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FOTONFLITE™

Securely synchronise, archive and backup Avid projects and workspaces across the internet

Marquis
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FOTONFLITE

Contents

Introduction

Fotonflite enables a high performance, secure 'on-the-fly', point to point transfer of Avid Media Composer projects and media workspaces between source Avid ISIS / NEXIS and a broad range of target storage types, including Avid, generic and proprietary storage. It is unique in its ability to do this especially with Avid ISIS / NEXIS work-in-progress.

Fotonflite has been developed in response to two different customer requirements:

- A studio that needed to securely sync Avid NEXIS between US and UK
- A post house who wanted to securely protect and manage remote freelance Media Composer projects on Tier 2 storage.

Existing transfer technologies were deemed insecure as they required data 'at rest' outside of the connected servers. Fotonflite solves this problem by deploying an always 'in-flight' encrypted point to point connection.

Using unique ISIS / NEXIS analytics, Fotonflite also transfers the project and media changes as 'delta transfers'. This intelligence transforms the speed and efficiency of subsequent updates or backups. In some scenarios, reducing network payload by 90%.

This whitepaper describes the underlying technical approach behind Fotonflite and highlights a number of newly supported workflows.

Fotonflite is an option within Marquis Workspace Sync, Workspace Backup and Project Parking. It is available as an upgrade for existing customers with a valid support contract and as an option for new customers.

It also offers more choices when deploying remote disaster recovery and business continuity solutions to protect Avid ISIS / NEXIS work-in-progress. More information is available here.

The Technical Challenge

Traditionally, access to ISIS or NEXIS has only been possible if a workstation was attached to a NEXIS via a high-performance, low latency, low jitter LAN and was locally running the Avid NEXIS Client software.
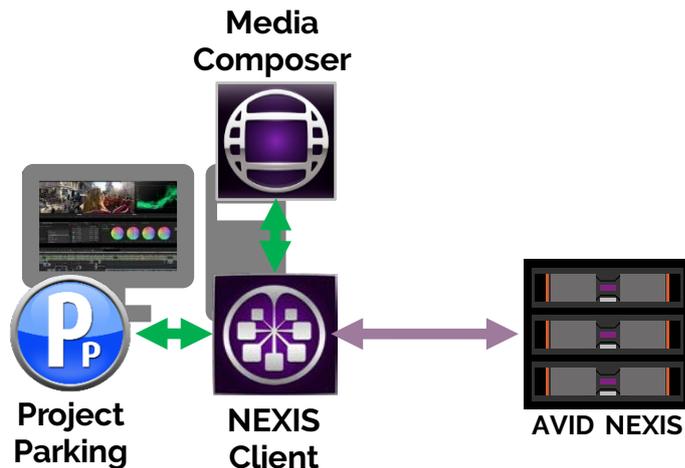
For Media Composer or any other application to be able to use an Avid NEXIS it must connect with the NEXIS Client.

In the example above, we show Avid NEXIS operating in a conventional configuration with Marquis Project Parking. In this configuration the network distance is restricted.

Fotonflite removes this fundamental limitation for attached Marquis applications, enabling many new, remote workflows if required operating at intercontinental distances.

