REFERENCE ARCHITECTURE

Building a Collaborative Workflow for Adobe Premiere Pro Remote Editing with Quantum StorNext and CatDV

Abstract

This document defines a reference architecture for deploying a collaborative production environment for Adobe Premiere Pro teams using Quantum StorNext® CatDV.
The storage infrastructure is implemented with Quantum software and appliances.

Quantum.

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Executive Summary

The objective of this paper is to present a detailed, repeatable reference architecture to deploy asset management and collaboration solutions for Adobe Premiere Pro-based content production teams using the Quantum CatDV media management platform integrated with Quantum StorNext™ shared storage file system. The architecture demonstrated allows creative teams to work on shared projects collaboratively whether they are in the facility, or working remotely, while all having a single view and access to all needed content as their work progresses from first asset ingest through finished production.

By implementing the MAM as the creative user's primary interface into their projects, customers will be able to index and ingest master files, organize assets, and have a searchable interface to quickly find content across their entire deployment. By configuring powerful workflow automation engines users can order and speed their workflow steps including managing ingest of raw or source files, production management and planning, craft editing and finishing, review and approval, asset enhancement and monetization, and archive workflow steps.

At a very high level, Figure 1 below provides a view of the components and options of the Quantum Collaborative Remote Workflow Solution:
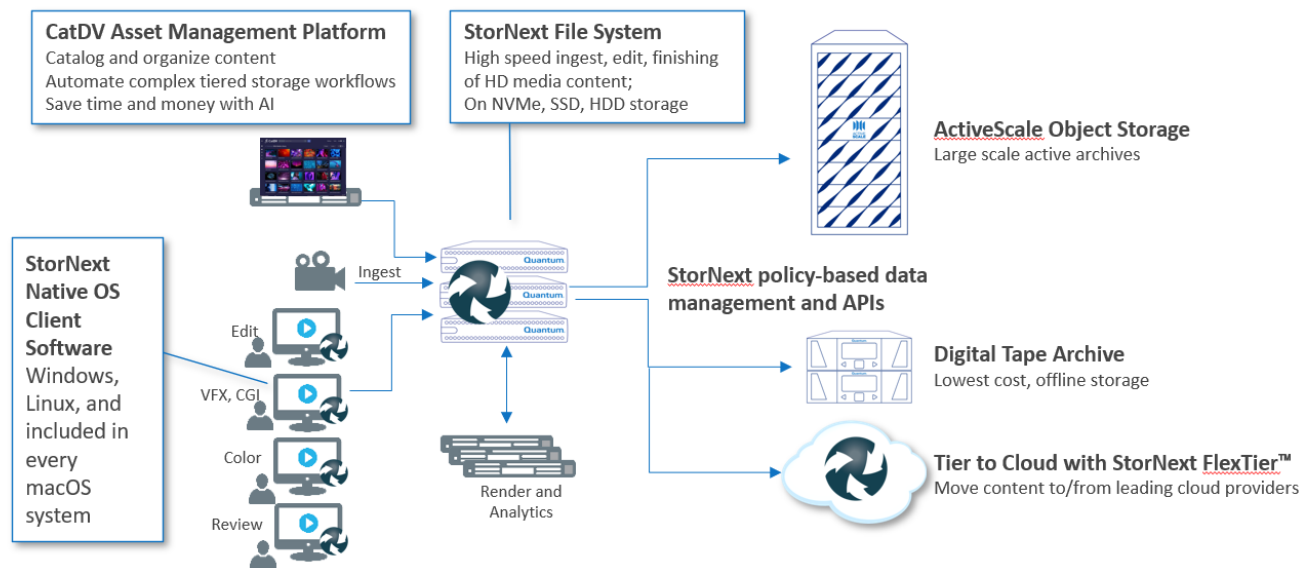

Figure 1 – Quantum Solutions for Media Workflows

The Need for This Solution

As content creators, producers, and content library experts increasingly need the ability to work remotely, there is an urgent need for solutions that let these team-members work together as a team no matter where they are, with a shared understanding of projects in flight, the state of assets and projects as they are being worked on. Above all, these team members need to work in the tools they are most efficient in, and to have a single source of trust of each asset that goes into a finished project.

Designing and deploying solutions that meet this need can be a time-consuming process, so to speed deployment of a proven mix of these technologies, Quantum offers fully tested, recommended, and supported integration of these solutions that can be easily customized to a customer's need. In this way, a customer can rely on Quantum's experience in assembling and integrating the solution components and making it available as a complete, ready-to-use solution including installation, configuration, and even training and customization to ensure that the customer has minimal disruption or downtime and can begin highly efficient content operations as soon as possible.

This Reference Architecture is specifically prepared for teams that have adopted Adobe's Creative Suite tools such as Adobe Premiere Pro. The offered solution combines StorNext shared storage and CatDV for asset management and collaboration, including the Quantum CatDV panel integrated in each users Adobe Premiere Pro installation to allow project check in, check out, and asset selection and marking directly within Adobe Premiere Pro.

Solution Overview

The Collaborative workflow solution consists of a high-performance StorNext 7 collaborative shared environment prepared and tuned for editing teams working within the facility, and remote editors or producers. A Quantum CatDV installation is integrated with the shared storage to index, catalog, tag, and manage assets for all team members, while promoting collaboration at an asset, catalog, or project level. CatDV Server and Worker Nodes are deployed to power automation workflows for file ingest, proxy creation to enable editing for remote teams without requiring download of full-resolution masters. Additionally, the Quantum CatDV Panel for Adobe Creative Cloud is installed for each user, and available within Adobe Premiere Pro, After Effects, and Photoshop, giving creative users access to their entire content and project assets. Most notably, Adobe Premiere Pro users can not only choose assets and clips to add to their project, they can also check projects in and out directly within CatDV, allowing multiple team members to efficiently handoff entire Adobe Premiere Projects from one team member to another.
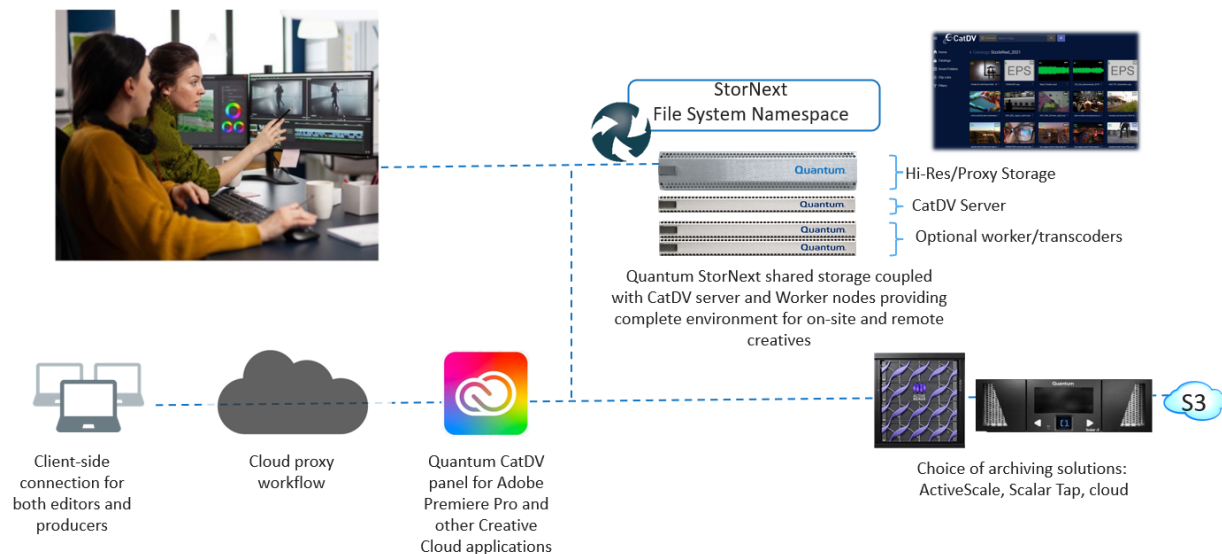
Quantum

