Avid Open Solutions

Avid

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Introduction

Avid® Technology takes pride in delivering the best possible solutions to our customers' business needs. These can range from the workflow benefits of Avid Total Conform for post production facilities, to seamless "ingest to playout" workflows with tight newsroom integration for broadcasters. Yet no matter how effective these solutions may be, we recognize they must also work in a larger context. It is essential that Avid applications and solutions integrate as seamlessly as possible with other workflows, products and infrastructures.

In this white paper we will describe the extent and specifics of Avid Open Solutions. In particular we will show how, through the use of Open Standards, APIs, Plug-Ins, etc., Avid delivers many open solutions across our entire product and solution range. This paper's purpose is to describe the way in which our solutions can interface with third party applications rather than to provide detailed descriptions of the solutions themselves.

For detailed information about any Avid product, service or interoperability program please visit the Avid web site.

Concepts and Solutions

Many different concepts exist which can contribute to the principle of Open Solutions. In this paper we will focus on the application of the following concepts:

- Open Standards and Protocols
- Media Formats
- Plug-Ins
- APIs
- Avid Services & Support

We will see how Avid uses these concepts to deliver open solutions for:

- Editing
- Storage
- Workgroups
- Acquisition and Playout
- Archiving
- Newsroom
- Graphics

Open Solution Licensing

As this paper will show, many of Avid's open solutions are achieved through the use of industry standard open formats and protocols. Occasionally, however, close integration calls for solutions that interface directly with Avid software applications through the use of APIs (Application Programming Interfaces). In common with most other companies, prospective implementers are invited to enter into a license agreement with Avid and participate in the appropriate development partner program. Far from restricting access to Avid solutions, these agreements and programs can help ensure sustainability of third party development efforts. For example, licensed users are notified of updates, and may also be entitled to access technical support from Avid to assist in development.

Avid Media Composer

Open Editing Solutions

Since the first appearance of the Media Composer® in 1989, Avid editing applications have consistently been at the forefront of nonlinear editing developments. In those early days little requirement to work together or with other systems in real time. Today however, the story is very different. With the advent of file-based workflows, it is particularly essential for the editor to be able to interface easily and quickly with a wide range of systems. Open Editing Solutions typically fall into one of the following categories:

- Interchanging compositional and media data
- Controlling the editor remotely
- Real time interaction with the editing process
- Processing time-dependent metadata

In the sections which follow we'll see how Avid delivers solutions for all of these categories.

Interchanging Compositional and Media Data

The ability to exchange both media and compositional data either between different Avid systems or between Avid systems and those provided by a third party is perhaps the most fundamental of all the open solutions needed in content creation environments. One of the most obvious solutions is the adoption of Open Standards, something that Avid wholeheartedly supports.

Defining Open Standards

An Open Standard can be thought of as referring to a methodology, whether for media compression, media or metadata exchange, or a control protocol that meets the requirements of the industry as a whole and is not controlled by any single individual or manufacturer. A good example of this is the Material Exchange Format (MXF) which was initially developed by the pan-industry Pro-MPEG forum and is now the subject of many SMPTE standards. The Advanced Authoring Format (AAF), which delivers the most comprehensive post production compositional metadata exchange, is another good example of an Open Standard. In this case it is managed by the industry itself with manufacturers and users working together in the AAF Association, but without the need for formal standardization.

Open Standards in Avid Editing Systems

Avid editing systems use many different open standards, in this section we will look at a number of examples and how they are used.

Material Exchange Format

Development of the MXF format began in 1999 and in 2003 Avid became the first company to publicly commit to its support. Today all Avid editors are able to use MXF as their native container format for media and its associated metadata. There are several defined variants of MXF which allow it to accommodate a broad range of applications, while also sometimes requiring minor repackaging when moving between certain applications. One area where this can be seen is in the disparate requirements of transmission and editing.

Recognizing these differences is one of the reasons why the different MXF variants (known as Operational Patterns) have been defined. Avid generally prefers the pattern known as OP-Atom, which is characterized by the audio and video components of a material item being stored as separate files. OP-Atom is also implemented by a number of camera manufacturers as their media acquisition container format.

OP-Atom is well suited to nonlinear editing environments, especially those based on networked collaborative shared storage solutions. For example, when performing an audio-only edit, the performance is not burdened by having to skip large quantities of video data as would be the case with a single interleaved file for transmission (as in OP-1A).

However, through the use of Interplay™ Transfer many Avid editing applications are also able to import and export MXF files that are wrapped in the popular OP-1A interleaved format. Many Avid Editing applications also support the direct import of OP-1A from popular file based camera acquisition solutions.

For more information about MXF please visit the SMPTE web site (http://www.smpte.org/).

