

AMPP

Agile Media Processing Platform



The world's most agile production and distribution platform.

The *Agile Media Processing Platform* (AMPP) from Grass Valley is the live production and distribution platform that empowers today's media makers to create more content more efficiently, giving creators the additional resources, flexibility and technical edge necessary to thrive in a challenging live media future. AMPP's unique integration of hardware, software and cloud-native services provides the foundation for comprehensive suites of media production and distribution tools from ingest to playout, with the ability to quickly scale the system to whatever size is needed and to

give secure access to team members wherever they are. Producers can arrange for the best team and tech on a per-job basis, and quickly deploy custom workflows to suit each project.

Work anywhere. Play everywhere.

Hardware-based production suites are tested and proven. But they don't always match the need for agile, easily changed systems that can create the volume and diversity of content your business requires. That's why Grass Valley hardware, software and services are integrated into AMPP, bringing a seamless connection to new

capabilities that are only available in cloud technology. With AMPP you can choose to work in your studios, remotely, on premises, in cloud, with hardware, software or all the above.

In the emerging model of dispersed production, creatives, crew and talent in multiple locations come together per event. AMPP supports every aspect of live production, from every point on the planet. With your "dream team" already working anywhere, crew travel and entertainment costs drop dramatically. And of course, cloud-based distribution means your show can play instantly everywhere.

Key Features

- Scalable to as many instances as required without upfront buildout
- Located on any combination of public and private cloud services
- Flexible, elastic I/O with access to any source on the AMPP fabric
- Cloud-hosted replay without sacrifice on responsiveness and accuracy
- Operator experience remains the same regardless of distance from the processing
- Operators may connect using typical residential internet
- Frame-accurate for live production
- Fully compatible with connected control surfaces and applications
- Intuitive software solutions



Match your business needs

Making it even simpler to track costs for each production, AMPP's platform management tools bring logging, user administration, task controls and a billing overview into a single, unified user interface. It has never been easier to quickly oversee all the costs associated with a specific production.

Spinning workflows up and down can be done in minutes. You no longer need to know in advance the size of the system needed for a particular production. It is easy to quickly expand a system in terms of both scale and functionality.

You can experiment with new concepts at little risk. Add another feature or workflow such as content localization or highlight packages to your existing production capability without a major upfront investment. Try out a potential solution and then rearrange as needed.

Open to invention

AMPP is an expansive, inclusive ecosystem with unlimited scope. As an open platform, AMPP gives users access to solutions from across the production chain – from ingest to playout – including solution options from a variety of vendors. Using AMPP APIs, third-party members of the

AMPP Alliance offer fully vetted solutions that can plug right in and join the party. Any imaginable workflow can be built without relying on a single vendor for the whole solution.

We love live

To attract and keep an audience, your content must look good. While it can work in most common formats, AMPP's internal 4:2:2 uncompressed 10-bit processing provides a signal quality that meets the demands of professional broadcasts on linear TV, including UHD HDR.

Designed to support live media production, AMPP provides precision signal timing and low latency. Operators can work on-prem or in the cloud with no noticeable difference in performance or system response times. The system also offers a range of resiliency architecture alternatives that maintain high availability – even if the cloud connection is temporarily lost.

There's a reason Grass Valley is a trusted name in television technology. For six decades we've been inventing tools that enhance creativity – and work reliably. Only Grass Valley offers the open, comprehensive, end-to-end approach to television's new, wide-open future. AMPP.

AMPP Infrastructure

The AMPP platform is the common infrastructure for all applications running on the platform. The infrastructure seamlessly manages both on-prem and cloud elements so that there is no difference in operation for the content creator. Any source is immediately available to all applications, which makes it easy to set up workflows that automatically distribute content for use across the production suite. The infrastructure may include any of the following:

Edge devices

Existing Grass Valley products. Grass Valley is providing new technology updates that allow existing hardware or software to integrate with cross-platform equivalents running on AMPP. For example, production switcher panels may be connected to K-Frame CS X, and GV STRATUS may be connected to Framelight X. GV Orbit may also be used with AMPP as a single interface for SDI, IP and cloud network control.

