within the **InfinitySet 3D world,** as another InfinitySet object, so any object created in UE can be exposed like any other object, a feature that has been polished and updated for Suite 6. These UE objects no longer have to be textured layers, they are part of the scene, and therefore can sit **anywhere in the scene and interact with the rest of the elements**, with reflections and refractions for instance, which is essential for a correct integration with the real content.

Texture Manager

UPD

Unreal Control works in a **bi-directional way**, so not only can control blueprints, objects and properties from InfinitySet's interface, but it can also **transfer any input to Unreal Engine** to use it as a texture within a UE object:

- **Live video**, including chroma keyed talents
- **Movies** and playlists
- **Still** images
- Aston **objects** and **projects**, including the **StormLogic**
- Regular **textures**

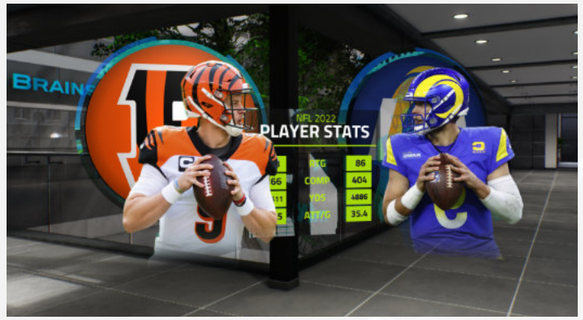


Such textures can be **applied to any object within the UE project**, like monitors, LED volumes, floors, walls, flags, etc. So, it is extremely easy to edit Unreal Engine projects using the more friendly Brainstorm environment.

Templates and data-driven graphics in Unreal Engine

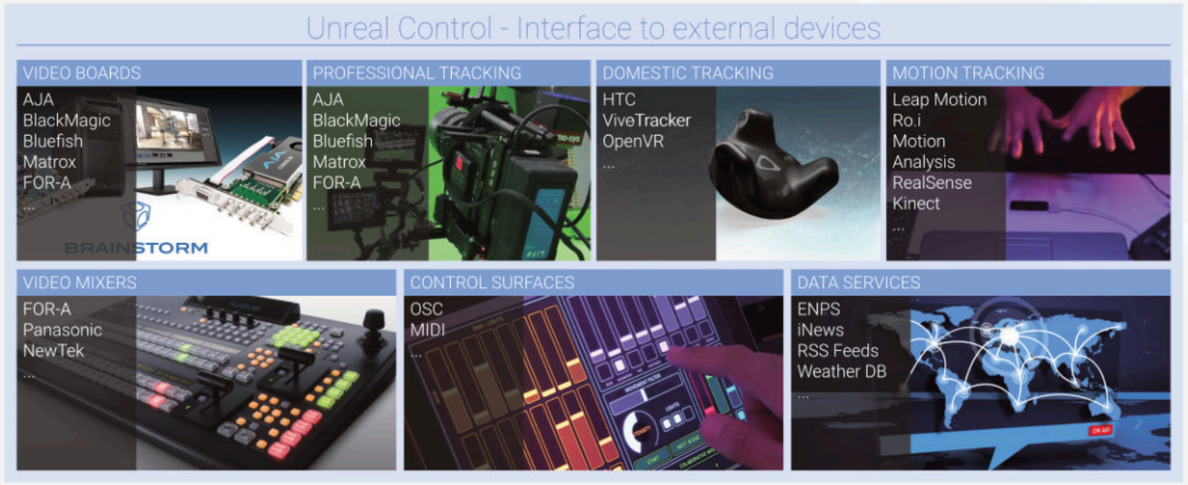
UPD

The Combined Render Engine is an effective and transparent solution to include statistics, charts, text and other broadcast graphics within UE-generated content. Brainstorm Suite 5 goes one step beyond, being able to send Aston projects directly to UE as textures, including its StormLogic, or alternatively using an Aston as a layer over UE. This opens the door to having typical broadcast graphics like tickers, lower third, etc within Unreal Engine scenes, and drive them as in a standard broadcast workflow, which is essential for television production. This is



possible because what Brainstorm offers goes far beyond what a game engine can do by itself. Broadcast graphics workflows have specific requirements, like database connections, statistics, tickers, or lower thirds, a variety of elements that are alien to the game engine framework but essential for broadcast operation.

This allows for adding advanced audio-visual aids such as in-context typography, motion graphics, statistics, charts and many more, all perfectly integrated in the composition both in animation, tracking, perspective matching and image quality.



For UE-based competitor solutions, graphics and data-driven projects can be a nightmare to create using blueprints, and even more complex to edit and impossible to alter in live production, but the Brainstorm control layer allows doing so with total ease. On top of that, InfinitySet UnrealControl can also be used to create FORMS for controlling external hardware devices and software applications.

Video reflections with UE

UPD

One of the added benefits of the Texture Manager approach is that we are able to **transfer textures to and from the UE environment** and the InfinitySet world. On Suite 6, the enhancements in this feature, combined with the ability to integrating UE objects within the InfinitySet environment, makes the insertion of UE objects as AR easier and more realistic.

Any UE object that is inserted within InfinitySet as an AR object can now **reflect the environment** it is placed on, and if it has properties such as **refractions** or lighting, these are also transferred to the final scene and applied accordingly. This opens the door to create fully realistic AR scenes with hyper realistic UE objects, perfectly integrated regardless its complexity, and applying their properties, even with particles.