Advanced Authoring Format

Avid is proud to be one of the founder members of the Advanced Media Workflow (formerly AAF) Association which is responsible for the development and management of AAF. Along with other members, Avid actively participates in the ongoing development of the format which has evolved as the natural successor to the Open Media Framework® (OMF®), originally developed by Avid. AAF is well suited to the exchange of compositionally rich metadata; as such it is the ideal tool to pass edit and effects

data between systems. Thanks to AAF, Avid is able to deliver Avid Total Conform which means that a sequence created, for example, on an Avid Media Composer system can be seamlessly conformed on an Avid Symphony™ Nitris® DX.

For more information about AAF please visit the Advanced Media Workflow Association web site (http://www.aafassociation.org/).

Standard Media Formats

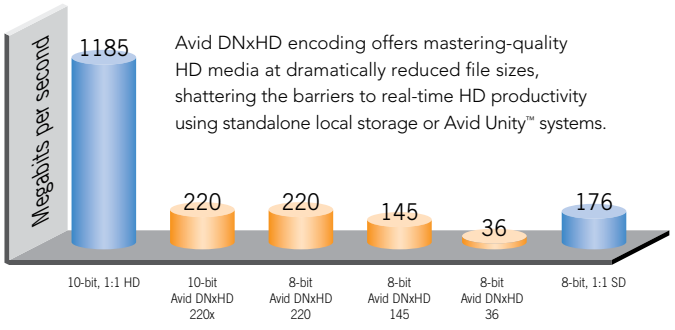
Avid editing systems support many of the commonly used industry standard media formats including:

- DVCAM
- DVCPRO
- DVCPRO-HD
- HDV
- MPEG2 I/IBP
- P2
- P2HD
- Avid DNxHD® (VC-3)
- MPEG-IMX
- AVC Intra
- XDCAM
- XDCAM HD
- XDCAM EX

Avid DNxHD

Avid DNxHD is an HD mastering format which Avid has developed specifically to maintain high quality high definition throughout post production processes and workflows yet it only requires the same storage and network requirements as are needed for standard definition solutions. Avid DNxHD is available as an open solution for both manufacturers and end users. Avid DNxHD is the fundamental encoding technology associated with the SMPTE VC-3 video compression standard, SMPTE 2019.

For more information about Avid DNxHD please visit the Avid HD Solutions web page (http://www.avid.com/dnxhd/index.asp).



Other Solutions for Media and Compositional Data Exchange

In addition, there are a number of other solutions that one may use to exchange data with an Avid editing system. Examples of these include the use of XML and QuickTime reference movie export

XML

XML is frequently used as a means of exchanging instructions and data between systems and applications. The MOS Protocol, used to exchange data within newsroom environments and described later on page 19, is a good example of the use of XML. Camera manufacturers also frequently use XML to encapsulate additional metadata, such as that describing the production for which the material has been captured. One of the misconceptions surrounding XML is that it is an Open Standard. Certainly the structure of XML is standardized, however the data or instructions that it conveys may well be unique to a particular manufacturer or solution, and are frequently proprietary.

QuickTime Reference Support

While the Avid editing application is able to export sequences in a number of different formats, there may be occasions when the one needed is not supported. For example, perhaps a particular internet streaming format is required, or the wish to take advantage of the background processing capabilities of a third party solution. Exporting the sequence as a QuickTime reference movie makes the sequence information available in a format that a large number of third party applications can use, but as no media conversion is performed – the movie simply "points to" the existing media – the process is extremely fast and does not consume large amounts of disk space, allowing exports to be completed quickly and efficiently.

Taking Control of the Editor

Editing by its very nature is almost entirely dependent on human intervention. Typically it is unlikely there will be any requirement to control the editor in any way other than manually. However, there may be occasions when some degree of remote control is needed. Such an occasion may be when laying back an edit to tape. Rather than have the editor control the destination recorder directly, e.g., as a Digital Cut, it could be convenient to use an edit controller to manage the process.

This is best achieved if the editor can perform as if it were a VTR, and consequently the majority of Avid editing solutions implement a level of VTR emulation. Some Avid editing applications provide simple normal speed playback, and others also implement record emulation.

Remote control is typically provided by emulating the industry standard "9 pin" VTR protocol.

Real Time Interaction with the Editing Process

One of the best examples of Avid's open editing solutions is Avid AVX™ technology. With AVX (AVid eXtensions) plug-ins, third party developers are able to extend the effects capabilities of the Avid editing system, or to include directly selected features of their own applications. AVX plug-ins feature an Open Architecture implementation which promotes transparent effect integration and ease of use, platform and host application independence, and backward compatibility.