For simplicity these workflows are described as point to point. However, these Avid Platform Certified Applications* can support many workflows and are agile enough to be easily configured to new or ad-hoc workflows as required.
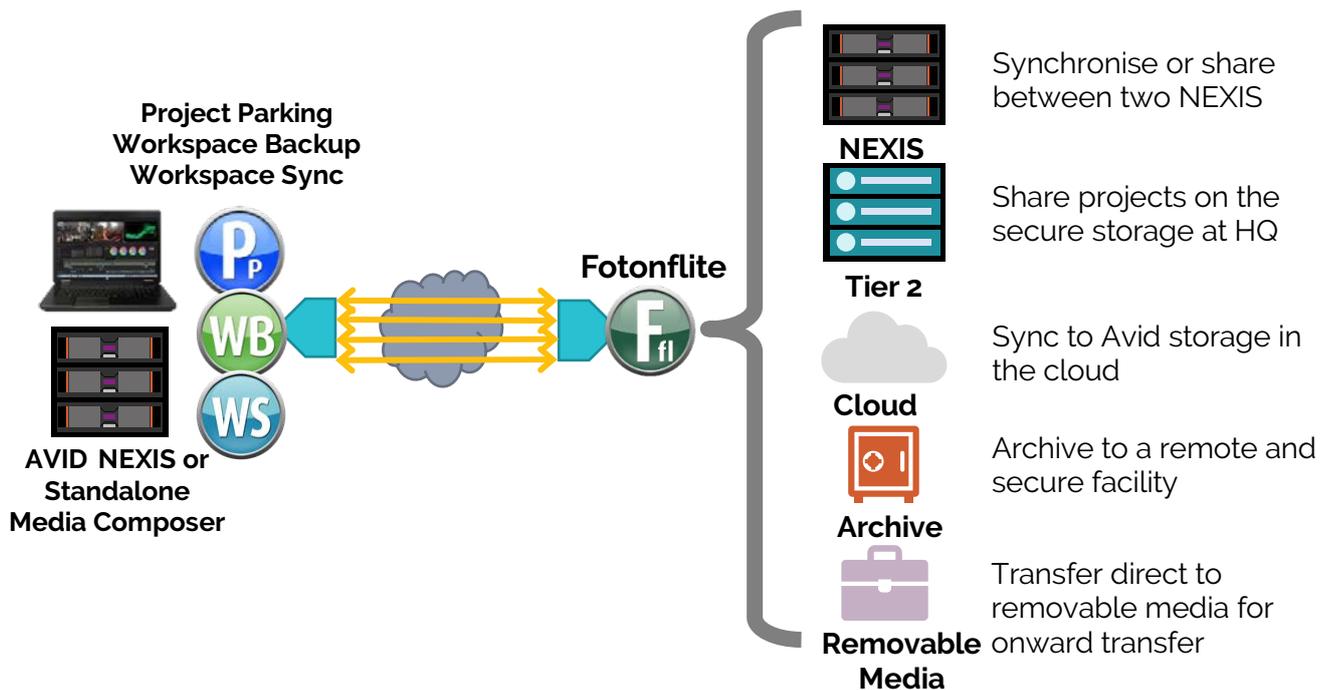

Fotonflite is an option for Marquis Workspace Sync, Workspace Backup and Project Parking. The operation of Fotonflite is totally transparent to these applications.

*Workspace Backup, Workspace Sync and Project Parking are Avid Platform Certified see here.

Fotonflite Characteristics and Benefits

Always 'In-Flight'

At no point during the Fotonflite enabled replication, archive, copy, share and sync processes is data 'at rest' outside the source or target storage systems. The transfer is always 'in-flight' and is transient on network, CPU and associated memory.
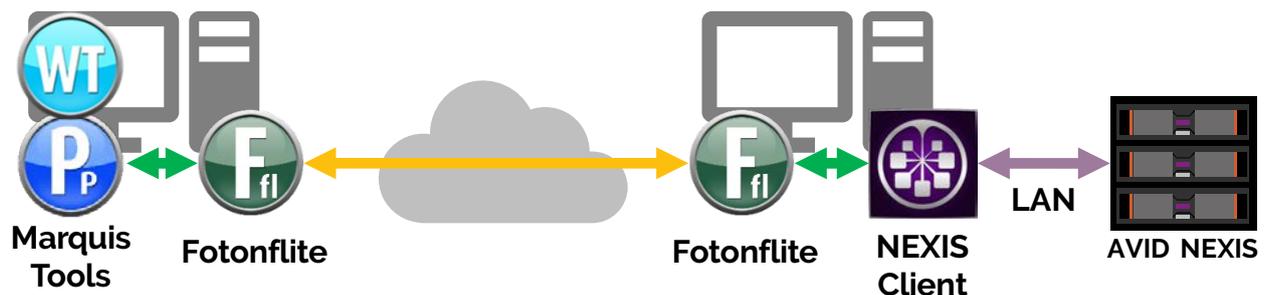
The solution is to keep the NEXIS Client close to the NEXIS and pass data to and from it over a secure HTTPS connection to a RESTful API.

Fotonflite is the only system that can directly connect and securely synchronise live NEXIS systems between production centres over the internet, for example between London and LA.

Secure

Fotonflite uniquely provides a secure point to point, multi-threaded, native server connection -files are sent securely, and checksum validated.

Conventional transfers expose the Avid production to additional security risks as the files must often be copied to a temporary folder (at rest), before the network accelerated transfer system will pick them up.

The in-flight data stream is secure, as all communications between locations are via HTTPS, so encrypted by the Transport Layer Security (TLS). Authentication is provided by encrypted usernames and passwords which are shared between the two sites. The connection to the RESTful API is protected by a token key system, preventing unauthorised access. These security strategies protect against eavesdropping via MITM (man-in-the-middle) intrusion.

Robust Resilient and Fast

The communication methodology is inherently resilient. In addition, Fotonflite will re-try if individual block transfers fail, or the file checksum fails. It is resilient to network jitter, high latency and variable latency connections. It also automatically resumes transfers following network outage.