Combined Render Engine

UPD

Brainstorm's initial approach to external render engine support was unique in the industry, providing alternatives for using different render engines so users can achieve anything they require. Brainstorm's combined its eStudio render engine with Unreal Engine in a single machine, that is, the **Combined Render Engine**. Despite the new developments and the improved UE compatibility and UE-native workflows, the Combined Render Engine approach is still valid and available for users, so they can select whatever fits best with their requirements or workflows.

InfinitySet's TrackFree™ technology allows for using tracked, fixed cameras or a any combination of them, using internal or external chroma keyers. When using fixed cameras, InfinitySet can move the scene rendered by Unreal, by using InfintiySet's own camera presets. InfinitySet's FORMS also allow for easily design and apply custom interfaces to control Unreal's rendering and blueprints directly from InfinitySet.

With the Combined Render Engine, Unreal Engine's render are transferred to the InfinitySet engine in real-time, allowing the combined engine to combine the background, the chroma keyed talent, the data-driven graphics and other elements. Most importantly, CRE makes both engines to behave like a single render engine, and working in a single machine. In essence, the CRE combines with the PBR capabilities of our engine, so we can match the image quality of the backgrounds with that of the broadcast graphics, primitives and text objects which are essential in broadcast and AR operation. The Combined Render Engine also supports 4K in a single system, unlike other competitors which require a dedicated rendering machine to create AR with Unreal Engine. It does not require external tracking thanks to the TrackFree™ technology, and supports both tracked and mouse movements at the same time, as well as Brainstorm's internal or external chroma keyers.

DEBUNKING THINGS THEY SAY...

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Most competitors use Unreal Engine as their one and only render engine, so they claim they work natively in Unreal and therefore are more deeply integrated than Brainstorm. That is not the case anymore, as we will see in the next pages, but, most importantly, it also implies that our competitors are limited by whatever Unreal Engine delivers, while Brainstorm provides a plethora of features and connectivity on top of the UE offering (even using our UE-native workflow), due to our decades-long experience in the business.

Following you will find some claims we've encountered when facing the competition, and we'll explain how some are obsolete, others directly untrue, but all of them easily debunkable.

"Brainstorm's internal engine treats Unreal as a plugin"

"Unreal is just a background for Infinity Set"

"Unreal has to be stopped to edit the project"

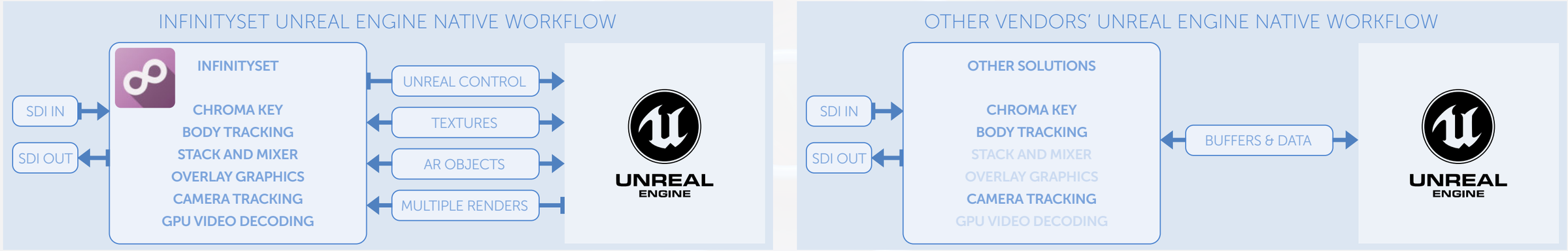
"Brainstorm requires Python versus Blueprints"

Claim:

Brainstorm's internal engine treats Unreal as a plugin

What does that even mean?

Other UE-based vendors use a modified version of Unreal Engine, and they also process the inputs through a middle application, driving Unreal from such interface. InfinitySet can simply do more than just being an Unreal controller.



Claim:

Unreal is just a background for Infinity Set

This is not true since Suite 5.1, and it has been vastly improved in Suite 6. With InfinitySet, the video input is spatially placed on the Unreal scene, and the composition happens in Unreal.

When creating Virtual Sets, there is no need to mask the objects in front of the talent, and the video input can be placed behind defocused objects. InfinitySet also supports translucency in foreground objects with refractions, so talents can also be reflected on any surface using Lumen reflections. And of course, they can cast shadows.

Shadows and ambient occlusion on the media surface are available for AR objects, also with fake 360 reflections. On top of that, image-based lighting is available using Lumen, Unreal's global illumination method.Bloom and light wraps are supported in AR objects (development in progress for virtual sets), but floor reflections is a development in progress for AR.

