

# SILVERDRAFT



**Virtual Production Technology Overview**  
**April 12, 2022**  
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**Erik Smith**











# Virtual Production





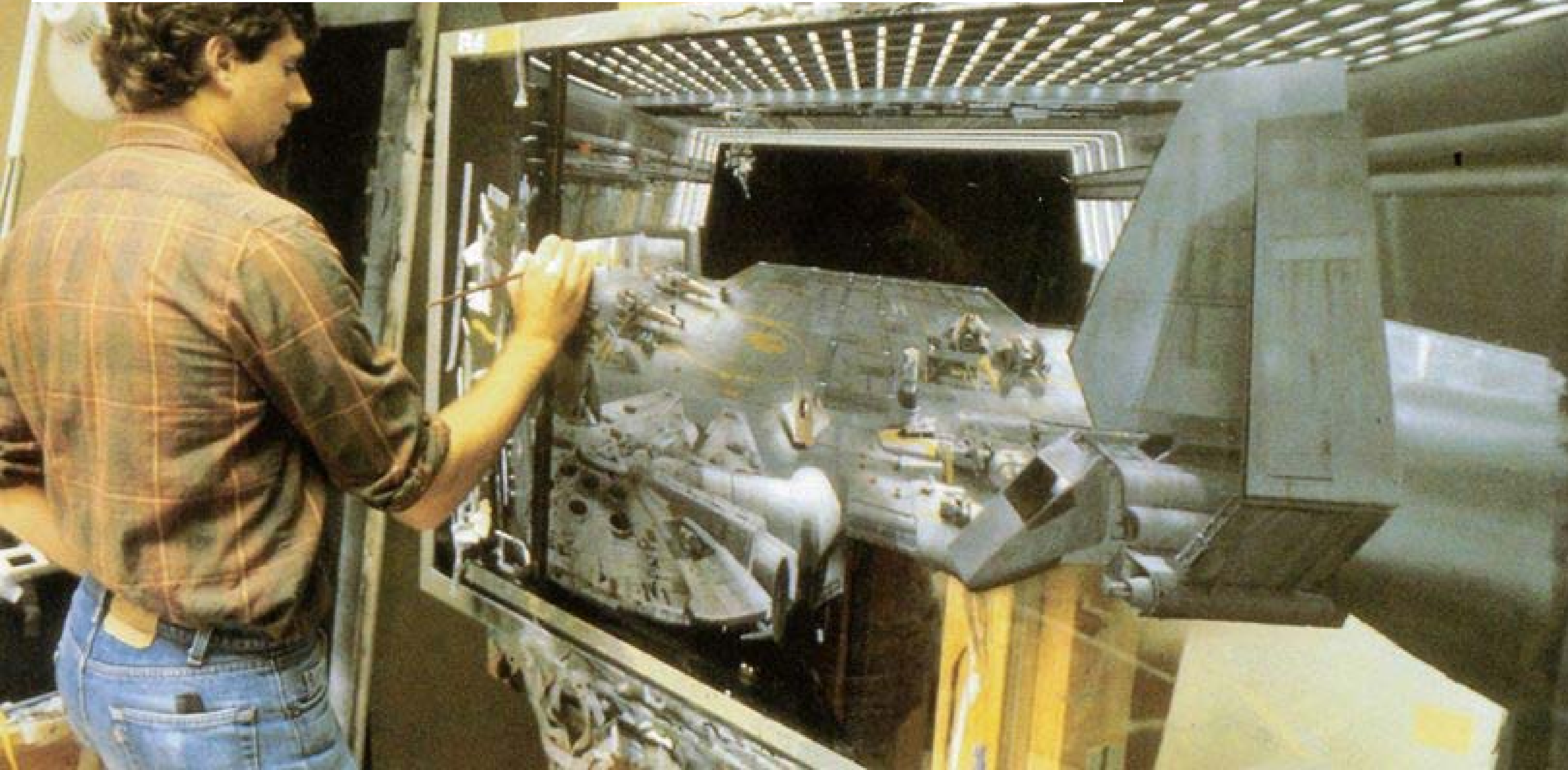
# The Art of Storytelling





**It All Started With Matte Painting**

# Matte Painting (cont)





# Chromakey





# ChromaKey

# Why Now?



**“We are seeing three years of digital and culture transformation in three months.”**

**– Paul Daugherty, Accenture's group chief executive and chief technology officer**



# Virtual Production LED Stage



# Virtual Production - Challenges

## NEW PROCESS AND WORKFLOW

Production process gets flipped. VFX comes first, physical production after. Requires team to learn new flow.

