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With growing legal requirements for accountability among content providers and broadcasters, and the increased focus on fail-safe delivery and archival for broadcast content, the DVStor and DVShift families are an ideal fit for these niche requirements.

A flexible architecture easy to set up and a comprehensive set of options, the DVStor and DVShift families make it simple to deploy archival and time-shift solutions within the broadcast chain.

BACKGROUND

The dynamics of broadcasting and the vast distances separating the source and destinations in the broadcast chain have given rise to some interesting issues to be tackled by broadcasters worldwide. Ranging from disaster recovery to timely and correct retransmission across time zones, the problems are varied and hence require pin point focus for effective remedies.

The DVStor family of products provide reliable and efficient means to store and reproduce the broadcast stream for various purposes. For compliance recording and back-office applications, the DVStor preserves transport streams with the complete table structure for further analysis at a later time. This approach is much more comprehensive compared to the older base-band signal storage being implemented in other comparable solutions.

The DVShift family of products have been successful in pioneering frame-accurate time-shifting of ASI transport streams. From disaster recovery and time-zone adjustment to cost-efficient transmission over cost efficient public networks, the range of applications of DVShift is vast.

DVSTOR

Key Features

The DVStor is the premier extended storage solution for extended storage and recording of transport streams on the incoming cable or off the air. This basic function is enhanced by the addition of the following features and options:

Recording: The DVStor can record incoming transport streams from the ASI (Asynchronous Serial Input) or IP (Ethernet) inputs. The IP input can be either copper or fiber gigabit ethernet connection. The DVStor also allows live play-out of what it is recording, making it a perfect monitoring solution. Coupled with local video playback, the DVStor can be used as a video monitor at any point in the broadcast chain while recording the same stream.

Scheduled Recording: Incoming transport streams can be recorded according to a pre-defined schedule, thereby making automation simpler.

Playback: DVStor can also playback recorded streams. It is possible to play out recorded streams on either the ASI or IP interface.

Variable bit-rate testing: The play-out bit rate on the DVStor can be adjusted for lab testing scenarios. This allows for load testing of monitoring and test equipment.

State-aware: When the DVStor recovers from a power-failure or an unscheduled restart, it can resume whatever it was doing before the incident.

PID Filtering: From a collection of video, audio or data streams present on a transport stream, it is possible to select a subset for recording or playback. This allows for possible saving of recording space on disk or bandwidth on transmission media. For example, if

![Pixelmetrix corporation logo]

there are data streams in the transport stream multiplex that need not be archived, they can be excluded using a simple interface.

Extensive SNMP Support: The DVStor is built from the ground up with excellent SNMP support. Using this open standard, the DVStor can be integrated into any existing NMS or Consolidator+. Using SNMP, the DVStor can be configured or controlled. SNMP traps may also be employed to report the presence or loss of input signals.

Electronic Program Guide: The DVStor uses the program guide in the transport stream as stored to present a schedule of the content for easy playback.

Options

While the DVStor provides an extensive feature set as is, the base DVStor can be extended with the following options:

- **IP Generation**: The DVStor can stream up to seven different transport streams out of the ethernet interface. Up to 1 Gigabit per second of SPTS/MPTS traffic can be sent out on the wire, making it a line-speed traffic generation solution. When coupled with the built-in impairment scenarios, IPGen is a great IP test tool.

- **Direct Attached Storage**: The DVStor-DAS option extends the storage capacity to 15 TB using a robust RAID disk array. The DAS provides completely dual redundant storage, all the way from the storage media to the power supplies. When used in conjunction with a dual redundant DVStor setup, it provides a completely fail-safe mechanism.

- **Daisy-Chaining**: Two or more DVStor can be connected so that when one DVStor fills up, it will pass control on to the next DVStor in the chain. This allows for backup without human intervention.

