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NFX203

Cloud filesystem in studio workflows: A Netflix Drive case study

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Agenda

Netflix Drive: Brief introduction

Architecture overview

Case study 1: Integration in an automated workflow

Case study 2: Artist workstation cloud storage

Conclusions

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Introduction

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What is Netflix Drive?

- A multi-interface, multi-OS cloud file system
- Seamless abstraction of object stores
- FUSE-based
- REST API interface
- Capable of supporting disparate data, metadata, and event/alerting backends

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Motivations

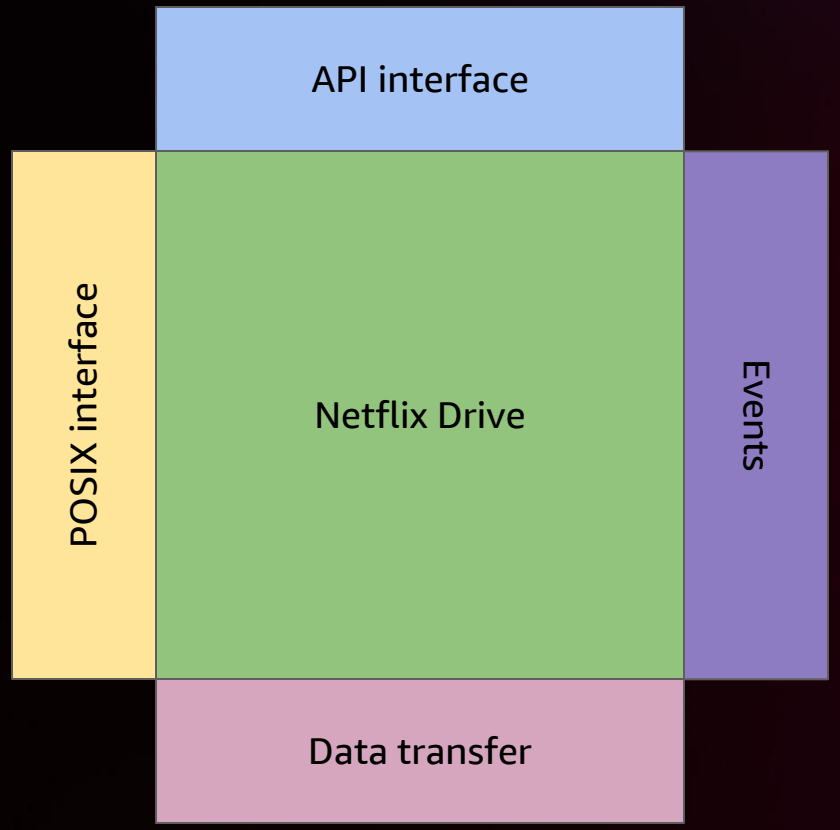
- Asset metadata and data managed by heterogeneous systems and services
- Studio applications expect POSIX file folder interface
- Studio workflow pipelines – move assets across stages of creative iterations
- Ephemeral project-level access controls

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Architecture overview

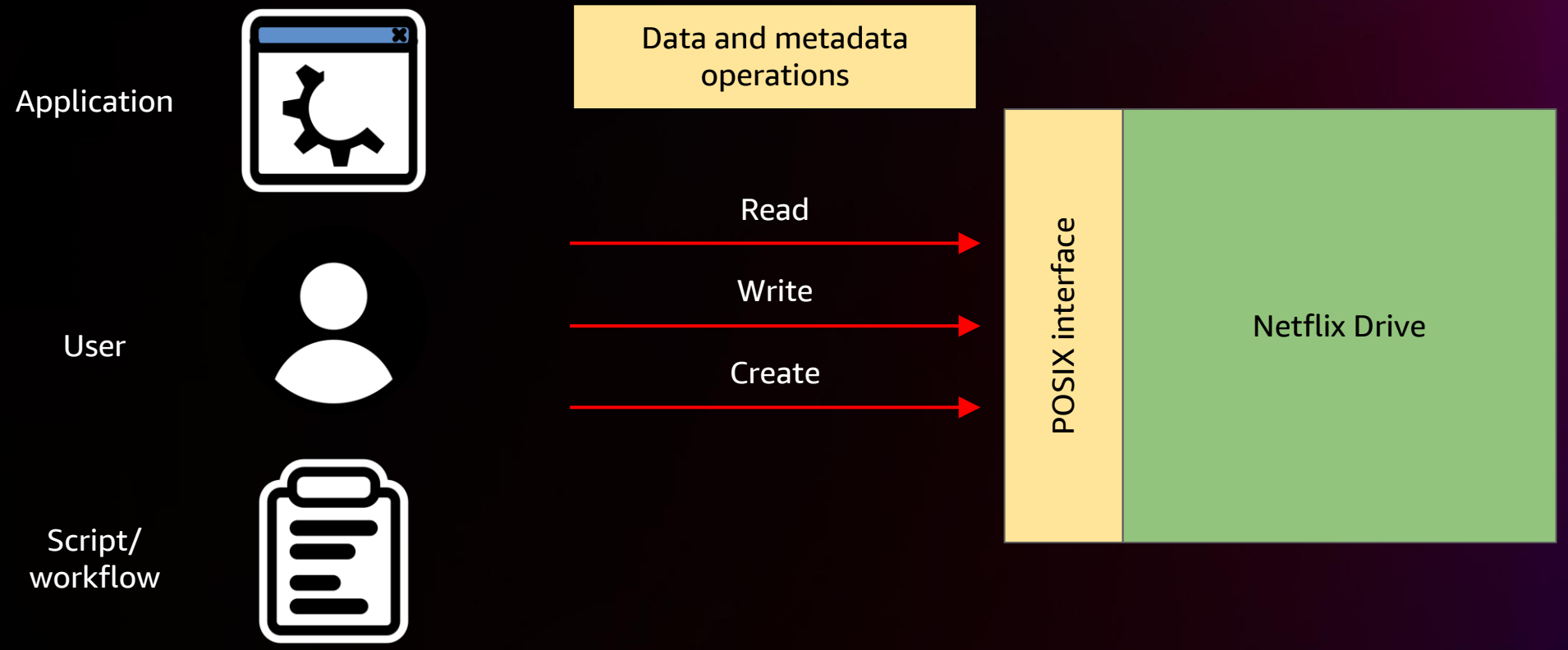
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Multi-interface design