Claim:

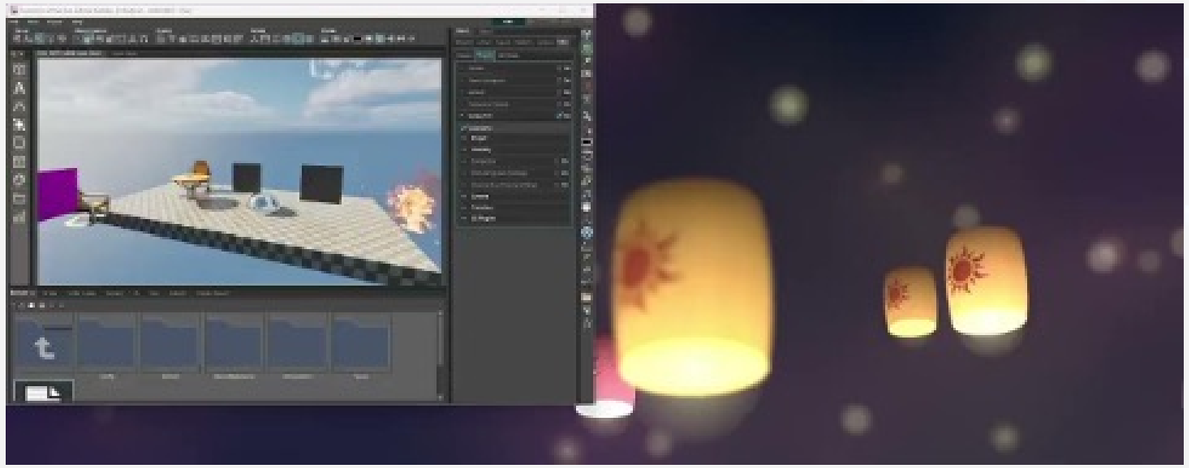
Unreal has to be stopped to edit the project

This is not true at all, as Brainstorm's Unreal Control allows for managing blueprints, objects and properties directly from the InfinitySet interface, and updates in real time in Unreal.

Do you need to move any actor? Just right click on it and select "Edit Transformation".

Need to find an actor or modify any other property? Just find it in the Actors list in the UECTL panel.

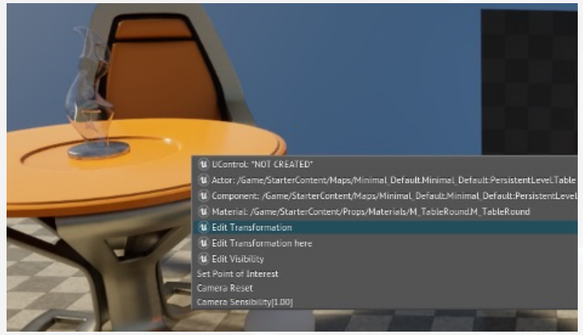
So, if the user needs to edit anything in the Unreal project, just have to use the Unreal Editor action.



Claim:

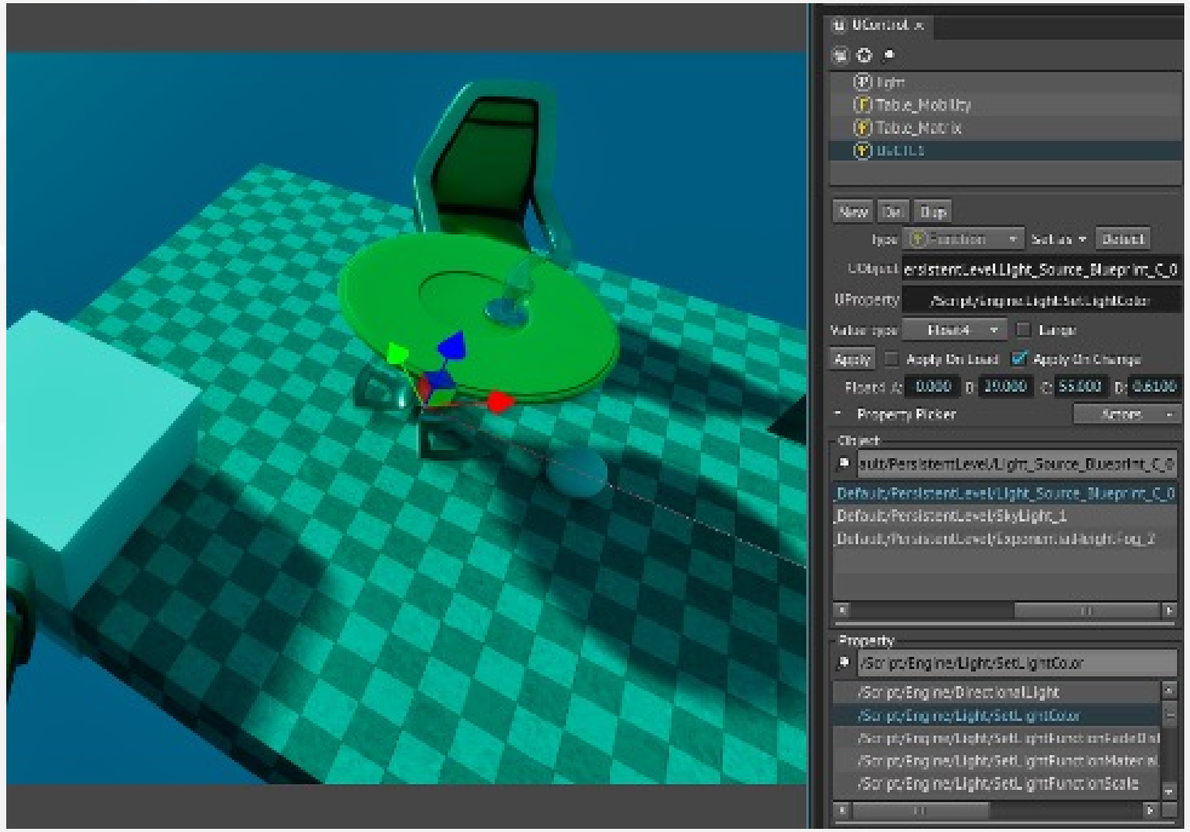
Brainstorm requires Python versus Blueprints

Well, actually users can use both.