## TIMELINE

Prep time takes longer. But physical production should be faster.

## CREATIVE CONSTRAINTS

Physical constraints of stage size and LED density may limit camera placement, focal range, and depth-of-field

## COMPUTE PERFORMANCE

Latency between motion capture and wall display may limit camera movement

## PHYSICAL - DIGITAL

Matching color between LED characteristics, virtual elements (like lights), and physical elements can be challenging



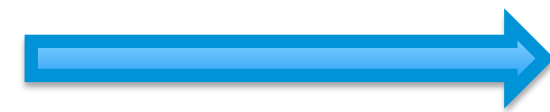
# SilverScreen: Cinematic Twin

Art Department

Modeling

Location Capture

Sets & Props  
Capture



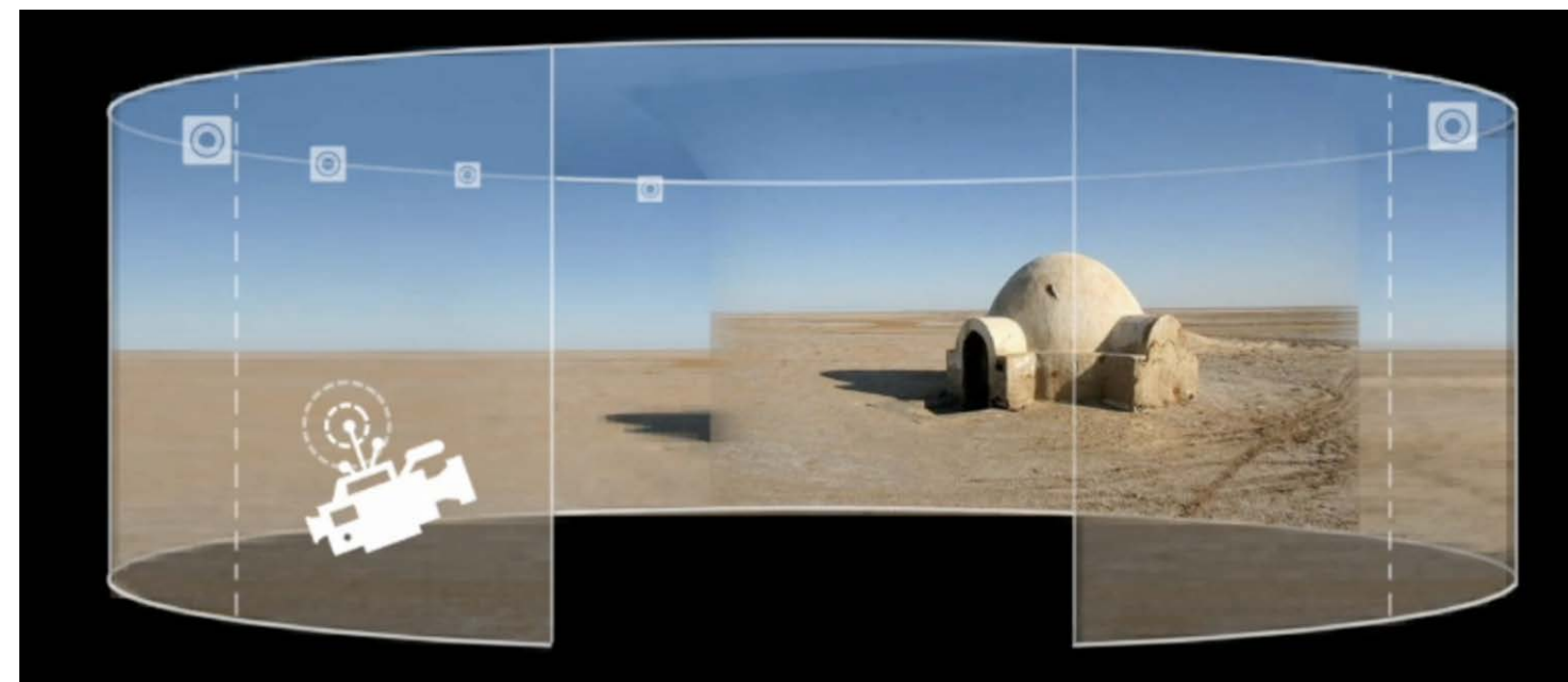
Cinematic  
Twin



Physical  
Production

Safety

Creative



# Technical Architecture

CORE RENDERING: CPU/GPU/RAM

NETWORKING

REAL TIME DATA FLOW AND ASSET PIPELINE



# Benefits

## CREATIVITY

**Cast and crew can actually see what the audience will see**

## LIGHTING

**LED wall casts the correct light on the set and the performers eliminating the need to fix the green glow in post production and generating a more natural look.**

## FINAL PIXEL

**WSYWIG applied to filmmaking. You see what you are getting. Fewer fixes in post.**



# Virtual Production Process





# Workflow: Modeling for Real Time

*“Whether it’s innovating based on new production techniques we’re developing or innovating based on technology associated with new platforms of distribution, there is a way for filmmaking and technology to continue the dance that they’ve been in for 100 years that’s created breakthroughs for both.”*