Figure 2 – High-Level Adobe Remote Collaboration Reference Architecture

Technology Summary

The table below lists the technology components that make up the Quantum Remote Workflow Solution Reference Architecture outlined in this document. The paragraphs that follow provide more detail on the function of each component in the solution.

Solution Components	Item	Notes	
StorNext	Admin Credentials	Ability to access StorNext Configuration UI	
CatDV	CatDV Credentials	Ability to login to CatDV as User or Administrator	
Adobe	Cloud Credentials	Account used to access Adobe License	
Adobe Creative Cloud	Version (s)	License	Notes
Adobe Premiere	2022	User-Provided	Editing Software
Adobe Media Encoder	2022	User-Provided	Transcoding software
Quantum Software	Version (s)		Notes
StorNext	7.0.1		CentOS Linux release 7.7.1908
CatDV Server	10.0.1		Windows 10 Server
CatDV Worker	9.0.1		Windows 10 Worker
CatDV Pegasus Client	14.01		macOS Big Sur Pegasus Client

Table-1 – Technology Summary

Quantum CatDV Media Asset Management Platform

Figure-3 below lists the server versions available and the specific features with each.

Figure 3 – Quantum CatDV Server Versions

Quantum CatDV is an agile asset management and workflow orchestration platform that provides powerful asset management, automation, and collaboration tools for organizations managing large volumes of digital media. The platform delivers a wide variety of media-centric capabilities, including traditional PAM, MAM, and DAM, sophisticated workflow automation, and fully customized applications. CatDV deployments create transparency and visibility, ensure that best practices are followed, and increase team productivity. CatDV unlocks value buried in large media libraries, saving time, money, and stress. Whether deployed on-premises or in the cloud, across traditional and object storage tiers, customer benefits include:

- communicating and collaborating more effectively,
- automating workflows across tiered storage products,
- unlocking value in large content archives and
- Saving time and money by leveraging Artificial Intelligence

CatDV is used today in post-production, corporate video, sports, government, and education markets, and has potential to expand to other markets using specifically designed plug-ins for expanded use cases such as genomics research, autonomous vehicle design, geospatial exploration, and any use case dealing with large unstructured data. For a closer look at what CatDV with Quantum brings follow the link here to find latest in what Asset Management from Quantum brings you.

Adobe Creative Cloud

Adobe Creative Cloud is a set of applications and services from Adobe Inc. that gives subscribers access to a collection of software used for graphic design, video editing, web development, photography, along with a set of mobile applications and also some optional cloud services. This solution provides extended benefit to users of Adobe Premiere Pro, though other solutions such as Adobe Photoshop, Adobe Illustrator, and Adobe After Effects can also view and access assets directly within those tools as well. The shared storage, and dedicated servers for transcode can also be of benefit to users throughout the workflow, including with the use of Adobe Media Encoder.
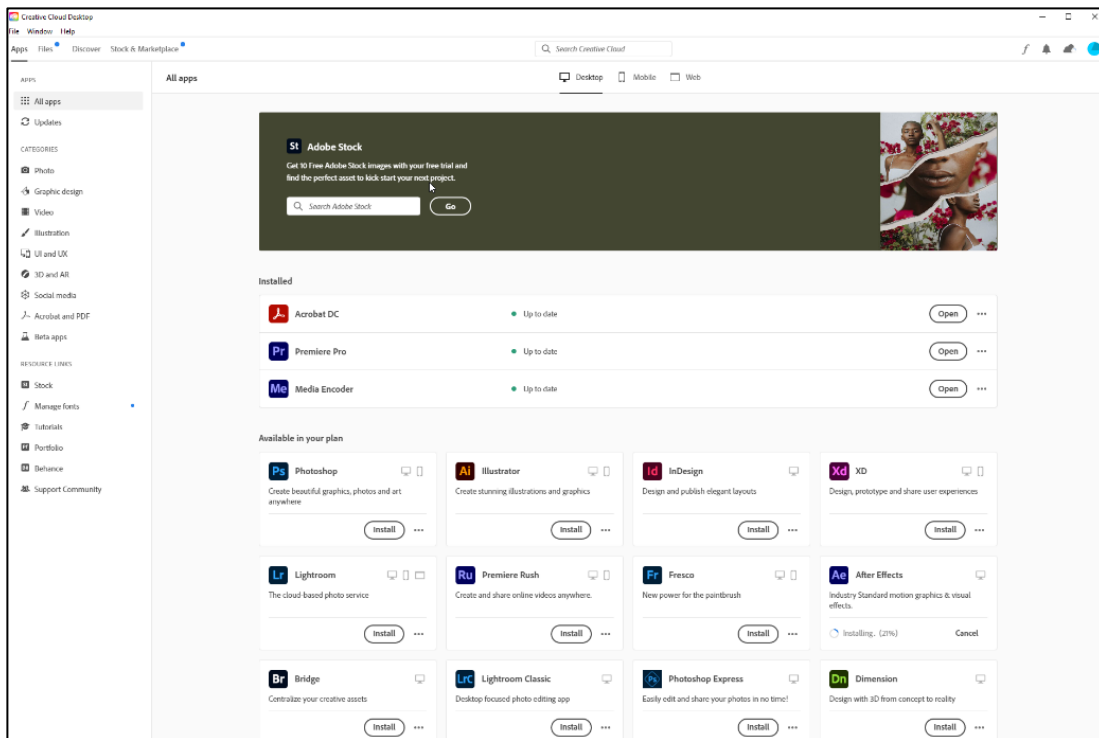