AVX plug-in effects are available through the host application's Effect Palette alongside the standard Avid visual effects, and can be applied as segment and transition effects to the timeline or saved as effect templates. An AVX plug-in may use the host application's effect editor to display its controls to the user, or may implement its own user interface. To date there have been over 40 different AVX plug-in developments ranging from CG and Graphics implementations, through lens effects, to 3D effects and chroma keys, to waveform monitoring.

For more information about the Avid AVX, the associated partner program and a list of current AVX plug-ins please visit the Avid AVX Developer Program web page at www.avid.com/thirdparty/developers/AVX.

Processing Time-Dependent Metadata

Handling time-dependent metadata may well be an important issue for production, particularly when developing applications such as subtitling tools or those requiring some level of interactivity. Avid's MetaSync® technology provides the ability to synchronize virtually any kind of metadata with video and audio content within the editing application. MetaSync can empower any downstream, interactive process such interactive TV content solutions and converging technologies such as motion simulation rides, movie theatre effects, internet devices, and interactive toys.

MetaSync is delivered in the form of an SDK which includes tools that enable conversion and streaming of XML formatted application data into and out of Avid editing systems for synchronization with program video and audio. In the timeline, pointers to the original data can be positioned, trimmed and edited just like video and audio clips. The application can then be launched directly from within the Avid system in order to modify or view the result. Any changes made are instantly reflected in the timeline and bin.

For more information on MetaSync and the Authorized Developer Program, visit the Avid MetaSync Developer Program web page at www.avid.com/thirdparty/developers/metasync.

Open Storage Solutions

Avid storage systems are widely regarded as leaders in their class with their ability to deliver solutions which combine many different features, including support for:

- Large numbers of concurrent users simultaneously sharing material
- A wide range of third party products and applications
- A wide range of media formats, from offline to HD
- Industry standard connectivity such as Gigabit Ethernet
- Failover

What is not always recognized is that Avid storage is not restricted to supporting Avid applications and workflows. Other applications you may use to support your workflow – 3D animation or modelling packages for example – can also access and store their data in the Avid environment, thus extending to them the same level of security and controlled access as that enjoyed by the Avid media itself. Beneficially, when storage is combined with an Avid workgroup solution as described in the next section, such any non-Avid assets can be tracked as well as Avid native ones, therefore greatly enhancing the overall total system integration.

Open Workgroup Solutions

Avid uses the term Workgroup Solutions to describe our range of applications and productivity tools that greatly extend and enhance the way in which our products can work together in a collaborative environment. This includes solutions to:

- Manage assets, both Avid native and Third Party
- Provide tools to enable the widest possible range of disciplines to take an active involvement in the production process
- Manage user rights and privileges
- Exchange media with Third Party applications
- Provide Third Party access to the asset management database
- Assist in the creation of media in common distribution and streaming formats including the use of Third Party encoding solutions
- Provide a framework supporting enterprise wide features such as health monitoring, time synchronization and problem reporting

Workflow Acceleration and Asset Management

Locating and tracking assets is an increasingly essential part of any workflow, whether it's simply finding a particular clip or tracking the rights associated with an item.

Avid Interplay

Avid Interplay

Avid Interplay is the result of thoughtful customer input, extensive workflow research, and several hundred man-years of development. It goes well beyond the capabilities associated with asset management systems, and is unique in the depth of its integration with creative tools and the creative process. Avid Interplay includes a range of capabilities and optional services that transparently speed work within and between applications, tools to allow assistants, producers, and other non-editors to contribute productively, as well as extensive user controls, settings, and status and health monitoring capabilities. While it is not appropriate to provide a detailed description of Interplay in this document, some of its key features are:

- Integrated asset management
    - o Links all assets and tools in the process
    - o Transparent in the workflow
    - o Handles both Avid and non-Avid assets
- Workflow Automation
    - o Delivers parallel workflows to reduce production time and cost
    - o Provides optional tools that enable more contributors to the process
    - o Enables and manages multiple resolution workflows transparently
    - o Archive integration
- Security and control
    - o Centralized user and access management
    - o Flexible control over roles, access, and preferences
    - o Powerful component monitoring and status reporting

For more information about Avid Interplay please visit www.avid.com/interplay.

Exchanging Media with Third Party Applications

Bringing media into and out of the Avid environment is one of the solutions most frequently requested by Avid end users. While all Avid editing applications have import and export functionality, the growing dependence on file based workflows increasingly demands direct exchange of media in the same format as that used natively by Avid applications. In order to meet this requirement Avid is introducing a new tool for its third party partners, the Avid Media Toolkit.