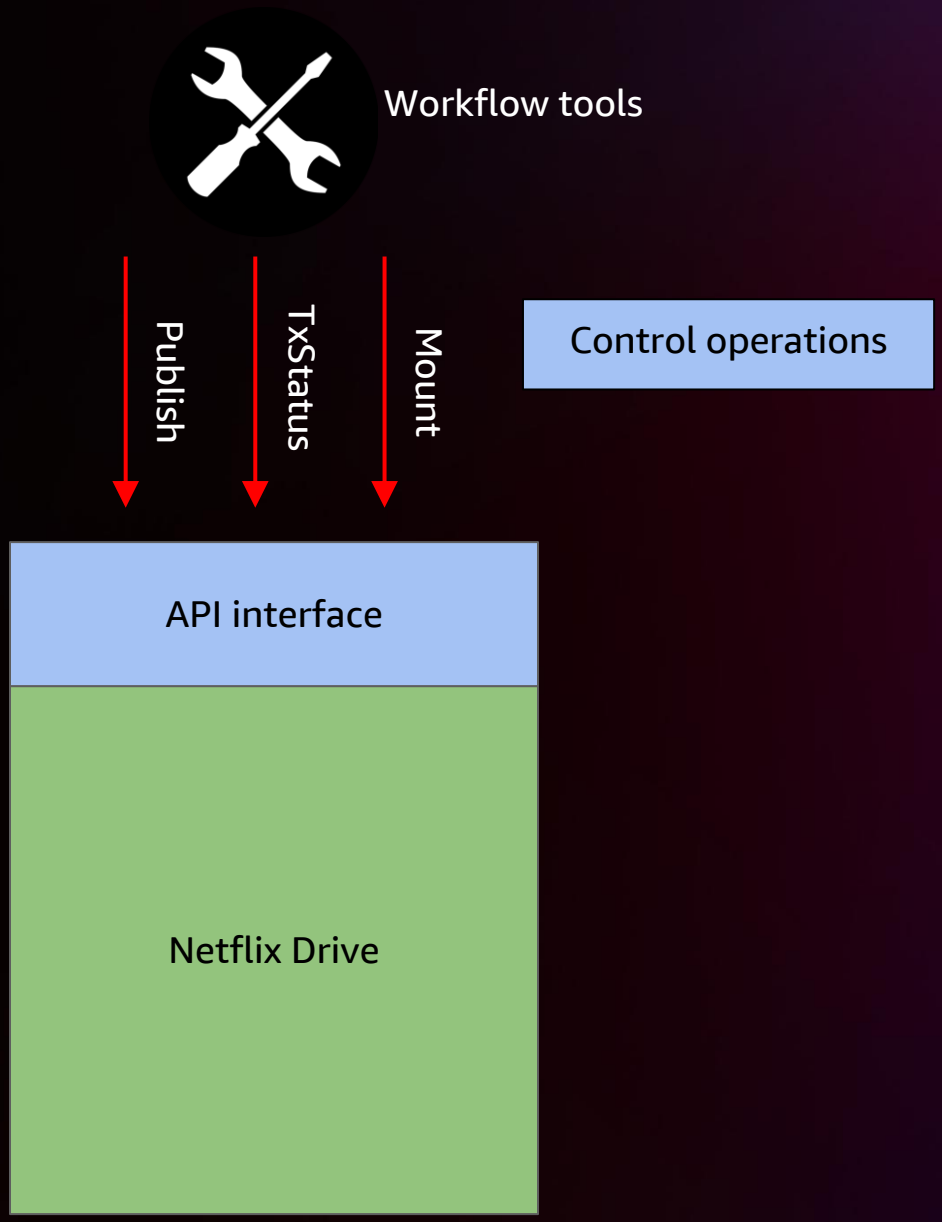
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POSIX interface



