Tools and Technologies Shaping Business models for the Broadcast Industry

A Content Production & Delivery SIG Event

2nd December 2025

CAMBRIDGE WIRELESS

WHO WE ARE

Cambridge Wireless (CW) is a global not-for-profit membership organisation at the forefront of innovation in connectivity and digital technology.

Since 2000, CW has united industry leaders across connected devices, networks, software, data analytics, telecoms, satellites, and more.

We help our members...

COLLABORATE
LEARN
SHAPE THE FUTURE

CAMBRIDGE WIRELESS

WHAT WE DO

We bring together leaders, innovators, and experts through a range of initiatives designed to foster collaboration, drive innovation, and support professional growth.

From flagship conferences and networking events to strategic innovation projects and skills development, our programmes create valuable opportunities for members.

- Special Interest Groups (SIGs)
- Events and Conferences
- Academy and Training Courses
- Executive Meetings
- Knowledge Bank
- Partnership Programmes
- Connections, Visibility and Exposure

CAMBRIDGE WIRELESS

SPECIAL INTEREST GROUPS (SIGs)

SIGs are at the heart of CW's mission to help our members to Collaborate, Learn and Shape the Future. Built by and for our membership, with content shaped and delivered by the SIG.

- Focus on specific technology and market sectors
- Keep members up to date with industry developments
- Create opportunities for influencing developments
- Explore new business opportunities
- Encourage networking

CAMBRIDGE WIRELESS

- Academic & Industry
- Artificial Intelligence
- Connected & Intelligent Places
- Connected Thinking
- Content Production & Delivery
- Future Devices & Technologies
- Health Tech
- Location
- Mobile Networks
- Non-Terrestrial Networks
- Radio Technology
- Security, Privacy, Identity & Trust
- Sustainability
- Wireless Heritage

The Content Production & Delivery Group

The aim of the SIG is to address the challenges and applications of new technologies which facilitate the digital production and delivery of various types of content.

David Crawford,
University of Essex &
Ravensbourne
University

Susan Hewitt
Hewitt Innovation,

Tony Lavender
Lavender Consulting

Chris Nokes
Ofcom

Welcome from Digital Catapult

Digital Catapult

Digital Catapult is a deep tech innovation organisation.

We accelerate the practical application of deep tech innovation to equip the UK to be future ready.

www.digicatapult.org.uk

CW SPECIAL INTEREST GROUPS

Agenda

14:15 Prof Jonny Freeman - ‘Creativity, Convergence, and Foresight: a research ecology surfacing the future of media production from the CoSTAR Foresight Lab’

14:35 Q&A

14:40 Susan Hewitt - 'AI, Streaming and Advertisement - New Methods, Challenges and Solutions in a Rapidly Changing Landscape’

15:00 Q&A

15:05 Refreshment break

15:45 Gerard Phillips, Arista - ‘Modernising Media Creation & Delivery’

16:15 Q&A

16:20 James Uren, Mo-Sys Engineering Ltd - ‘Virtual Production Trends’

16:45 Q&A

16:50 ‘Holodeck or The Matrix? - A look into the crystal ball of content‘

A fireside chat with Matt Stagg, MTech Sport & Professor David Crawford, University of Essex & Ravensbourne University

‘Creativity, Convergence, and Foresight: a research ecology surfacing the future of media production from the CoSTAR Foresight Lab’

Professor Jonny Freeman

Director, C0STAR Foresight Lab

Managing Director i2 Media Research Limited

Goldsmith University

CW SPECIAL INTEREST GROUPS

'AI, Streaming and Advertisement - New Methods, Challenges and Solutions in a Rapidly Changing Landscape'

Susan Hewitt

Founder,

Hewitt Innovation

CW SPECIAL INTEREST GROUPS

CAMBRIDGE WIRELESS - CONTENT PRODUCTION & DELIVERY SIG

AI, Streaming and Advertisement

New Methods, Challenges and Solutions in a Rapidly Changing Landscape

Susan Hewitt

Hewitt Innovations Ltd

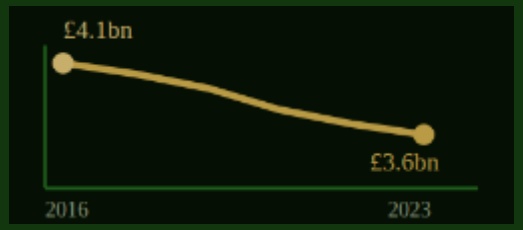
Former CTO, Ryff Inc

2nd December 2025

The Fundamental Shift

Revenue crisis across UK television

COMMERCIAL TV AD REVENUE TREND



Peak: **£4.1bn** (2016)

4 years decline

Production: -£392m

BBC LICENCE FEE CRISIS

£1.1bn lost/year

314k fewer licences

12.5% evasion rate

Licence fee revenue down **30%** in real terms since 2010

AUDIENCE BEHAVIOUR

93% skip/block ads

68% UK streaming

💡 The Imperative

New solutions essential for content funding sustainability

Sources: See Appendix for full references

Streaming Business Models

The convergence of subscription, advertising, and transactional models

SUBSCRIPTION

SVOD

Netflix | Prime | Disney+

All major platforms now offer ad-supported tiers

20.1M

UK SVOD households

AD-SUPPORTED

AVOD

+29% household growth

75% would switch to free/lower tier

23M

UK ad-supported subs

TRANSACTIONAL

TVOD

iTunes | Sky Store | Google

Pay-per-view rentals and purchases

£1.2bn

UK TVOD market

FREE STREAMING

FAST

1,400+ US channels

Monetise catalogue without reshoots

16%

UK viewers access FAST

CTV — Connected TV

The device — any television connected to the internet (smart TVs, streaming sticks, gaming consoles). Refers to the hardware used to access streaming content.

