



Transforming Live Production Workflows with GV STRATUS Nonlinear Production Tools & K2 Media Servers and Storage at Sky Racing

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APPLICATION NOTE



Introduction

Live media coverage allows viewers to experience the action of sporting events and immediacy of sports news in real time. So what is behind a flawless viewing experience? In live broadcasting — where speed, agility and reliable execution make the difference between success and failure — it is providing streamlined workflows across the entire production chain, enabling staff to be versatile and collaborative and offering reliable technology implementations.

GV STRATUS application framework is the ideal foundation for this type of production. Combining a Grass Valley K2 media server and storage infrastructure with GV STRATUS nonlinear production tools, and an open ecosystem for integration with third-party systems provides a proven and efficient framework for a new generation of digital workflows. This application note describes how the GV STRATUS concept was applied in news/live production workflows, including content-specific news production.

Business Background

Sky Racing commenced transmission in 1985 when Australia's first domestic satellite was launched. Today Sky Racing is a world leader in multi-venue, multi-channel race broadcasting, telecasting more than 80,000 races each year to millions of viewers in Australia and around the globe. A pioneer of satellite television in Australia, Sky Racing transmits to more than 5,000 outlets across Australia, and into 51 countries around the world via satellite, cable, mobile and the Internet. Sky Racing has a reach of more than two million Australian homes with the potential to more than double that figure in the near future.

Currently, Sky Racing operates three racing channels. Racing1 (Channel 519) is the long-established Sky Racing channel, which continues to give viewers comprehensive Australian thoroughbred, harness and greyhound racing coverage. Sky Racing2 (Channel 520) features all international racing, as well as offering viewers extended coverage and choice of Australian thoroughbred, harness and greyhound racing. Sky Racing World (Channel 521) is the superior thoroughbred racing channel, capturing the best thoroughbred racing action from Australia and around the world.

Sky Racing is owned by Tabcorp, Australia's premier entertainment and gambling group.

Client Summary

Client Organization

- Multi-venue live sports production
- Sports event coverage aggregated from a large number of venues disparately located across the country and internationally
- Multichannel distribution model — TV, Internet, mobile platforms
- Annual volume of televised/streamed live events: 80,000+
- Real-time sporting event coverage, transmitted 24x7 domestically and to 51 countries around the globe
- Produce 12 magazine shows and sporting event related news bulletins, using 5 studios

Legacy Situation

- Disparate pieces of sports replay equipment
 - Legacy equipment for transmission playout
- Many point tools, all with different user interfaces:
 - Third-party newsroom computer system
 - Third-party NLE
 - Third-party content management system
- Production in SD using DV25

Goals

- Bring all users under the same graphical user interface
- Improve efficiency, meet increasingly faster turnaround times
- Link disparate pieces of live replay equipment
- Seamless extension to third-party environments (MAM, archives, playout)
- Access and leverage media content by all users in the organization
- Orchestrate complete live production workflows including: media processing, replay, news playout

Operational Statistics

Sky Racing broadcasts 85,000+ races a year with three types of racing, across 3 channels, 18 hours a day live:

- Total of 25 broadcasts a day that make up the 3 channels
- Production is a combination of DVCPRO (SD) and XDCAM HD422 (HD)
- 30 to 50 Replay Clips created per controller per K2 Dyno user
- 450 races are sent to the web per day
- Mounting yards, pre-recorded packages: 8-10 per day, 2-3 hostings per day, 16-30 interviews
- Mounting yards, clipped up individually: 8-16 per day, typically resulting in 200 clips daily

Solution Overview

From Goals to Solutions

Challenged by the ever-growing number of distribution platforms to support (TV, Internet, mobile), and dealing with the inefficiencies of existing disparate infrastructure, Sky Racing knew they had to make a transition to more efficient workflows. They were seeking to transition from an existing disparate infrastructure and discrete workflows to a fully networked environment where everyone can access and work with any piece of content acquired and produced. Inherent to this overarching goal was to bring all participants in the production workflows under a tool-rich, flexible, modern graphical user interface.

The decision was to adopt a GV STRATUS/K2 solution, enabling Sky Racing to preserve existing MAM/NRCS workflows, yet linking them seamlessly together with a single, adaptable application layer. Overview diagram of the overall solution can be found in Appendix 2.

Sky Racing needed to be able to ingest 30 channels of SD content while retaining the ability to switch to HD easily. With upgrade to K2 Summit-based SAN, they now have 80 channels available. The 30

ingest channels are controlled by Ardendo, but content, media and low-resolution flows are under GV STRATUS control.

In the new configuration, archiving of assets processed in the Grass Valley system is handled by the pre-existing Ardendo content management system. In order to get archival material to Ardendo, Sky Racing is using K2 Dyno Production Assistant to create rules that automatically push MXF files with Apple Final Cut 7 EDL/descriptive metadata to an Ardendo NAS. The Ardendo MAM archives the files from there while also regenerating its own proxies.

Sky Racing also needed the ability to drive playback and replays for five studios covering sporting events and decided that a combination of K2 Dyno, GV STRATUS Channel Panel tool and Aurora Playout would be the most flexible approach.

Sky Racing is using AP ENPS as their newsroom computer system. The integration with GV STRATUS involves plug-ins that enable ENPS users to browse content and associate it to stories. For content editing, they use a mix of third-party NLEs.

Solution Summary

Grass Valley Components

- GV STRATUS Core Services B1 FT
- 80-Channel K2 Summit SAN
- FCP Connect — GV STRATUS integration with Apple Final Cut Pro editing app
- GV STRATUS integration with AP ENPS newsroom system
- Aurora Playout application
- Replay control: K2 Dyno Replay Controllers (7)
- Switchers: Kalypso Video Production Center (5)
- Routers: Trinix NXT (512x512)

Third Party Components

- Established Ardendo system for ingest, content management and archive workflows
- Established nonlinear editing application — Apple Final Cut Pro
- Established nonlinear editing application — AVID Media Composer
- Established Vizrt graphical editor application
- Ardome EasyCut timeline editor application
- Established newsroom computer system — AP ENPS

Concept

GV STRATUS application framework contains a complete — and evolving — set of tools applicable to many different workflows. Configured into a unified production environment, the framework integrates with existing third-party solutions to provide Sky Racing with all the tools necessary to plan, create, publish and archive a live broadcast. The GV STRATUS concept forms the basis of an improved operational environment that can be configured and reconfigured to the changing workflow needs.