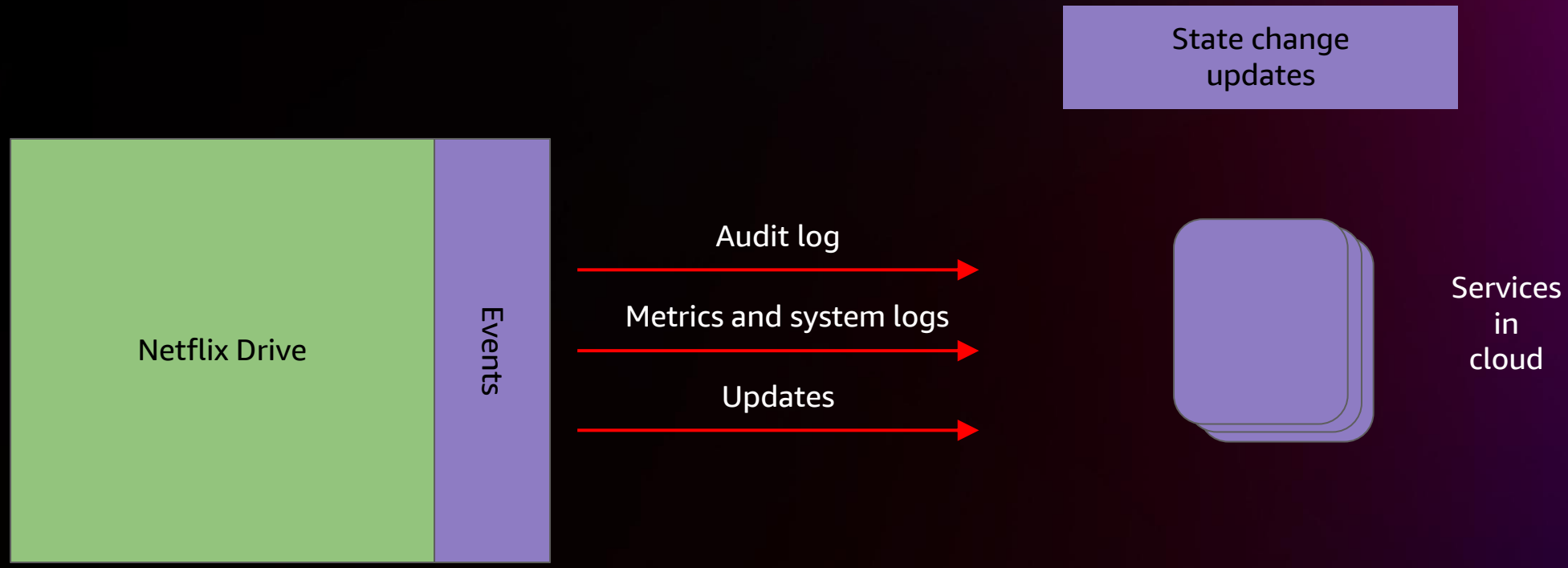
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API interface



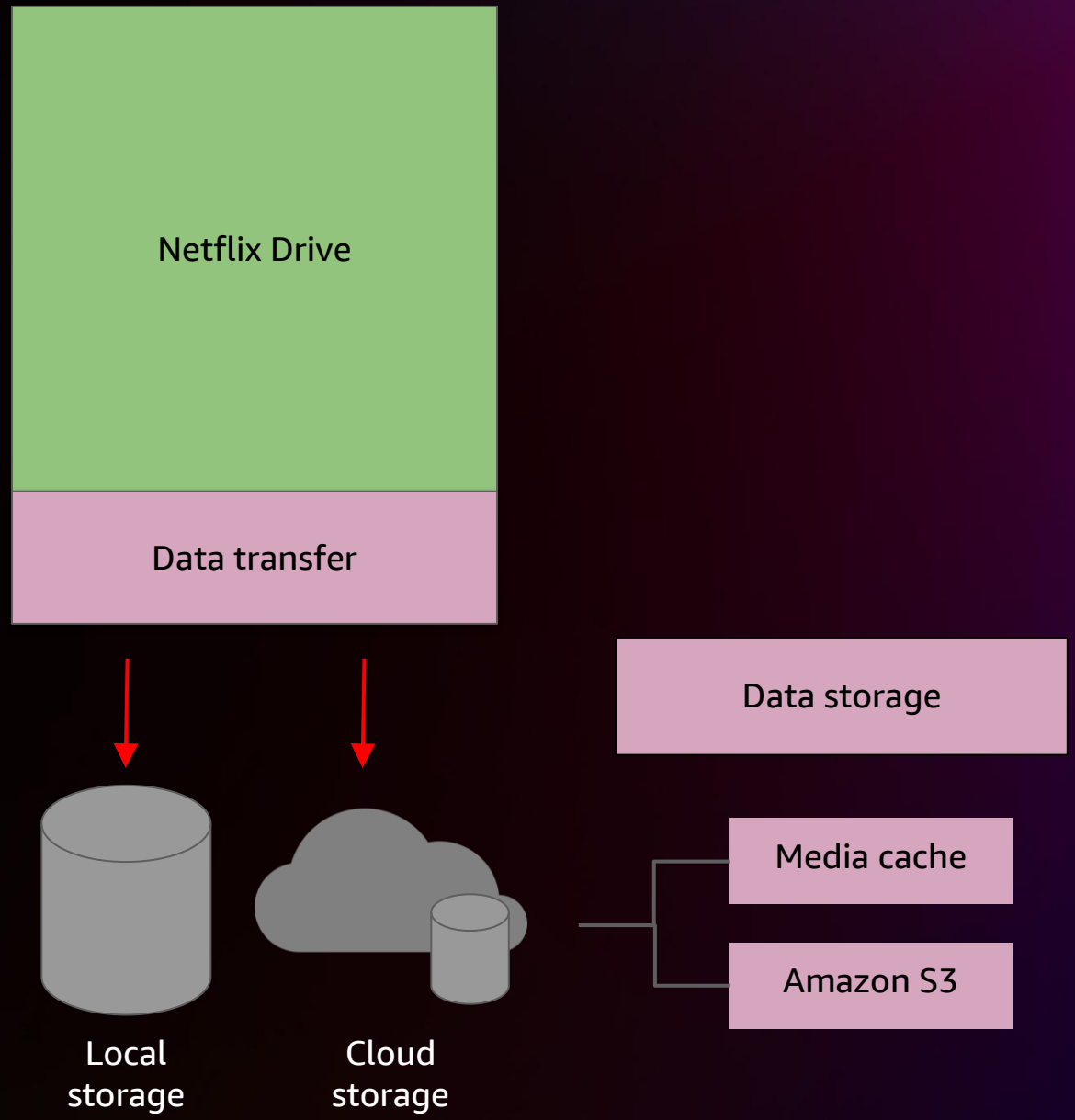
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Events