Unreal artists can do all the scripting they need using blueprints. And Python can also be used to script UECTL or editors inside InfinitySet itself. Most interestingly, Unreal Engine and InfinitySet properties can be modified in the same script.

Not only Python, but also Lua can be used in case of high performance requirements (Python is slow and Blueprints even slower!). Other actions such as binding two properties don't ever require scripting at all. So, don't be afraid to challenge the competitors to match this versatility!



LED XR CREATION & WORKFLOW

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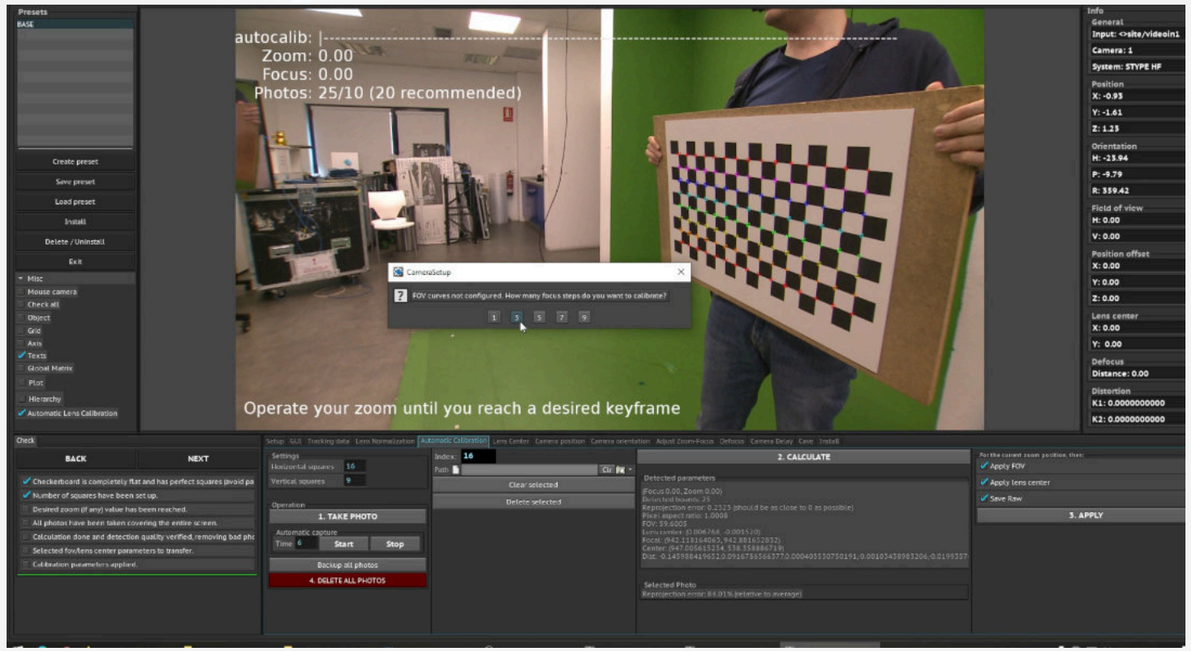
CalibMate - Automated Lens Calibration

NEW

CalibMate allows for automated lens calibration with InfinitySet. Camera lens calibration is a complicated and manual process, as there are not two lenses that are exactly the same, for obvious manufacturing issues. CalibMate makes the calibration process more mathematically accurate, as it runs the lens data through a purpose-built algorithm that excludes human error while simplifies the process.

CalibMate uses a physical pattern that is recorded with the required camera+lens combination, and though the analysis of the different shots uses the mentioned algorithm to recreate the lens geometry (including aperture, nodal point, distortion...). This analysis provides the data required to re-create the lens properties in the InfinitySet rendering, resulting in a pixel accurate virtual scenery that fully matches what the lens "sees".



XR Config

NEW

XR Config is a script designed to simplify the setup of XR environments. This script automates the InfinitySet configuration for a given XR setup just by inputting the required data: screen size, resolution or format (flat, corner, floor...) of the LED wall.

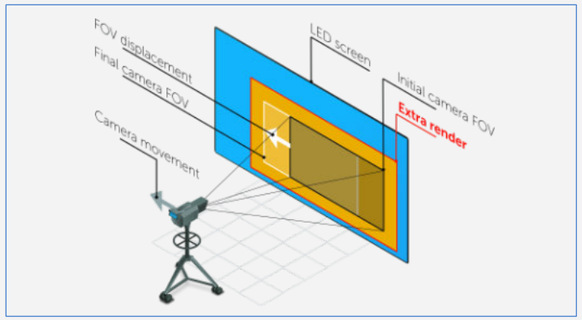
Predictive Extra Render

NEW LTR

One of the obvious issues of any LED-based XR workflow is the delays resulting from the time difference between the capture of the tracking data, that is, the time required for rendering the image and displaying it on the screen prior to the camera capture.

If the camera only captures a portion of the LED screen, we will just need to render an image that fills in the field of view (FOV) of the camera, with the resolution of the camera capture.
But, in any real situation, the camera moves while the rendering is being done and sent to the screen, so we will need to render a larger image than the required for the camera FOV, to fit a "safe projection area" which will prevent the camera to see a blank, non-rendered image when moving.