Sky Racing also values GV STRATUS as an evolvable platform that provides good return on their investment. GV STRATUS software is constantly evolving, making new features available to meet emerging market requirements. Additionally, the client plans on using the GV STRATUS documented API to create their own tools and interfaces.

Integral to the GV STRATUS concept is its infrastructure, based on Grass Valley K2 server and storage components. They are combined into a scalable, reliable and cost-efficient architecture optimized to the needs of digital live production. K2 provides a unified media database structure and asset model so that creation and access of assets and metadata is the same for all GV STRATUS components, applications and production processes. Metadata can be created, saved and exchanged with other systems for easy content management. Open standards-based file and metadata structures enable useful re-purposing of content.

Also important is the installation, deployment, maintenance and upgradability of the system. GV STRATUS includes a control panel to simplify the configuration of hardware and software components from a single point. This eliminates the time-consuming need to configure servers and clients one at a time. GV STRATUS systems can easily be scaled in size and even distributed across multiple locations.

Operational Workflows

With the GV STRATUS framework in place, Sky Racing was able to design agile and participatory workflows that adapt to their live production environment so that any participant in the workflow can better contribute to the production process.

For further reference, some representative workflow diagrams are presented in Appendix 1.

Production/Resource Planning

All resource planning and production schedules are prepared in a third-party system (Ardendo). Sky Racing's own system provides data to the Ardendo system and the appropriate metadata is populated into the Ardome database against a clip placeholder. The existing traffic system produces data that is used to schedule record events on the Ardendo DART ingest system.

Part of each sporting event (or recording) is a set of metadata fields, including event name, number and importance level. Each day, the client's database produces an XML feed of all of that day's metadata, and feeds it into the GV STRATUS/K2 environment. This metadata is then fully available to all users on the Grass Valley system, within the GV STRATUS database, as well as from any K2 Dyno Replay Controller. Replay operators add these XML files to their K2 Dyno session where they can associate the recordings with the relevant metadata. The XML metadata file contains pre-created names for K2 Dyno sessions, bin names, jockey/horse names and other data. This system follows strict naming conventions used throughout the facility by all departments.

Ingest

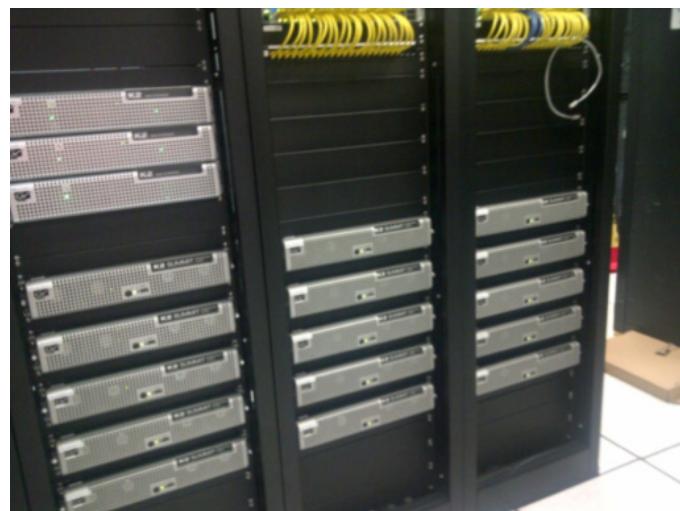
All pre-scheduled event ingest is done automatically by the DART system. Of the 80 K2-based SAN Summit client ports, 28 are under Ardendo DART control. Typically event recordings last 5 minutes, but Ardendo adds handles according to a number of rules.

Growing files are almost instantly available to all operators who start to add metadata, and create highlights and replay as needed.

Accessible from the versatile GV STRATUS Channel Panel view, the GV STRATUS Scheduler is used to schedule *ad hoc* recordings and to back up some of the most important recordings of recurring programs. These recurring recordings happen several times a day, at the same time each day, and are rarely supervised. The GV STRATUS Scheduler controls two K2 Summit ports as well as Jupiter-controlled Trinix NXT routing switcher to switch the relevant source for each recording. This function requires no input from an operator, and therefore it is run completely independently, only occasionally monitored by an engineer or supervisor.

While media is recording to the K2-based SAN, Ardendo streams the file out of the SAN to nearline storage for archive purposes.

Over time, Sky Racing would like to gradually migrate all of the scheduled recording from Ardendo to the GV STRATUS system. They plan to leverage the open RESTful API available with GV STRATUS, and to specify and develop a tool that will facilitate this new operational model. Among other functions, it will implement rules to create clips and recordings, including the full range of recording metadata.



Operational Workflows (Cont.)

GV STRATUS Database (Bin Structure)

Sky Racing keeps their folder structure as basic as possible with 16 folders on the SAN and only five of the folders set up with subfolders. This flat, search-centric bin environment is preferred by the staff who are accustomed to this kind of operating mode.

Live Event Replay

To get dynamic sporting events on air, Sky Racing's staff has to prepare and distribute replays and highlight packages in a very fast turnaround environment. Sky Racing met this challenge head-on, implementing efficient workflows based on GV STRATUS and K2 Dyno Replay Controllers.

There are typically four operators in the live event replay area. Each workstation has a GV STRATUS client, a K2 Dyno Replay Controller, a K2 Dyno user interface and a DART schedule overview. Various monitoring outputs are also available, with XY button panels and a Jupiter user interface to control the Trinix NXT router. Finally, an X-Keys button panel is connected to the GV STRATUS client.

Four K2 Summit servers are dedicated to K2 Dyno replay control, providing a total of 16 ports, and a great deal of flexibility. K2 Dyno operators can easily open another K2 Dyno session while recording, and do additional clipping and replay on multiple record trains.

Before each race, the K2 Dyno replay operator takes their assigned position in one of the four event replay areas, creates a new session and prepares the highlight bins per strict naming convention according to the provided metadata.