– John Favreau







# Volumetric Production







# Car Process



NODE 105

NODE 101

NODE 102

NODE 103

# Render Cluster

MASTER CLOCK/SPD  
model 8601MSC

LIGHTWARE  
MX2

FURMAN  
115

Smart Videohub 40 x 40

TESSERA SX40 PROCESSOR

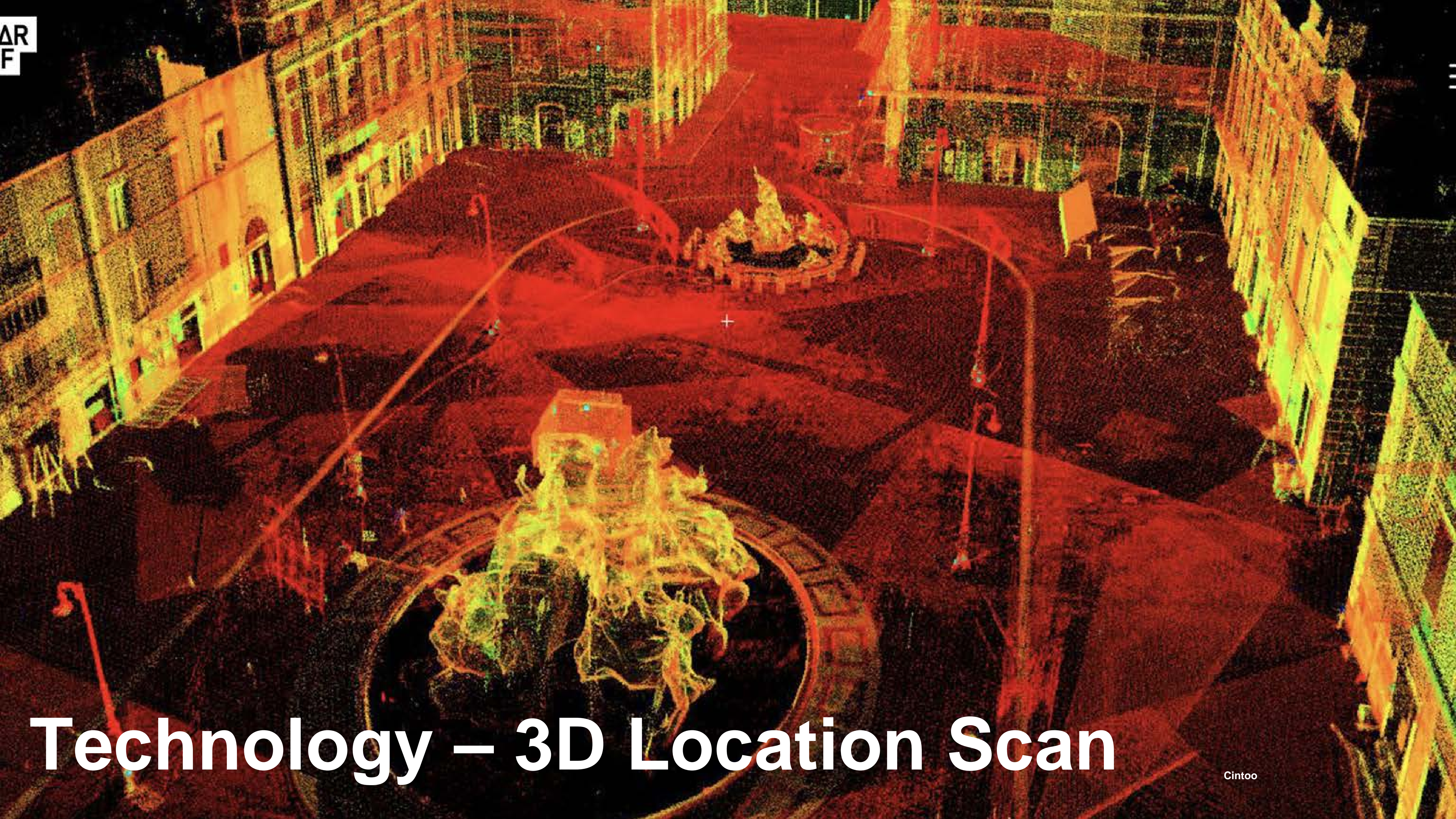
TESSERA SX40 PROCESSOR



# Self-contained Datacenter







AR  
F

# Technology – 3D Location Scan



# Case Study: The Lion King



# Case Study: The Mandalorian







# Case Study: Ripple Effect





ENTERTAINMENT  
TECHNOLOGY  
CENTER

# A short film pushing the limits of virtual production, technology, and COVID safety.

“Ripple Effect” is presented by the ENTERTAINMENT  
TECHNOLOGY CENTER at THE UNIVERSITY OF SOUTHERN  
CALIFORNIA