Figure 4 –Adobe Creative Cloud User Page

Reference Architecture

The following diagram represents the lab environment that was configured to build the solution, and is a typical implementation of the Reference Architecture and components used:
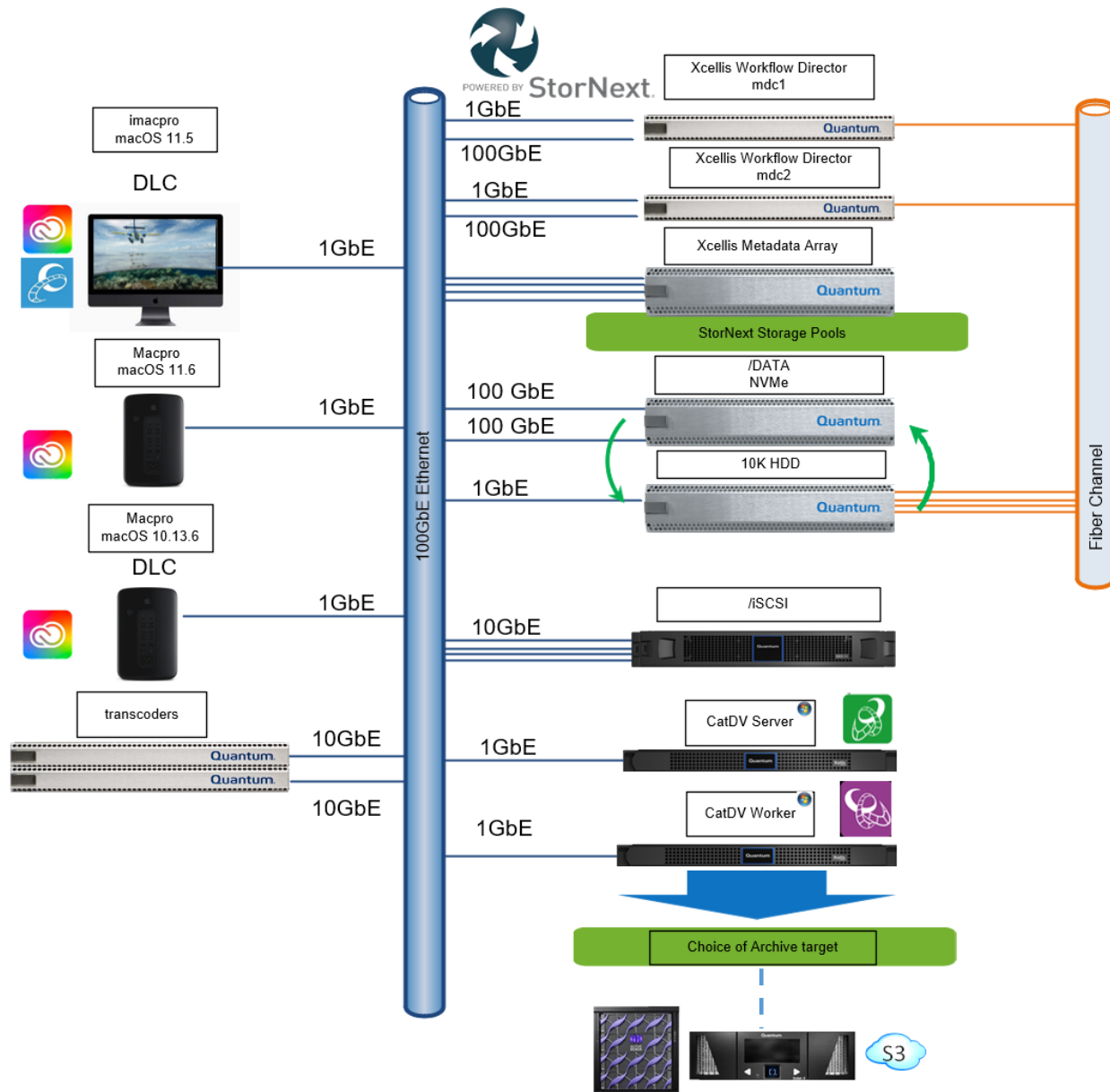

Figure 5 – Quantum Tested Adobe Remote Reference Architecture

Requirements

File System

The file system needs to have the ability to play back footage to users at real-time speeds for various workloads up to 8K resolutions. Depending on the workflow, multiple streams of high resolution and high frame rate files will need to be supported for users editing on high-performance networks within the facility or accessing workstations within the facility remotely. If the workflow is designed around proxy workflows, the file system needs to have appropriate capacity to create and serve the additional assets. Further, the file system should also be highly available for uninterrupted access to assets. The file system should be presented to the client's workstations NFS and SMB NAS protocols, in addition to direct access and seen as block storage devices with fibre channel and iSER. The StorNext Distributed LAN Client (DLC) is another ethernet connectivity option but presented with a proprietary LAN client software. As the underlying file system, StorNext can provide all these options, multiple automated file movement and tiering options including tape, object storage, and S3 targets, all presented in a single namespace that spans all of these potential asset locations.

Networking

The network requirements can vary depending on the facility and the specific workflow. For this Reference Architecture, we selected 100GbE networking to storage there is also a limited amount of 16Gbit fibre channel storage connected to the file system the file system is configured for future use with StorNext pools feature. The CatDV servers and workers are connected via 1 or 10GbE ethernet. Clients in this RA are connected via 1 or 10 ethernet. We used a mix of DLC connected clients and SMB connected clients in the local facility. Remote clients are connected via ISP in specific region and upload via the CatDV web client with downloads via the CatDV Adobe Panel as proxies.

S3 and Public Cloud Targets

Multiple locations can be freely added to support an advanced, hybrid environment across multiple S3 environments.

Database

A Database will be required for the CatDV solution, while a light-weight built-in database is provided during installation, performance is highly tuned for MySQL and Microsoft SQL.

Configuration

The following sections detail the configuration required for Quantum StorNext and CatDV. Adobe products will need to be installed via Creative Cloud and licensed from Adobe. CatDV Panel for Adobe will be installed and configured depending on the facility and for this reference architecture. The objective of this section is to provide enough setup details that the reader can get the products working together and create a basic workflow.

Quantum StorNext Configuration Details

StorNext and Storage Manager are an integrated component of the solution. The configuration has many features and configuration aspects that are presented as services of the file system and delivered by the StorNext metadata controller. As a turn-key solution, the File system and Storage Manager will come configured based on the performance and capacity needed for the installed solution. Further details can be provided during a Pre-Sales and post-sales conversation.