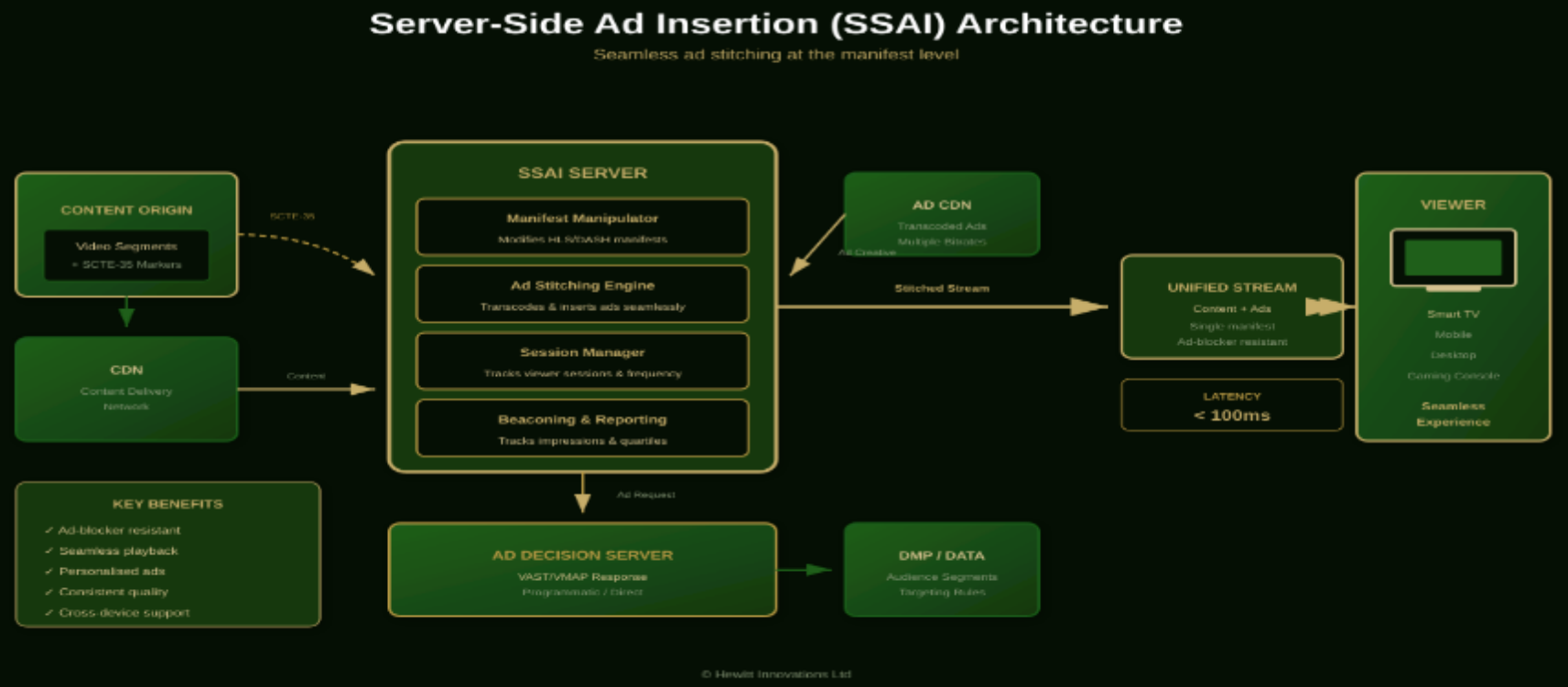
OTT — Over-The-Top

The delivery method — content delivered via the internet, bypassing traditional cable/satellite. Refers to how content reaches viewers (Netflix, iPlayer, etc.).

Sources: BARB, TiVo, Kantar, Ampere Analysis 2024-2025

Technical Architecture: SSAI

How content and ads merge into a single unified stream



KEY BENEFITS

✓ Ad-blocker resistant — ads indistinguishable from content
✓ Personalised — different viewers see different ads
✓ Seamless — no buffering between content and ads

PROGRAMMATIC CTV

70% programmatic

66% via PMPs

90%+ completion

PLATFORM STACK

SSPs: FreeWheel, Magnite, Publica

DSPs: The Trade Desk, DV360, Amazon

Sources: IAB, eMarketer, FreeWheel 2024-2025

Evolution of Ad Formats

From interruptive to integrated experiences

PAUSE AD WITH QR CODE EXAMPLE

Courtesy of Disney Advertising Sales

Pause Ads

Appear when viewer pauses content

+34%
brand recall

Interactive

Clickable overlays on screen

125×
vs QR engagement

QR Codes

Second screen activation

30%
scan during TV

Shoppable TV

Direct commerce integration

£6.8bn
UK 2026 projected

Key insight: 83% use phones while watching TV — formats that bridge screens outperform

Live Sports: Virtual Advertising at Scale

Proven technology processing 4,000+ live productions annually

HOW IT WORKS

NHL DIGITALLY ENHANCED DASHERBOARDS

+21%
YoY revenue

700
brands

4
feeds/game

120 × 30-second slots per match

MARKET VALUE

€100M+

TGI Sport acquired Supponor (2024)

BUNDESLIGA

5
regional feeds

F1

Virtual
billboards

KEY CAPABILITIES

- Occlusion handling
- Camera tracking
- Real-time render

💡 **Regulatory Benefit**

Region-specific ads solve gambling advertising restrictions

https://supponor.com/

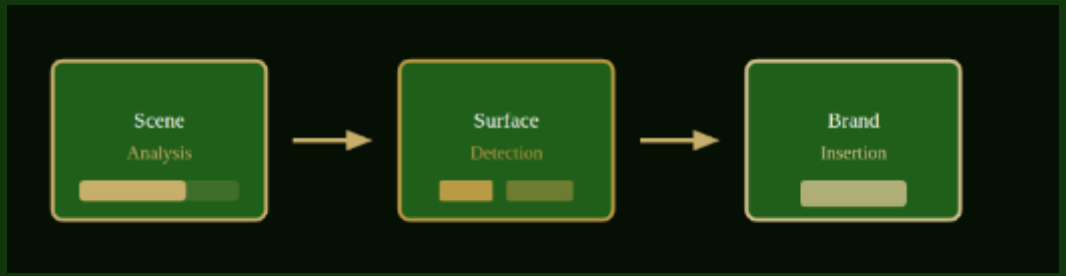
https://www.youtube.com/watch?v=AJtLAYmdgTw

Sources: SportBusiness, NHL.com, DFL 2024-2025

AI-Powered Innovation: Virtual Product Placement

From interruptive advertising to integrated brand experiences

VPP PROCESS



+28%

brand recall

vs traditional ads

4×

attention

than interruption

KEY PLAYERS

Ryff | Mirriad | Rembrand | Triplelift

CONTEXTUAL INTELLIGENCE

vs demographic targeting

Scene-matched placement

GDPR-compliant by design

TECHNICAL PIPELINE

Computer Vision | Depth Estimation | 3D Rendering | Brand Safety | Programmatic

💡 Key Advantage

Monetise existing content libraries without reshoots - unlock catalogue value

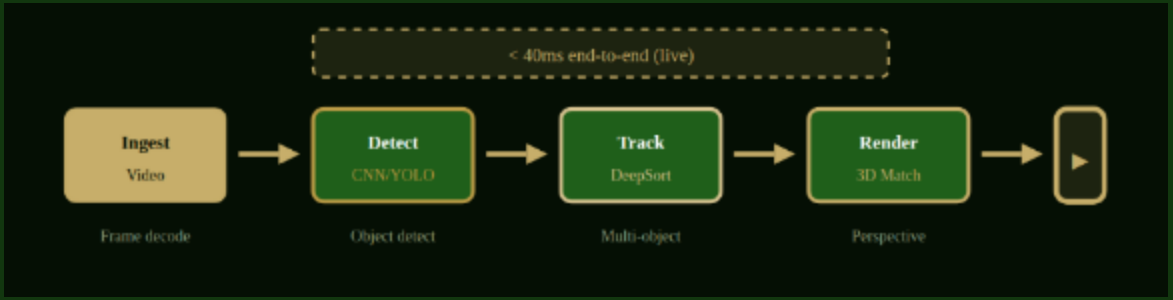
https://www.youtube.com/watch?v=1Zkvx5KAhM4

Sources: Seedtag, Deloitte, Industry data 2024-2025

AI/ML Technical Pipeline

Computer vision and real-time processing architecture

PROCESSING PIPELINE



DETECTION

YOLO / Detectron2
Segmentation masks
MiDaS depth

TRACKING

ByteTrack / DeepSort
Occlusion handling
Camera motion

CONTENT ANALYSIS LAYER

Scene
Genre, mood, activity

Audio
Speech, music, ambient

Safety
Violence, sentiment

RENDERING CHALLENGES (SOLVED)

- Occlusion
- Camera shake
- Lighting match
- Reflections

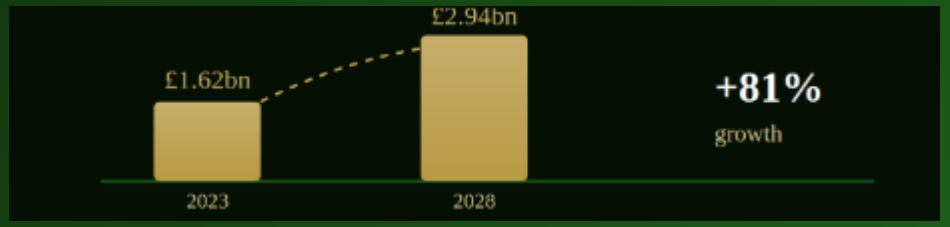
Validation at Scale

Sports broadcasting has proven this pipeline works for 4,000+ live productions annually