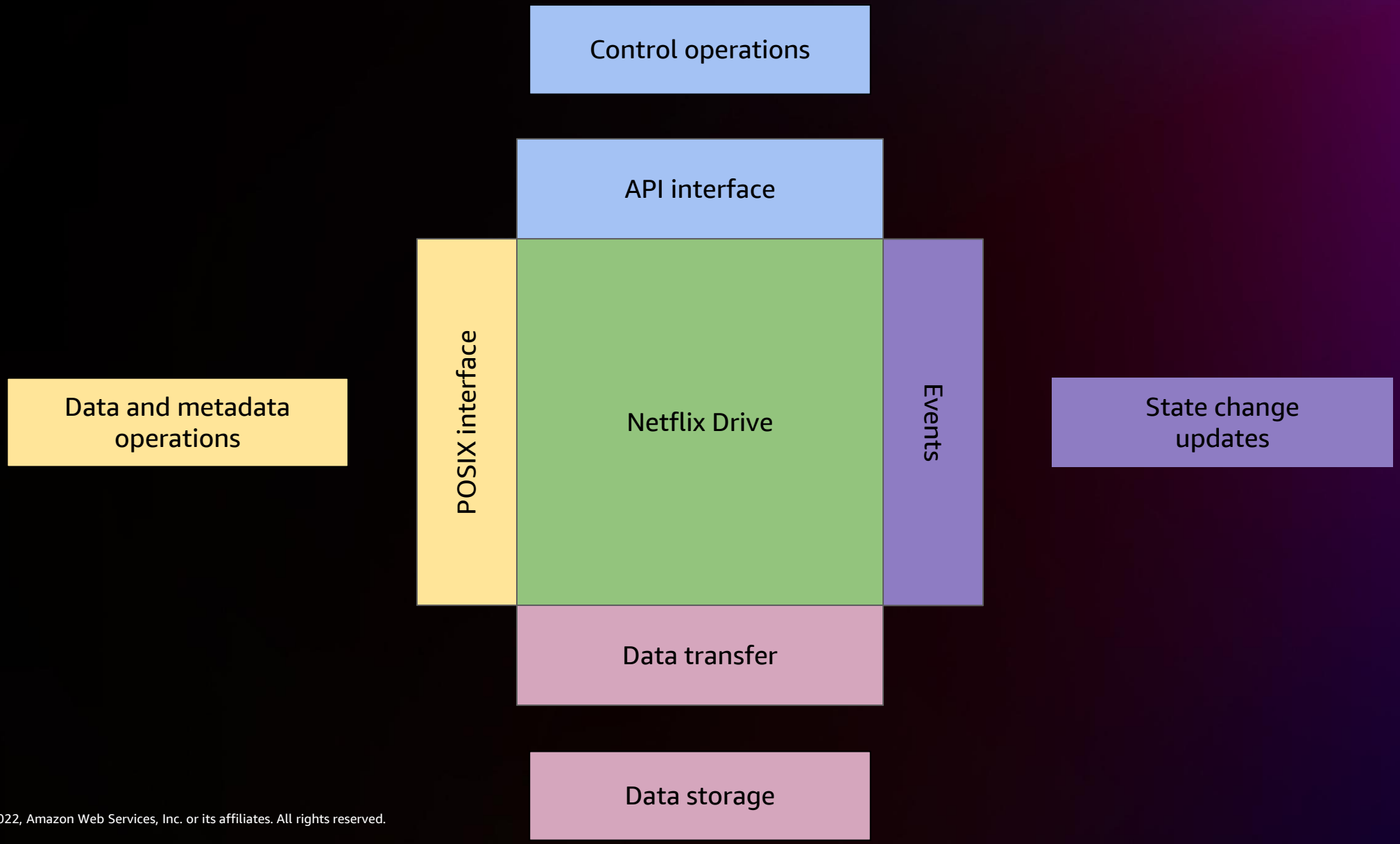
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Abstracted data transfer interface