If power is lost to the source or destination servers, the services will automatically restart when powered back up, all scheduled tasks will then recommence.

The transfer of data is optimised by multi-threaded transfers. The number of simultaneous transfers is configurable either automatically or manually, as is the block buffer size. The configuration can be optimised automatically by 'auto-trialling' on the available network, source and target storage. So, the transfer will take place as fast as the server IO and intermediate networks will allow.

As the server connections are direct there is no need to copy source files to external storage or watch folders etc. before transmission, as would be the case if using a traditional file transfer acceleration system.

Smart 'Delta Transfers'

Our Workspace Tools and Project Parking applications are Avid workspace and project aware. After the first full Fotonflite transfer, any subsequent transfers send only the project and media changes called 'delta transfers'. In most cases this will dramatically reduce the transfer payload, making for the fastest possible target project and/or workspace updates.

This is ideal for productions that need to remotely connect two live NEXIS systems. For example, one in Pinewood UK and the other in Hollywood USA.

Agile

Fotonflite uses a plugin architecture to support a wide range of diverse types of storage. For example, local removable, Tier 2 and on and off-premise cloud as destinations for Project Parking archives, Workspace Backup disaster recovery backups and Workspace Sync to Avid NEXIS. One source system can also have multiple storage targets so new workflows can be set up within minutes. New storage types can be accommodated by simply adding a new plugin.

The web-based Workspace Tools administration UI can be used to remotely administer the services. This could be useful in a disaster recovery scenario when a building is inaccessible but still running.

Operationally Simple

Fotonflite is completely transparent in operation. Project Parking, Workspace Backup and Workspace Sync will act in the same way as they would when writing to any of the storage types locally. The transfer to the remote site is handled entirely in the background and the remote storage looks, to the Marquis user, as if it were installed locally.

Cost Avoidance

Network acceleration is an inherent capability of Fotonflite. Fotonflite does not use or require watch folders or external staging storage.

It removes the additional cost and complexity of:

- Additional intermediate staging storage
- Additional acceleration software licenses
- Couriering encrypted drives
- Using dedicated high-speed networks

In most cases after the first transfer, the analytics ensure that only project and media changes are transferred. So, in some workflows, Fotonflite can also operate over lower speed and lower cost networks.

Fotonflite use cases

Remote Synchronisation

Remote NEXIS synchronisation with Workspace Sync

Workspace Sync is the most advanced and successfully deployed ISIS / NEXIS synchronisation application, used by major studios, post facilities and broadcasters.

Primarily for live NEXIS synchronisation (for business continuity) and for operationally live ISIS to NEXIS migration. All the features of Workspace Sync are still supported when Fotonflite is used.
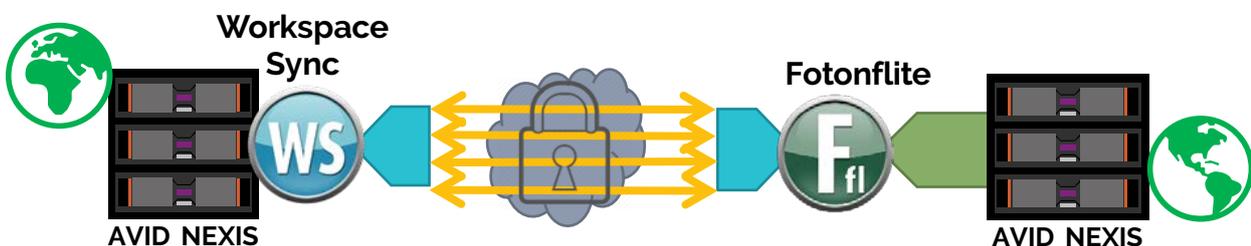

Conventionally, the physical distance that the two NEXIS systems can be apart is restricted due to the latency intolerance of the NEXIS client.

The latency of an antipodal (other side of the world) network connection is typically around 300mS. However, for many reasons this latency could be higher. Fotonflite can robustly withstand long and varying latencies.

Workspace Sync is also very useful when migrating from and old ISIS to a NEXIS and as both systems can remain fully operational and in use during the migration. Adding Fotonflite also makes the migration possible between distant locations.