Usage Scenarios

DVStor is the best solution to capture of broadcast history and analyze it at a later point in time. With both ASI and IP inputs and outputs, the flexibility allows for the DVStor to be a swiss army knife solution to most issues faced by broadcasters at all points of the content transmission stream.

Providing accountability to various parties has become a major issue to broadcasters. Being legally responsible for the media being handled in a public broadcast, and to provide break-free transmission to the end-users, broadcasters need as much support as possible. Since DVStor records the table structure in its entirety, the recorded transport stream can be used for later analysis.

The DVStor can be used in various scenarios, including but not limited to, the following.

Scenario: Compliance Recording

Broadcasters are now required by law to archive any content for a period ranging from 30 days to three months, depending on the country of operation. With the advent of dynamic programming, and coupling of meta-data with content, it's always a good idea to save the transport stream as broadcast.

DVStor uses in-place real-time trans-rating of the video down to VHS quality, leaving audio and other data in the transport stream untouched. This allows for maximum compression, thereby reducing the need for costly external storage.

Content is stored in a sliding window fashion, hence no human intervention is required. This is in contrast with existing DLT solutions and the incumbent VHS tape stacks. When coupled with a DAS (Direct Attached Storage) option, DVStor can store media in excess of a year without a need for human intervention.

DVStor can be set up in hot-standby mode for maximum redundancy. With the DAS option, the dual-redundant DVStors can both access a secure RAID-6 storage solution which is fail-safe with hot-swappable spare hard disks and dual-redundant power supplies.

Scenario: Lightweight Streaming Server / Troubleshooting

DVStor can be used as a lightweight streaming server in order to help in troubleshooting video equipment. DVStor can play back any recorded transport stream. With a loop function, the DVStor can provide a continuous video source over either ASI or IP.
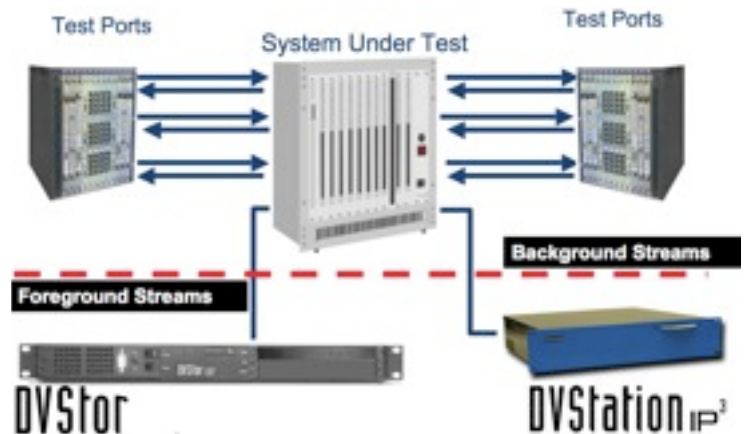
Scenario: Lab Testing

The DVStor-IPGen can generate up to 7 different transport streams in parallel for a maximum of 1 Gbps of line traffic. DVStor-IPGen can generate a variety of line impairments to conduct foreground testing of network traffic routing equipment.

DVSHIFT

Key Features

When faced with wide geographic dispersion of target audience, it becomes difficult to manage timely distribution of content with accuracy and without errors.

For live transmission, it helps to be able to preview any content for a 5 to 10 second window before being put on air to allow for content censorship and audit checks. In both events, accurate time-shifting of content is important.

Media shifting: DVShift is the premier solution for media shifting on ASI. Using variable size buffers, DVShift can buffer incoming transport streams and then provide frame-accurate time shifting from the input channel to the output channel. All meta-data is transparently repackaged and forwarded to the output.

SNMP Trap support: DVShift has extensive SNMP trap support for notification of input/output signal loss and detection as well as the start / stop of media shifting.

Dynamic Time Shifting: In the event of unscheduled outages or unexpected disasters in transmission, DVShift is able to play out stored media to prevent blackout on the transmission channel.