This is called "extra render" and can be created either as a larger than the camera capture (HDTV, 2K, etc) render, or as an interpolated image (extra FOV), an image with the same resolution of the camera output but stretched to fit the "safe"



larger projection area. As extra render is required when the camera moves, or zooms out, it makes sense to predict where the camera is moving towards to render the extra pixels only in that area. So, for example, if the camera moves to the right, InfinitySet is able to discriminate this so it will only render the extra image on the right side of the current field of view.

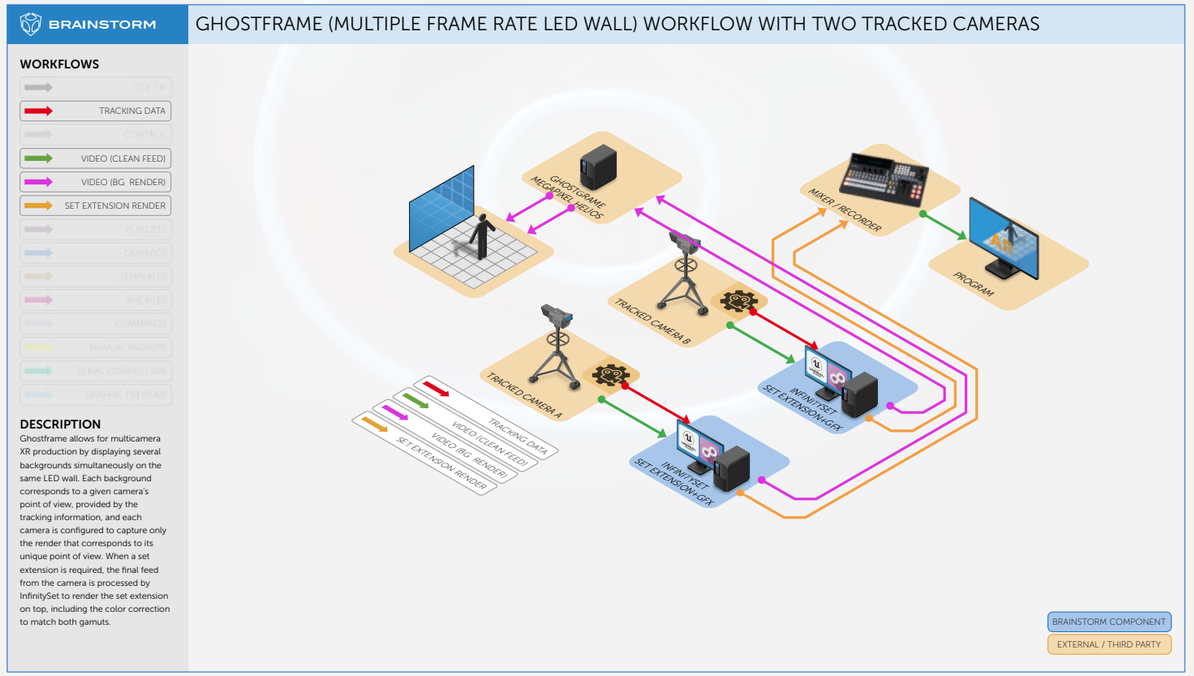
Enhanced XR Tools

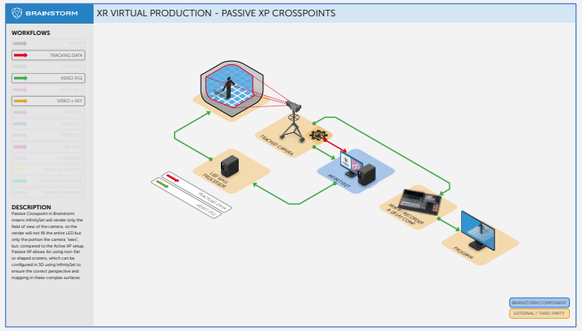
UPD

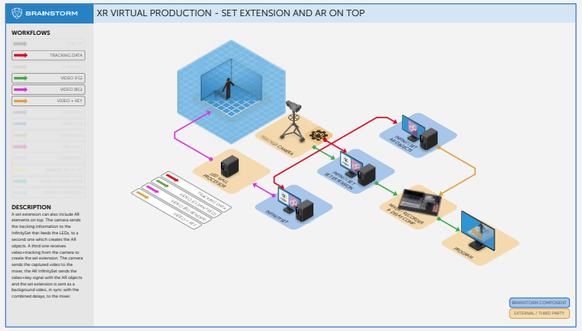
In multi-camera productions with LEDs, cutting between cameras becomes more complex, and sometimes impossible. As the cameras have, most likely, different FOVs and perspectives, live cuts from one camera to another imply sending a different render to the LED wall, and sync the whole operation accordingly. Film productions most likely will be shot in single camera mode so this issue should not be that important here, but in live or live-to-tape productions multi-camera is widely used for time savings.

There are several methods to overcome this issue, like multiplexing images several time the frame rate in the LED wall, or creating macros on the production switcher. In any case, InfinitySet is fully compatible with Ghostframe, Frame Remapping and other multiplexing tools, and also with mixer macros, which allows greater flexibility when designing LED-based XR Multicamera environments.