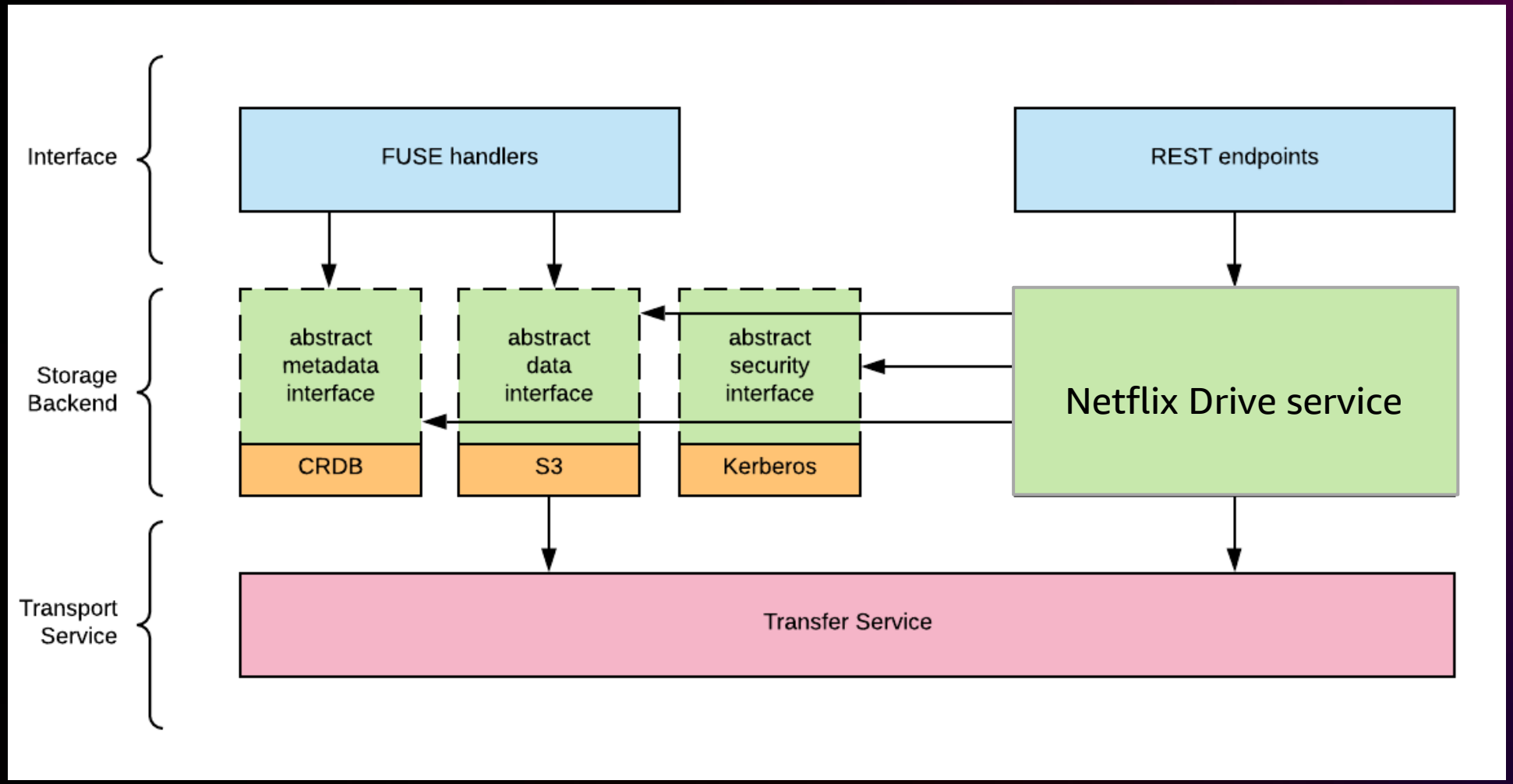
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Netflix Drive internals



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Case study 1: Media workflow orchestration