## Quantum CatDV Configuration Details

1. **Server** - Download installer for specific operating system here
   a. Post install – Configure through Server Control Panel 5 tabs, instructions linked here
      1. Installation – location of installation
      2. Licensing – install registration code
      3. Database, either an expedient build-in DB for small installations, or MySQL or Microsoft SQL for production
      4. Web Server, CatDV offers one that suits most installations, or a separate Apache instance can also be configured
      5. CatDV Server set server IP address and port number
   b. CatDV Enterprise or Pegasus Server Software - minimum requirements
      - Windows or Linux Servers (Can be virtualized)
      - 4 Cores
      - 16GB RAM (32 Recommended)
      - SSD (NVMe recommended) 40GB (More for larger databases)
      - 10GbE network connection
2. **Worker** - Download installer for specific operating system from here
   a. Install client per instructions, linked here
      1. Install License
      2. Enter Server hostname or IP under the CatDV tab
      3. Proceed to "watch actions, click + to add new action. This part takes some investigation and planning. Review "Configure the Worker Node" in the manual
      4. Another good section "Hints and tips"

    b. CatDV Enterprise or Pegasus Worker node Software – minimum requirements
- Windows or Linux Servers (Can be virtualized)
- 12 Cores
- 24GB RAM
- SSD 40GB
- 10GbE network connection

This example was designed with 4 simultaneous Worker node threads running at any time. More may be needed depending on the customer environment

3. **Web-Client**
    b. Most Web browsers are compatible, the interface uses HTML 5/CSS3/JavaScript
    c. Licenses should be obtained along with Server license.
    d. Can be deployed in a DMZ with SSL certificate
    e. Administrator or created username, then opens Web3 interface
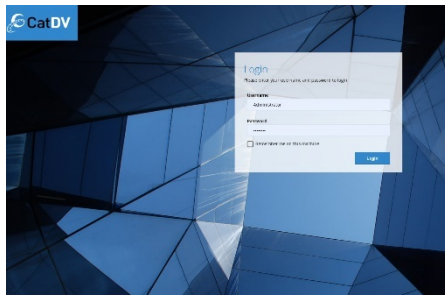
4. **Desktop Client –** If users prefer to use the Pegasus rich desktop client application, download installer for the specific operating system here
   a. Install the client and following instructions
    b. License the application with registration code
    c. Connect to server with proper credentials
    d. Overview of main features
        1. Import clips
        2. View clips
        3. Outputting clips
5. **CatDV Active Scale Archive Plugin**
    a. Installed on CatDV Server
    b. Can be deployed on 1 or more dedicated Archive servers for load balancing and redundancy
6. **Plugins**
    a. Server-side
        1. CatDV Project Template Plugin
- Allows definition of one more Project templates
        2. Some licenses for worker plugins will be licensed on the server
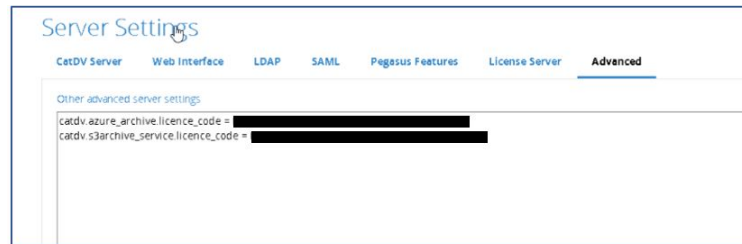
b. Worker-side
1. Download worker plugins from here
2. Install plugins per instructions detailed in the manual , each plugin has different instructions, but the plugin usually resides in:
   - Windows - C:\ProgramData\Square Box\Extensions
   - Linux: /usr/local/catdvWorker/extensions
   - Mac: /Library/Application Support/Square Box/Extensions

7. **Optional CatDV Tools**
   a. CatDV Enterprise or Pegasus Client

   Pegasus Client is required for complex cinematic media types to playback natively in the application examples - RED, R3D, Arri, etc...

8. **CatDV Adobe Panels and FCPX Extensions**
   a. Installation instructions here
9. **Dedicated CatDV Archive Server**
   a. Final option, have a dedicated server to manage archive tasks

Adobe Creative Tools Configuration Details

First step in the Adobe Tools installation is in the installation of Creative Cloud.

1. Download Creative Cloud installation https://www.adobe.com/
   a. Account with Adobe required, and licenses assigned
   b. Licenses are provided by Adobe
2. Next install Adobe Premiere Pro and Media Encoder
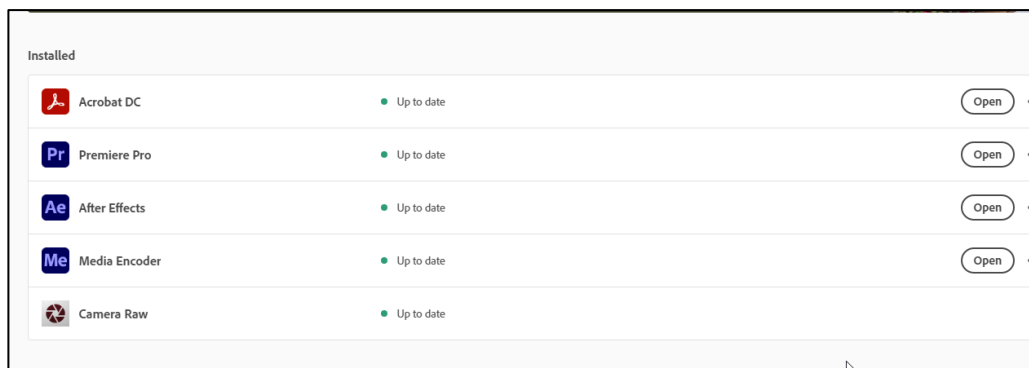
3. Install CatDV Adobe Panel
    a. Download latest panel from Quantum download site here
    b. Download third party installer for Adobe extensions, UberManager from github, windows and macOS work the same just different installers
    c. Install and run UberManager, select "Install Extension | XXP
    d. Locate Adobe Panel in downloads select open, process will complete
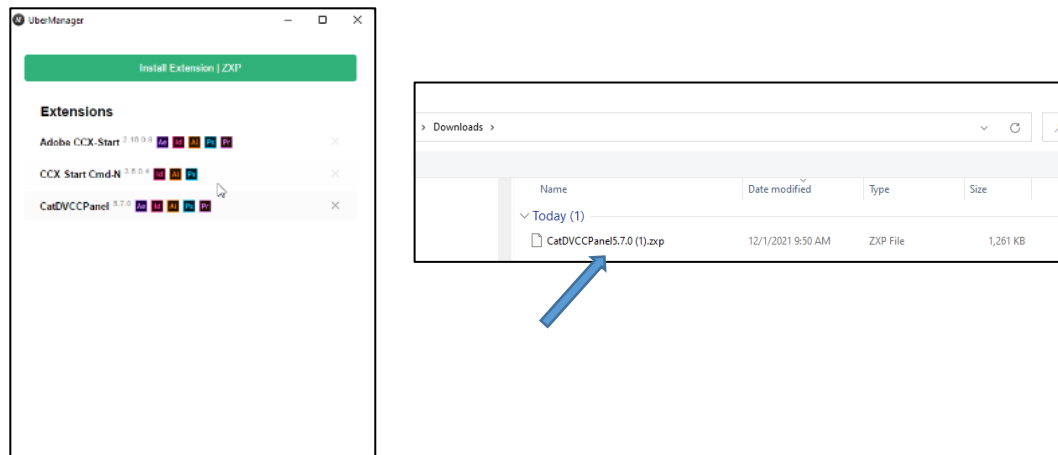
Validation Steps

The following steps can be used to validate the solution's operation and readiness for content production. These steps can be summarized as local site team setup with StorNext, CatDV and Adobe clients, remote clients connected via Internet Service Provider (ISP) pushing and pulling data to local site, collaboration with local team and remote users, final review done onsite with various final outputs for review by local or remote producers/directors.