Also, Set Extension is often required when using smaller LED volumes, or when featuring wide shots that capture the scene out of the boundaries of the LED screens. In this cases, we will need to render the same scene that the LEDs show, with the same tracking, perspective, and lens parameters, and place it on top of the camera footage. This means that this render will need to match the colorimetry of the LED output. Brainstorm has developed tools that make this matching easy, using 3D LUTs to ensure the color matching while making this operation transparent to the users.







GRAPHICS AND USER INTERFACE

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Aston Graphics Instances

NEW

Aston was developed with collaborative workflows in mind, allowing for multiple inputs from designers and other team members typically involved in the creation, composition and/or playout of sophisticated graphics projects. In this way, Aston allows for sharing objects, libraries, presets, compositions or even complete projects so they are available to any user on the network, even with remote teams or freelancers.

To further facilitate this collaborative process Aston now includes Graphic Instances, the ability to create centralized assets (instances or pre-compositions) that can be recalled by any designer to be included in any graphic or template. The instances allow for creating elements of sets of elements that a designer can reference or recall without the need to creating them for an individual graphic. These instances do not belong to the graphic but to a common library, and can be shared by any designer or included in any project.

Being common elements, Graphic Instances can be modified in the central library, so the changes are automatically applied to any graphic or template they are included in. On the other hand, instances can also be modified within an individual graphic or template but this changes will not be applied to the initial asset.

Graphic Instances greatly simplify the design process and provides additional control to the leading designers, as they can not only create pieces and concepts that the rest of the team then use to create all the versions required, but also ensure that the looks and essential updates can be applied directly, without the intervention of the rest of the team.

BRAINSTORM

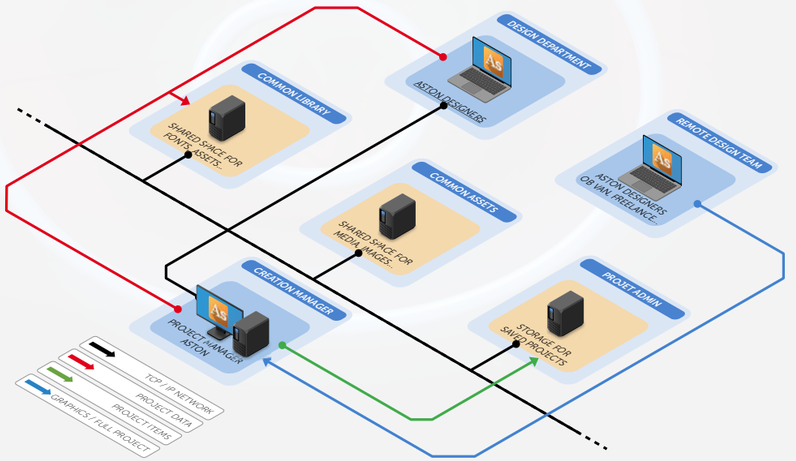
ASTON COLLABORATIVE WORKFLOW | ASTON GRAPHICS INSTANCES

WORKFLOWS

- TCP / IP NETWORK
- PROJECT DATA
- PROJECT ITEMS
- GRAPHICS / FULL PROJECT

DESCRIPTION

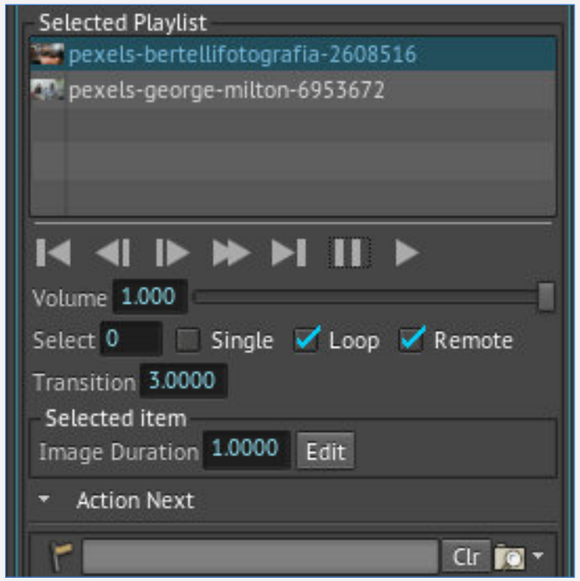
Aston integrates seamlessly into collaborative workflow environments, allowing for multiple inputs and from designers and other team members typically involved in the creation, composition and/or playout of sophisticated graphics projects. In this way, Aston can share objects, libraries, presets, compositions or complete projects so they are available to any user on the network, including remote designers. Aston Graphics Instances also allows to create instances (pre-compositions) that can be recalled by any designer, and updated automatically when edited by the main designer.



Blending FX in Playlists

NEW

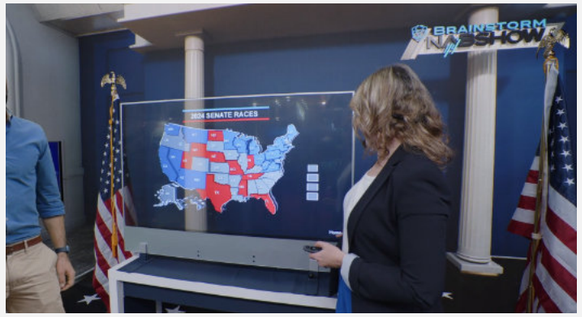
Suite 6 incorporates new features on the playlists. In previous versions, InfinitySet was able to display playlists on the virtual screens, but only with cut transitions between elements. With Suite 6, Brainstorm includes additional blending modes, such as Fades and Wipes, greatly enhancing the possibilities of the playlists used within the virtual scene or objects.