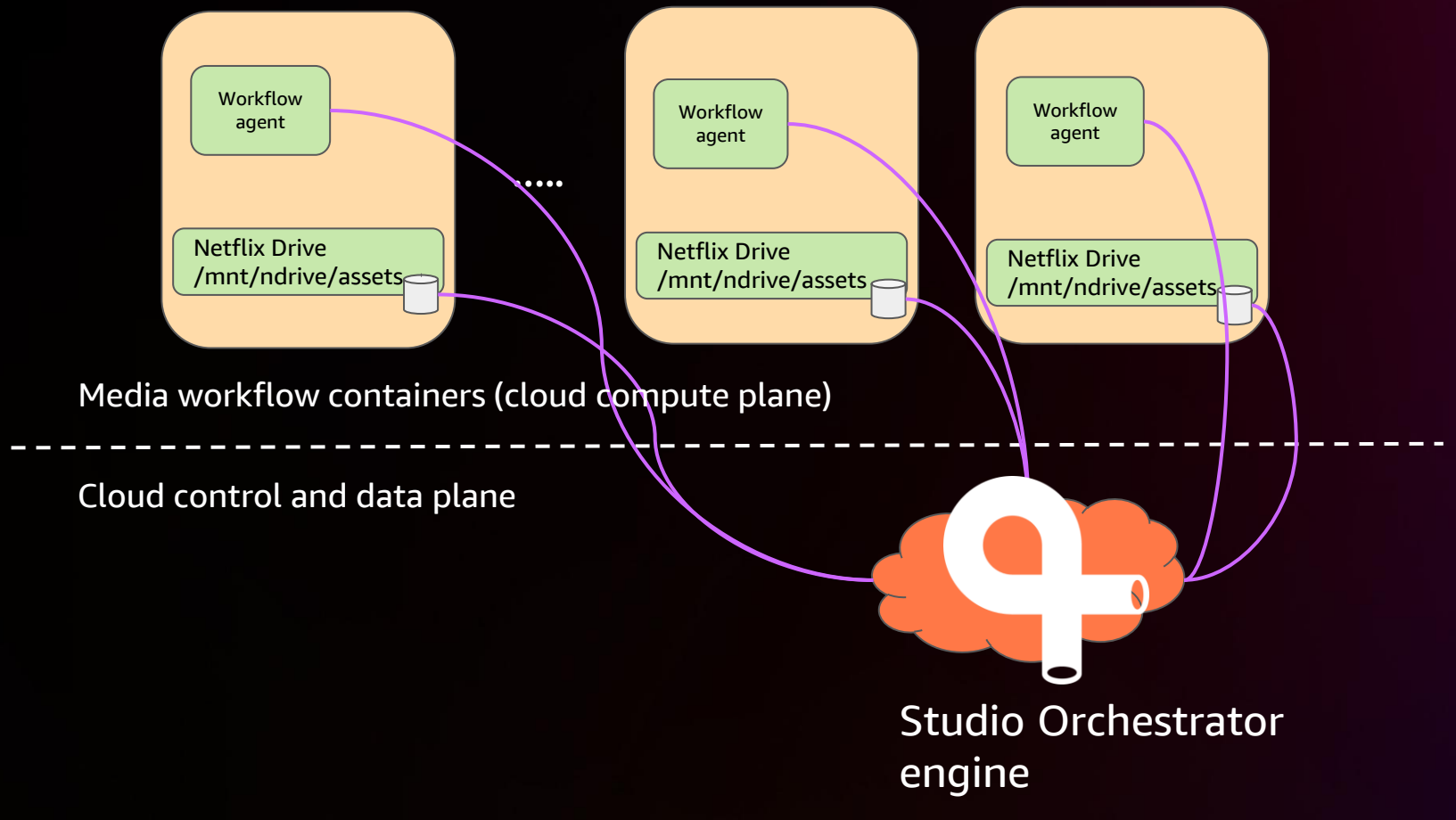
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Motivation

- One-time media operations
- Close to the data in the cloud
- Integrated into the Studio Orchestrator ecosystem

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Orchestrated media processing workflow



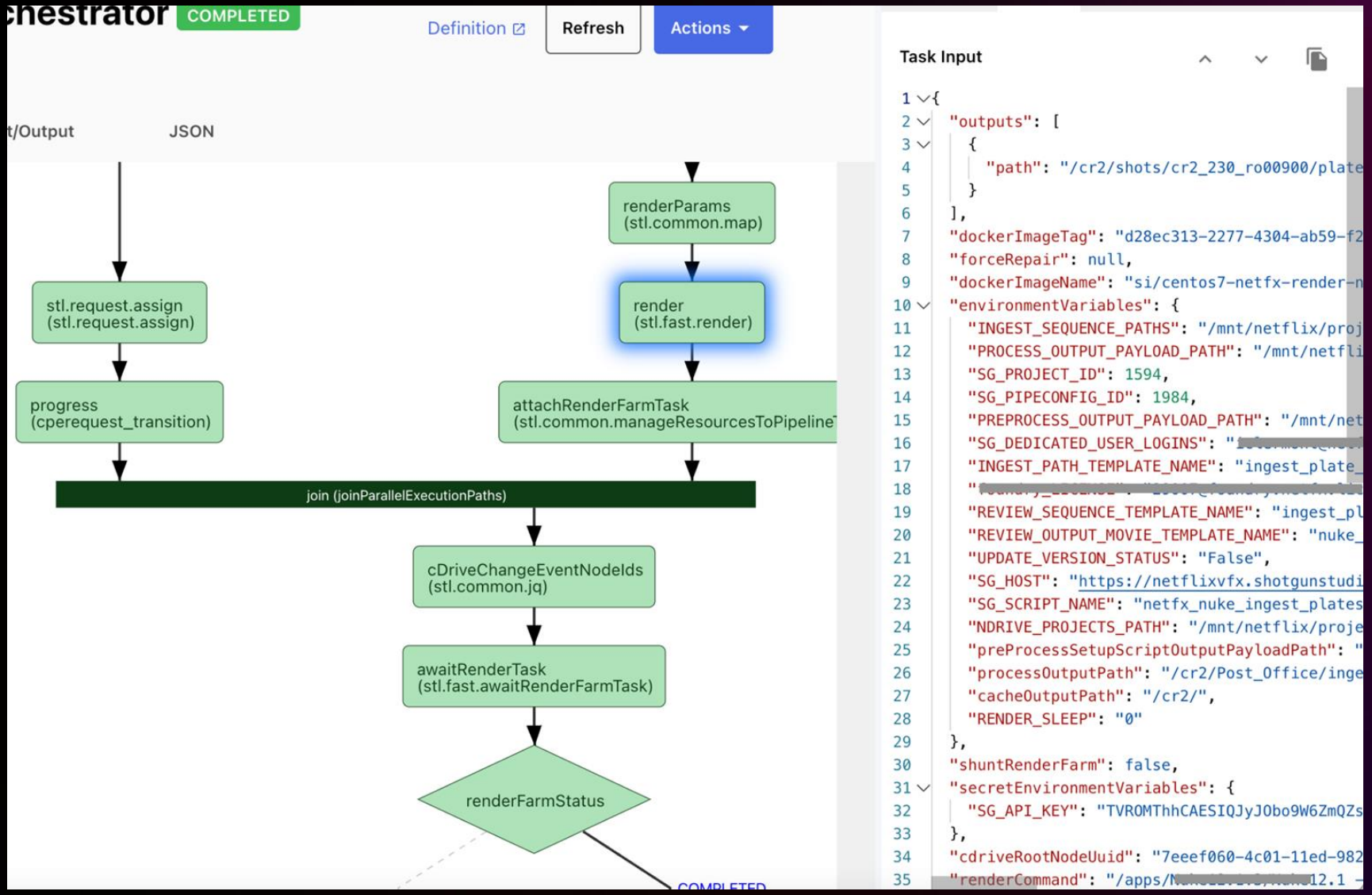
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Use case requirements vis-à-vis storage access