Avid Media Toolkit

Avid Media Toolkit is designed to make it as easy as possible for those third party partners who want to generate, or access media in the same OP-Atom format used by the Avid editing applications. The toolkit, which is supplied in the form of a Software Development Kit, greatly simplifies the task of constructing, and decoding, OP-Atom

files. Routines are provided to create files, add tracks to those files and populate the tracks with media. Complementary routines are available to retrieve media essence from existing files.

Avid Interplay Transfer

Another frequently encountered need for media exchange occurs in the context of WAN exchange, typically with a video server used for acquisition or playback, or an external library or archive system. Avid Interplay Transfer offers an Ethernet based mechanism for the seamless exchange of media, furthermore because transfer tasks run in the background editors are free to concentrate on their creative tasks.

Avid Interplay Transfer manages the processor-intensive tasks of media transfers and format interchange into and out of Avid Unity nonlinear environments, or supported applications such as Media Composer, NewsCutter and Symphony. Interplay Transfer is an extensible IP-based solution which manages the exchange of media between an Avid Unity environment (or enabled standalone editor) and a device or application that is not supported natively within the workgroup. These devices may be Avid products, such as AirSpeed® and Thunder® servers for example, but through the use of the appropriate API any third party device that supports a compatible media format can be interfaced to the storage and workgroup environment.

Interplay Transfer Data Handling Module API

This API (TM-DHM API) consists of a number of DLLs which are provided in the form of an SDK. A developer can readily adapt the modules to provide the appropriate native communication needed to interface with the specific product or application. The TM-DHM API supports both media import and export, and for import also ensures that the items are checked in to the database together with any relevant metadata. Note that the import and export processes do not involve any media transcoding; it is simply a case of "repackaging" the existing media data.

Generic FTP DHM

One special case of the TM-DHM is the Generic FTP solution. This is a DHM implementation created by Avid and available as an option to Interplay Transfer provides an interface to import media from, or export media to, any standard FTP server which supports media wrapped as MXF OP-1A. With the rapidly increasing usage of MXF-supporting applications and file-based workflows, the Generic FTP solution may well be of interest.

Automating the Process

Although Interplay Transfer handles all media transfers in the background a small degree of involvement on the user's part is involved. Examples are when ingesting material, the items to be imported may need to be selected and dropped in an editor bin, to start the process. Similarly it will allow the user to request that a particular clip or sequence is exported, or "sent to playback". However, it is possible to minimize the degree of user involvement and eliminate the need to interact with an editing application, through the use of the Automation API, a feature that is incorporated into the FTP DHM for example.

The Interplay Transfer Automation API

The Automation API, or TM-AUTO, can be used to reduce, or eliminate altogether, the need for manual intervention with Interplay Transfer based imports and exports. An example of the implementation of TM-AUTO might be an interface to a server which automatically initiates the transfer of newly recorded material. Another application might allow the use of a custom user interface to control the transfer itself, such as a browser-based product with allows the import of only part of a clip from a server.

Enabling Third Party Access to the Media Database

Avid has undertaken effort to ensure other parties can access its asset management database products. While the standard interfaces will typically be sufficient for most users, sometimes such as when an Avid workgroup is part of an enterprise level Content Management system, there are requirements outside of their scope. For example, this can happen when an Avid workgroup is part of an enterprise level Content Management system. Support for third party access is provided by Interplay Web Services.

Interplay Web Services

Avid Interplay Web Services are based on industry standard open platform SOAP technologies and expose many of the functions that were previously only accessible through the Interplay Access application. Through the use of web services third parties can now integrate Interplay seamlessly into their customized automated workflows.

Currently Interplay Web Services provide third parties with the majority of those functions that they would need in order to manage assets in an Interplay environment. Key functionality includes:

- Folder navigation and listing
- Folder management
- Asset check-in
- Asset retrieval

- Metadata input and retrieval
- Searching
- Locator and sub-clip management

For a full description of Avid Interplay web services, please see the white paper which is available from the Avid web site.

Interplay Application Plug-ins

Avid Interplay can provide a completely new approach to integrating third party applications through its use of application specific plug-ins which bring considerable Workgroup functionality to another application. For example, you could create additional File Menu commands to access the workgroup, browse for materials, and check them out for editing directly within the application. Once modifications are complete, a simple "Close Document" action is all that is needed to check the asset back into the workgroup database and update its version history.

Currently Avid Interplay ships with plug-ins that enable native integration with Microsoft Office and Adobe Photoshop.

Transferring Material between Workgroups

The transfer solutions discussed so far are all concerned with the exchange of master clips and finished sequences between Avid Workgroups and (typically) third party media servers. Such transfers are generally "one way" with sequences transferred as "ready for air" packages. When the ability to transfer material between Avid Workgroups is desired, it generally requires the preservation of all the editing capabilities of any sequences that are involved. Avid offers a second Interplay Transfer API to support such transfers.