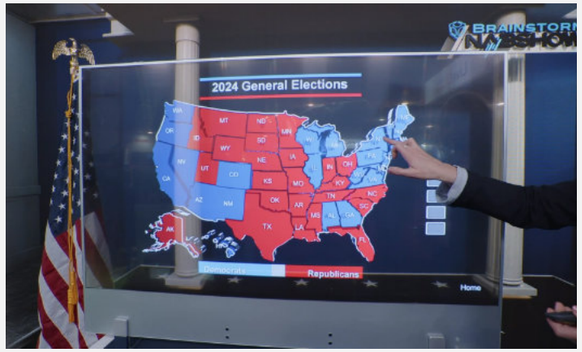


Built-in Touch Screen Creator

With Suite 6, Aston features a built-in toolset to create interactive projects that can be used with a touch screen. This toolset permits the creation of specific buttons to trigger actions, and supports multi-touch gestures, which allows for creating interactive projects that can be used while in production by presenters, on screen.

On top of that, this feature includes real-time telestrator capabilities that allow for fully interactive management of the Aston graphics from a touch screen, even while on-air.



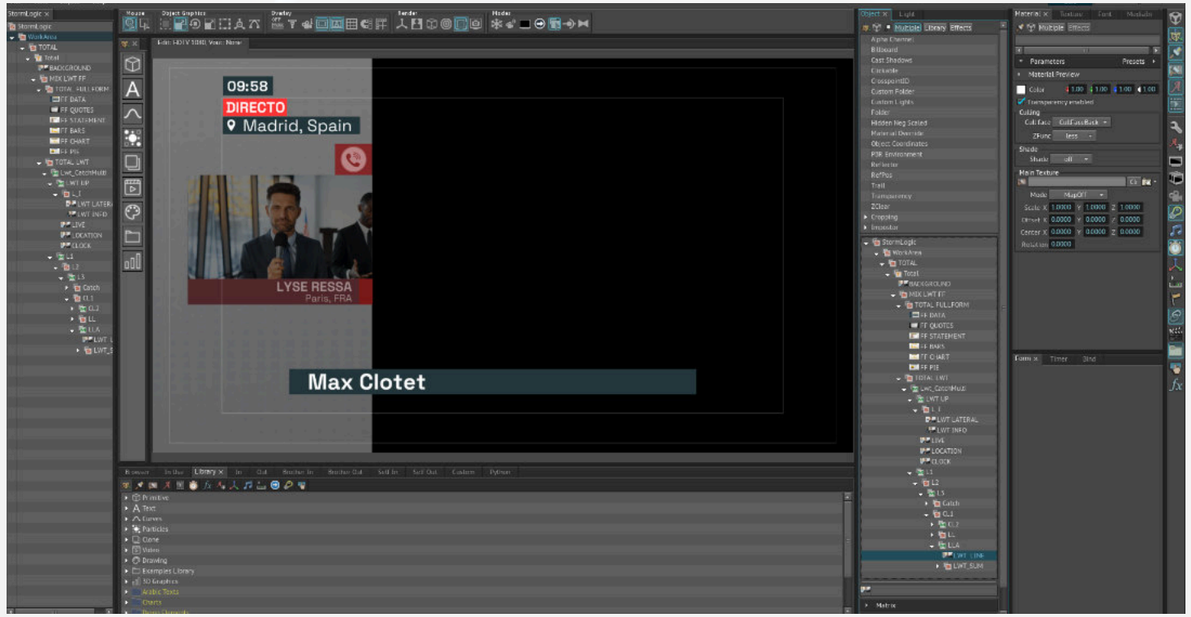


Enhanced StormLogic

Brainstorm's StormLogic is one of the most, if not the most, advanced interaction logic for graphics on-air playout. Aston graphics, and InfinitySet, fully support StormLogic, enabling the automatic management of complex interacting graphics and templates without the usual need for hours of programming and the creation of complex tables or spreadsheets, providing users with an extremely flexible playout system.

StormLogic allows building complex animations and interactions between elements with no need of scripting or complex animation matrixes. What makes StormLogic different is that its logic works at the group level, not at the template level, while competitors have to define the logic between each template, template by template, one by one, or even between each page, one by one. So, when using StormLogic we have control of the complete series of interactions at anytime, while other systems in the market need to define the interactions between each element.

Suite 6 adds in new transitions and interactions between templates, such as Crop and alpha-channel based transitions, which greatly enhance the visual impact of the graphics playout. Of course, and on top of that, Python scripting can be input directly in the Aston interface, creating the custom scripts with total ease, even creating additional, specific functionality within the software.



Media Viewer

MediaViewer is an Edison feature that has been upgraded to work with the rest of the products in the Suite. MediaViewer allows users to see all the inputs the system has available as if it was a multiviewer. This makes possible to control, from the interface, all the system inputs in a visual format, in separate windows for better control of the scene elements.