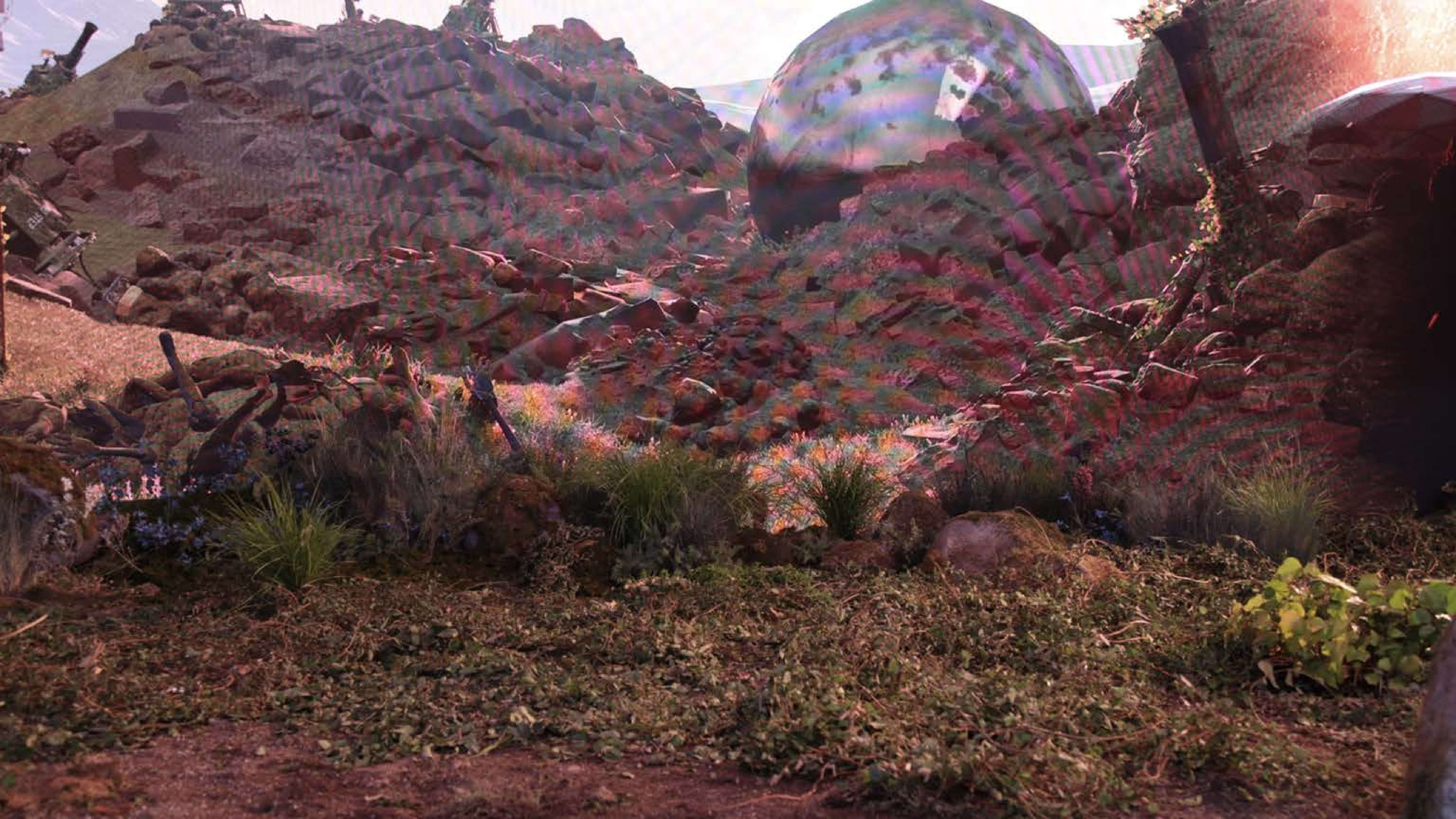




**LED wall brings the fictional world into the scene**



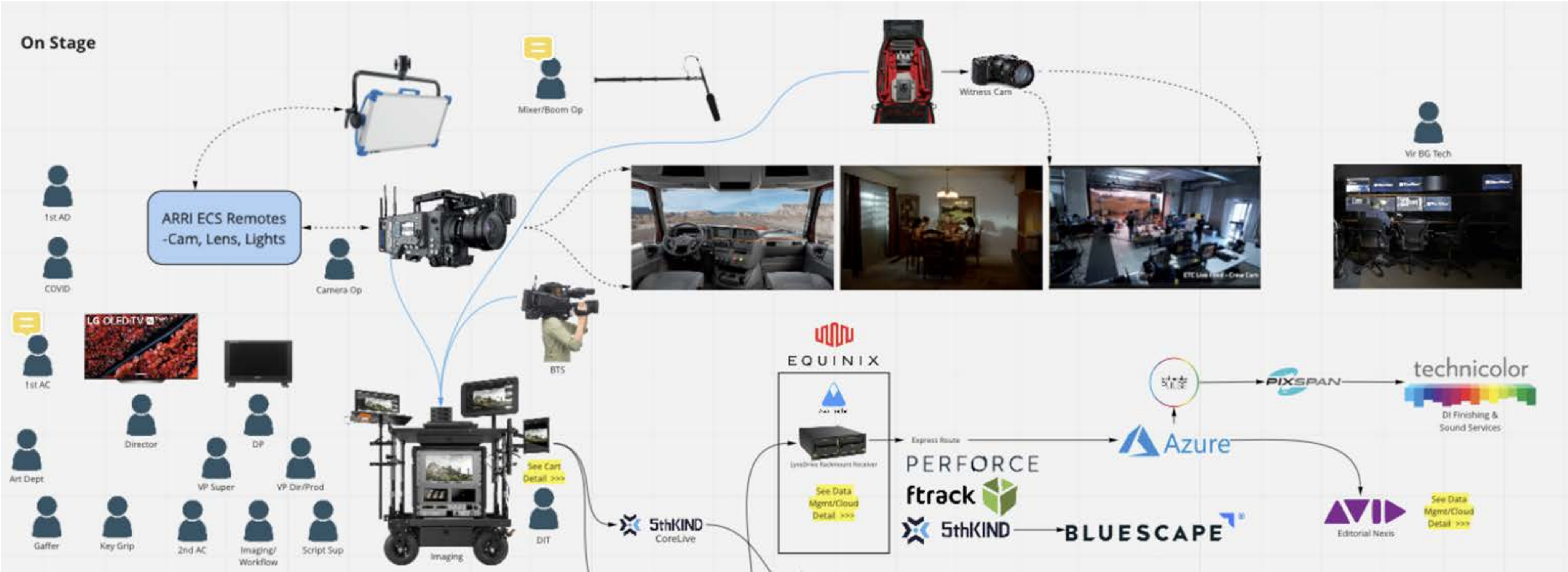








# Dynamic Workflow



# Remote Participation & Cloud Workflows

## LIVE FEEDS FROM SHOOTING STAGE

Remote crew can monitor shooting and stage activities live.

## CLOUD-BASED ASSET LIBRARIES

Full production data is available everywhere to everyone. Shared real-time access enables quick review and decision-making.

## CLOUD EDITING AND POST PRODUCTION

Large data and images are quickly available to the whole team wherever they are.