Interplay Transfer Dynamically Extensible Transfer API

Known as the TM-DET – Dynamically Extensible Transfer – this API has the ability to wrap all the components of a sequence into a single package for exchange. At the destination, the package can be unwrapped back to the original editable sequence.

Third Party Developers

To date more than 80 customer and vendor developers have taken advantage of Avid's range of workgroup APIs and related solutions.

For more information about Avid's range of APIs, please visit Avid Interplay APIs (http://www.avid.com/thirdparty/developers/APIs/index.html).

Open Archive Solutions

Media assets probably represent the single biggest investment of enterprises involved with content creation, users of which will almost certainly want to preserve them in as secure an environment as possible. Avid offers a number of archiving solutions including support for third party archive management and robotic library systems. There are usually three main aspects to an archive and retrieval system:

- Packaging the assets in a form that is convenient to the archive environment yet permits repurposing at a later date
- Managing the storage and retrieval of assets within the external archive
- Restoring assets to the Avid workgroup, including the ability to perform partial restoration

As far as encapsulating the assets is concerned, the Dynamically Extensible Transfer API described in the previous section delivers all the functionality required. It wraps all components of a sequence, including essential metadata, and also supports partial restoration.

Managing the External Archive

Archival hardware solutions are varied and each typically has its own proprietary interface. Rather than attempting to communicate directly with these varied libraries, Avid has chosen to work with SGL, a middleware vendor who handles all the details involved in storing middleware that provides standardized interfacing to the Avid workgroup while at the same time supporting all the commonly used tape and disc archive solutions.

For more information about SGL please visit the Avid Interplay Archive™ and "near line storage" Solutions web page (http://www.avid.com/products/Interplay-Archive/index.asp).

Archive Workflows

Archive workflows are somewhat different depending on whether MediaManager or Interplay is involved, although the mechanism for sending material to the archive remains the same in both cases.

Sending to the Archive

Sending to the archive is simply achieved using the "Send To Archive" command within an Avid editing application. Avid Interplay also supports the creation of folders that facilitate the automatic archival of items placed in them.

Restoring From the Archive with Avid Interplay

Avid Interplay supports the creation of an archive database which allows the archive to be browsed using the same client as used for browsing on-line material. Ability to search the archive is also provided and assets can be easily restored from within the Interplay Access asset management client.

Open Server Solutions

Particularly for broadcast users, media servers figure prominently in their workflows. The media server is the essential component linking the real time world of baseband audio and video with the IP-based workflows of the non-linear editing environment. Avid provides a number of Open Server Solutions including:

- Network-based APIs for server control and management
- Support for industry standard remote control protocols
- Network-based media interchange

Avid supports two main server families – AirSpeed and Thunder. Legacy AirSPACE™ servers generally support the same types of solutions as AirSpeed, so we will refer only to AirSpeed in this whitepaper. Thunder is covered under Open Graphics Solutions below.

AirSpeed Solutions

Avid AirSpeed

Network-Based API

The AirSpeed sever is designed to speed ingest and playback of media in conjunction with an Avid Unity workgroup or standalone editing application. In an Avid Unity environment internal storage buffers recorded media while transferring to the Avid Unity, and caches media ready for play to air. In standalone, the internal storage caches both the ingested media and media ready for play to air dependent on whether the device is being used for ingest or for playout. AirSpeed supports a comprehensive network-based API. Known as PAPI, the API allows third party developers to implement:

- Media inventory listing and management
- Destination template management
- Status reporting such as drive usage
- Full transport control for playback and recording
- Timecode reporting
- Configuration

One key feature of the PAPI interface is the fact that many functions are implemented asynchronously. This means that a client simply needs to indicate to the AirSpeed that it wants to be notified of, say, transport status events. Then, if the transport status changes, the AirSpeed will notify the client automatically. It is not necessary to repeatedly "poll" the unit just to see if something has changed.

For more information about the PAPI interface, please contact your Avid representative or API Licensing Programs, Avid Corporate Development.

Industry Standard Protocols

AirSpeed supports the two most common "9 pin" RS-422-based protocols – VDCP (also known as Louth) and Sony VTR. For VDCP, AirSpeed supports the use of variable length IDs up to a maximum of 31 characters. A number of proprietary Avid commands are also supported by an extended Sony VTR protocol. These include the capability to perform limited inventory management including the creation of new clips.

Network Based Media Interchange

With the latest release of AirSpeed it is possible to use the PAPI interface to manage the movement of media between two AirSpeed servers.

Avid Thunder Solutions

For details of the Avid Thunder solutions please refer to the Open Graphics Solutions section on page 18 of this document..