Prerequisites:

    a. StorNext 7 installed and sharing file system via SMB or DLC
    b. CatDV server/worker installed and configured
    c. Archive via CatDV interface, ActiveScale, Scaler, S3. All licensed with CatDV plugins installed
    d. CatDV Panel for Adobe Extension installed on any Adobe Creative Client in the workflow
   e. Adobe Creative installed on clients, Adobe Premiere and Media Encoder at a minimum

Validation Steps:

1. Login to CatDV Web interface
2. Have already defined Catalogs for the workflow
3. Create Project in Adobe Premiere on local client
4. Open Panel in Adobe Premiere on local client
5. Save project via Adobe Panel with Check-in feature from local client, setting up the project
6. Use remote client to access project via Adobe Panel Check-out feature

7. Remote client adds media to on-prem storage via Web client uploads, generated proxies
8. Remote client/s select Projects/CatDV/AdobeRemote Catalog open project via Check-out
9. Check project back in from remote client via Check-in feature
10. Back to the "on-prem" client we will open the project again
11. Create deliverable with Adobe Media Encoder for Client Review from CatDV
12. Review finals in CatDV web client
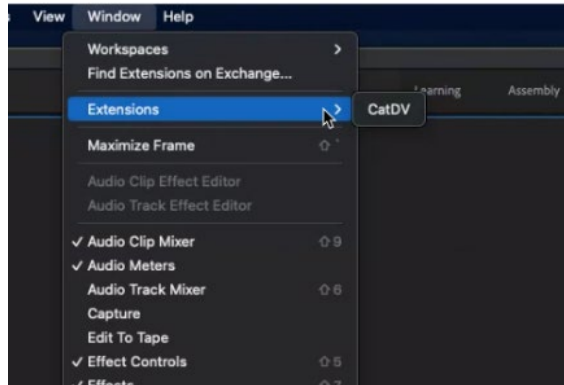
Collaborative Remote Workflow Testing

1. Login to CatDV Web interface
   a. http://CatDV-WebUI:80 (example)
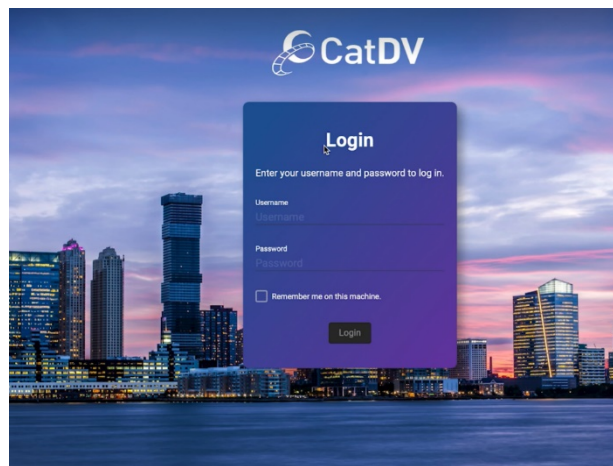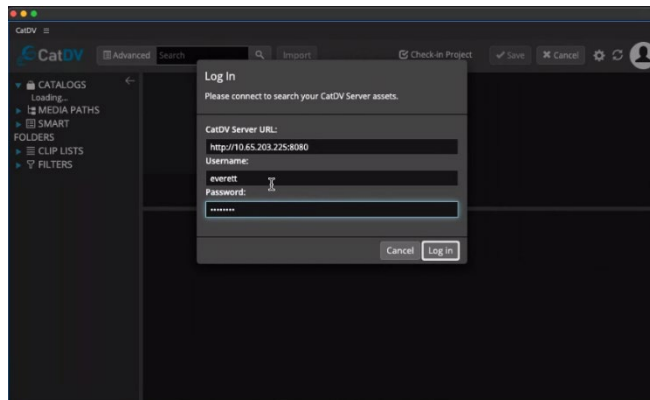

2. Have clearly defined or pre-defined catalogs
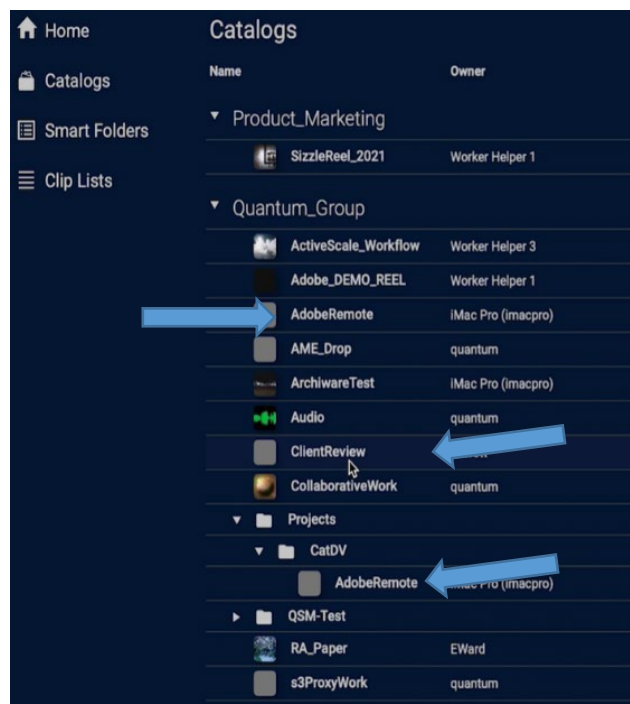
3. Open Adobe Premiere from "on-prem" client (locally attached to shared storage)
   a. Create New Project