Scheduled time shifting: DVShift is capable of inserting programming based on a scheduled playlist. This makes it possible for broadcasters to replace content on the incoming channel with other programming to work around licensing restrictions or objectionable material.

Wide Delay Range: DVShift has a very wide delay range from 5 seconds to close to 85 days, assuming median bandwidth usage of terrestrial transmission (40 Mbps).

IP Streaming: With the S21 option, DVShift-S21 can stream media over public networks. Various network media sources can be connected without the use of costly leased lines or other connection infrastructure.

Usage Scenarios

DVShift's basic functions of buffering and shifting media can be used in various diverse scenarios, including but not limited to the following.

SCENARIO: SCHEDULED CONTENT INSERTION

DVShift can insert or replace incoming content with stored or archived material. This capability can be used for various purposes such as licensing restrictions, objectionable material or just repeating prime time material for better visibility.

Scenario: Disaster Recovery

In the event of an unexpected loss of signal, DVShift can be set up to loop back previous content to prevent a blackout on the output channel, thereby providing buffer time for support operations to bring the input back online.
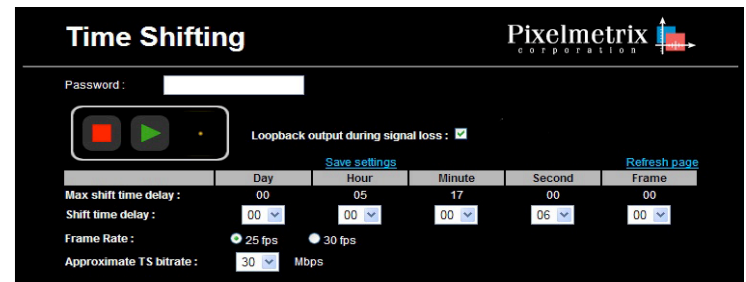
SCENARIO: STREAMING OVER PUBLIC NETWORKS

DVShift can be extended to use the public networks when used with the S21 software option. DVShift-S21 utilizes the ethernet interface on the DVShift-S21 to stream video input on the ASI port over a public network to other DVShift-S21 machines. The receiver DVShift-S21 machines can perform any amount of time - shifting and then play it out on the ASI output interface. Since the time-shifting is done on the receiver end, it is possible to adjust shifting for different time zones.

The DVShift-S21 uses RTSP to negotiate media transport. This makes excellent use of existing infrastructure to use cost-effective bandwidth and channel space to transmit content. This is done by ensuring Using a reliable media streaming engine, the DVShift - S21 can ensure that the media transport channel is made error-free over connection-less UDP networks.

Key Customers

Pixelmetrix enjoys an equal distribution of customers among the world's geographic regions. We have products deployed on all seven continents, including Antarctica.

Key clients of Pixelmetrix include:
- Turner Entertainment (CNN, TCM, et al)
- ESPN
- HBO
- Canal+
- NTT
- Telstra
- NHK
- BBC
- SBC, and others

About Pixelmetrix

Pixelmetrix Corporation is the global expert in Preventive Monitoring for digital, cable and IPTV networks. The company provides equipment and network intelligence systems to television broadcasters for the management and monitoring of quality of service and quality of experience. Headquartered in Singapore, Pixelmetrix has offices in the United States and Europe.

Pixelmetrix has been conferred the Frost & Sullivan Industrial Technologies Award 2009, C+T Technology Development Award 2009, Engineering & Technology Emmy® Award 2007, Broadcast Engineering publication Pick Hit Award 2005 and 2008, TV Technology publication STAR Awards (Superior Technology Award Recipient) 2000, 2004 and 2007, BIRTV Product of the Year Award 2006, Cable-Satellite/Mediacast Product of the Year Awards 2003 and 2004, as well as the Peter Wayne Award 2000, for Best Design and Innovation.

For More Information

To learn more about the DVStation, request a demo, or learn how Pixelmetrix might help you optimize video network integrity, contact us today!

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