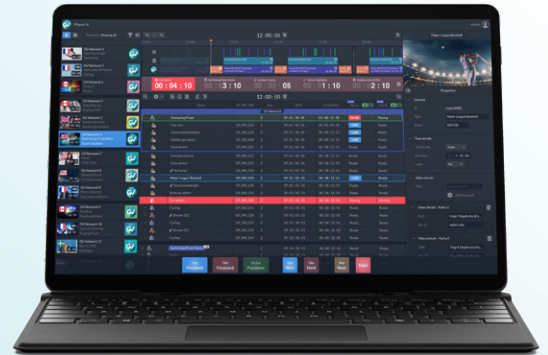


PLAYOUT X

Flexible, Scalable, Cloud-native Playout Solution



Broadcast-grade playout leveraging the power of Grass Valley's Agile Media Processing Platform (AMPP) technology.

Playout X is a broadcast-grade solution for schedule-driven playout, building on Grass Valley's rich heritage of playout and automation — relied on by thousands of channels around the globe to deliver their content every day.

Playout X is built on the Grass Valley® AMPP® platform, enabling flexible deployment of playout channels to meet the modern challenges of diverse media delivery and consumption.

The key principles of AMPP are the very definition of "edge computing," taking advantage of massively scalable cloud-native technologies. Using highly efficient microservices architecture and processing techniques, high-density channel deployments can be achieved with a choice of OS — Linux or Windows — for dramatically lowered cost of ownership.

This means Playout X channels can be deployed at scale on-premises, in public or private cloud, or in any combination of these, enabling video processing to be best placed to suit media locality or signal hand-off. With centralized orchestration

providing a single "point of truth," these diversely deployed channel legs can be managed and monitored from anywhere in the world.

While addressing the features and typical operational workflows of dynamic live and linear playout, Playout X goes far beyond the typical playout "point product." It leverages the power of AMPP, taking advantage of the rich suite of Framelight™ X asset management tools, while enabling solutions to be built with any combination of inputs and outputs supported on the Platform.

The ability to flexibly deploy channels and outputs enables direct integration into OTT and FAST value chains, supporting the diverse business models that are increasingly important in the shifting media consumption landscape.

Content registration workflows in Framelight X make assets available directly to the Playout X channels — meaning that content never has to leave your facility or control, even when hosting in your choice of public cloud.

Integrated support for AMPP control, through either operator UIs or scheduled secondary events, further extends Playout X solutions across both native Grass Valley AMPP and AMPP Alliance Partner solutions. This provides a truly software-defined channel chain that is easily adaptable, to suit any level of complexity.

AMPP and Playout X also provide a rich set of APIs, from scheduling to AsRun, logging, monitoring and beyond, allowing a "build once, integrate many" approach to system integration.

User configurable dashboards and GV.UI layouts capable of spanning multiple monitors and even integrating with hard panels — connected through the single point of truth provided by AMPP — allow operators' positions to be quickly and easily built to suit specific needs or preferred workflows.

Key Features

Video

- Live Inputs:
 - Uncompressed: SDI, SMPTE ST 2110 with -7 redundancy
 - Compressed: SMPTE ST 2022-2, SRT, RIST, NDI, RTMP
- Unlimited Outputs:
 - Uncompressed: SDI, SMPTE ST 2110, SMPTE ST 2022-6
 - Compressed: SMPTE ST 2022-2, SRT, RIST, NDI, RTMP
- SD, HD, UHD and HDR support with up/down/cross conversion
- Integrate with routing systems using NMOS IS-04 discovery and IS-05 connection management protocols for 2110 or NP17 & SW-P-08 for SDI routing
- Use NDI discovery, internal AMPP Fabric routing or AMPP Global routing
- Mixer transition effects

Audio

- Support for up to 64 audio pairs per channel
- Multi-language/track shuffling and substitution
- Audio description/described video
- Dolby D, D+ and E support with up/down mix and pass-through
- Integrated audio loudness correction (ALC)
- Kantar and Nielsen (including Numeris) audio watermarking, with support for multiple profiles

Ancillary Data

- SCTE 104/35 Support:
 - Act on or insert SCTE 104/35 messages with splice inserts, time signaling and segmentation metadata
- X31 Insertion
- AFD and ARC
- XDS and VCHIP
- Multilingual closed captions/subtitles:
 - 608/708 and WST/OP42/OP47
 - Open captions/subtitles
 - DVB bitmap and SCTE-27 subtitles

Graphics

- Native logos and DVE
- Integrated support for HTML5 graphics rendering including crawls/tickers
- NDI fill and key input