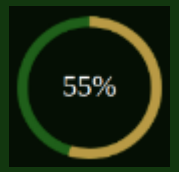
UK CTV Advertising Market

Market size, growth, and measurement evolution

UK CTV AD SPEND GROWTH



UK VIEWING HABITS



16-34s on CTV

4h 31m daily video

US COMPARISON

$33bn → $46bn

UK MEASUREMENT LANDSCAPE

Origin
Cross-platform

Lantern
Broadcaster collab

Nielsen
Sept 2025 launch

TECHNICAL CAPABILITIES

90%+ completion | Household reach | Cross-device | Brand lift | AI attention

💰 Pricing Reality

UK CTV priced at premiums over linear TV - measurement standardisation essential for market maturity

Sources: IAB UK, Ofcom, Nielsen, BARB 2024-2025

Challenges and Considerations

Technical, regulatory, and experience hurdles to address

Technical

- Ad fraud in programmatic
- Viewability verification
- Latency in live insertion
- ML model accuracy

72%

reuse assets across channels

Privacy & Regulatory

- GDPR compliance costs
- VPP disclosure rules

✓ Contextual = compliant

Fragmentation

- 100s of streaming services
- Inconsistent measurement
- Walled gardens
- Linear infrastructure limits

User Experience

- **40.6%** cancel due to ads
- Ad fatigue drives churn
- Frequency capping essential
- Quality > quantity

What's Next: 2026 and Beyond

Emerging technologies and market evolution

EMERGING FORMATS

Voice Ads
Conversational commerce

AR Overlays
Product visualisation

AI Scenes
Dynamic per-viewer

LIVE SPORTS EVOLUTION

Dynamic L-Bars
Ads alongside play

Double-Box
Split-screen formats

GB UK: Freely Platform

PSB streaming with integrated ad tech - BBC, ITV, C4, C5

COMMERCE INTEGRATION

INDUSTRY CONSOLIDATION

- Unified measurement standards
- Cross-format programmatic
- Cross-platform identity

CONVERGENCE POINT

Sports virtual ads + Entertainment VPP + Shoppable TV + AI creative = **Unified programmatic ecosystem**

Key Takeaways

Practical recommendations for broadcasters, advertisers, and technologists

For Broadcasters

✓ SSAI is table stakes
Ad blocker resistance essential

✓ Hybrid models win
Offer ad-supported tiers

✓ Monetise archives
VPP unlocks catalogue

✓ Invest in measurement
Justifies premium pricing

For Advertisers

✓ Context beats demographics
4× attention scene-matched

✓ Integrated > interruptive
VPP: +28% brand recall

✓ Watch frequency
6+ exposures hurts intent

✓ Test interactive
125× vs passive viewing

For Technologists

✓ CV/ML pipeline proven
Sports validated at scale

✓ Real-time achievable
<40ms latency for live

✓ Build privacy-first
Contextual needs no PII

✓ Measurement is the gap
Standardisation opportunity

Questions?

Susan Hewitt

Hewitt Innovations Ltd

Appendix: References

Data sources and citations

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NHL.com, Digitally Enhanced Dasherboards programme data

DFL (Deutsche Fussball Liga), Virtual Perimeter Advertising

Deloitte Digital Media Trends Survey, 2024-2025

STREAMING AND CTV

TiVo Video Trends Report Q4 2024

Kantar Entertainment on Demand, UK 2024-2025

eMarketer, UK CTV Advertising Forecast 2024-2028

Nielsen Ad Intel UK, 2024-2025

TECHNOLOGY AND AI

FreeWheel Video Marketplace Report, 2024

Magnite CTV/OTT Report, 2024

Seedtag Contextual Advertising Benchmark Study, 2024

‘Modernising Media Creation & Delivery’

Gerard Phillips,

Technical Lead Systems Engineering,

Arista

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ARISTA

Modernising Media Creation & Delivery

Gerard Phillips - Systems Engineer, Media & Entertainment Tech Lead.
Q4’26
gp@arista.com

Media is Everywhere, and it's all IP

Social Media / Remote Working

Storage and Playout

Streaming

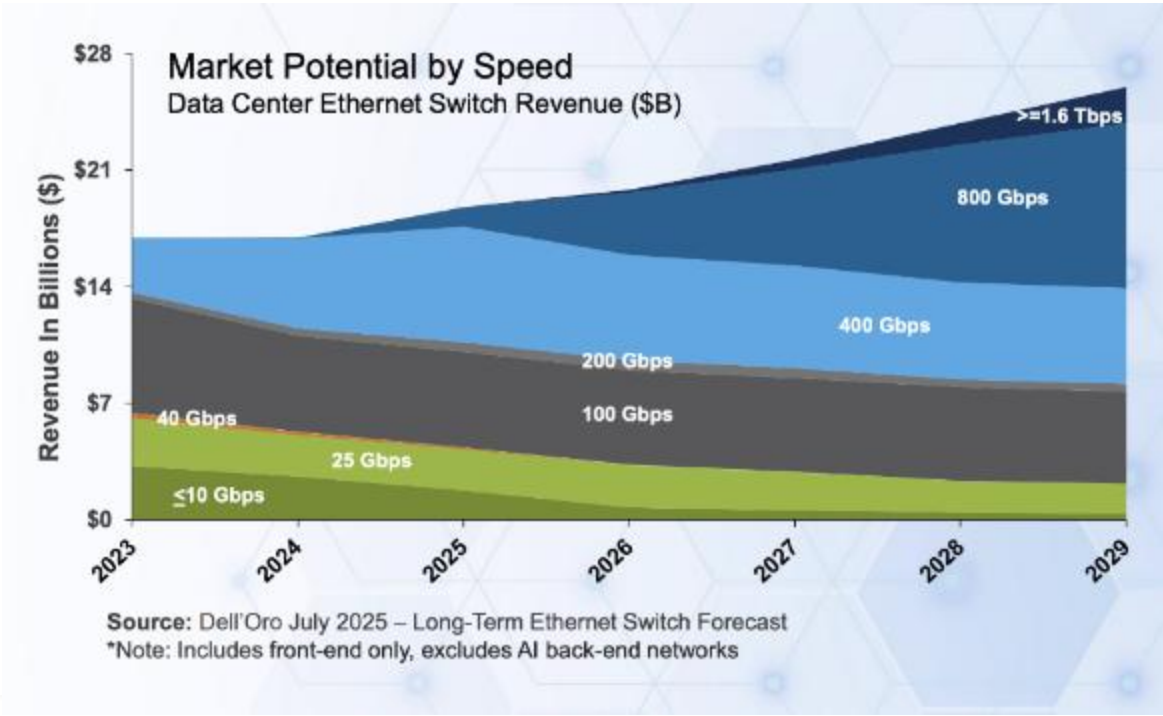
Media & Entertainment

Content Production

Live Sports, Concerts, eSports

Distribution / CDN

Networking Industry Direction



State of 800GbE

- Required technologies:
  - 100G SerDes – Introduced with TH4
  - 800G transceivers – Shipping since 2023
  - 800G MAC layer – **Implemented in TH5, J3**

Standard	Status	Description	Electrical Interfaces	Chipsets
IEEE 802.3ck	Sept 2022	100, 200 & 400 GbE using 100G lanes	100G-1, 200G-2, 400G-4	TH4-100, TH5, J3 Family
Ethernet Technology Consortium 800GBASE-ETC-R	October 2020	800G using 100G lanes	800G-8	**TH5, J3 Family**
IEEE 802.3df (Reduced Scope to 800G-8)	February 2024	800G using 100G lanes	800G-8	**TH5, J3 Family**
IEEE 802.3dj	Target 3Q2026	200, 400 Gb/s, 800 Gb/s, and 1.6 Tb/s using 200 Gbit/s lanes	200G-1, 400G-2, 800G-4, 1600G-8	Future 1600G Silicon e.g. TH6, J4 (based on available drafts)