For details, please see product-specific information on the [Grass Valley website](#).

AMPP Edge. Available in three different sizes, AMPP Edge is an on-prem device that provides local I/O in SDI or SMPTE ST 2110 as well as compute for various AMPP applications. For details, see the [AMPP Edge webpage](#).

Third-party encoding solutions from Alliance members. Many of the most popular signal encoding/decoding solutions have a validated integration with AMPP. For details, see the [AMPP Alliance webpage](#).

Compute Infrastructure. AMPP allows the choice of compute infrastructure to run the applications – either on-premise or in public cloud. Users can bring their own servers or public cloud provider or they can select to source it from Grass Valley in the form of AMPP Edge servers or Hosted Compute. The compute infrastructure includes required storage and networking elements to provide a complete workflow.

Inputs and outputs

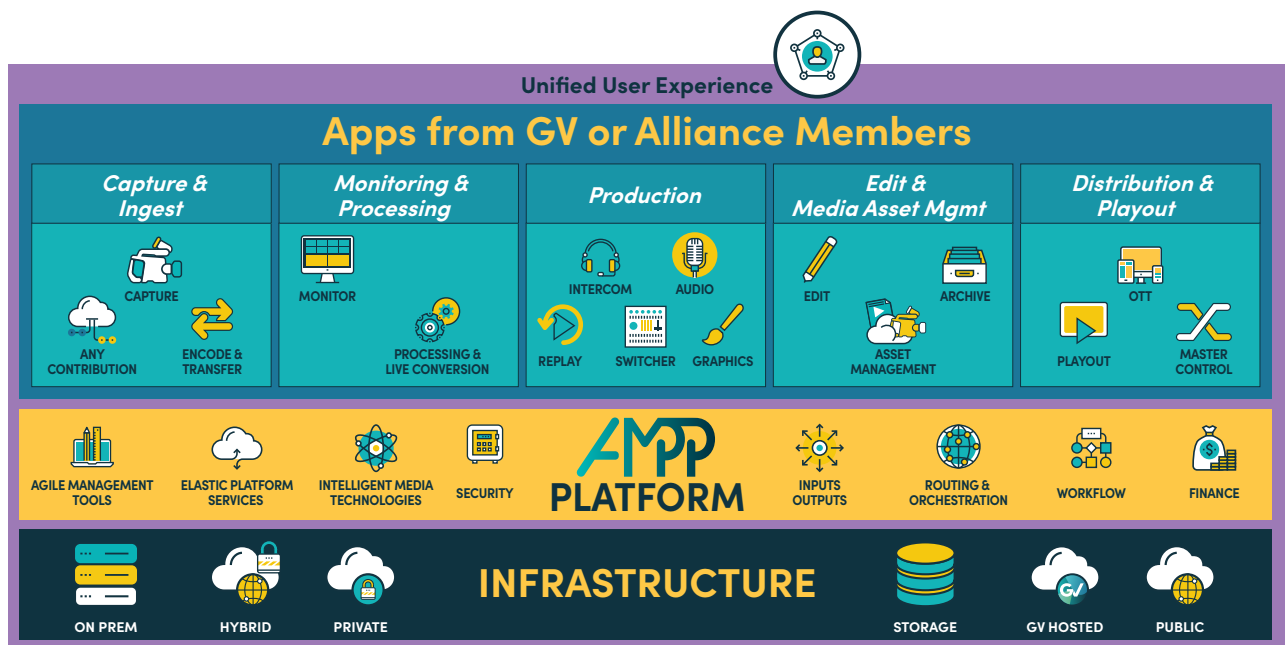
Unique I/O capabilities. Unlike hardware devices with a fixed number of inputs and outputs with specific formats. AMPP can have an unlimited number of inputs and outputs that support all common local input and output formats including SMPTE ST 2110, NDI and SDI for easy connection to your existing devices. Global inputs and outputs allow you to stream between different AMPP nodes – either site-to-site, ground-to-cloud, or between cloud instances with low-latency and high-quality streaming. In addition, built-in encoders and decoders for compressed I/Os support all common formats such as RIST, SRT, RTMP and MPEG-TS, which gives you a wide variety of profiles to fit your needs.