UX

- Operational focused UIs:
 - Network overview, schedule control, offline schedule building, “events UI” break management
- Advanced schedule manipulation and monitoring tools
- Commercial minutage counters
- Over and underrun alerts
- Multiple timers and clocks

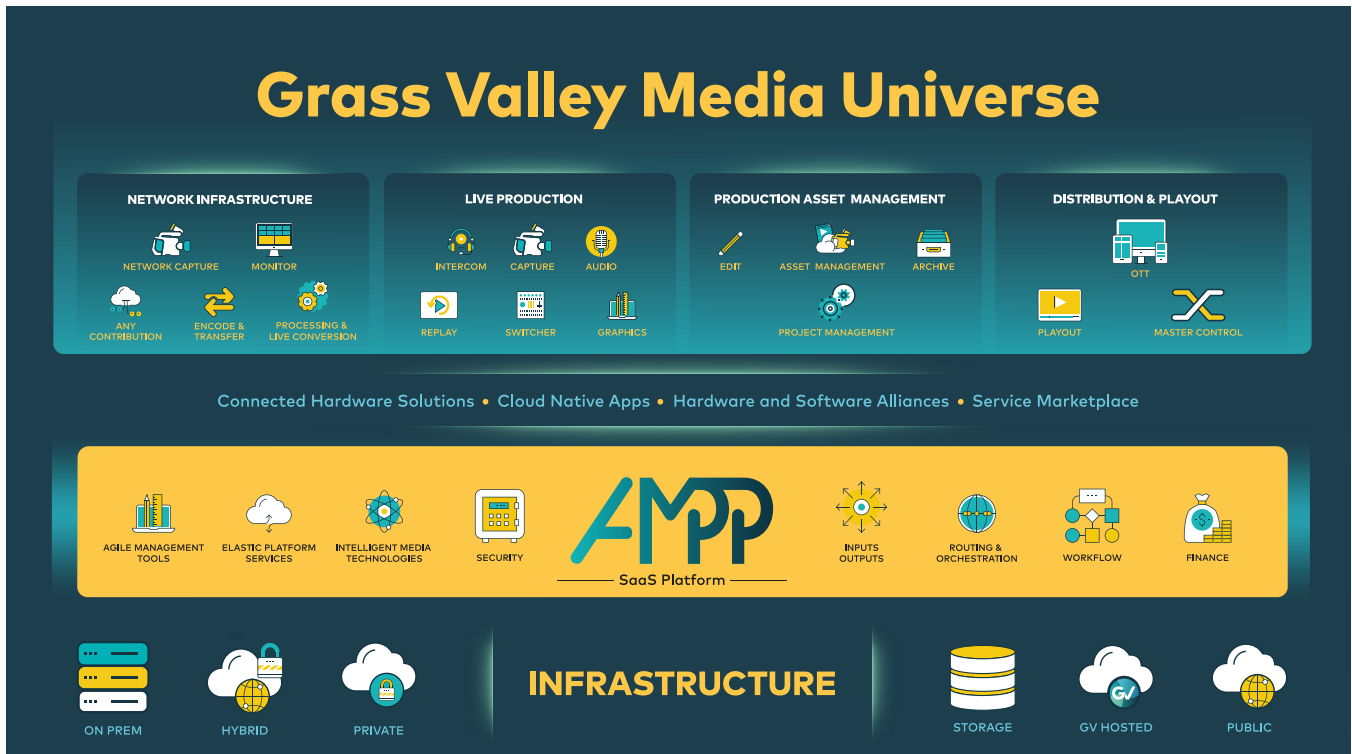
- Multichannel and gang controls
- User customizable interfaces using GV.UI
- Assignable user rights, including “read-only” views