- A cloud storage access layer with a rich control plane
- Flexibility around partitioning of workloads
- Fine-grained control over what gets uploaded to cloud and doing it transparently and optimally
- Provide guarantees over cloud uploads, which affords greater determinism in managing the container lifecycle

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Netflix Drive for cloud storage access



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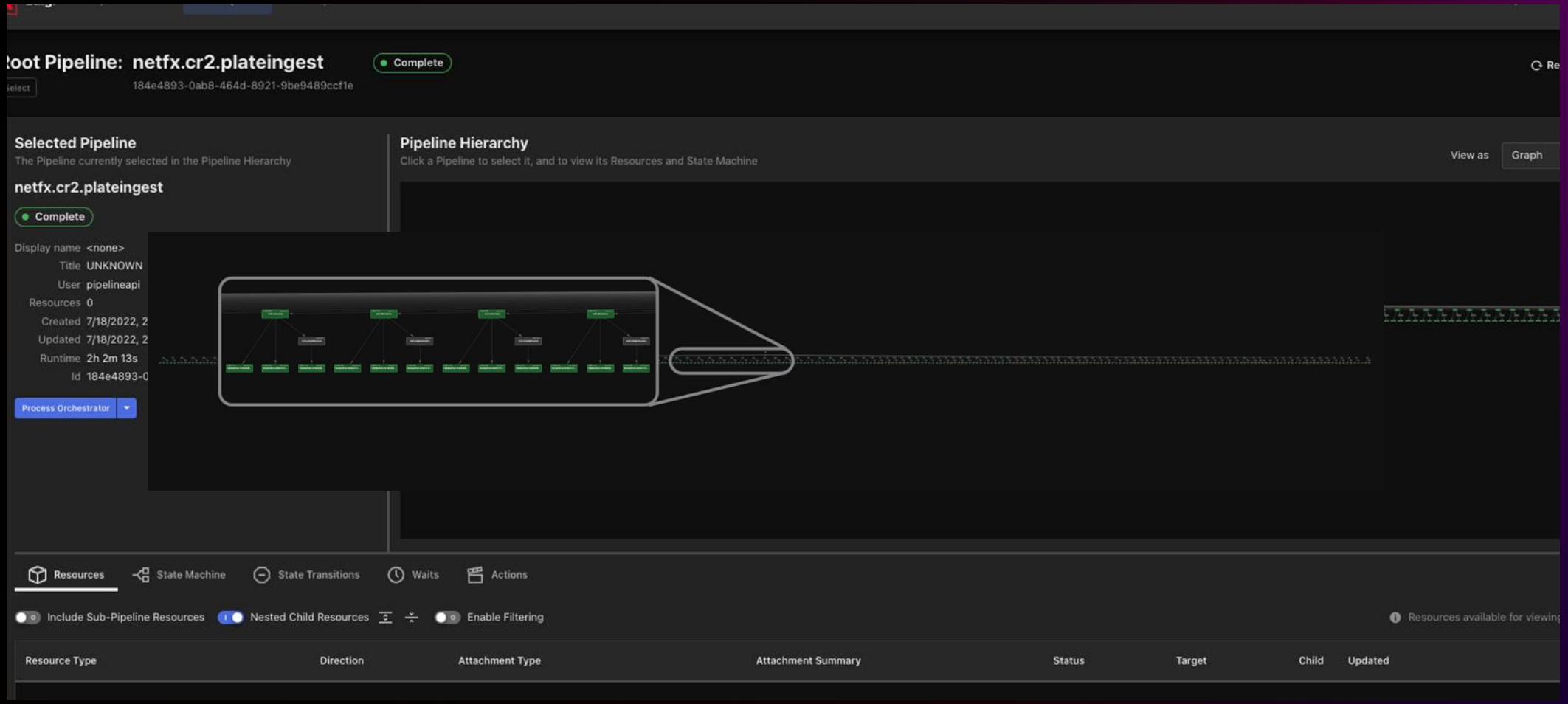
Workflow highlights

- Orchestrated and managed by a Studio Orchestrator service
- Orchestrator service is responsible for preparatory work
- Partitions workload into smaller, parallel jobs
- Relies on a separate cloud container service to launch jobs
- Monitors job states; validates and consolidates final results

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Netflix Drive for cloud storage access



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Netflix Drive for cloud storage access