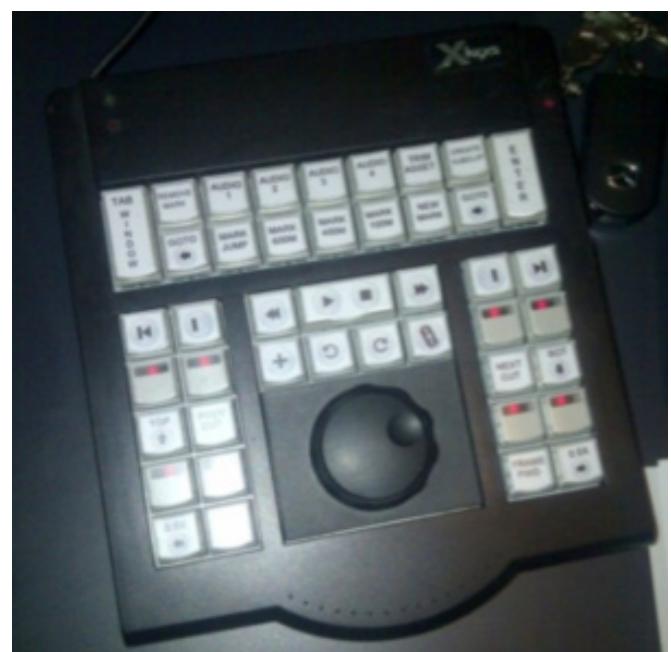


When event recording begins, the K2 Dyno operator uses the Replay Controller to control two record trains and two playback channels. They use the controller for live slow-motion repeats, creation and playback of highlights, race day interviews, color packages (beauty shots) and so on. Each K2 Dyno Replay Controller is used extensively on a daily basis.

In addition to the K2 Dyno Replay Controller, replay operators use GV STRATUS extensively to manipulate recordings — for example to add a description, rename the highlights, or to copy to another folder. The X-Keys controller has been configured to control most functions of the GV STRATUS user interface: object inspector, Channel Panel, add metadata markers at a specific timecode, etc.

There are a further three K2 Dyno Replay Controllers in the tapes area, which are also used for replays, clipping, creation of highlights and playlists as required.

The GV STRATUS Channel Panel tool offers a broad range of capabilities for control of video server channels. Available on any GV STRATUS client on the system, it is extensively used in both the event replay and tapes areas to load clips as needed (for review, replay, etc.) and for crash recording. There are a total of 12 K2 Summit ports that are not allocated to either replay or new playout, and these are used for Channel Panel operations, as required.



Operational Workflows (Cont.)

Newsroom

Sky Racing's current implementation of newsroom workflows integrates the AP ENPS newsroom system, Vizrt graphics applications, GV STRATUS and Aurora Playout applications. Long established at Sky Racing, ENPS from Associated Press is the system in which journalists write up their stories and scripts, research, schedule crews and allocate resources. With few exceptions, the journalists only have the GV STRATUS Basic newsroom license which limits their functionality inside the ENPS application to creating placeholders, dragging to story scripts and monitoring what stories are missing.

Producers create rundowns on ENPS and stories are prepared including Vizrt Content Pilot graphics content which is later transferred to Viz Trio (Vizrt) for on-air finishing. The ENPS rundown is linked to Aurora Playout via MOS protocol for on-air playout control, leveraging Aurora's efficient playlist controls. This integrated workflow replaces the previous procedure, which was simply printing the rundown on paper. Currently, two of Sky Racing's shows are on-air using this automated workflow.

Only the media managers have full access to the GV STRATUS client plug-in within the ENPS application, enabling them to search, browse and access media across the GV STRATUS system through a GV STRATUS view embedded inside their ENPS application. Over time, Sky Racing may gradually extend this license to other users as required.

From an evolutionary standpoint, GV STRATUS now offers a complete tool environment to manage news stories across the entire news workflow — all from a single interface. From anywhere across the GV STRATUS workflows, the GV STRATUS Assignment List tool provides a live connection to the NRCS system of choice. From their GV STRATUS workspace, authorized users view the currently active rundowns with stories displayed in the current running order. From any operation in the newsroom — ingest, edit and so on — GV STRATUS users can link assets directly to a rundown, making a story available for playout inside of that rundown. Conversely, any NRCS user can invoke the GV STRATUS environment as an embedded window within their NRCS user interface, and have the entire GV STRATUS toolset available to them. They can work on and complete a story inside GV STRATUS. When the story is ready for playout, the Aurora Playout application facilitates an efficient playlist control, but also permits linking of assets directly to rundowns.

Editing

Once content is quickly and efficiently ingested and stored, it needs to be ready for immediate editing and preparation for air. Sky Racing is using a combination of their two established editing applications to accomplish this.

Ardome EasyCut is a timeline editor with audio track functionality that is used by the client to create highlight packages. The highlight packages created with EasyCut consist of event highlights plus an opener and closer bumper. Craft editing when creating promos, long-form programs, and bumpers are done on Avid Media Composer, which at this site currently has no integration with the Grass Valley production system. Notably, since the GV STRATUS application fully supports integration with Avid Media Composer, Sky Racing has the option to integrate the GV STRATUS/K2 and Avid editing environments at a future point.

Any edited material that needs to be played out from the K2-based SAN is transferred via FTP from Ardome.

As an aside, the GV STRATUS framework did not offer a timeline editing alternative to EasyCut at the time of deployment. With GV STRATUS storyboard editor and EDIUS XS low-resolution editor options now available in GV STRATUS, implementing an equivalent capability on GV STRATUS platform is now available. The GV STRATUS storyboard editor is a versatile, yet quick and simple tool when assembling a basic editing sequence.

For deep editing of content in low-resolution proxy mode, GV STRATUS employs EDIUS XS — a low-resolution version of the EDIUS Elite suite of tools. For nonlinear craft editing, GV STRATUS workflows seamlessly integrate the GV EDIUS Elite editor, as well as all mainstream editing suites — Avid Media Composer and NewsCutter, Adobe Premier and Apple Final Cut Pro 7. This provides choices when integrating GV STRATUS workflows into specific solutions, and allows editors to apply their favorite editing suite within the context of GV STRATUS workflows.

Each of the editing applications has its strengths and its most appropriate use cases. A GV STRATUS system does not dictate which platform or application must be used — all can be efficiently integrated, and all can be deployed in the same system.

Operational Workflows (Cont.)

Studio Control Rooms

Each studio control room has a GV STRATUS position with Aurora Playout. The rundown can be opened from the Studio Playout position from ENPS by making the rundown MOS active. This loads the clip list into Aurora Playout and provides clip status of each video event.

Sky Racing's news directors view the introduction of Aurora Playout as possibly the biggest improvement in their daily operations. With the previous system, they relied on a clip playout operator to manually load and play each clip for them. With Aurora Playout, the director has full control over the playlist, loading each clip well in advance of the bulletin on-air time. They can preview each clip in low resolution at any time. The director also manually allocates the port to be used for each clip, as this makes it easy for the audio operator to know what channel is coming up next.



Aurora Playout uses ports A, B and C for manual plays and background loops. To play clips that are still recording, they prefer to use the GV STRATUS Channel Panel tool, because drag-and-drop to Aurora Play requires a placeholder, which introduces a delay.