Sneakernet sync & remote resync workflow

'Sneakernet' sync allows the bulk of a workspace to be shipped and locally copied onto a second site's NEXIS. Fotonflite then connects the two systems and Workspace Sync
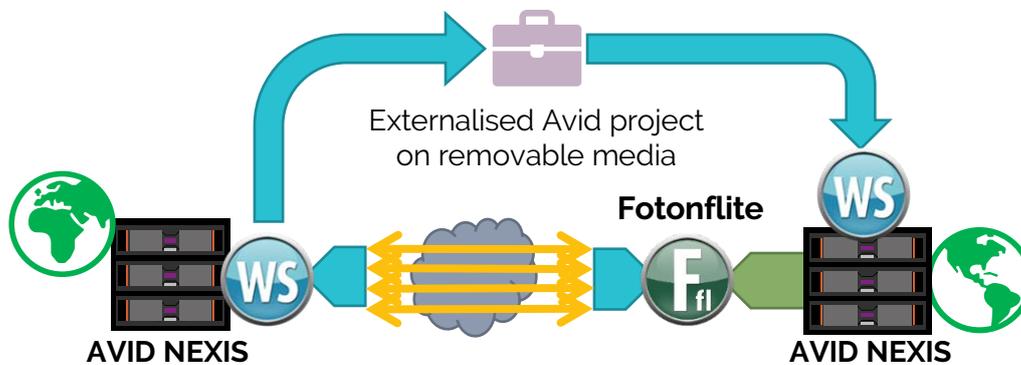

looks for changes and 'delta transfers' commence reducing the network payload. The production workflow is then identical to the standard remote sync workflow above. As the first sync was physical, there are lower on-going speed requirements for the network, saving network costs.

For productions that hire in NEXIS systems, it is beneficial to quickly 'off hire' the Avid NEXIS system on project completion. There are several ways that this could be achieved:

- Use Workspace Sync to sync the workspace back to the original system
- Use Project Parking to write a project archive to local storage (or cloud)
- Use Workspace Backup to continuously write backups during production to local storage or cloud. This has the benefit of maintaining the entire project and workspace history through the retention period.

Remote Generic Tier 2 Storage synchronisation with Workspace Sync

The same workflow syncing concepts described above can also be applied to standard Tier 2 storage.
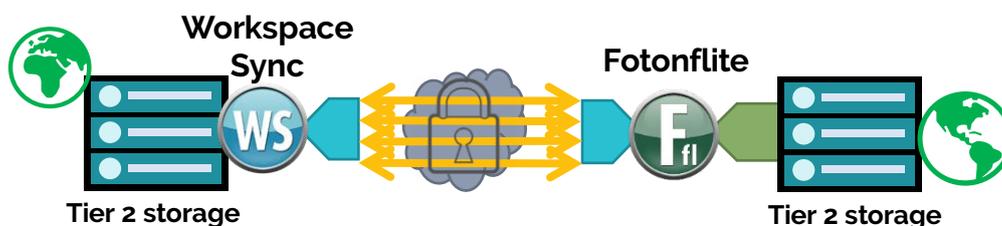
Remote synchronisation of multiple NEXIS with Workspace Sync

Using Workspace Sync at multiple locations with Fotonflite, will allow multiple Avid shared storage systems to be synchronised to share work-in-progress or provide business continuity.

This is ideal for large scale events, such as sports coverage where different production teams in differing geographies may benefit from access to the same content, e.g. sports, sports news, news or promotions.
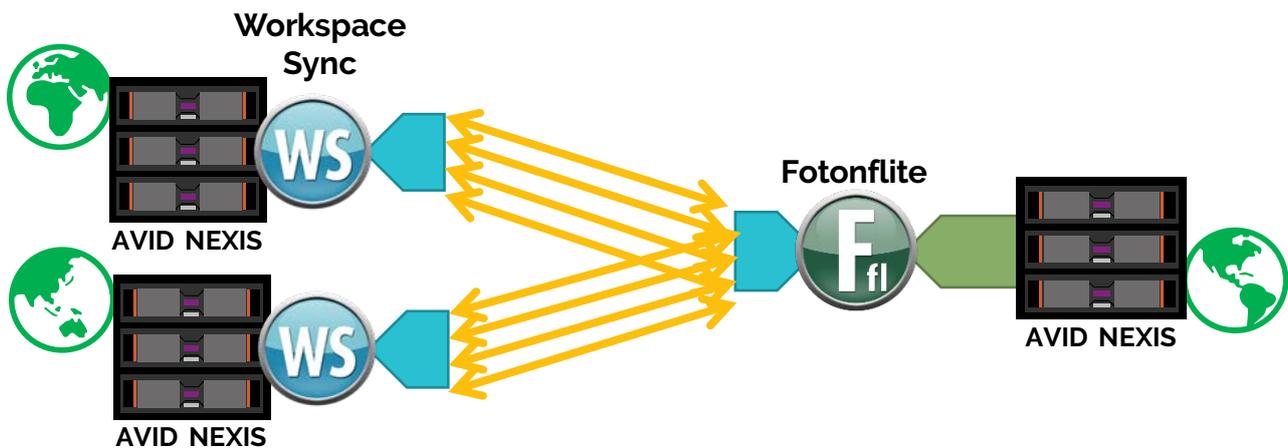
Remote Backup

Remote Disaster Recovery Protection with Workspace Backup and Fotonflite

Workspace Backup is the primary choice for disaster recovery protection for Avid NEXIS systems. Using advanced Avid project analytics, it can look for production changes in NEXIS storage and only write the workspace and metadata changes to the backup. This provides an easy mechanism to protect Avid work-in-progress on external storage.