Compatible

800GBASE-ETC-R is The Common Standard for 800GbE

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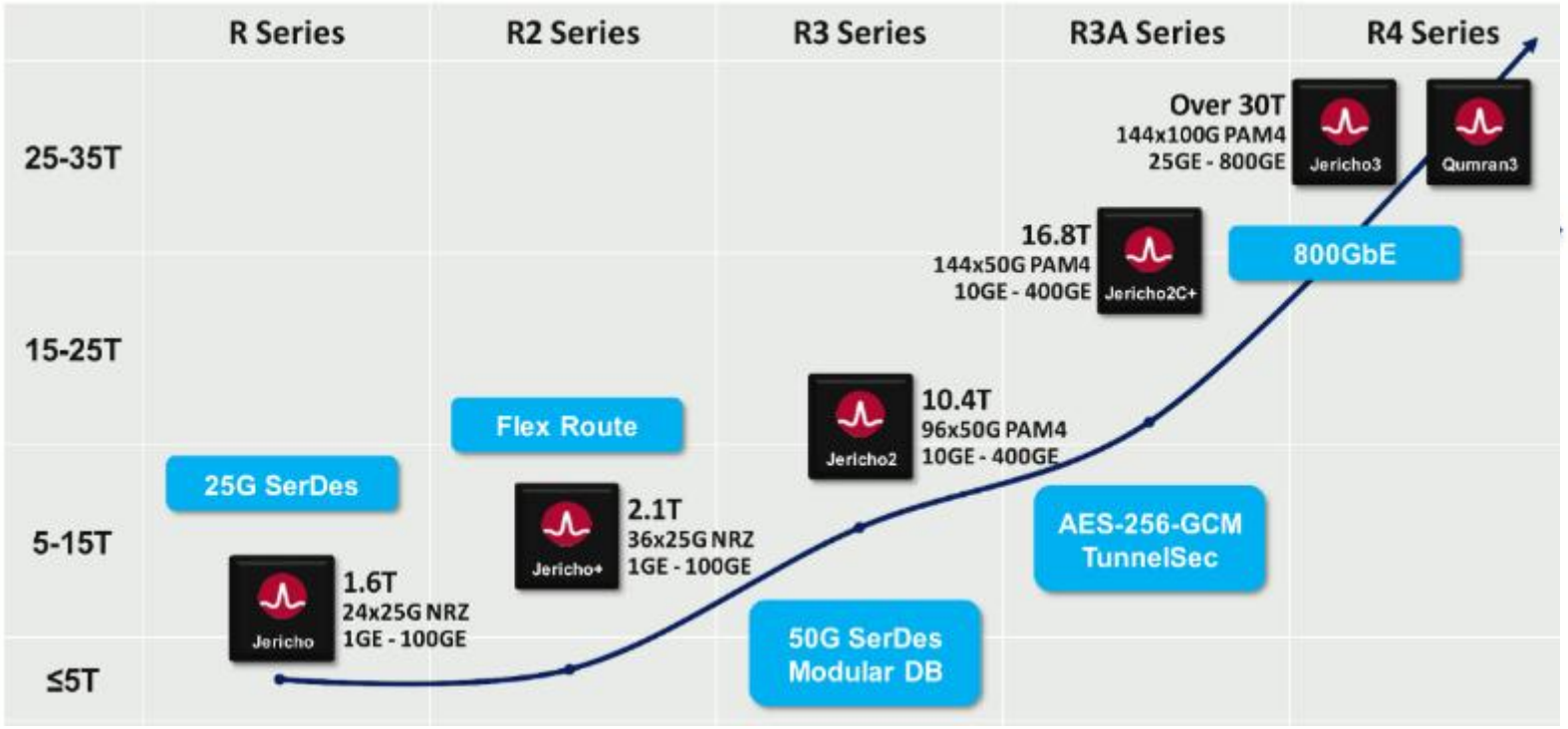
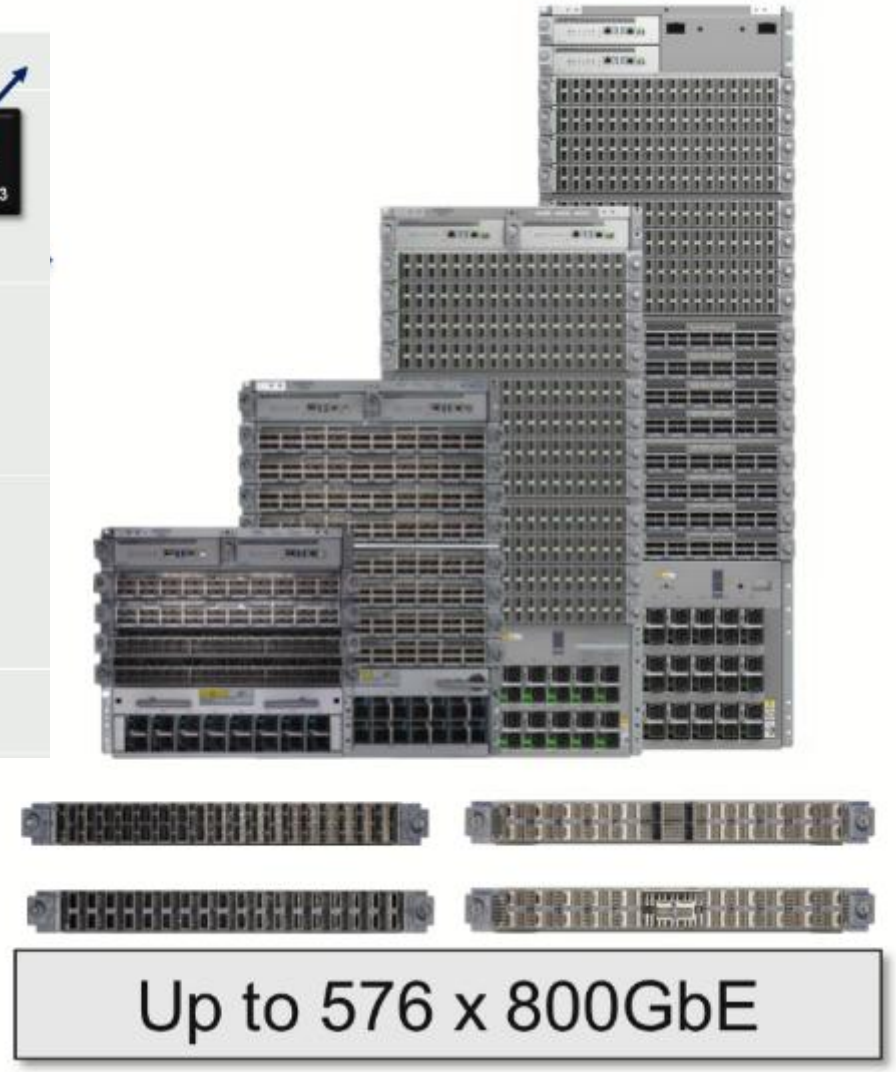
Networking Industry Direction





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Connectivity: Is Everything

- There is never enough…
- 400G, 800G is in the DC / Mobile DC now
- 400G, 800G ZR/ZR+ DWDM enables 25.6Tbps / Fibre
- Commodity DC / SP grade switching is the enabler

Reach All of Europe with 400G/800G-ZR DWDM

PAN EUROPEAN FIBEROPTIC NETWORK ROUTES PLANNED OR IN PLACE

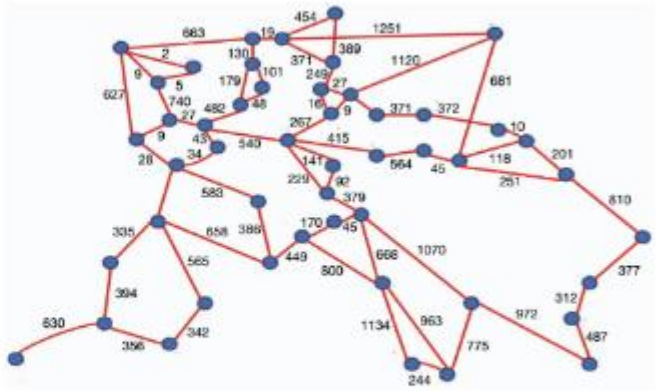


Image Credit: Nattia Cantono, Roberto Gaudino, Vittorio Curri, Stephan Pachnicke, "Potentialities and Criticalities of Flexible-Rate Transponders in DWDM Networks: A Statistical Approach," J. Opt. Commun. Netw. 8, A76-A85 (2016);