To control the playlist and the Channel Panels, the director usually employs an X-Keys panel, configured to manipulate several of the functions in the GV STRATUS and Aurora Playout user interfaces.

Studio 1, which is used for the entertainment channel, also has a standalone K2 Dyno, which is often used to build playlists during the recording of a show. These playlists can be later replayed either with K2 Dyno or loaded in Aurora Playout. This was simply not possible before the introduction of the Grass Valley system in the studio control rooms.



Content Management and Archive

Content in digital production environments is stored as files in various types of media storage, and the ability to easily access, browse and share stored media by all participants in the production process is a critical aspect in implementing efficient digital media operations.

In Sky Racing's implementation, the K2-based SAN infrastructure facilitates instant access to content by all users, while providing sufficient bandwidth and scalability to grow. The GV STRATUS application framework brings several content creation departments under the same graphical user interface. In this unified environment, every member of the staff can access and work with any piece of media on the SAN, as soon as video feeds begin to come into the facility.

The introduction of the K2-based SAN has also impacted how media storage is used and administered, bringing with it a great deal of cultural change. The previous system had servers dedicated to each studio or user group. This meant that each team was responsible for the administration of its own storage and media. In contrast, efficiently using the new storage pool requires a higher level of organizational coordination.

With the large SAN available, users take storage capacity for granted. Consequently, the supervising team of media managers needs to be strict with the deletion of media. Naming conventions have been crucial in this sense, allowing users to clearly label the content in a manner that makes it easy for media managers to quickly identify content by its name. Media managers ensure strict adherence to the established naming conventions when creating folders/bins per program, date, month and so on, which facilitates efficient clean-up of the system in a 7-day cycle.

Since not everyone always fully follows the naming conventions, there is an additional deletion rule in place, whereby any assets that have not been starred (i.e., given three stars rating via K2 Dyno or GV STRATUS) are deleted after seven days. Media that needs to be protected against deletion are locked in the GV STRATUS system. Any media that have not been named according to the conventions are deleted by a supervisor manually.

Deletion is done daily by the supervisors, using saved searches that look for given time periods. Media have different expiration dates depending on the subject and size. For example, K2 Dyno sessions (which can range up to 20 hours) are kept for two days as a back-up to the Ardomo archive system. There are folders set up to keep the last eight days of events for fast, easy access to review footage from the previous week. Any bins that don't follow the established naming convention are manually deleted.

Additionally, most deletions are handled automatically via FTP by the Ardomo system, based on asset expiration date. Deletions for the K2 Dyno sessions are performed by the operators first thing in the morning, usually via the K2 Dyno Replay Controller.

Under normal circumstances, Sky Racing aims to have around 400 hours of free space, out of the 1,000 hours of storage space that the SAN provides at DV25.

Assets that have been star-rated are automatically picked up by the Ardomo system and archived. Besides archiving any starred media such as highlights, interviews, or packages, the Ardomo system also archives all live recordings. While an event is being recorded on the K2-based SAN, Ardomo streams the file out of the SAN to nearline storage for archiving.

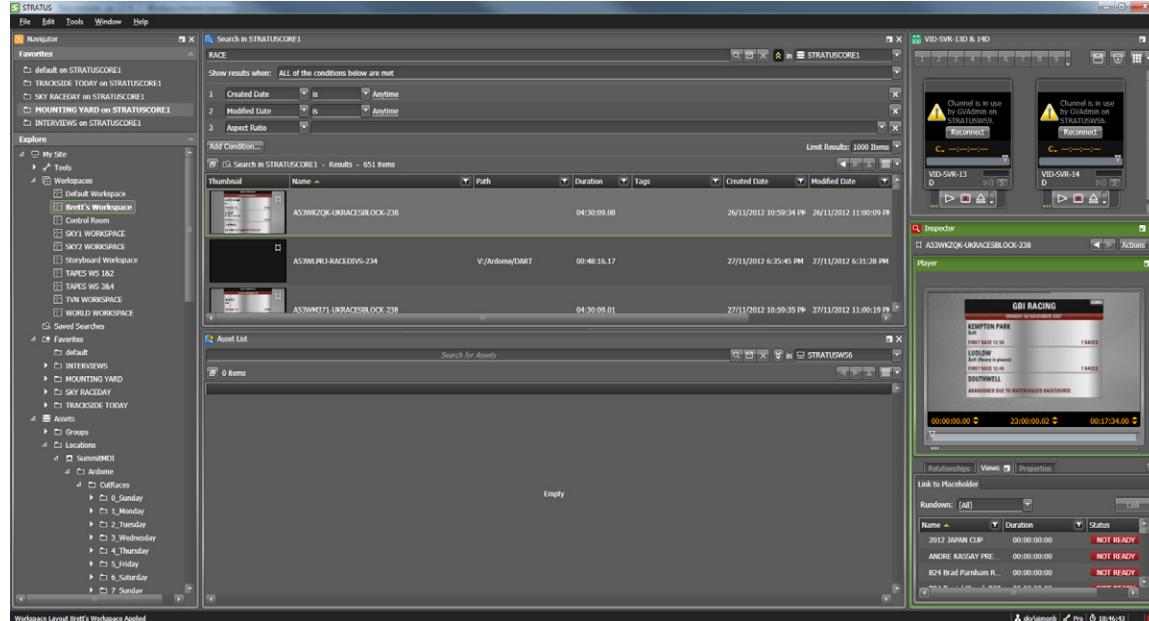
User Experience

User Interfaces

Core to the GV STRATUS concept is a common look-and-feel user experience across the entire media production lifecycle. Working from their desktops, the staff interacts with the system through a highly intuitive, configurable interface. This environment enables them to combine the needed tools into workspaces that match their roles and work preferences according to the task at hand. This spatial diversity empowers individual users keyed into the system from a single, unified screen to accomplish tasks that once required multiple users, at multiple screens and employing different types of interfaces.

The GV STRATUS user interface consists of administratively defined toolsets that users combine into targeted screen arrangements, which can be saved or switched with a mouse click to suit another mode of operation or a user's preference. These workspaces are saved with the user profile and are loaded into the application when the user logs onto the system. They can be recalled and adjusted and then sent to other operators via messaging if required to load into their profiles. The level of user security is set by the user profile and will allow for a standard workplace to be set up and not be tampered with if required.

Following is a representative example of a GV STRATUS workspace, as used by staff in Sky Racing's workflows.