While a common production format is not required within AMPP, inputs and outputs can be set to encode, decode, or transcode to alternative formats as required.

Webcapture. Remotely bring in user content from a web camera and PC desktop while monitoring the program output in real time.

HTML5 Graphics Input. Easily add graphics to the production or delivery using HTML5 from Alliance members like Singular.live and Flowics. Can also be used to bring in any HTML content to the production.

Test Signal Generator. The AMPP Test Signal Generator comes with a variety of test signal parameters enabling testing across the entire fabric. Includes a preview panel that displays the output stream as periodically updated thumbnails of the video stream. The Generator can produce: Color bars, solid colors, tone, and sync signals.





Routing

Automatically detect all available running signals and route them to their destination. AMPP enables local routing of NDI, SMPTE ST 2110 and TS sources on an edge device and global routing between multiple compute nodes using either AMPP Streaming protocol or protocols such as SRT or RIST. For integration with audio devices, AMPP supports Dante, AES3 and Pulse-code modulation (PCM).

For easy operation, virtual routing panels are simple to set up in any AMPP UI. Any AMPP signal can be mapped to a routing panel regardless of format to provide single-click changes to the view you want to see. If you prefer hardware to virtual panels, sources – as well as many other system actions – can be mapped to a Grass Valley MAV panel, Elgato Stream Deck or other external control device.

Orchestration. The AMPP Dashboard allows you to visually monitor all your applications and flows at a glance. Your entire AMPP account can be made visible and thumbnails allow advanced monitoring functionality of all flows and applications in your account. With the AMPP Dashboard you can edit, start, and stop workloads – including workloads that integrate Alliance solutions – with a single click.

For hybrid workflows, GV Orbit may also be used with AMPP to provide a single interface for SDI, IP and cloud network control.

Changeover. To provide consistent uptime, AMPP supports an automatic fail-over on loss of signal. Supporting many alternative use cases, the A and B inputs can be different source types such as a playout channel and a clip player, as well as different formats such as SMPTE ST 2110 and NDI. For a complete discussion on setting up system redundancy and maintaining high availability in AMPP, see the [Resiliency in AMPP whitepaper](#).

AMPP also enables API control of Alliance member endpoints. For details on endpoint options, see the [AMPP Alliance webpage](#).

Monitoring

Remote viewing. Each Flow Monitor enables low-latency live streaming from anywhere to everyone. Accessible from any Internet browser with variable bandwidth setting, Flow Monitors can provide high-quality viewing of a single signal or display multiple signals in a Mosaic or Multiviewer.

Multiviewer. A fully customizable multiviewer that allows you to create different layouts with a single click. Sources can be switched in seconds and the multiviewer editor enables you to create layouts in minutes. Like all routing services, the multiviewer supports multiple formats.

Video Scope. AMPP allows you to QC incoming sources with a built-in video scope that offers Vectorscope and RGB Parade modes.

Software

While the infrastructure is critical in bringing together the signals that are basis for new content, it is the AMPP software that makes the platform truly unique. Capable of running in any data center or cloud environment, AMPP uses a modern microservices architecture that allows the system to quickly scale to any size. Users spin up or spin down applications as needed and to only pay for the services used.

The AMPP platform gives media providers the power to easily transition to cloud- and data center-based operations because it addresses the concerns that complicate IP and cloud deployments – particularly network connectivity and latency.

GV AMPP's architecture is based on five core technologies and 17 patented advancements:

- **GV Intelligent Media Fabric:** Unique management for distribution of digital media (video, images, audio and metadata).
- **GV Intelligent Media Connect:** Unique management for connections between devices that distribute and process digital media (video, images, audio and metadata).
- **GV Intelligent Media Timing:** Unique management for the timing of digital media (video, images, audio and metadata).
- **GV Intelligent Media Identity:** Unique management of the identity of connected devices that process and distribute digital media (video, images, audio and metadata) and manage the identity of the digital media (video, images, audio and metadata) itself.
- **GV Intelligent Media Streams:** Unique management for processing digital media (video, images, audio and metadata) based on the media itself.