Networking Industry Direction

Scale
Reliability
Visibility
Automation
Open Standards
Zero Trust
Software Defined
Operational Efficiency

Media Industry Direction - 2025

Cloud Playout

CDN

SDI

ST 2110 @ Scale Connected

Corporate / Enterprise Media Production

Security

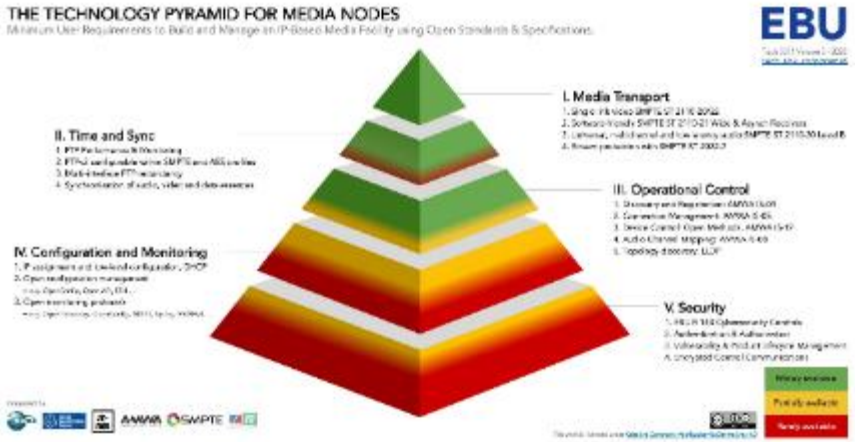
ST 2110 Islands

ST 2110 Segmentation Automation Orchestration

Software Virtualised Workflows

Cloud Production

IPMX Pro-AV



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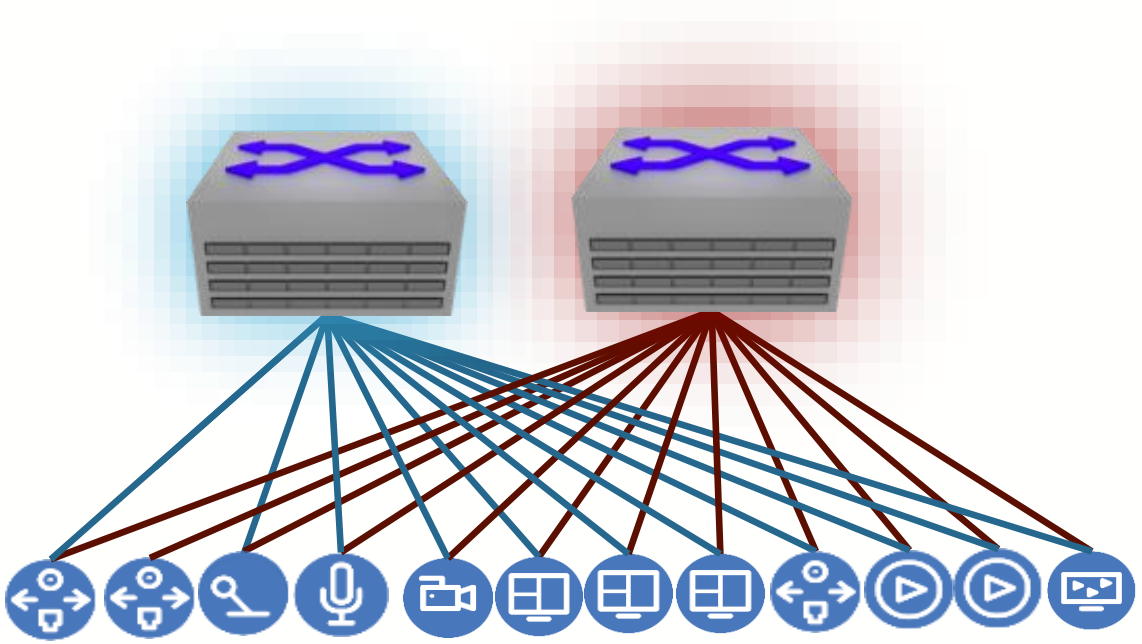
rtl/BCE (2017)

ST 2110 Islands

Redundant Monolithic

- ST2022-6/7
- Monolithic
- Future ready
- Simple to Configure
- Simple to Operate



- Separate Red and Blue monolithic switch topology
- Media Nodes w/ connection to both Red and Blue
- IGMP / PIM works well
- Intrinsically non-blocking
- 10G -> 800G

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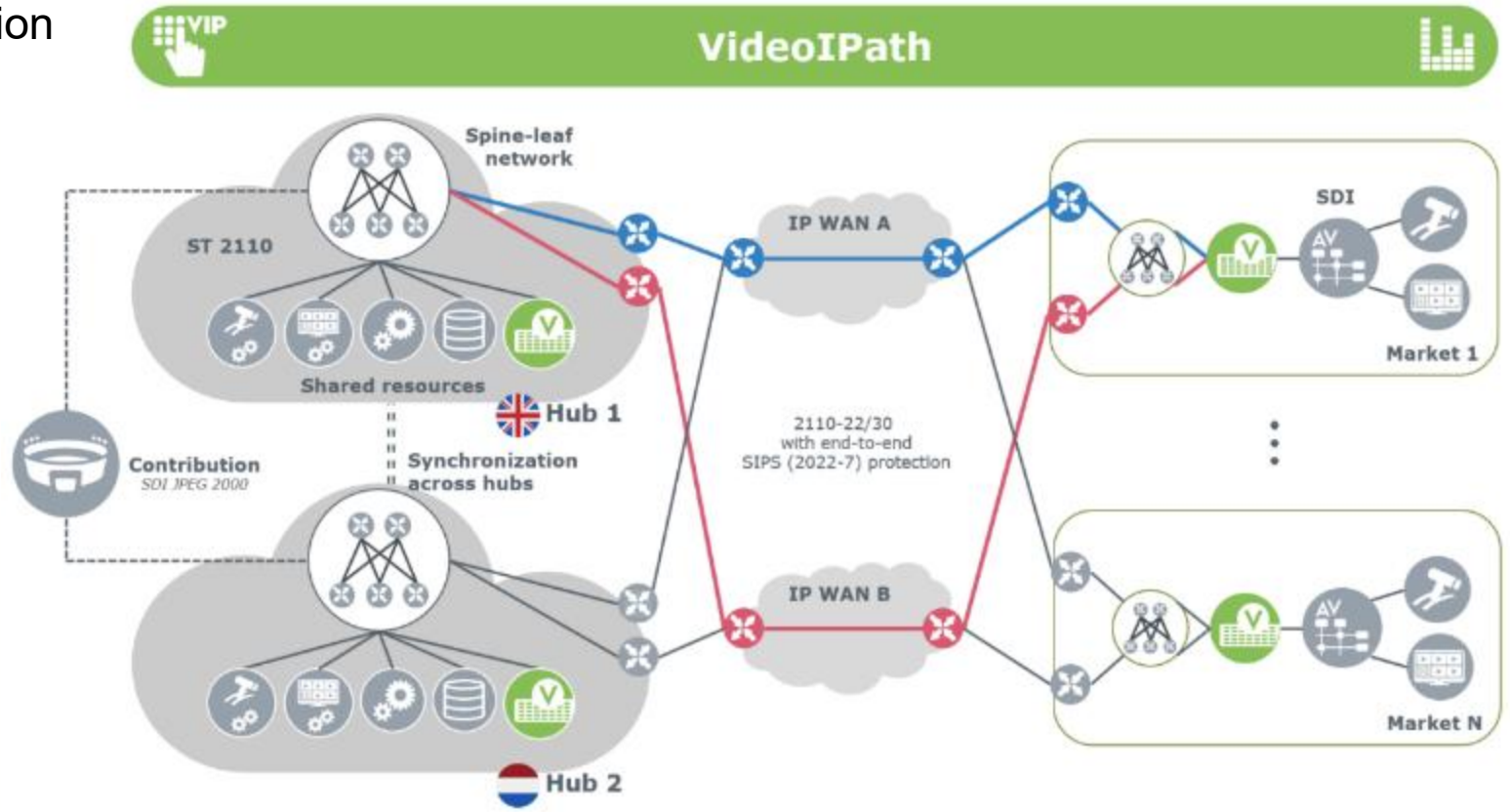
Discovery / Eurosport (2020)