- Navigator (Left).** The Navigator view is the starting point for workflows in the GV STRATUS environment. It provides users with a way to access and select the tools, workspaces and searches which belong to their login profile. It is from here that users select and load workspaces, recall saved searches, browse media and save and recall favorite clips or setups — all within a single, unified desktop workspace.
- Search View (Center Top/Bottom).** From this search dialog, users run customized searches on assets across the GV STRATUS/K2 environment and display them as asset lists. Users can run advanced searches based on a broad range of asset attributes, including asset metadata and other properties. The results can be organized in different ways and modified, reused, shared, or saved as needed.
- Inspector Tool (Right Middle).** Users load a clip into the Inspector pane where they can not only view its detailed information, but also mark it up and instantly share it across the workflow. Other examples of practical operations include the reading and creation of metadata, looking at EDLs for playlists, linking to placeholders, and looking at associations of parent clips to subclips. From here, users can load clips for playout by dragging-and-dropping them into the Channel Panel.
- Channel Panel Tool — Record (Right Top).** The Channel Panel tool offers a broad range of capabilities for users to control video server channels. With a click of a mouse, users can start a record on an *ad-hoc* feed coming in. They can also see other record and

playback panels within live event replay by pushing the 1-10 buttons across the top of the Channel Panel tool. From here, as with any other GV STRATUS tool, users can interact with other tools in their workspace. For example, while in recording users can add in/out marks for good content and dynamically drag the Channel Panel viewer window over to the Inspector, add metadata and link to placeholders in ENPS (Assignment Tool — right bottom). This streamlines the process from ingest to making a story available in a rundown, fusing it into a single workflow.

- Channel Panel Tool — Play (Right Top).** Users can play clips on a single channel by simply dragging content directly from a search or the Inspector window into the Channel Panel and play content with a mouse click. As required by their workflows, users can select 10 different Channel Panel configurations on the 1-10 buttons on the top and play back content in any one of those channels. Channels can also be grouped into gangs either by selecting them in an inspector view of the Channel Panel or by simply dragging one atop another within the Channel Panel interface. A clip can be loaded into all channels within a gang by simple drag and drop.
- Assignment Tool (Right Bottom).** In this pane, users can view ENPS rundown placeholders and assign clips to them, making stories available inside of that rundown.

As illustrated, this sample workspace integrates a complete tool environment that enables the staff to manage live production across the entire workflow — all from a single interface. This helps Sky Racing to get live events to air faster and more efficiently than ever before.

User Experience (Cont.)

Training

Another measure of quality for a user experience is the required learning cycle. The GV STRATUS framework was designed not only to be easy to use, but also easy to learn. A fast learning curve means short training cycles, increased acceptance and lower operating costs.

At Sky Racing, training was done on a parallel setup, keeping the old system on air, while gradually migrating production to the new Grass Valley system. Staff first attended training courses with Grass Valley trainers, then were allocated to operate in the new system for a period of 2-3 days, and then they returned back to the old system.

Gradually, all operators were scheduled to use the new system in parallel for a few days. Eventually, all operators were moved to the new system, which was then steadily ramped up to full production.

In terms of how the tools are used, most operators use the same GV STRATUS workspaces. Some users have chosen to customize their workspaces and views, but mostly they all operate in a similar manner. They find the system and tools flexible, user friendly and easy to learn.

“We see all kinds of possibilities for GV STRATUS and how it can help improve our efficiency. It’s all about navigating the user experience to make sure that the staff can work the way they like to work, yet deliver projects fast and efficiently for the benefit of the entire team.”

Carl Petch, Chief Engineer, Sky Racing

Benefits Summary

The GV Production system has introduced a number of advantages and major improvements in the production process at Sky Racing. Many of these factors are clear differentiators from their previous production system:

- The time to prepare content for air has literally halved.
- The overall workflow is clearly defined and understood by all users.
- Users are more independent and can produce more in less time, while becoming more vested in the workflow process. For example, operators have more control over their own content, whereby they can monitor audio, input metadata and so on.
- The combination of networked environment, a shared media storage pool (SAN), and workflows better linked under GV STRATUS control resulted in more collaborative workflows.
- The SAN-based environment created a single depository where all material is available to all users, eliminating departmental boundaries.
- The GV STRATUS application layer efficiently joined up workflows in the client's facility across Grass Valley and existing third-party systems.
- The common GV STRATUS user interface enabled a single way to control content across the workflows.
- Material can be located, accessed and loaded much faster throughout the production lifecycle.
- The folder structure and ability to classify media is much more flexible. Content is collaboratively shared across all users.

- Naming conventions are clearly defined, and always used to search for media (e.g., news directors use a saved search for the day — “B29” for “Studio B 29 November”), which allows them to quickly locate the material for the day and prepare playlists.
- With the new system, directors and producers can prepare their productions much earlier than before: highlights, playlists and news items all can be ready before live events finish. This is an enormous improvement from the previous production environment.
- The inclusion of Aurora Playout in the workflows has contributed to reducing the number of people required in the control area. The news director can now play the entire rundown without a playout operator. In the prior environment, a playout operator was required to search, manually load, and manually play each clip. With the newly streamlined and automated workflow, the director has a complete control of the newscast creative process, from rundown to playout.
- The K2 server/storage infrastructure brought about a major increase in the number of channels and storage available.
- The streamlined and centrally managed production platform resulted in less technical issues and calls to support.

Applying GV STRATUS-based solution in Sky Racing's fast-paced environment of 24x7 sports event broadcasting has resulted in enormous improvements. In summary, Sky Racing was able to achieve faster turn-around, improve their operational efficiencies and do more with less.

Summary of workflow organization and operational benefits

| Workflow Organization | Operational Benefits |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Production/Resource Planning <ul style="list-style-type: none"> • Proprietary traffic system to schedule event recording on Ardendo ingest system • XML metadata ingested into GV STRATUS/K2 Dyno environment on a daily bases • 4 replay operator positions • Replay operators add metadata to their sessions and associate with recordings | <ul style="list-style-type: none"> • Rich metadata available to all users in GV STRATUS/K2 Dyno environment • Efficiently associate content and metadata • Well defined workflows contribute to fast, reliable operations in a demanding live production environment |
| Ingest <ul style="list-style-type: none"> • Prescheduled automatic ingest on 28 K2 Summit ports • Backup recording through GV STRATUS Scheduler | <ul style="list-style-type: none"> • Increased business resiliency with dual systems in place • GV STRATUS/K2 capable of processing a broader range of ingest workflows • Access to ingest controls throughout the GV STRATUS workflows |
| Live Event Replay <ul style="list-style-type: none"> • Typically staffed with 4 operators • Each workstation includes: <ul style="list-style-type: none"> – 1 GV STRATUS client – 1 K2 Dyno Replay Controller | <ul style="list-style-type: none"> • Powerful, intuitive and efficient replay interface on K2 Dyno • K2 Dyno operator can create a highlight and instantly post it to a rundown • Higher level of independence for each operator to “own” and work on their projects • Easy sharing of materials/metadata across the team |

Benefits Summary (Cont.)