INFINITYSET KEY FEATURES

suite6

VIRTUAL SET

Resolution-independent: HD, 4K and higher

Built-in libraries of sets, materials and textures

TrackFreeTM

- 3D Presenter: Volume, lighting, shadows
- TeleTransporter
- HandsTracking
- Freewalking

FeetShade

PBR Materials

MagicWindows

- VideoGate and VideoCAVE

Virtual camera detaching

Dynamic Virtual Shadows over virtual elements

Combined Render Engine with Epic Games' Unreal Engine

Chroma Key

- Internal Chroma Key
  - » Main single-click Key
  - » Difference Key
  - » Automatic spill correction
  - » Unreal Engine Key
  - » Secondary Key for FeetTracking
- Color correction to match live sources with virtual elements
- Support for 3rd-party Chroma Keyers
- Remote control of Ultimatte parameters

Support for virtually any external tracking hardware

Support for robotic cameras

Editable internal lighting

Remote control of external light panels (such as Arri Skypanels)

Selective defocus with depth of field and distance control

Compatible with most common 3D formats

Actor Chase

Starlight Virtual Light interface

PBR Rendering

Real-time Raytracing

Enhanced HDR Workflow

UNREAL ENGINE NATIVE WORKFLOW

Unreal Engine 5.3 Support

Enhanced Compositor

UnrealControl

- Control of any BLUEPRINT, OBJECT and PROPERTY inside UE
- Property Picker

Combined Render Engine

Enhanced Texture Manager

- IS can transfer any texture to/from UE and apply it to any material: Live Video, including keyed talents, Crosspoints (Display Out), Playlists, Aston, Regular textures, Movies
- Support for Alpha channels
- Support for Unreal AR objecta within InfinitySet environments
- Video Reflections in Unreal Engine

Templates and Data-Driven Graphics

- InfinitySet can use Unreal Engine editors to create FORMS capable of controlling external devices.
- Aston projects (including StormLogic) can be transferred to Unreal to become objects in the scene

XR WORKFLOW AND LAYERS

Multiple simultaneous renders

Mixer Crosspoint

Stack Crosspoint

CAVE Crosspoint

LED Layout Interface

CalibMate - Automated Lens Calibration

XR Config

Enhanced XR Tools - Multicamera, Set Extension...

Predictive Extra Render

Enhanced Stacked Layers

Creates XR content in any shape LED videowall

GRAPHICS AND AUGMENTED REALITY

4K and higher resolution graphics

Compatible with Aston projects

- Aston compositions overlaid over the virtual graphics
- Aston can be an additional layer in a Layer Stack

Direct editing of Aston graphics (Requires Aston license)

Compatible with Aston StormLogic

Object actions

Advanced animation

Augmented Reality graphics

Tracked Augmented Reality

PRODUCTION AND PLAYOUT

New OnDemand Lineup

Playlists of movies

Blending FX in Playlists

Support for multiple live input sources

Media Viewer

Virtually infinite virtual cameras and positions

Software Production Mixer for enhanced production

Optional virtual camera controller hardware (Hanabi 110)

Configurable crosspoints (camera, video input or playlist)

Embedded audio per input

Internal audio with independent control per playlist

ASTON KEY FEATURES

suite6

INTERFACE AND GRAPHICS CREATION

Ease of Use
Adaptative interface
4K and higher resolution graphics
Object-based 3D graphics creation
Aston Graphic Instances
Editable Bezier 2D & 3D curves
Object clonning
Dynamically defined Grids
Impostor (2D painting over 3D objects)
3D Primitives (surface, bar, pie) (extruded, torus, ring)
Built-in particle effects
Built-in Touch Screen Creator
Import of 3D objects and textures from third-party 3D software packages in a variety of formats (fbx, 3ds...)
Built-in libraries (fonts, materials, textures...)
Flexible Hardware configurations

MATERIALS AND RENDERING

PBR materials and support for PBR rendering
Unlimited movies or content resolution within projects
GPU movie decoding (Nvidia PureVideo)
Real time 3D projected shadows
3D texture editing
Reflector object

ANIMATION LOGIC AND TEMPLATING

Enhanced Stormlogic: Advanced Animation Logic

- Advanced intelligent group/object distribution
- Advanced object layering and interaction between objects

SmartTemplates Graphics creation and management
Pivots
FORMS - Custom interface creation
Layers - Simultaneous Multiple Renders
Enhanced Stacked Layers
Enhanced Scripting and External Data Link
Multiple projects in Playout Mode
Blending FX in Playlists
1-click reverse animation button

TIMELINE-BASED ANIMATION

Bezier-based and custom timelines
Advanced timeline animations (in/out, self...)
Timers and counters for non-timelined events
Timelines with no in points required
New Timeline Preset animations
New Font animation presets

MOVIES AND IO

Render to movie
Media Viewer
Frame accurate video decompressing
NDI IO

UNREAL ENGINE COMPATIBILITY

AR elements within InfinitySet worlds
Texture Manager
Template and Data-driven Aston Graphics in Unreal Engine

FONTS AND TEXTS:

Pre-rendered 2D fonts for Instant recall
Support for multiple alphabets and font sets
Vector-based and Shader-based 2D Fonts
Multiple text formats within a single text box
Real-time 3D Fonts
Intelligent text box with no script required
Highlight mode for text editing
Behaviour modes (autogrow, autofill...)
Text on a Path.
Advanced text creation (roll, sequence, counter, ticker...).
Advanced text effects.
Font Fix - Replacement of characters by images.
CG Mode.

SCRIPTING

External data link (database, spreadsheet, XML...).
Scripting capabilities (Python).
GAP protocol and SDK.

OPTIONS:

Dedicated external Aston Keyboard
Exporters plugins: PSD, AI, AE and 3DMax exporter
Aston Multichannel
Aston OnDemand