ST 2110
@ Scale
Connected

- Dual Tech Hubs
- 2x Capacity, or DR
- Max flexibility for media sharing
- No restrictions on workflows
- 10’s of Regional Locations
- Many flexible workspaces / Location

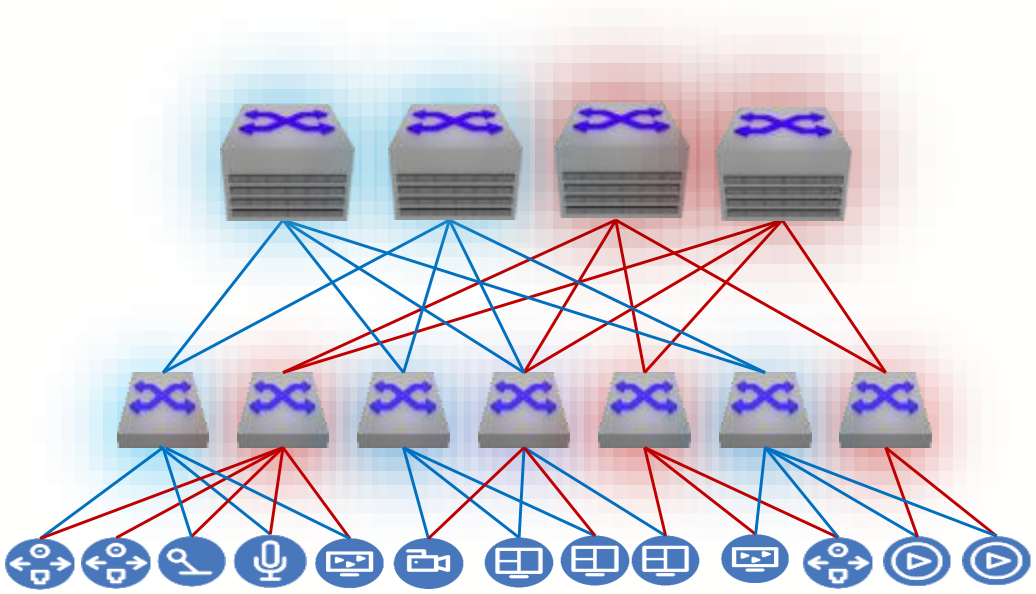


Discovery / Eurosport (2020)

- +750 Switches
- 100s of thousands of flows
- 100s of thousands of hosts
- > 1.1m switching events in 2 weeks

- Enabled by 400G cores
- Nevion VideoIPath SDN
- Comprehensive visibility
- (Early) Ansible Automation

Spine / Leaf



Each Tech Hub is a 400G Leaf and Spine
Many Regional Offices are also L&S

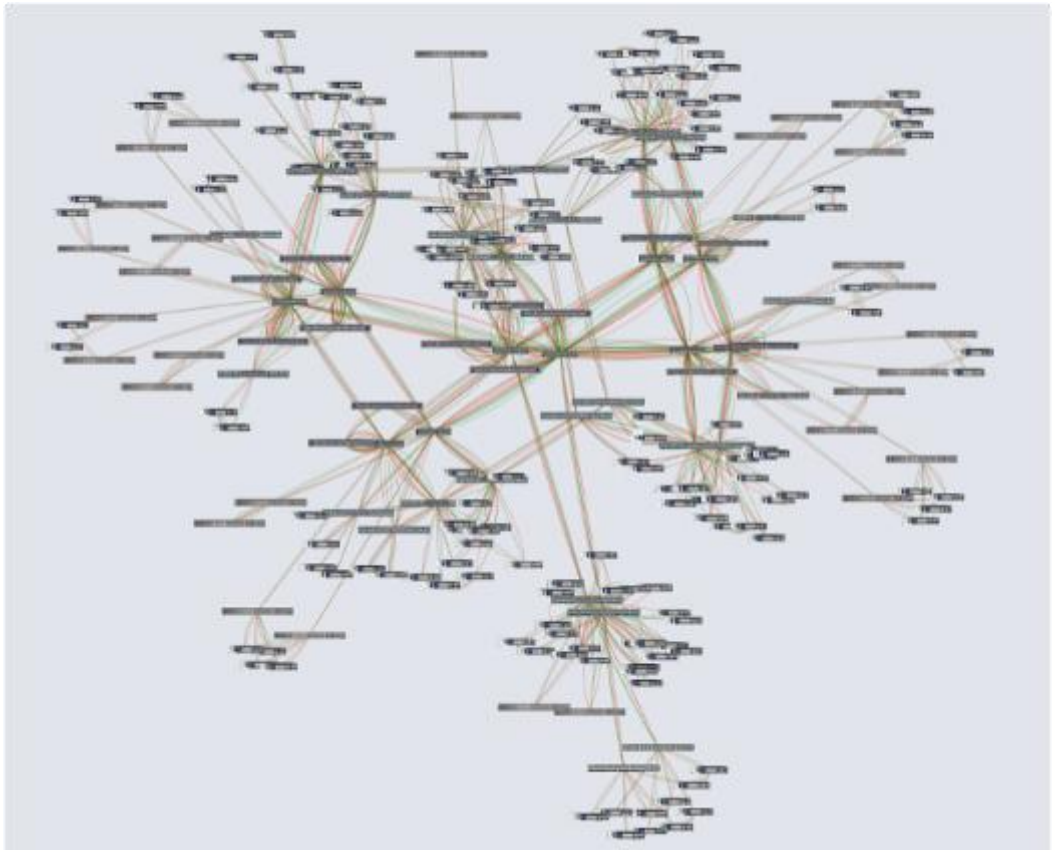
EMG Mobile DCs / OBs

Flexibility and Agility

- Physical Modularity
  - 100s of Standardised Rack units
  - Removable from OB Trucks
  - Extreme flexibility through module choice
- Deep Automation
  - Network topology and hosts auto detected
  - SDN delivers across fabric with bandwidth awareness
  - Comprehensive monitoring based on Arista Telemetry

EMG Mobile DCs / OBs

- Flexibility / Agility
- Deep Automation



ST 2110
Segmentation
Automation
Orchestration

EMG (EuroMediaGroup)
https://www.euromediagroup.com/home/

Project Scale

- Approximately 3200 endpoint interfaces
- Approximately 4500 active multicast groups (~22 Tbps active ingress b/w)
- Approximately 8000 connected multicast receivers (~13 Tbps active egress b/w)
- Roughly 1/3 sources are video, 2/3 audio

Arista / EMG Case Study:
https://www.arista.com/assets/data/pdf/CaseStudies/Arista-EMG-SDNsquare-CaseStudy.pdf

Modular system was used for the last summer and winter global games, opening, closing, and athletics.