Uniquely, the Avid projects and all changes are externalised in the backup, meaning that any version of any project from any day during the retention period, can be immediately restored and opened by a Media Composer. Other backup systems must recover the entire NEXIS from backup before production can re-commence, as the media needs of the critical project are obscure, a large NEXIS could take weeks to recover.
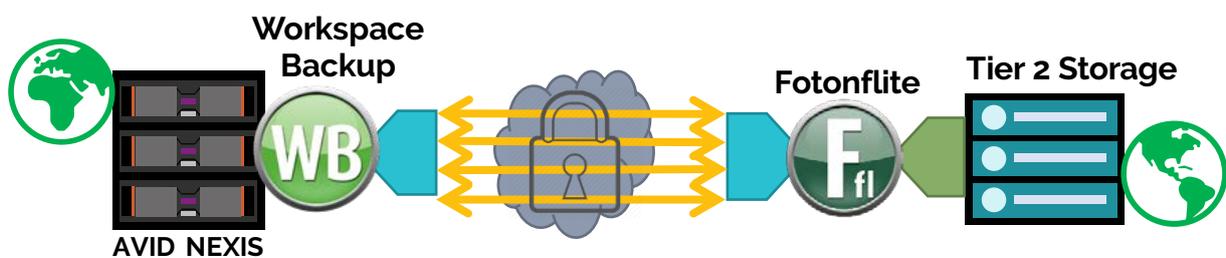
Workspace Backup provides that fastest mechanism to recover Avid work-in-progress to production. It's the only system that provides fundamental mitigation of risk and speed of recovery for Avid work-in-progress.

All the features of Workspace Backup are supported when Fotonflite is used. Fotonflite enables Workspace Backup to securely write to, and recover from, an off-site secure remote storage via the Internet or private WAN.

As the first backup is usually as large as the source NEXIS, it could be written to local storage that is then physically shipped to the remote DR site and uploaded via a fast, local network. Workspace Backup will see the remote backup and continue to automatically send later versions of work in progress.

A web-based management UI provides system management and control to manage policies, storage targets etc. There is also an operational view which provides system status only.

## Remote archiving of Avid project to secure remote storage

Project Parking offers a unique range of Avid project aware tools for managing ISIS / NEXIS storage. Using Project Parking, facilities can track how projects are using space on their valuable on-line edit storage and then use that information to manage the storage.

Facilities can choose to move projects to near-line storage if they are temporarily stalled, archive them permanently if they have been completed, move the project to removable storage or a laptop for work outside the facility, or delete it and its exclusive media when it is no longer needed.

Project Parking can also be used to find duplicate media (the same media in different files, perhaps in different workspaces) and orphan media (media files not used by any of the projects). These use up space unnecessarily and Project Parking can identify them and then delete duplicates or sweep them (move to tier two storage before deleting from on-line storage).
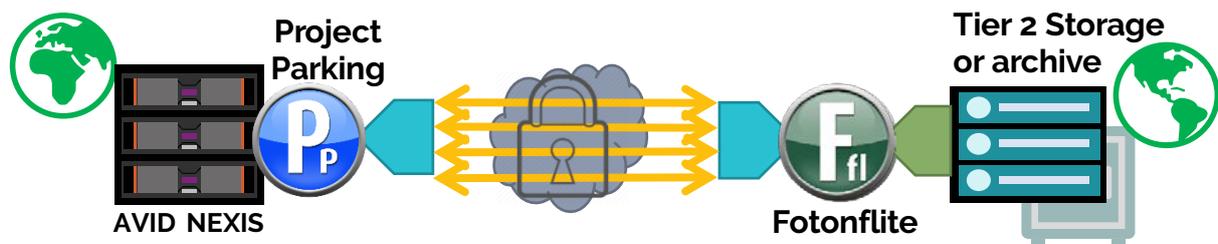