Open Newsroom Solutions

Users of Avid iNEWS®, the world's most widely adopted newsroom computer system, may already be aware of the rich, open environment iNEWS provides. For the benefit of those not so familiar, iNEWS offers the following open solutions:

- Ability to list, access, and in many cases update, data stored in iNEWS Queues.
- Support for the industry standard MOS Protocol including the hosting of vendor specific ActiveX Controls
- Control of a wide variety of playout devices such as CGs, Stills Stores and Servers

Exchanging Data with iNEWS

iNEWS allows exchange of data using an industry standard FTP Interface. Data is exchanged in a format known as NSML (News Story Mark-up Language). NSML is an SGML-based mark-up language which is used to describe all the content and information in a story. FTP connectivity can be used to perform many story editing and management functions including:

- Creating new stories
- Updating existing stories

- Deleting existing stories
- Re-ordering stories
- Monitoring the change status of stories

No specific API is required as all communication is via a standard FTP interface, which can be used in two different ways.

iNEWS FTP Server

The iNEWS FTP Server provides conventional FTP access to the iNEWS database. Clients must first log-in to the server, after which standard FTP commands are used to navigate the queues and extract the data requested.

RXNET/TXNET

The RXNET and TXNET implementations differ from the FTP Server in that they are typically associated with specific queues within the iNEWS database. An RXNET implementation, for example, can be used to monitor for stories that may be posted from a third party application and then carry out an appropriate action, such as posting them to a specific queue. Similarly a TXNET implementation can be used to send stories in a variety of formats automatically to a third party application.

For more information about the FTP interface or NSML please visit Avid Online Support at http://www.avid.com/onlinesupport (keyword = NSML). Here you will find the FTP interface specification and NSML specification.

Support for MOS Protocol

MOS Protocol is widely used to enable communication between Newsroom Systems and Controlled Devices such as media servers. Typically this is a two-way communication with the Newsroom maintaining an up to date running order on the devices controlled, while at the same time the servers provide information back to the Newsroom about the state of their media items. iNEWS provides MOS support through a dedicated MOS Gateway and also supports the use of ActiveX Controls which are typically used to provide close integration with controlled devices.

iNEWS MOS Gateway

The iNEWS MOS Gateway is a dedicated server-based application which provides an interface between the iNEWS environment and a controlled third party device. It can also be used to provide interfacing to station automation systems. No specific API is required to communicate with the MOS Gateway.

For more information about MOS Protocol please visit the MOS Protocol website at http://www.mosprotocol.com.

iNEWS ActiveX Support

ActiveX Controls are typically used to allow direct access to third party devices from within the newsroom client. A good example of this is Avid Deko® Select (described in more detail in the Open Graphics Solutions section on page 18 of this document). By embedding the Deko Select ActiveX control within the iNEWS client, users gain direct control over the content over selecting a graphic template and fulfilling it with specific text or images. Additionally, the completed graphic can then be previewed showing how it will actually look on-air. Once a graphic has been selected and fulfilled, the user only needs to drag the graphic's thumbnail into the iNEWS story. The graphic will be saved as a MOS object and sent to the iNEWS Command workstation when the rundown is made active.

Other ActiveX implementations include those for third party graphics and subtitling support.

For information on developing an iNEWS ActiveX Integration please contact your Avid representative or API Licensing Programs, Avid Corporate Development.

Controlling Playout Devices

An essential component of any newsroom system is controlling playout devices. A news producer, for example, will want to be certain that the correct media items – whether clips, stills or CGs – are cued and played correctly as each story goes to air. Within the Avid iNEWS system, playout control is provided by iNEWS ControlAir™, and iNEWS Command, two automation assist applications which receive information from the newsroom system concerning the media items associated with any currently active rundowns.

iNEWS ControlAir communicates with the media servers themselves via so-called Device Managers. There are three Device Manager types:

- Generic device protocol support
- Avid created native device support
- Third party native

Currently iNEWS Command communicates only with AirSpeed, Thunder or Deko and does not support any generic device protocol or third party native protocol.

Generic Device Protocol Support

Avid supplies a number of Device Managers with iNEWS ControlAir which are able to control playout devices using a generic protocol appropriate to the device. Examples of generic protocols are VDCP (Louth) control for video servers and III (Infinite Intelligent Interface, aka Chyron) protocol for CGs.

Avid Native Device Support

These Device Managers typically communicate with the controlled device using TCP/IP connectivity and using protocols native to the specific device. In general a much tighter integration is possible than that of the generic solutions. Examples of native Device Managers include those for the Avid AirSPACE and AirSpeed and the Thomson Grass Valley Profile servers.