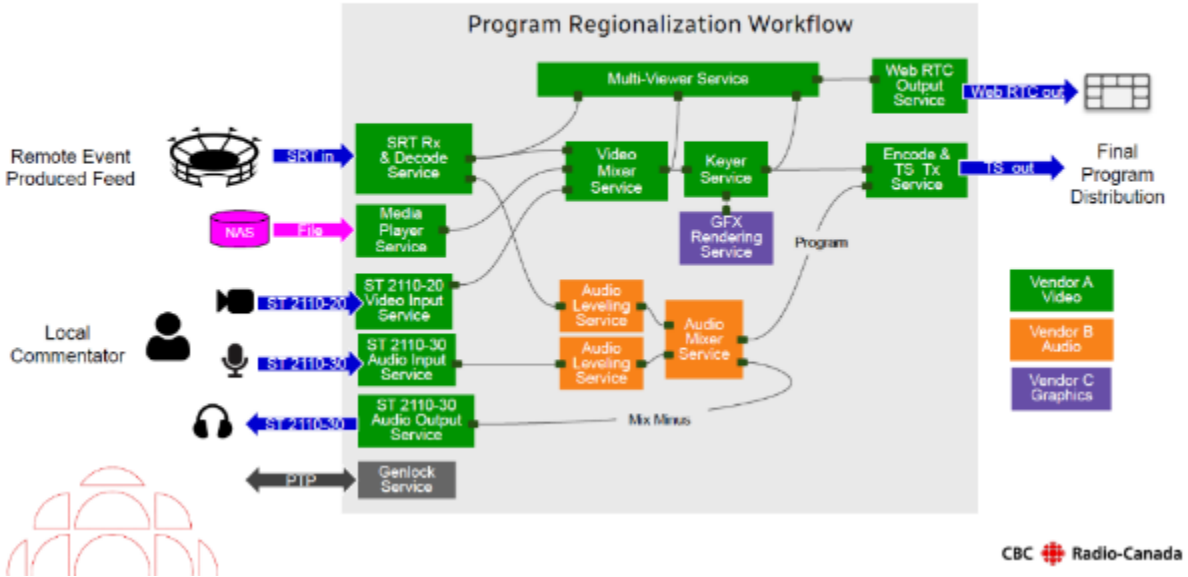
Dynamic Media Facility

- Software based
- Cloud Inspired
- Interoperable
- Software Defined

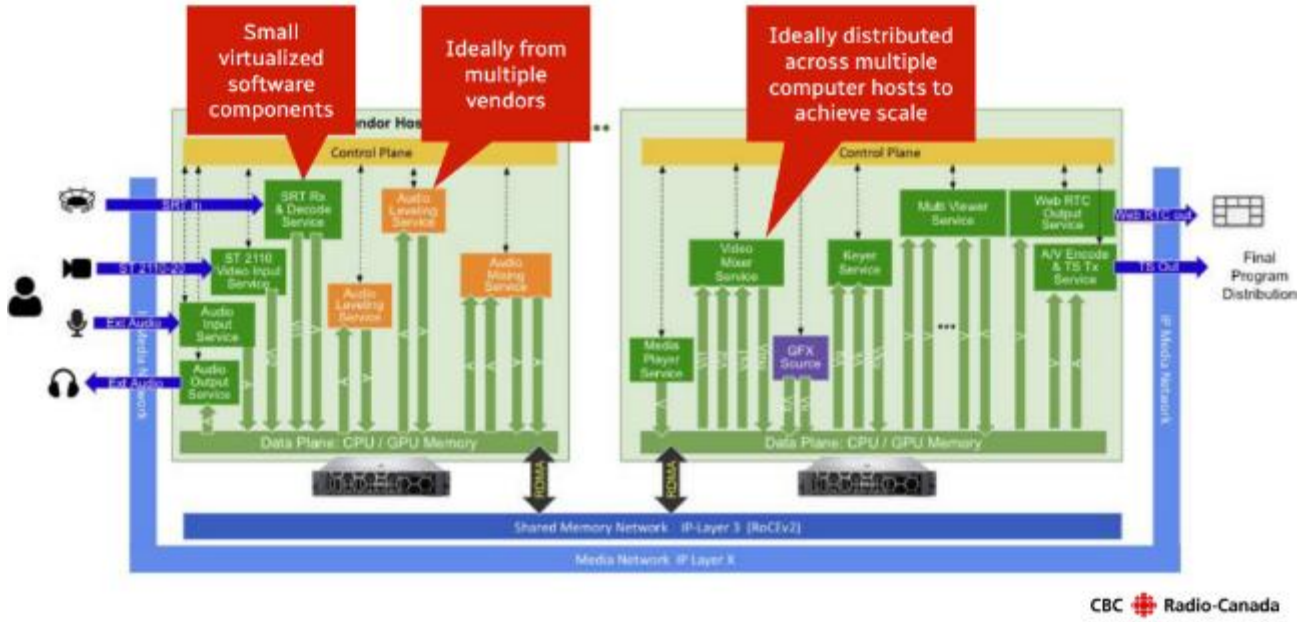
Software Virtualised Workflows

- Customised Workflows
- Simplified Scalability
- Flexible
- Operational Efficiency

Consider A Typical Production Workflow



Workflow Is Ported To A Software Based Model



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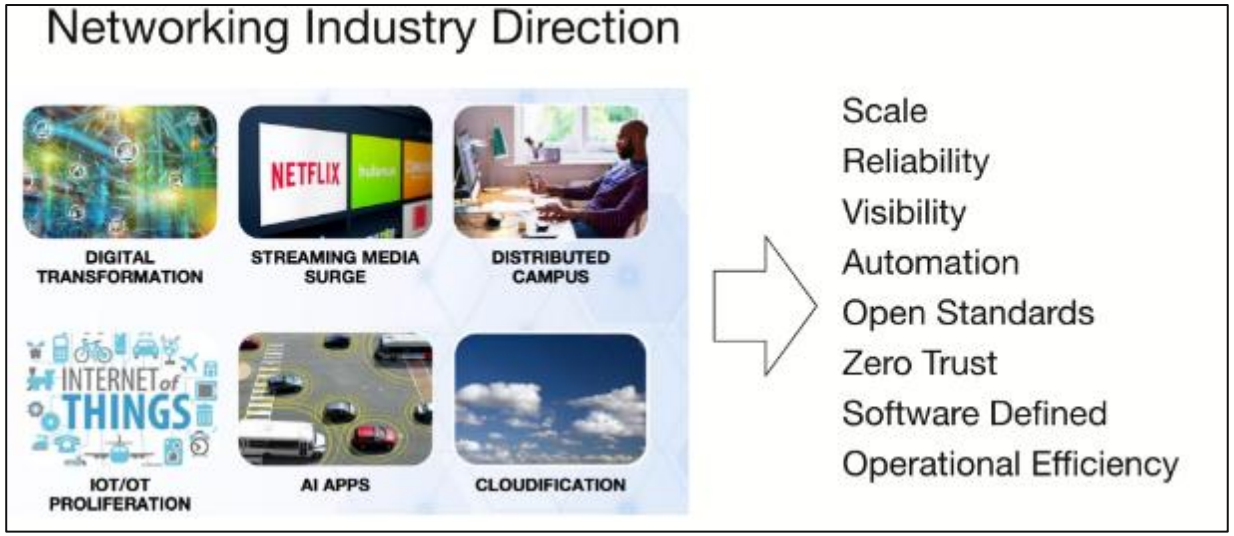
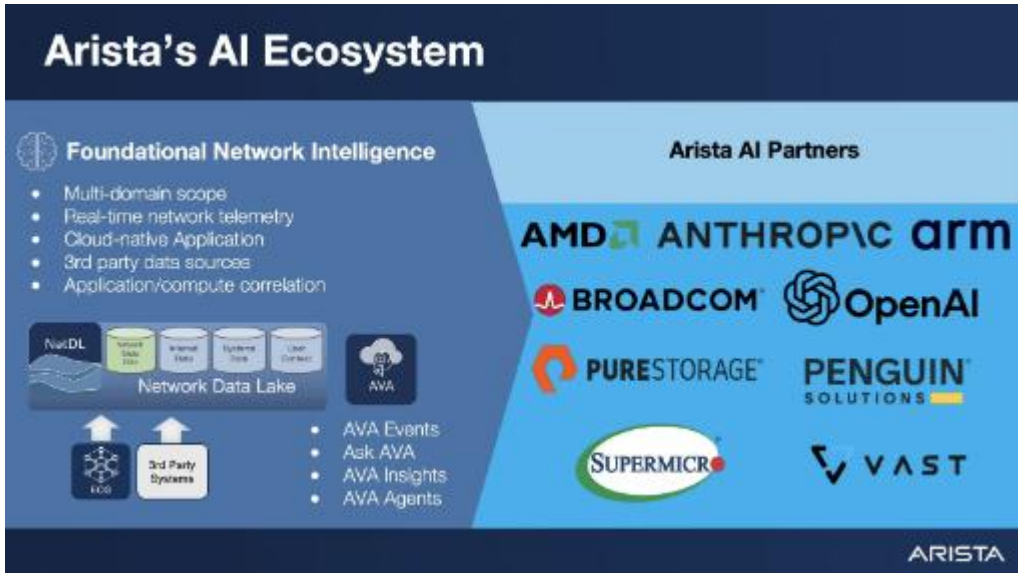
DMF Network Needs?