Using Fotonflite, Project Parking can archive from Avid on-line storage to Tier 2 storage in a remote location. This allows for additional protection from disasters by putting the archive off site. It would also enable a large facility with multiple locations to maintain a single archive site with savings in management, administration and security.
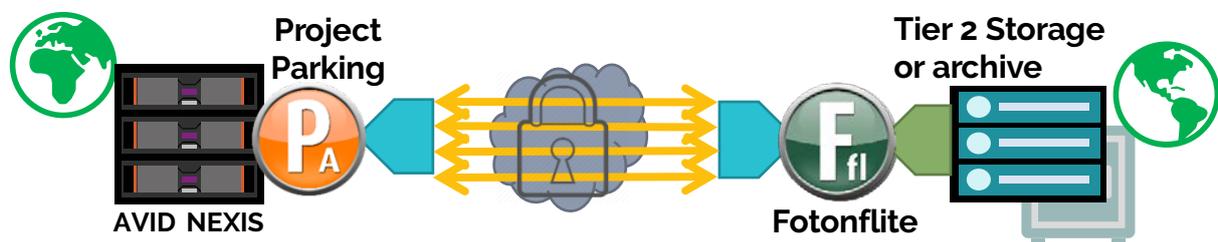
If remote secure archiving is required, but the full analytics and reporting of Project Parking is not required, Archive Parking offers a lower cost option and can use Fotonflite in the same way.

Remote parking of off-site work in progress to HQ or secure remote storage
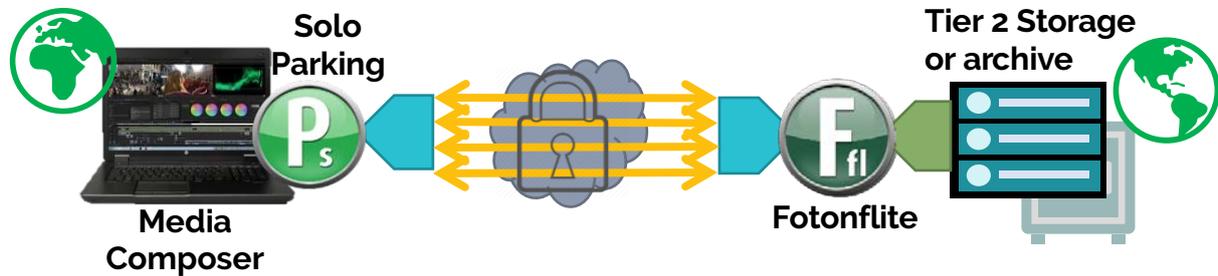

Where editors work on location, or just out of the office, where they are not using Avid shared storage, the economically efficient Solo Parking provides all the analytics and tools or Project Parking but running on a standalone Avid workstation.

This includes tools to move, transfer or delete projects, create and update archives. Where storage on a laptop may be very restricted, managing it is just as important as on a high value Avid shared storage system.

With the addition of Fotonflite, the freelancer or journalist, can archive or transfer their project back to HQ. If the project is already archived there (perhaps because it was started when they were working at HQ), they can update this archive with the latest version. The benefit of this is that only the new media needs to be transferred along with the updated project metadata.

Remote Access to Projects on a NEXIS

Similarly, an editor working remotely may need to access a breaking story that is being worked on at HQ, or media from a continuing story.
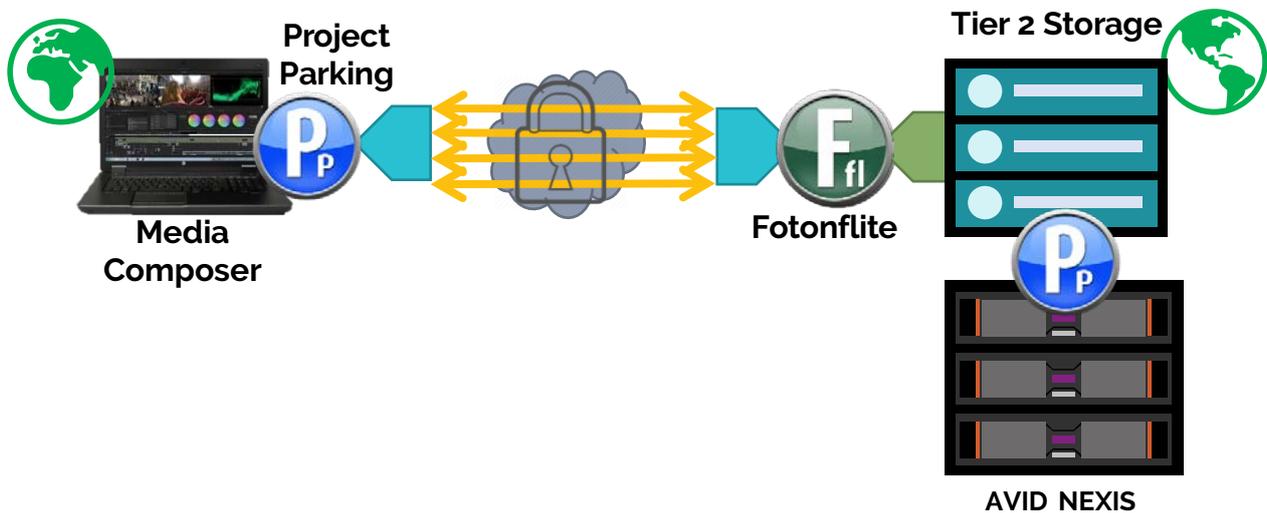
With Fotonflite running at HQ, the editor can use Solo Parking to transfer the latest version of the project along with all its media to their laptop from a backup on Tier 2 storage to continue developing the story and adding new media shot in the field.