Workflow

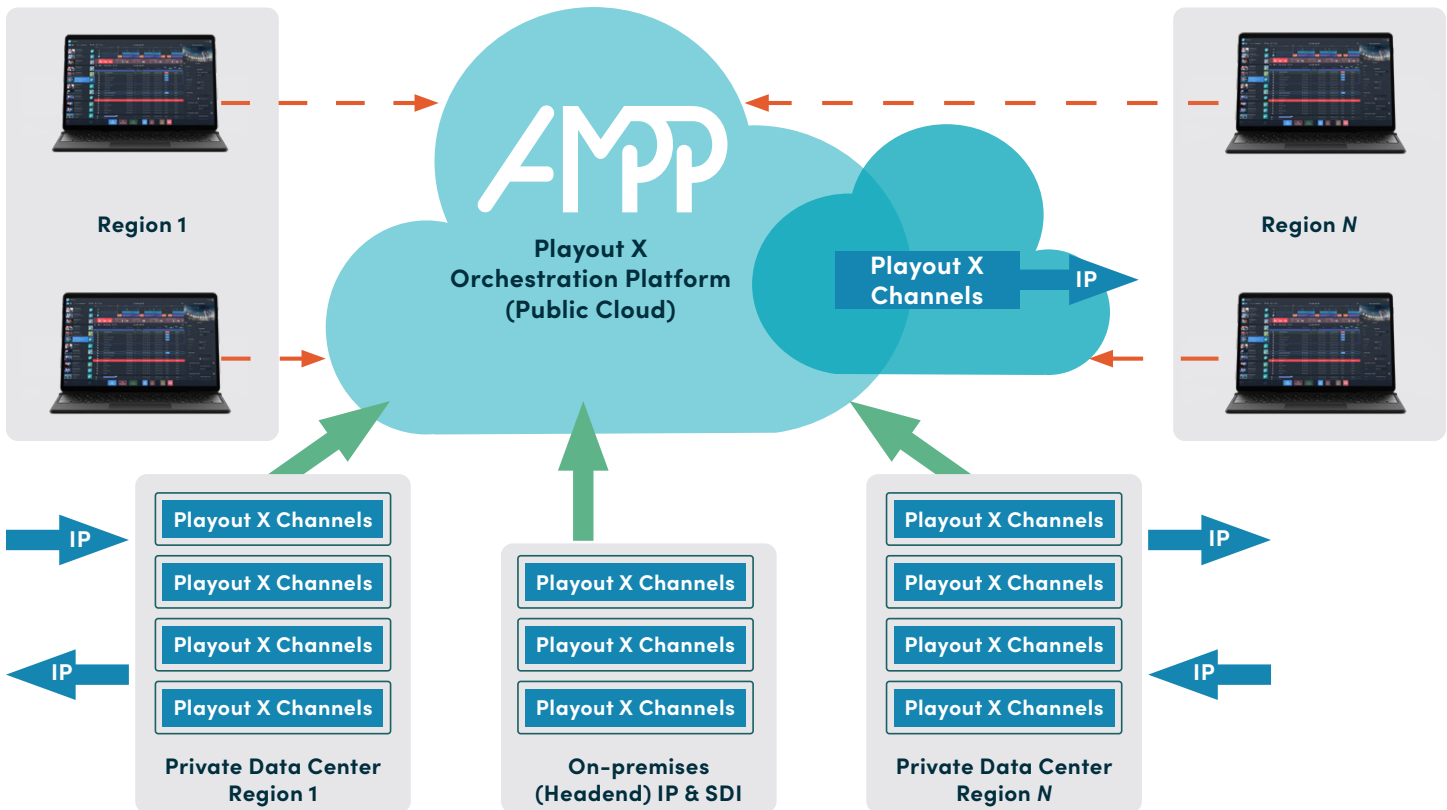
- Integrated Framelight X for playout asset management:
 - Register images, audio, video and subtitle assets
 - QC with generated proxies
 - Clip editing and easy soft-segmentation
 - Federated search and drag and drop to playout
- Secondary record, with configurable take-off points
 - Registers in Framelight X to supports growing file workflows
- Simple and complex delay channels
- Regional channels
- Schedules API
- Missing material API
- AsRun API

Resilience

- Flexible redundancy with 1+1, N+1, N+M
- Hybrid channel deployment support



Playout X: Architecture



In the above diagram we can see that we have the following system components:

- 1. The Orchestration Platform:** This is where the schedules are loaded and processed by the automation services along with other functions such as user authentication, security and as-run logging. These software services are all cloud-native and run in Docker containers under Kubernetes within AWS.
- 2. Playout X Channels:** Originates a channel output as derived from the schedule. Multiple Playout X channels can be run against a single playlist to provide resilient streams. Channel configuration can be changed on demand as requirements change.
- 3. Cloud or On-premises:** Depending upon the application, Playout X channels can be run in the cloud (public or private) or on COTS hardware located on-premises. For example, if the distribution is a compressed IP stream for OTT delivery, then the Playout X channel is best hosted within the cloud. If the distribution requirement is for uncompressed IP stream or SDI, then the Playout X channel can be hosted on on-premises hardware, located near to the distribution system for these signal types.
- 4. Operational UIs:** The operational user interfaces are HTML5 web-based, which can be accessed – with appropriate credentials – from any location that has a network connection to the orchestration layer.

Playout X: Operational User Interfaces

All Playout X operational user interfaces are modern, HTML5 web-based and are used to configure and control the system. These can be accessed from any location – with appropriate credentials – via a secure connection to the orchestration platform. The solution provides a set of standard configuration and control UIs, which can be combined into layouts using the GV.UI application to provide user customizable operation and control position. Users also have the option of utilizing the extensive AMPP APIs to develop their own interfaces, making Playout X very flexible and extensible.