4. Open CatDV Panel in Adobe Premiere
   a. Proceed to Windows/Extensions/CatDV

   b. Login to CatDV server with proper credentials

   c. Then finally select the setting button on upper right to set specific items for remote workflows
      i. Select -Download project files and proxy media to local cache – set a path
   ii. Select Check-in/Check-out Use CatDV to manage shared Premiere Projects
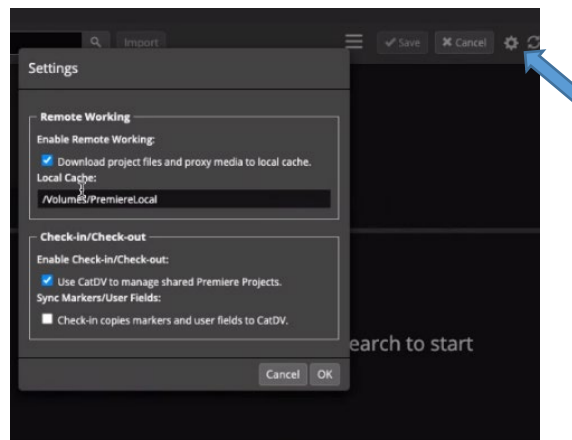
5. Save project via Panel with Check-in feature from local client, setting up the project
    a. Initial step at this point is from the local client, create project, save project through CatDV
    b. Proceed to Panel, select Projects/CatDV/AdobeRemote
    c. Select Check-in Project
   d. Project will save to shared storage and show up in the catalog as an Adobe Project
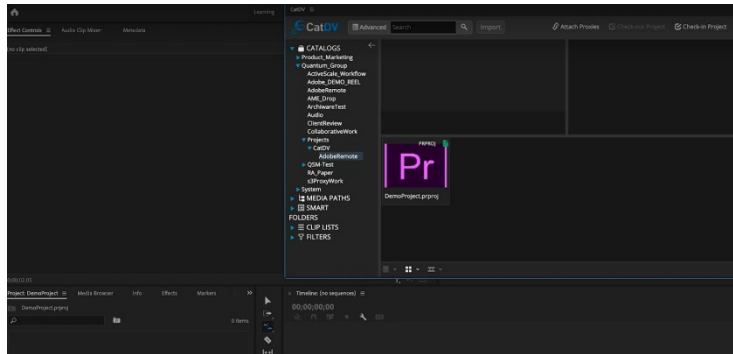
6. Use remote client to access Project via Adobe panel check-out feature
    a. Open Premiere on remote client/s
    b. Proceed to open CatDV Adobe Panel Windows/Extensions/CatDV
        i. If first time, proceed with Step 4 above to configure Panel on remote client
    c. Once Panel is configured and open proceed to Step 7 and upload media to On-Prem Storage

7. Remote client adds media to on-prem storage via Web client uploads, generate proxies, re-ingest to remote client proxies only via Panel
    a. Select + at top of web page. Upload destination is set on the server and a worker action is running to publish upload and generate proxies to the correct catalogs
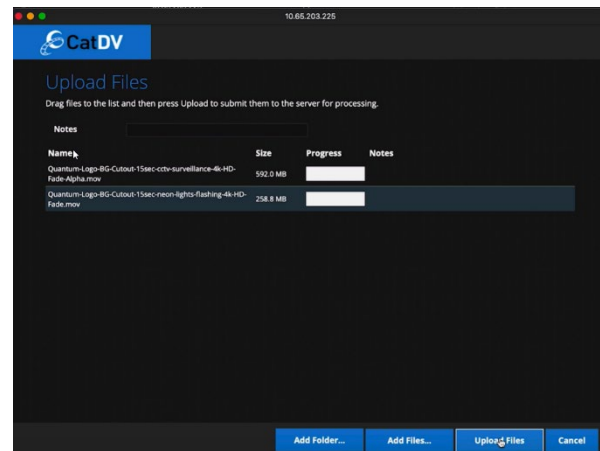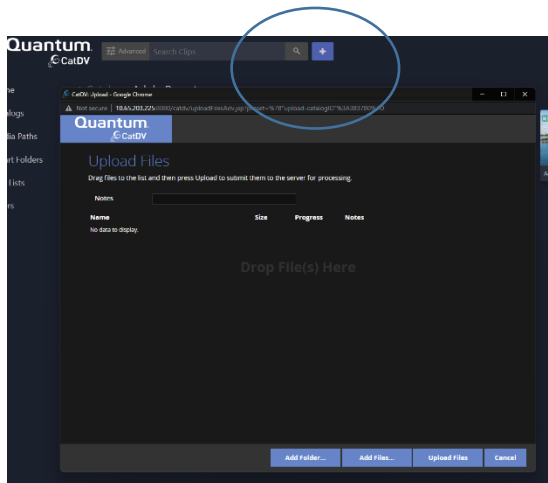
   b.   The files will get published to pre-defined catalog with proxies
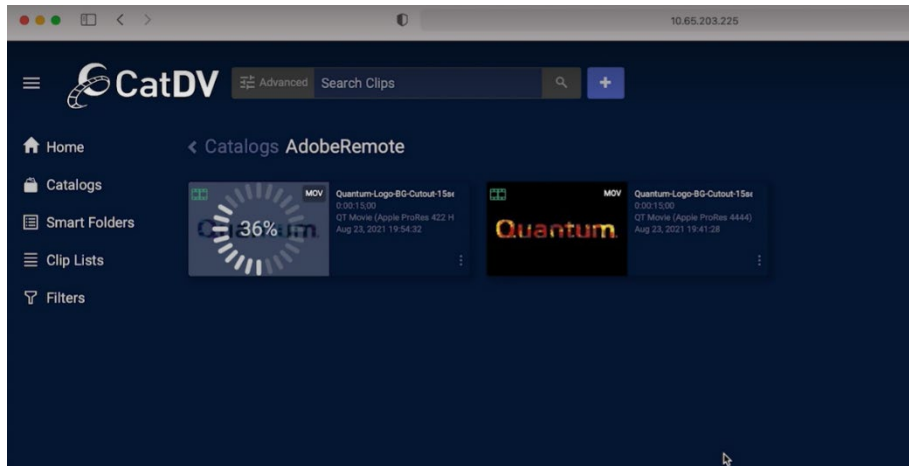
8. Remote client/s select Projects/CatDV/AdobeRemote Catalog open project
    a.   Select clips to import, select import top of screen
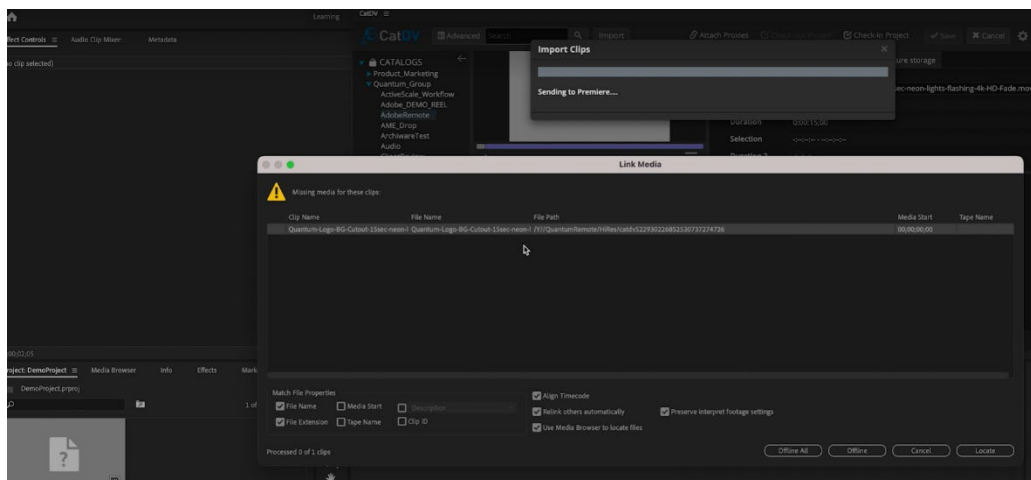
    b.   At this point you will see a warning that the path to the full resolution is not found, that is fine. Select offline all. This will then import the proxies from the server and allow a proxy workflow remotely
    c.   Create a timeline with or more clips, verify playback of proxy in Program monitor