Summary of workflow organization and operational benefits

| Workflow Organization | Operational Benefits |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| News Workflows <ul style="list-style-type: none"> Journalists work in ENPS to create stories, scripts, research, schedules, resource allocation, etc. Producers create rundowns on ENPS Stories are prepared using Vizrt Content Pilot to create graphics content Transferred to Viz Trio (Vizrt) for on-air finishing Completed ENPS rundown is transferred to Aurora Playout for on-air playlist Administrators use GV STRATUS plugin within ENPS application providing access to GV STRATUS tools and environment | <ul style="list-style-type: none"> Meets news operations demand for real-time edit of a clip in playout mode. Allows more time for approval process Integrated/automated rundown-playout workflows Unified GV STRATUS and newsroom (ENPS) environments further streamline the workflows The GV STRATUS client application can run on any ENPS NRCS client 100% of GV STRATUS functionality available inside NRCS which provides one integrated workspace |
| Editing Workflows <ul style="list-style-type: none"> Timeline editing on established Ardome EasyCut timeline editor Avid Media Composer currently not integrated with GV STRATUS production system Loose coupling of K2-based SAN and Ardome system via FTP transfers | <ul style="list-style-type: none"> Linkage between both GV STRATUS/K2-based SAN and Ardome systems in editing workflows Ability to interwork established editing workflows with GV STRATUS With today's capabilities, GV STRATUS offers unparalleled choices and flexibility for low-resolution and final editing that client can take advantage of when evolving their system |
| Studio Control Rooms <ul style="list-style-type: none"> 5 studios Each studio control room: GV STRATUS position with Aurora Playout ENPS rundowns are loaded to Aurora Playout GV STRATUS Channel Panel for playout of clips still in recording Studio 1: standalone K2 Dyno to build playlists during the recording of a live show | <ul style="list-style-type: none"> Gives the director independence to work within the rundown, reorder items, see missing media at a glance and take control of their newscast creative process Flexibility to control playout via the most efficient interfaces |
| Content Management/Archive <ul style="list-style-type: none"> Primarily on established Ardendo MAM Archiving to Ardendo archive storage Links between GV STRATUS/K2-based SAN and Ardendo system Common use and administration of media across departments Media naming convention and deletion policy to control available storage space | <ul style="list-style-type: none"> Streamlined data base management under a single GV STRATUS umbrella makes media management simpler and less prone to errors All media visible under one single content manager. Users can search, browse and transfer media across all storage nodes using GV STRATUS tools No need to double up on the asset management infrastructure — it can all be managed from a central GV STRATUS database |
| Folder Structure <ul style="list-style-type: none"> Current folder/bin structure: 16 folders on SAN, 5 of them with sub-folders Staff historically prefers flat, search-centric folder structure | <ul style="list-style-type: none"> Users are empowered to build an easy-to-use and efficient folder structure that is tailored to their unique environments and workflows |
| User Experience <ul style="list-style-type: none"> GV STRATUS customizable workspaces accessible from desktops Staged training process | <ul style="list-style-type: none"> Users participate in the workflow through a common look-and-feel interface, enabling easy learning and intuitive use Individual users configure customized workspaces to accomplish tasks that once required multiple users, at multiple screens, and employing different types of interfaces Reiterative process that supported users throughout the learning and adaptation process giving them ample opportunities to practice and reinforce new workflows and processes |

Evolving the Solution

The successful initial deployment of GV STRATUS and other Grass Valley components went well. With all users now fully versed in the new workflows, the client now looks to future possibilities with this agile platform. Grass Valley periodically adds new software components and features to preserve Sky Racing's investment and help them upgrade to the most advanced content creation tools gracefully, often based on suggestions from users. Equally important, Sky Racing is also planning to leverage the GV STRATUS open APIs to write its own software modules to add new features and capabilities as they see fit.

Sky Racing was an early adopter of the GV STRATUS concept, with deployment initiated in 2011. Since then, GV STRATUS has evolved to meet new and emerging market needs. This enables Sky Racing to cost-efficiently update their solution to meet their own growing needs. Phase 2 of this project may add the following capabilities:

- Leverage open APIs to develop own service modules
- Bring in EDIUS XS for timeline editing functions
- Deploy GV STRATUS multiplatform delivery capabilities to enable media consumption over a variety of platforms
- Migrate to new K2 Dyno S Replay Controller, with its game-changing user experience and networked environment (ShareFlex)

References

- Application Note: GV STRATUS News: The GV STRATUS Application Framework in the Newsroom
- Application Note: GV STRATUS for Live Production
- Application Note: Transferring Media Between K2 Summit 3G Media Server Systems with the K2 Dyno S Replay Controller in Live Replay Environments

Appendix 1

Workflow Use Cases

Key to Diagrams:

Content



Metadata

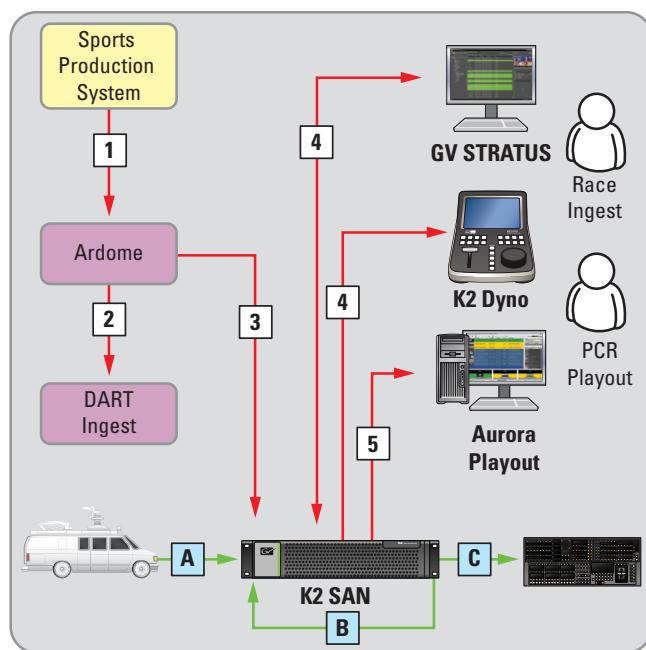


Figure 1 – Scheduled Ingest and Playout.