Third Party Device Managers

Possibly the biggest concern about playback control – that of obtaining the best integration for a specific device – could well be allayed through the use of a custom Device Manager. A number of companies, particularly those providing graphics solutions, have implemented their own Device Managers.

For more information about companies that have implemented native Device Managers please visit the iNEWS Developers website at: http://www.avid.com/thirdparty/developers/iNews.

Open Graphics Solutions

For broadcasters or live video producers, real-time graphics delivery is almost certainly of importance. For a sports producer, for example, a key requirement might be the real-time updating of results as they happen, or as a news channel operator, edge graphics may be a primary concern. In this section we will discover the various open solutions that are available in Avid's range of on air graphics systems:

- Avid Deko real-time "live to air" graphics
- Avid DekoCast™ "single box" solutions for edge-graphics and channel branding
- Avid Thunder multi-channel production servers with integrated graphics capabilities

Each of these products includes its own open solutions which we will introduce in the following paragraphs.

Avid Deko

Avid Deko Solutions

Avid Deko solutions are live HD/SD graphics production systems that feature fast creation speed, high visual image quality, sophisticated automation capabilities, and a comprehensive tool set.

Several open solutions currently exist for Deko, including:

- I.I.I. (Chyron) Protocol (RS-232, TCP/IP)
- The Deko Macro Language together with its associated API
- Deko Select

I.I.I. Protocol

I.I.I. (Infinite Intelligent Interface) is historically one of the most widely used CG remote control protocols. Deko provides an extension to this protocol with its support of Deko's K-Language (aka Macro Language) which offers a degree of macro support for features that are unique to a Deko workflow.

Deko Macro Language and API

By far the richest and most versatile means of creating open solutions for Deko products is through the use of its macro language. Macros can be used to achieve practically anything that can be created by an operator and indeed much that cannot. Effects and actions that might take many keystrokes and navigational commands can be produced easily and efficiently through the use of macros.

Macros may be created locally on the Deko system itself using the macro window. Once created the macro is typically stored locally on the system where it can be triggered by a keystroke or external trigger, such as one of the RS-232 protocol macro commands.

For those looking for a truly open solution, one which is able to respond in real-time to external data, the Deko API can be used. The Deko API allows macros to be created "on the fly" and passed to the graphics device for immediate execution. Dynamic results graphics are just one example of the use of the API.

For more information about Deko macros and the API, please see the Avid Deko User Guide and online Help documentation.

Avid Deko Select

Deko Select (previously known as DekoMOS) represents a completely different approach to an open graphics solution and will be of particular interest for broadcast news users. One of the difficulties often faced by the journalist – and sports journalists in particular – is while they may well know just what is to be displayed by a graphic or super, often they have very little control over how it will appear. Deko Select essentially removes that element of uncertainty.

When Deko Select is used, journalists are able to see thumbnails of all the graphics templates currently available in their system directly from within their newsroom application – thanks to the use of an ActiveX control. Using the ActiveX control – which communicates natively with a DekoMOS server – journalists can browse and select the template they need, populate it with their data. At any time they can choose to preview a static version of the finished graphic to check its appearance. Once this has been done they can drag a reference to the graphic into their news story. Now, when the news story is taken to air, the newsroom system will pass the reference to iNEWS Command workstation to trigger playout on Deko systems.

Avid DekoCast Solutions

Avid DekoCast is a single-box solution for delivering sophisticated SD or HD edge graphics and television branding. Typical DekoCast uses include news information and breaking news crawls, weather alerts, financial tickers, stocks boxes, school closings, station ids, promos, snipes and other in-program informational elements. At the heart of the DekoCast is the DekoCast Engine, which is the real-time application and animation software upon which DekoCast is built. As well as powering the local user interface, the DekoCast Engine is also able to respond to commands passed to it via the DekoCast API. In addition to the API, the DekoCast can also be controlled by XML formatted commands. Plug-ins for DekoCast that can be accessed directly within DekoCast scenes for data gathering, manipulation, or action triggering (for example) can also be created using the DekoCast Plug-in API.

Avid DekoCast

The DekoCast API

The DekoCast Engine is based on a combination of Scenes and Canvases. Scenes represent the graphics objects themselves and typically consist of Objects whose appearance, characteristics, animation, etc. are all determined by the commands and associated parameters passed to the DekoCast Engine. A canvas, on the other hand, represents the output channel and is used to display the scenes. A canvas can, and frequently does, display multiple scenes. For example an animated logo in one part of the picture combined with lower third stock tickers and breaking news banners. All this can be realized as an open solution through the use of the DekoCast API which provides a programming interface to the DekoCast itself.

Using XML

Another way to achieve control of DekoCast without the need for specific programming is through the use of instructions written in XML. Many of the DekoCast Engine commands are also defined as XML tags and as such can be authored using any text editor or other process. The DekoCast system can be configured to listen for XML commands on both serial and network interfaces.