9. Check project back in from remote client via Check-in feature
    a.   Make sure to select the Projects/CatDV/AdobeRemote catalog
    b.   Find the project, select it and Check-in at top of screen
   c.   Saving file and complete edit remotely

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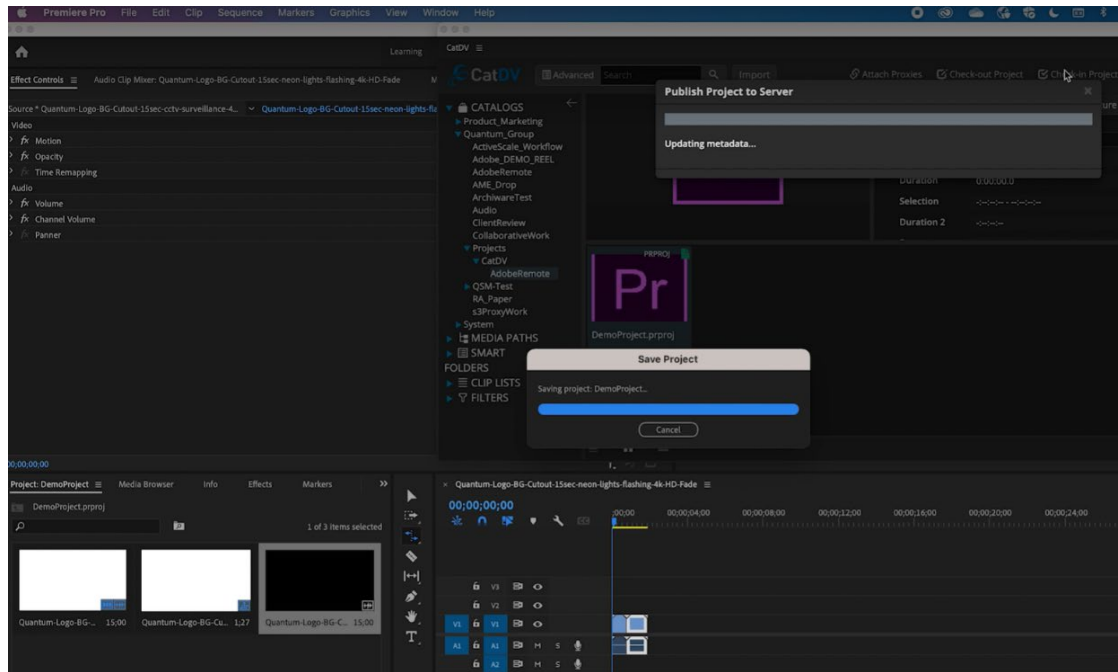
10. Back to the "on-prem" client we will open the project again
   a. Open CatDV Panel, go to Projects catalog and open the saved project by check-out process
   b. At this point you may get an error looking for the full resolution, you will need to locate the full resolution folder and re-link the media. Simply by selecting "locate"
   c. Find the path to the files full resolution and select ok. Do this for any clips that are not found. This process is done only on the local client that has access to the shared storage
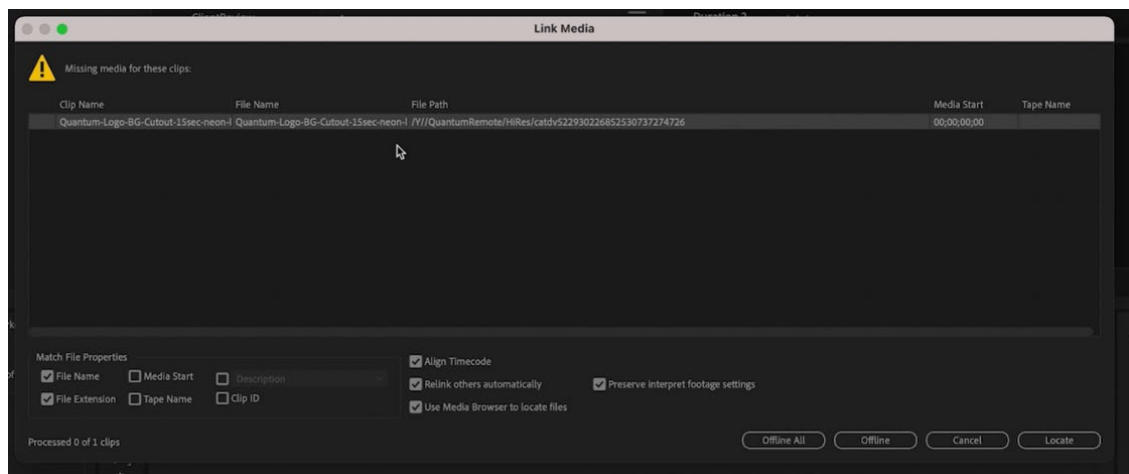

   d. Once Timeline is loaded, perform edits if any and check-in to save those changes, again be sure to select Project/CatDV/AdobeRemote catalog