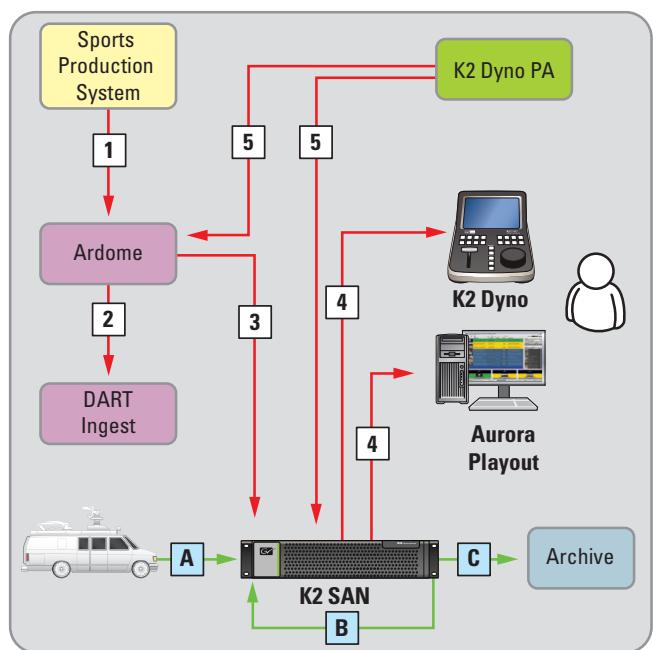


Figure 2 – Scheduled Ingest and Export/Update Metadata.

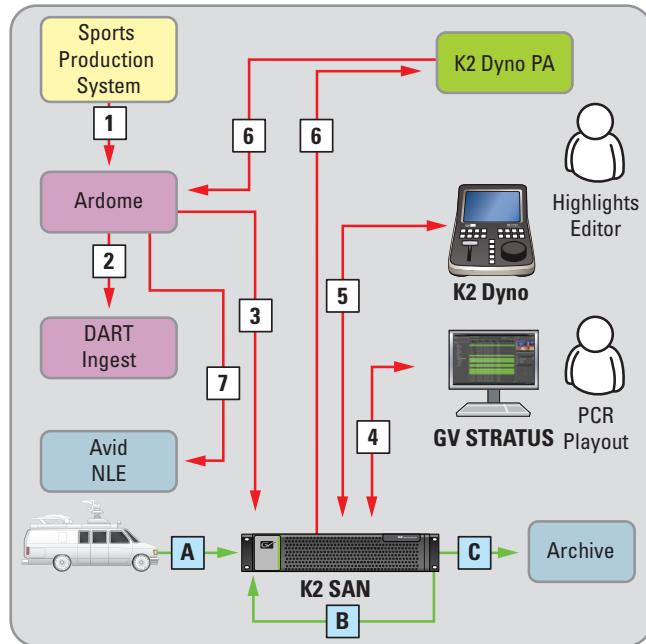


Figure 3 – Scheduled Ingest and Update EDL.

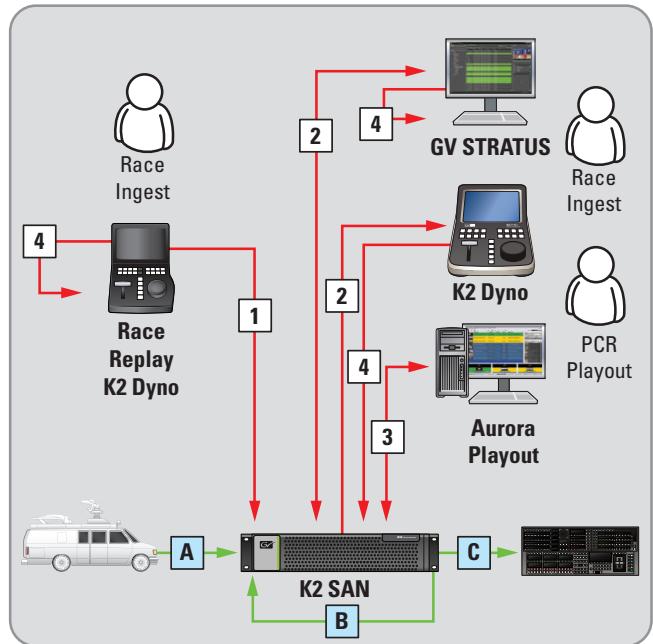


Figure 4 – Ad Hoc Ingest and Replay.

Appendix 1 (Cont.)

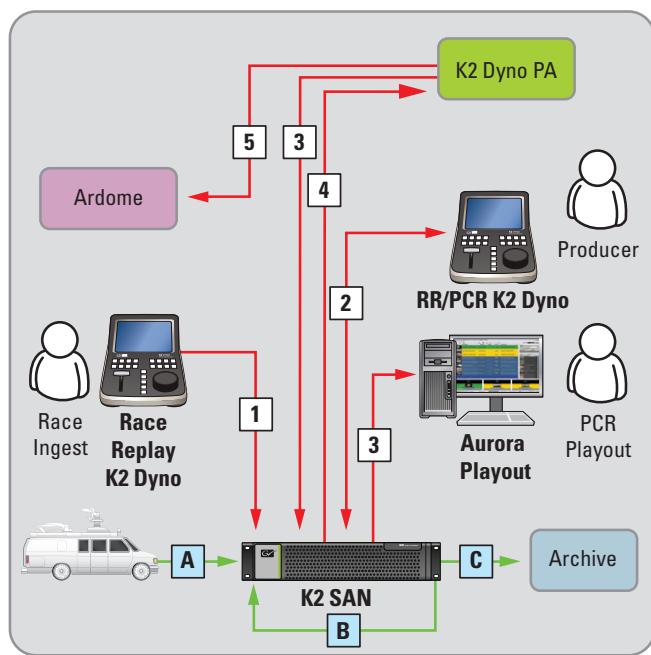


Figure 5 – Ad Hoc Ingest and Archive.