For detailed information on the technology behind the AMPP platform, please see our library of AMPP whitepapers. [Download the complete library](#) to learn more about: AMPP System Architecture, Latency, Resiliency, Security, and Single Sign-On (SSO).

The following services are built into the AMPP platform.

User tools

GV UI is an intuitive user interface that can host multiple HTML5 web components for an at-a-glance view of all your AMPP platform services as well as the content creation and distribution applications. Easily define and build your own interface and then create, load and save different layouts suited for any production and user.

AMPP Control Panels enable the design of operator-centric user interfaces that provide each user only the control required to perform their tasks, reducing complexity and minimizing the risk of on-air errors.

Logging. The AMPP Log Viewer provides detailed logs of all actions in an account with easy identification of fabrics. An extensive filter menu makes it simple to find and verify actions taken.

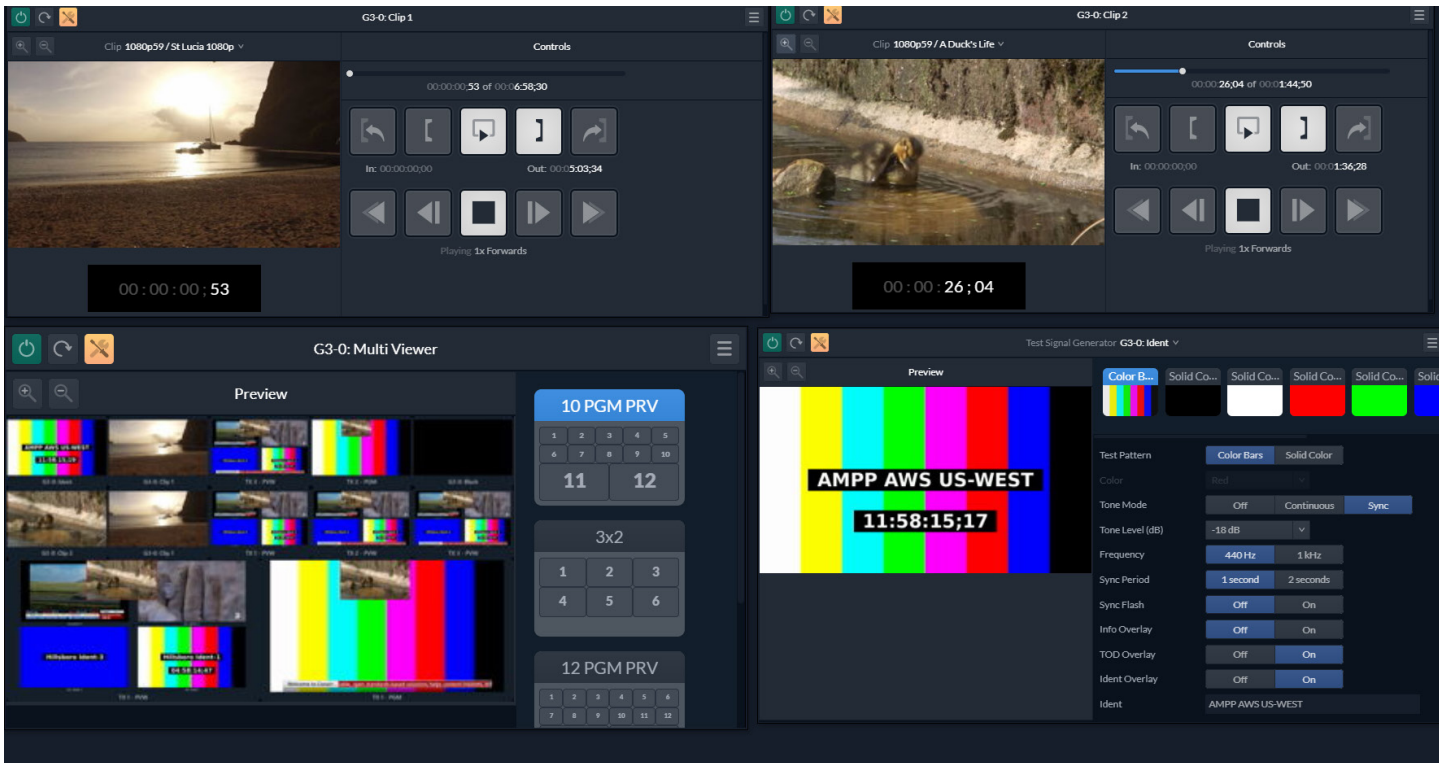
User management. AMPP is designed to allow entire production teams to simultaneously access the system from wherever they are working. To ensure security, each team member can have a single sign on password that applies to the entire system. AMPP currently offers support for the following methods of providing SSO integration: Okta, Azure AD, AWS Cognito and OpenID Connect + OAuth 2.0.