Once the project has been transferred to the laptop, it can immediately be opened in Media Composer. Once updated, it can be transferred back to the shared storage at HQ, again.

Delta Parking and Fotonflite

Delta Parking is the name we use to describe an Avid project sharing and archiving workflow. Using Delta Parking and cloud storage, multiple locations (either facilities with Avid shared storage or editors in the field on laptops) can share projects and version project archives in the cloud.

Each time a project is updated from any of the locations, any additional media is added alongside an updated version of the project metadata. This workflow has great benefits in saving upload and download time, in creating a complete record of every version of the project and every piece of media that has ever been used by any version of the project.

Many facilities are concerned about storing media and projects in cloud storage. They have concerns over security and access rights. Typically, these concerns are mitigated when the storage is on-premise protected by physical security measures and monitoring.
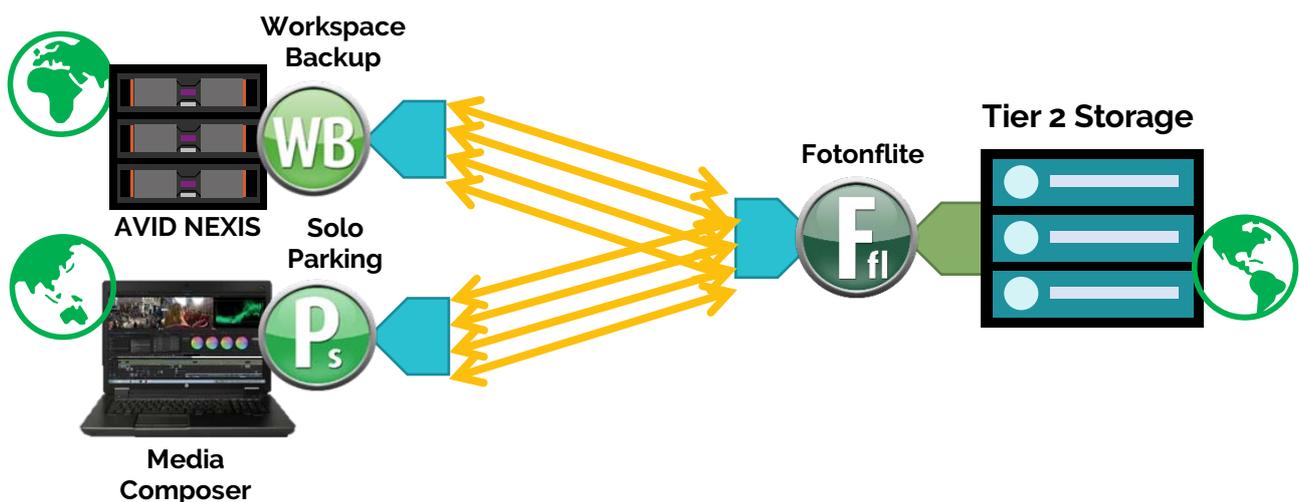
Using Fotonflite, Delta Parking is now possible using Tier 2 storage on-premise. This means that the storage can be monitored and access closely guarded. If there is any concern over access to the storage it can be physically disconnected until security concerns have been allayed.

Prerequisites

Fotonflite runs on a server or VM running at the target storage site. A Fotonflite plugin is also installed on the source Workspace Backup, Project Parking or Workspace Sync system.

We recommend Windows 10, 64-bit, or Windows Server 2012/2016 R2 64-bit, on 64-bit hardware (or equivalent VM), with at least 8GB RAM. Where an ISIS or NEXIS is present, the server or VM must include an Avid certified NIC and Client software.

Licensing

Project Parking, Workspace Backup and Workspace Sync contain the server-side component of Fotonflite in release versions 6.0 and above. An additional license is required for each Fotonflite target.