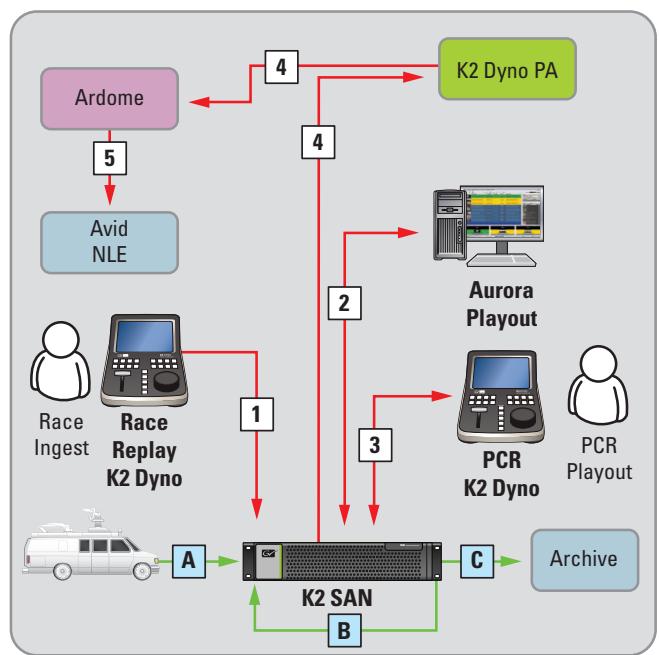


Figure 6 – Ad Hoc Ingest and Archive with EDL.

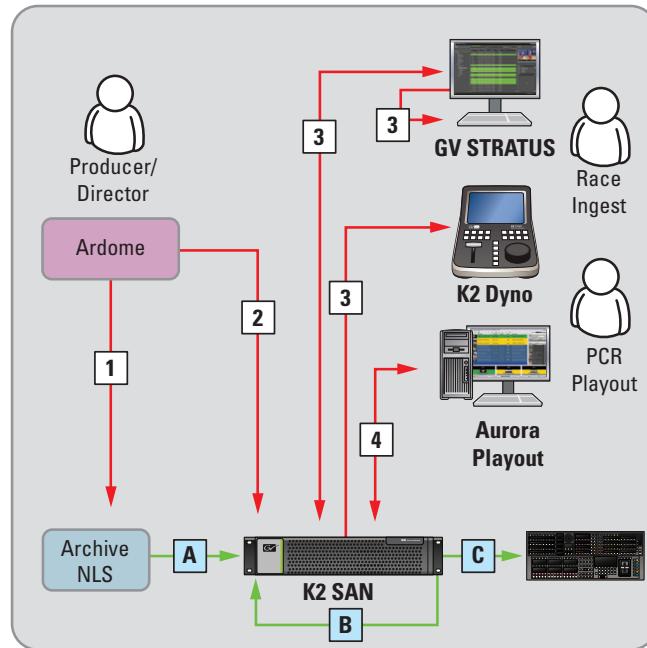
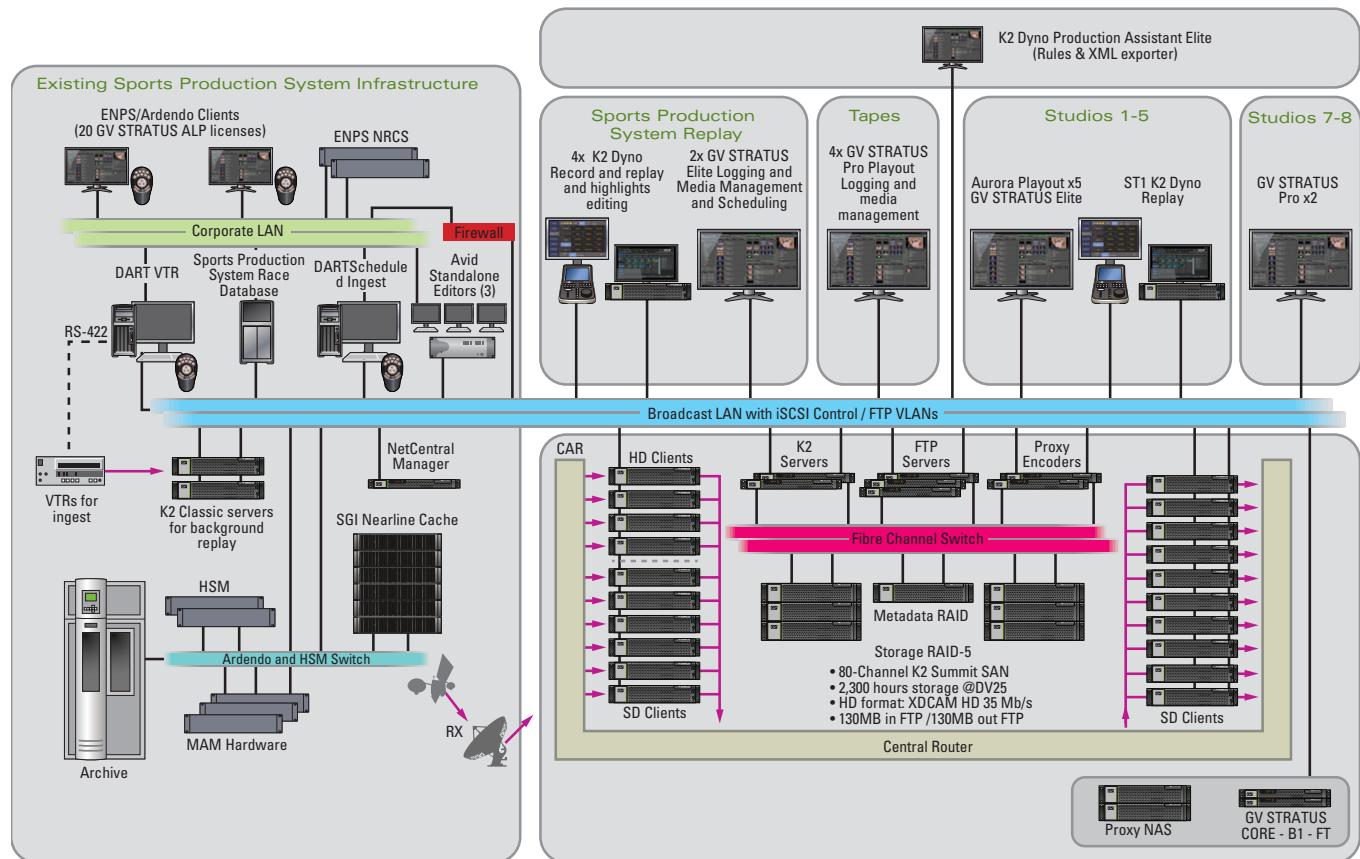


Figure 7 – Archive Restore and Replay.

Appendix 2

Solution Overview Diagram



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