For more information about DekoCast control please see the DekoCast API handbook and the XML Bytestream Command Interface handbook.

I.I.I. Protocol

DekoCast can also be interfaced through standard I.I.I. protocol. Though not as fullfeatured as the native DekoCast APIs, it does provide data fulfilment and playout control. For more information about DekoCast control through I.I.I. please see the DekoCast User Guide.

DekoCast Plug-in API

The plug-ins for DekoCast become objects within a scene, very similar to all other objects in a scene. Once added to a scene, plug-ins and their parameters can be modified in the following ways:

- By the plug-in itself
- By users editing the plug-in parameter from the DekoCast parameters list
- By changing a plug-in parameter from an Action

For more information about DekoCast plug-in creation, please see the Creating Plug-ins for DekoCast Guide.

Avid Thunder Solutions

Avid Thunder

Avid Thunder is a versatile live production video server built for demanding SD or HD broadcast applications. Each channel is able to independently handle video ingest, or playback of video and key with audio, animated logos, and real-time DVE effects and Avid Deko graphics. Thunder is also rich in the variety of open solutions provided for its control and integration. These include:

- VDCP ("Louth") protocol support via RS-422
- Odetics protocol via RS-422
- Sony 9 pin VTR protocol via RS-422
- MOS
- Native network-based Thunder Network protocol.

In addition to the industry-standard serial and network interfaces it is also possible for a custom application hosted on the Thunder workstation to gain control through the use of its COM interface. This interface enables development of a custom interface with the following capabilities:

- Transport control and associated status reporting
- Clip selection
- Basic database management
- AVI import and export
- Remote protocol selection and configuration

Thunder also supports a MOS enabled newsroom workflow in a similar way to that described for Deko.

Open Automation Solutions

Avid also provides solutions for Transmission automation in the form of its Sundance range of products. By their very nature automation systems must interface with a wide range of third party systems and applications.

Sundance™ Titan™

Device Control

Sundance transmission automation systems control a wide range of devices, including:

- Media Servers for acquisition and playout
- VTRs
- Routers and Switchers
- DVEs
- Graphics systems
- Camera Robotics
- Satellite ingest feeds

Typically such devices will be controlled by means of an appropriate industry standard, serial based, protocol, such as VDCP for a video server. Sundance maintains an extensive and continuously expanding library of peripheral drivers.

Media Transfer

Particularly with the growing dependency on file based delivery Sundance systems are also able to interface with popular third party systems, and are also able to manage the movement of media between servers, for example to manage mirroring for transmission redundancy.

Traffic Interfacing

Traffic interfacing is a key requirement of any transmission automation system. Many commercial traffic systems exist, however each typically utilises its own unique protocol. As part of the consultation and delivery process an interface to the traffic system of choice is created as necessary.

Broadcast Exchange Format

Sundance engineers are actively participating in the SMPTE committee that is developing a format for the exchange of, particularly traffic related, broadcast data. Once ratified as a standard, and adopted by traffic and automation vendors, it promises to deliver very close integration between scheduling departments and automation control.

Avid Services and Support

In many instances, customers have sought custom or third party solutions simply because they were not aware of all the capabilities of their Avid system; or, when designing a project, they may have missed a key feature of their workflow. Either case might mean that a customer failed to get optimal results from their Avid solution. Avid Services and Support offerings can help customers obtain optimal results for their Avid solutions.

Training, Support & Consulting Services

It could well be said that "no-one knows Avid like Avid", so to that end Avid maintains dedicated Services staff whose task is to work closely with customers before, during and after a project is implemented. They will make sure that every aspect of the customer's workflow has been analyzed and that the proposed solution will deliver the functionality required of it.

Before, during and after project commissioning they will work closely with the customer, ensuring that all aspects of the workflow are planned, integrated, supported and tested.

Finally once the solution has been delivered and commissioning has begun, Avid Services and Support staff can deliver training ranging from self-paced online interactive modules covering just one aspect of the system , customized on-site training at your facility to ensure your people are operationally ready to take ownership of your workflow solution and get the most out of your technology investment, or classroom-based "train the trainer" sessions designed to provide you with the highest degree of self-sufficiency.

For more information about Avid Services and Support offerings please contact your local Avid sales office or visit or visit http://www.avid.com/services_support.

Summary

With support of scores of standards, interfaces, and protocols as well as dedicated engineering and service options, Avid provides more ways to guarantee successful implementation than any other vendor of digital media solutions. Current and prospective customers are encouraged to contact Avid sales for any further information on how Avid solutions can meet your goals through interoperation with other systems.

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AOSWP0508