Useful References

Web links for products

https://marquisbroadcast.com/Workspace-Backup/workspace-backup.html

https://marquisbroadcast.com/Workspace-Sync/workspace-sync.html

https://marquisbroadcast.com/project-parking.html

https://marquisbroadcast.com/Products/delta-parking.html

Disaster recovery and business continuity whitepaper:

https://marquisbroadcast.com/whitepapers/workspace-tools/workspace-tools-advanced-risk-mitigation-and-protection-for-avid-isis-nexis-storage.html

Marquis announces Avid certification for Workspace Tools:

https://marquisbroadcast.com/news/product-news/marquis-announces-avid-certification-for-workspace-tools.html

Summary

Fotonflite provides a simple, secure and robust way to remotely connect Avid NEXIS to a wide selection of certified storage technologies. It enables many new workflows, including those of:

- Enhanced levels of site protection for disaster recovery and business continuity
- Advanced intercontinental remote syncing of NEXIS systems protecting and sharing work-in-progress
- Single and multi-user user remote project versioning with Delta Parking, again sharing and protecting work-in-progress
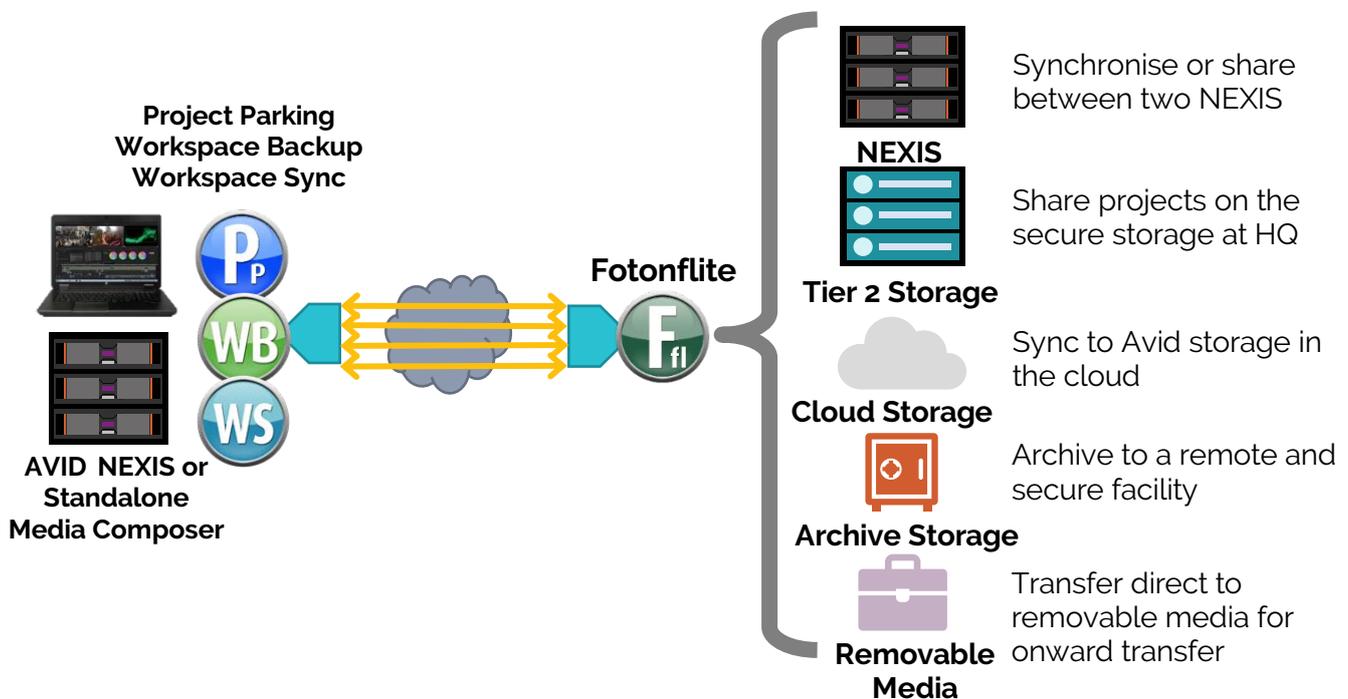
Fotonflite strips out costs of remote operations as it provides secure accelerated transfers, as it is uniquely project and workspace aware it only sends project or workspace changes after the first transfer. As transfers are always 'in-flight' point to point this negates the need of additional storage and watch folders.

Alongside Workspace Backup, Workspace Sync and Project Parking, Fotonflite is the fastest mechanism to remotely and securely transfer Avid projects and workspaces. It can strip costs out traditional workflows whilst being fundamentally faster and more secure in operation.

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