Compute control. Connect the public cloud infrastructure to AMPP and control the spin up/wind down of public cloud compute instances directly from the AMPP tools so that users can fire up a workflow which includes all of AMPP applications and compute in a single operation.

Appstore. Choose the specific applications required for a media workflow from the AMPP Appstore. Review and manage application software versions across entire system from a central location.

Health Discovery. The AMPP Health Dashboard provides an overview of all workloads in an account and their health state at-a-glance. Workloads are grouped to provide a systemized overview that may be filtered on specific application groups and status with a default filter to show all critical status workloads.





Business tools

Resource Manager. View all workloads, nodes and snapshots at a glance. Create, start, stop, update and configure all applications of your AMPP account. Select where you want a workload to run. Store configurations in snapshots with tags for recurring productions. When starting applications, you can choose to automatically update to the latest software or stay on a specific version.

Billing Portal. Easy-to-use analysis in the AMPP Billing Portal makes it simple to understand and account for how AMPP workflows are used. Going well beyond a basic list of workloads and run times, authorized users can access a variety of methods for analyzing usage data for any given period. Tagged workflows make regularly used reports even simpler to identify. Export data as a CSV file for use in other tools.

Support solutions

Central to supporting Grass Valley's AMPP Platform is the Network Operations Center (NOC). It is manned 24/7/365 – proactively monitoring the health of the AMPP cloud platforms and responding to support calls from customers. The NOC can be contacted via phone, email, web portal or Live Chat (currently Slack) and will provide first level of support as well as case and incident management. If a case requires more specialist investigation it is referred on to Grass Valley's extensive network of subject matter expert (SME) engineers spread

throughout the globe. From Monday–Friday, Grass Valley operates a “follow-the-sun” model, where cases are picked up by the Grass Valley region currently in business hours. From the end of the working day in Americas on Friday until the start of the working day in Asia-Pacific on Monday, there will be SMEs for each of Grass Valley's product specialties available on-call to respond to critical cases. This all helps to ensure that when customers need Grass Valley's support, we can provide it quickly and efficiently.

Specifications

May be hosted on these infrastructures:

- Amazon Web Services (AWS)
- Google Cloud Platform (GCP)
- Microsoft Azure
- Or provided by Grass Valley

Video codecs:

- AVC/H.264: 4:2:0 or 4:2:2, 8- and 10-bit
- HEVC/H.265: 4:2:0 8- and 10-bit

Audio codecs:

- AAC
- Dante
- Opus
- Dolby E, Digital (AC3) and Digital Plus (E-AC3)
- MPEG-1 Layer 2

WAN/LAN Transport Protocols:

- AMPP Streaming
- NDI
- RIST Basic and Main Profile
- SRT
- RTMP(S)
- SMPTE ST 2022-2 / MPEG-TS

Encryption and protection:

- DTLS-SRTP encryption
- Flex-FEC

Automation:

- SCTE-104 and SCTE-35

Security:

- Conforms to the best IT practices of a representational state transfer (REST) architecture
- IP streaming in AMPP is encrypted when applicable
- AMPP authentication is handled through an Identity Service which can optionally delegate authentication to a third-party server (e.g., OKTA)
- To ensure strict security standards are maintained, Grass Valley also regularly conducts third-party penetration testing

Ordering

Due to the variety of ways the AMPP platform may be installed and operated, including integration with existing equipment, please contact a Grass Valley sales representative to architect the best solution for your application. Solutions that run on the AMPP platform may be selected from the AMPP Appstore. Access to the Appstore is set up when the AMPP platform is enabled.

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

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