This UI shows a typical list-based view of a network or networks. The status of the events is shown across all streams. In this example, it displays which site each output is originating from and which of the main/backup channels is generating the final output. Also, event-specific data can be viewed and edited in the “Property Inspector” on the right of the UI.

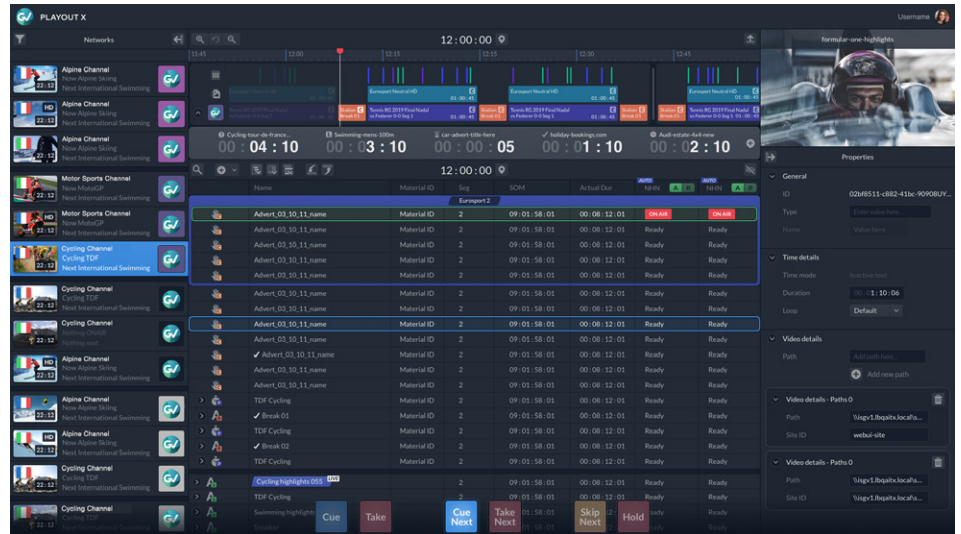


Figure 1: Channel Control UI.

This UI shows a view of multiple networks horizontally. The operator can easily see, by the use of different colors, different event types, such as program, live and commercial breaks. Events can be inspected by using zoom in and out controls.

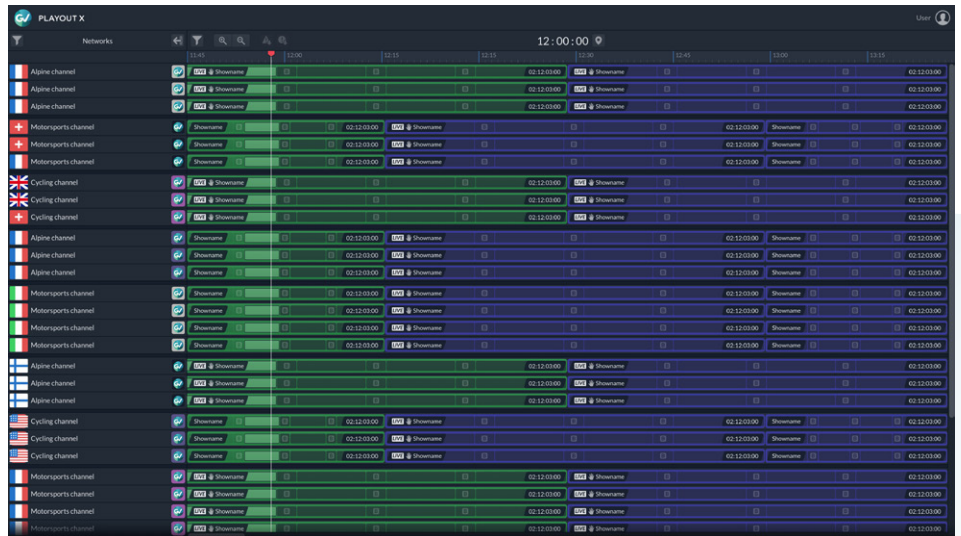


Figure 2: Timeplane UI.

This unique interface allows a single operator to manually control commercial breaks and sub events in all networks that are subscribed to a nominated live event. This provides the operator with a highly flexible dynamic interaction with the live event and schedule in progress.



Figure 3: The Event UI.

Ordering

Please contact your Grass Valley sales representative for more details.

This product may be protected by one or more patents. For further information, please visit: www.grassvalley.com/patents

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