- Adaptive and conducive to the Studio Orchestrator workload partitioning heuristics
- Provides file/path granular controls to regulate what job results are synced back to the cloud and when
- Enables different workflow combinations since a majority of applications expect POSIX access and access control semantics
- POSIX is important because the container mirrors what artists see on their workstations and enables common tooling and consistent views
- Enables optimizations around cloud downloads with on-demand fetching of data and prefetching of all metadata

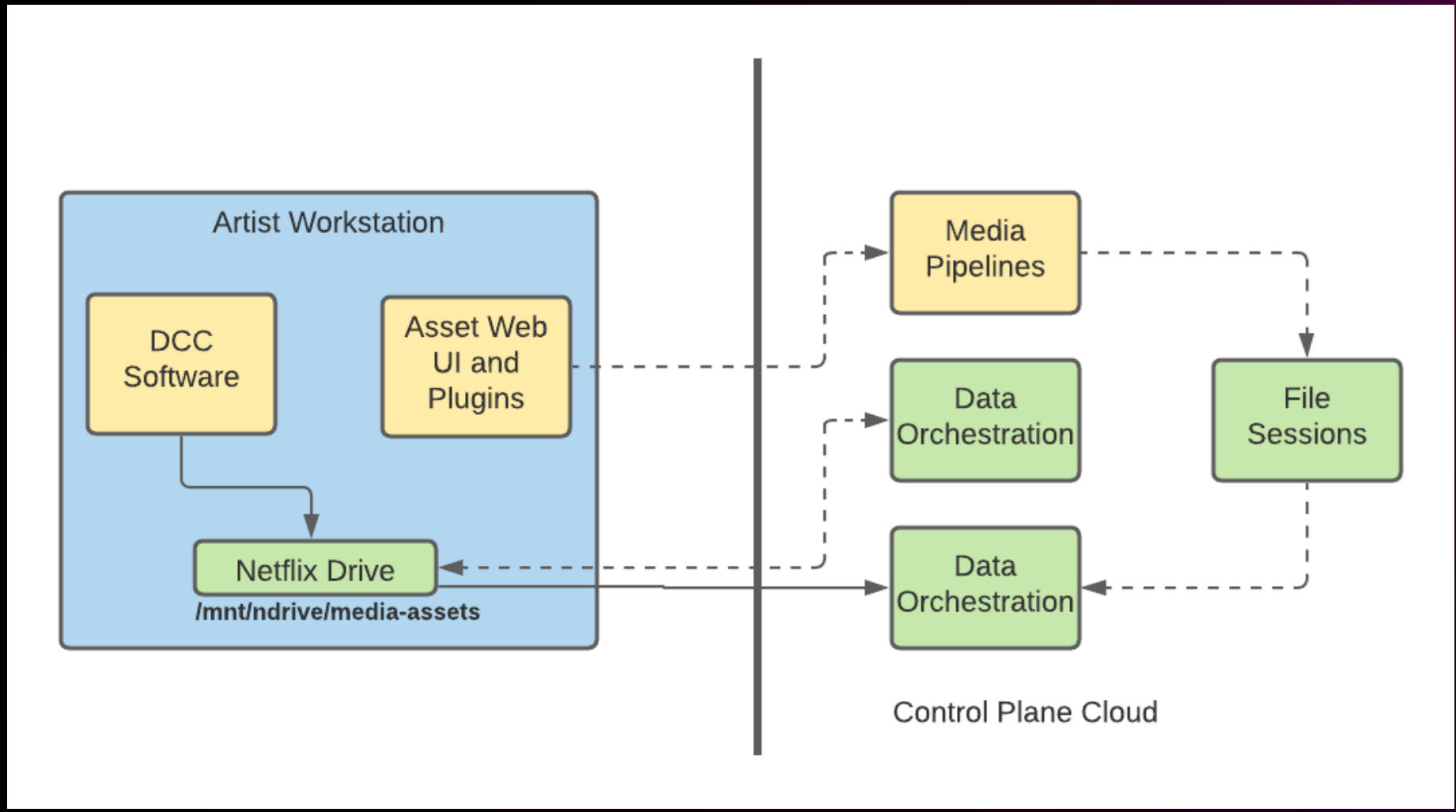
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Case study 2: Asset store for artists' workstations

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Asset store



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Use case requirements vis-à-vis storage access

- A cloud storage access layer with a rich control plane
- Flexibility around file/project granular access
- Ability to dynamically add and remove namespaces with specific asset versions
- Full application/agent control over sync to cloud

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The Chunnel Saga

Search Show

Create New

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68 edit settings

Assets Reviews

Search Workshop

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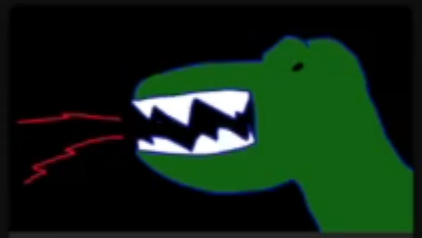
Modified By

Tags

File Type

1 items

Modified Date (Newest)



dinosaur

5

GG

Red

Orange

Concluding notes

- Netflix Drive is a highly configurable and adaptable cloud storage access layer service
- It is best suited for use cases that demand near-local file system performance, file granular access controls, and a rich control plane
- It is not intended to be a comprehensive solution for all cloud storage access use cases
- We have been judicious about deploying Netflix Drive only for the best-fitting use cases

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Netflix Drive Tech Blog

https://netflixtechblog.com/netflix-drive-a607538c3055

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Q&A

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