11. Create deliverables with Media Encoder, save to "ClientReview" catalog in CatDV
    a. Preparation should have been made or need to be made in Adobe Media Encoder
    b. Using watch folder/s we will generate various outputs from a single project using CatDV and ME
    c. First in Adobe Premiere select File/Save a Copy
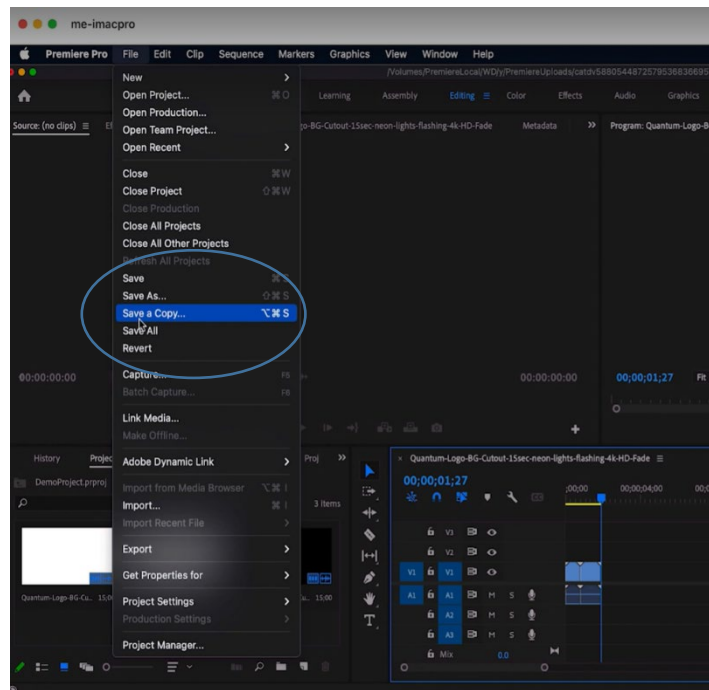
   d. Save the copy to a defined Adobe Media Encoder watch folder
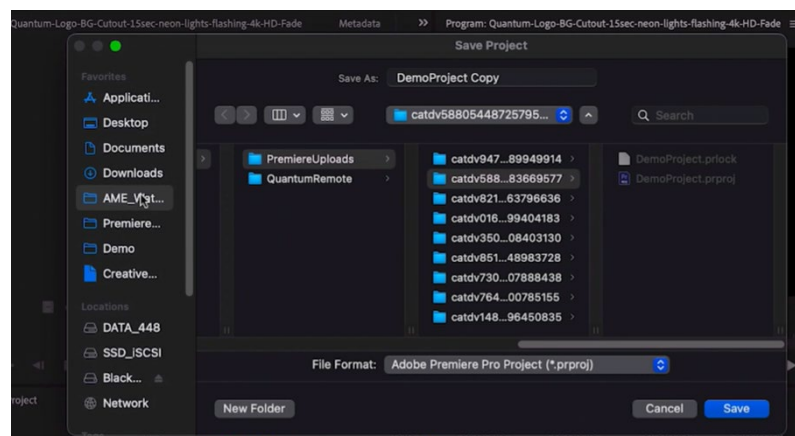
e. Back in Media Encoder you should see the pre-defined outputs being generated to a folder on the shared storage
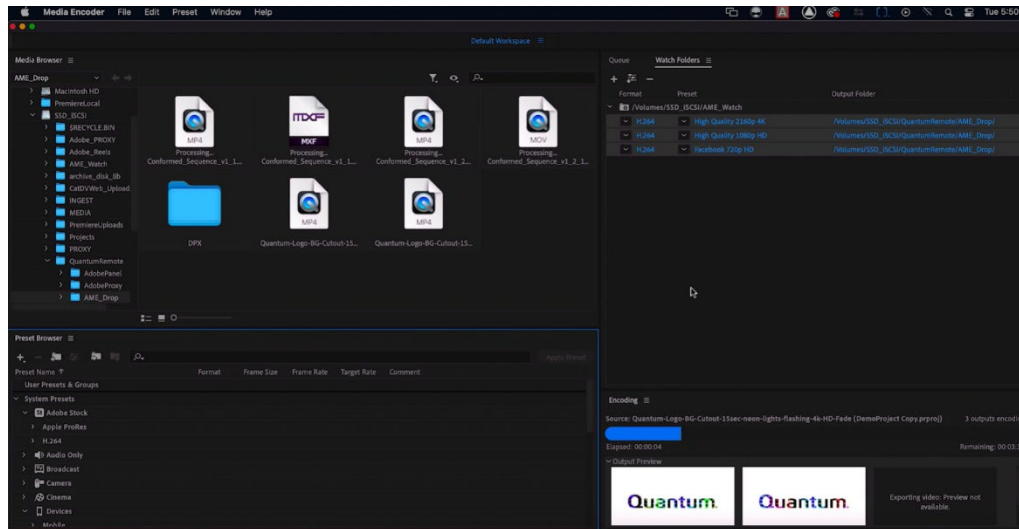
f. At this point the files will be scanned with CatDV worker action and moved/published to a catalog already defined "ClientReview". Proxies will not be generated at this point; they are final renders for client review

12. Review finals in CatDV web client
   a. Going back to the Web Client, you can select the Catalog ClientReview and then download any number of outputs to your local machine for review
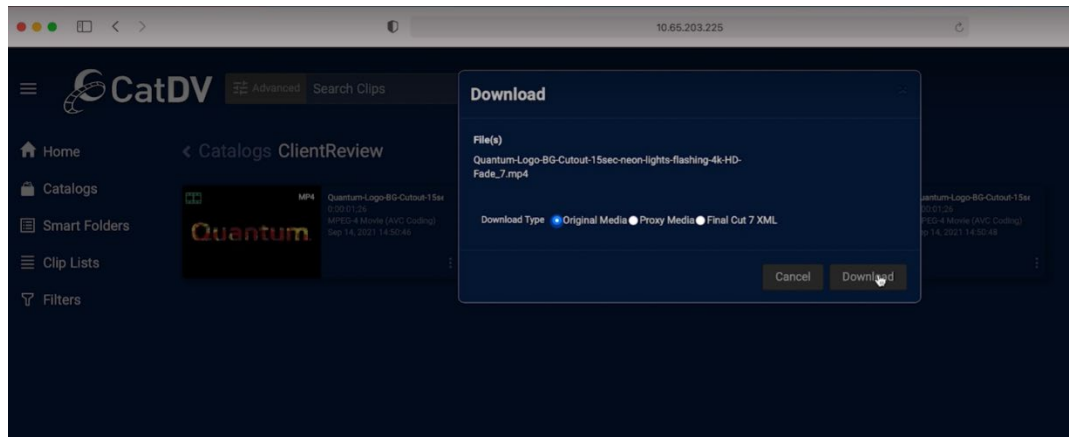
Considerations

When considering implementation of this workflow by sales, presales, and solution architects, it is recommended to conduct a thorough inventory the customer's unique workflow desired, current, and future needs, and the existing systems and network in place.

What does the capacity and speed of the current installation look like? What is the growth rate of content, project demands? For new installations, be prepared to architect a solution for immediate concerns but know the growth and sizing steps likely to be needed up to 6 years of projected future demand. What does the landscape look like in terms of expandability of storage capacity, performance requirements, asset management growth? Will the production facilities of tomorrow look different – perhaps emphasizing more dispersed, local facilities in different regions rather than very large, consolidated production centers? Will there be a higher emphasis on NVMe storage locally, and object storage everywhere else? Will cloud delivered content analysis solutions and API-level reporting or solution integration be needed?

Look for future opportunities to expand capacity and performance as the operation grows and seek to build the infrastructure capability for the future today, with a flexible mindset, and platforms that can help you respond to ever-changing needs.

Summary

A collaborative workflow solution based on Quantum StorNext, CatDV and Adobe Premiere Pro provides a wide range of options for remote users to access powerful, high-performance storage, work with projects and team members at a creative facility all while working with proxy media in real-time with remote teams.

With Quantum StorNext shared storage platform as the favored storage for media workflows with tuned parameters and proven performance, CatDV is now fully integrated into the file system allowing for faster searches and the ability to archive to multiple targets all within a single interface.

Efficiency and collaboration across the entire team is ensured with a range of collaboration tools withing CatDV, including the ability to check projects in and out, and hand them off directly from one user to another, speeding production.

References

The documents below are references to configure the software and the systems for functional testing

Document Title	Download URL
Adobe Creative Cloud Suite	Link Here
CatDV Server installation	Link Here
CatDV Worker Manual	Link Here
CatDV Client Manual	Link Here

Version History

Version	Notes	Date
1.0	Collaborative Workflow for Adobe Creative Cloud powered by StorNext and CatDV	December 2021