# Technology Stack

## WALL GEOMETRY MAPPING

**NVIDIA, Ndisplay, and game engine**

## CAMERA FRAME SYNC

**Genlock**

**GPU workloads**

**Frame remapping**

## LED PANEL CAPABILITIES

**Color gamut**

**Brightness**

**Frame/refresh rate**

**Mux rate**

## RENDER ENGINE

**Unreal Engine, Unity, Pixera**

## MOTION CAPTURE

**Mo-Sys**

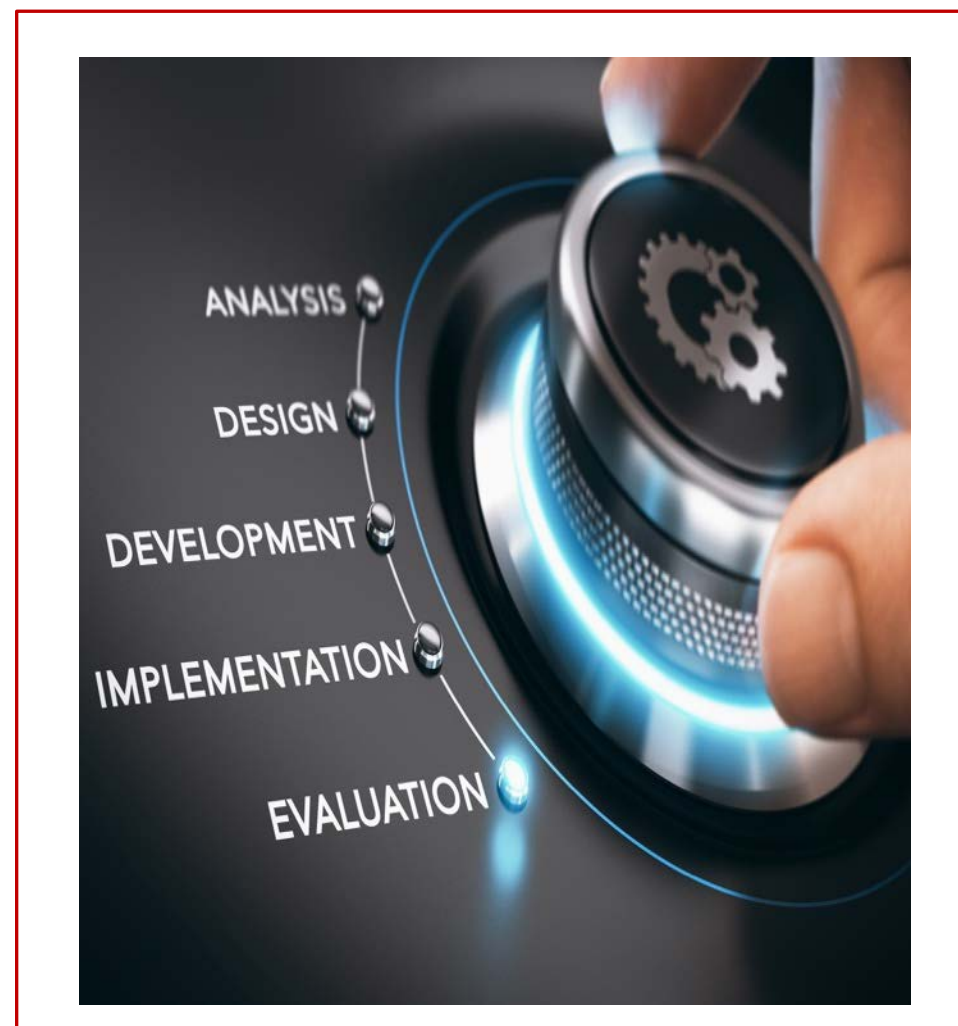
**Stype**

**Opti-Track**

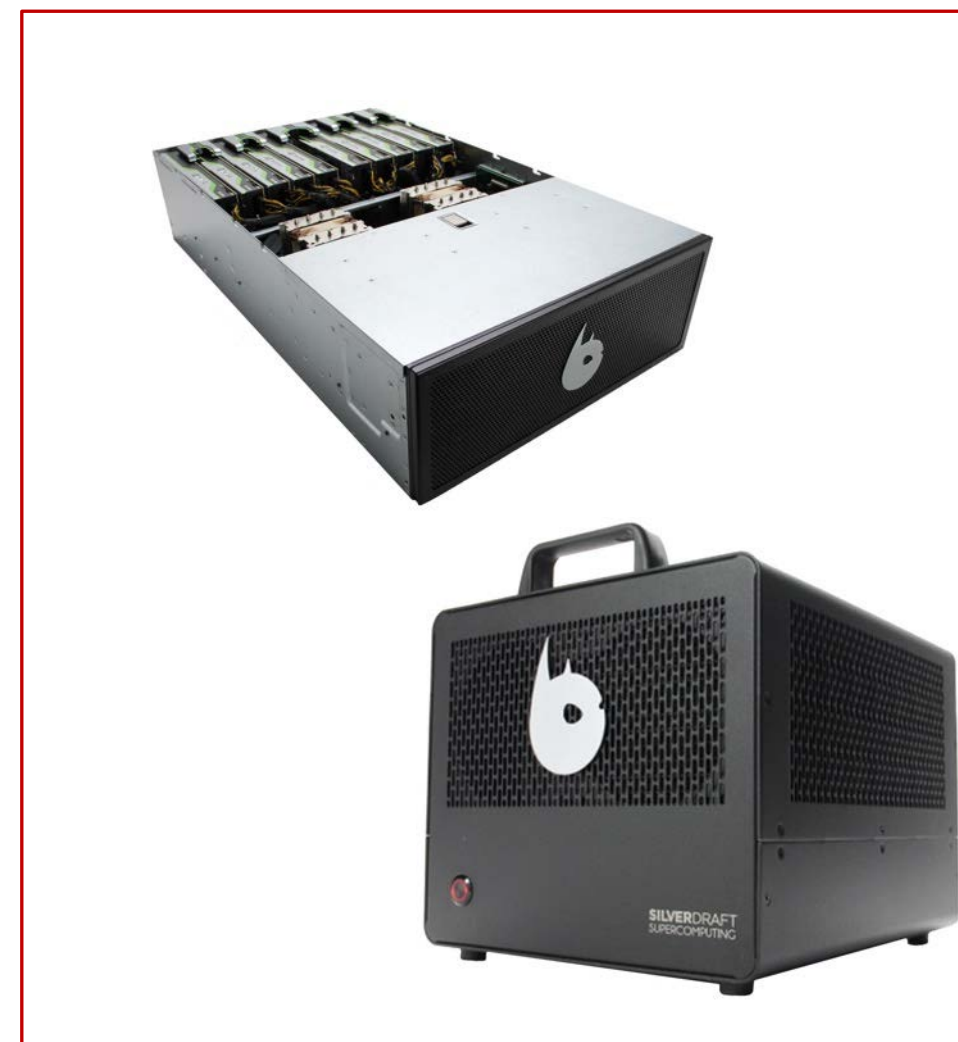


# SILVERDRAFT

R&D Services



Hardware



Software



Visual



**Complete End-to-End Workflow Solutions**