- Generic Compute Infrastructure
- Low latency
- High performance
- Maximum reliability & resilience

- **Much like modern AI workloads**





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Enterprise Network Evolution

Modern Operating Model

Autonomous Software-led NaaS

Modern Engineering Blueprints

Prescriptive Design Patterns



Repeatable design patterns

Scalable, Federated, Open Protocols

Infrastructure-as-Code

CloudVision | AVD | NetDL | CloudVision CI Pipeline

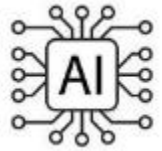
Workflow Automation, Telemetry-based troubleshooting

Procedural configuration, testing, and documentation generation - no CLI

Arista Continuous Integration Pipelines

Functional Virtual Twins for Simulation

Network-as-a-Service




Autonomous and automated network operations, software-led and delivered

AI-driven Operations: Predictive and Proactive Fault detection and correction

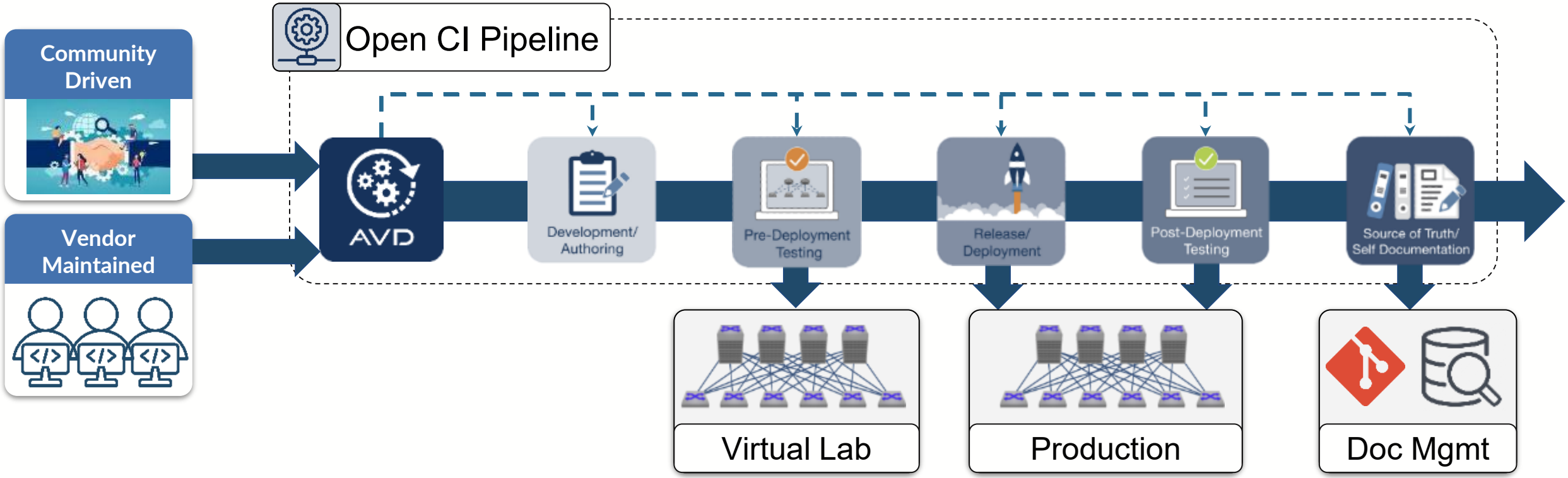
Digital Twinning Simulation Environments

CloudVision Application Platform

NaaS/Infrastructure-as-Code / Network CI

ARISTA

Software Defined Network-Wide Model



Complete Lifecycle of Network Provisioning -- Flexibility with Open Data Models
Multi-Domain Automation: DC, Campus, WAN -- Comprehensive Workflow

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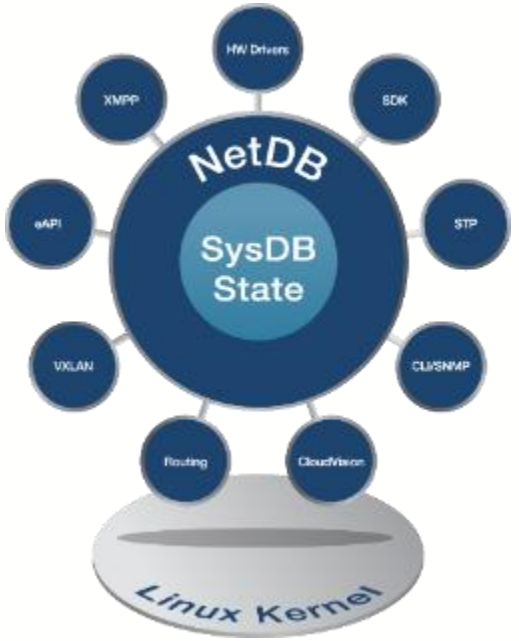
Lessons Learned: End-to-End IP has never been easier

- Moore's Law continues to drive the tech curve
- Connectivity has never been cheaper per Gbps or per watt
- IP / Connectivity drives creativity, agility and innovation
- Cloud-scale Operational practices drive network efficiencies and performance



ARISTA

ARISTA

Thank You

Q&A

‘Virtual Production Trends’

James Uren

Technical Director,

Mo-Sys Engineering Ltd

CW SPECIAL INTEREST GROUPS

mo-sys

Virtual Production Trends

James Uren – Technical Director, Mo-Sys

james@mo-sys.com | LinkedIn @juren

Shot on Mo-Sys

Shot on Mo-Sys

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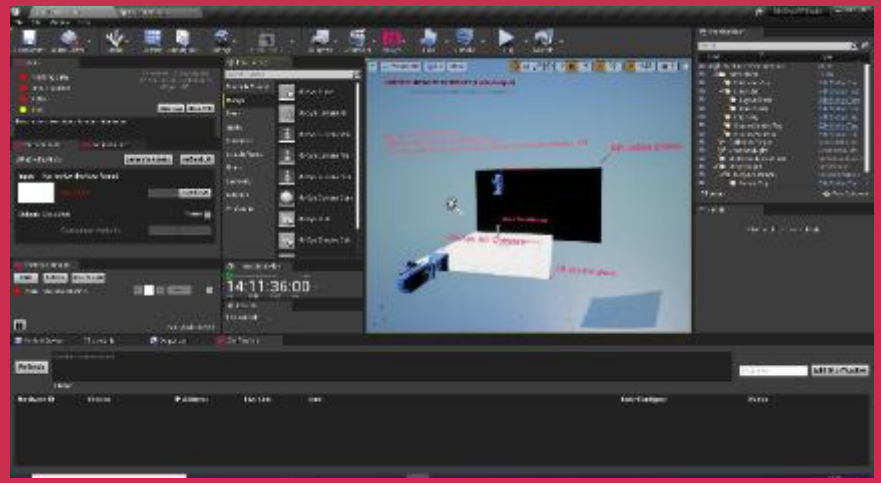

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Using camera tracking and/or robotics to create a perfect virtual version of the camera inside a video game engine

What is Virtual Production?

VP is an umbrella term for a variety of real-time VFX techniques:

- Augmented Reality
- Chromakey
- LED

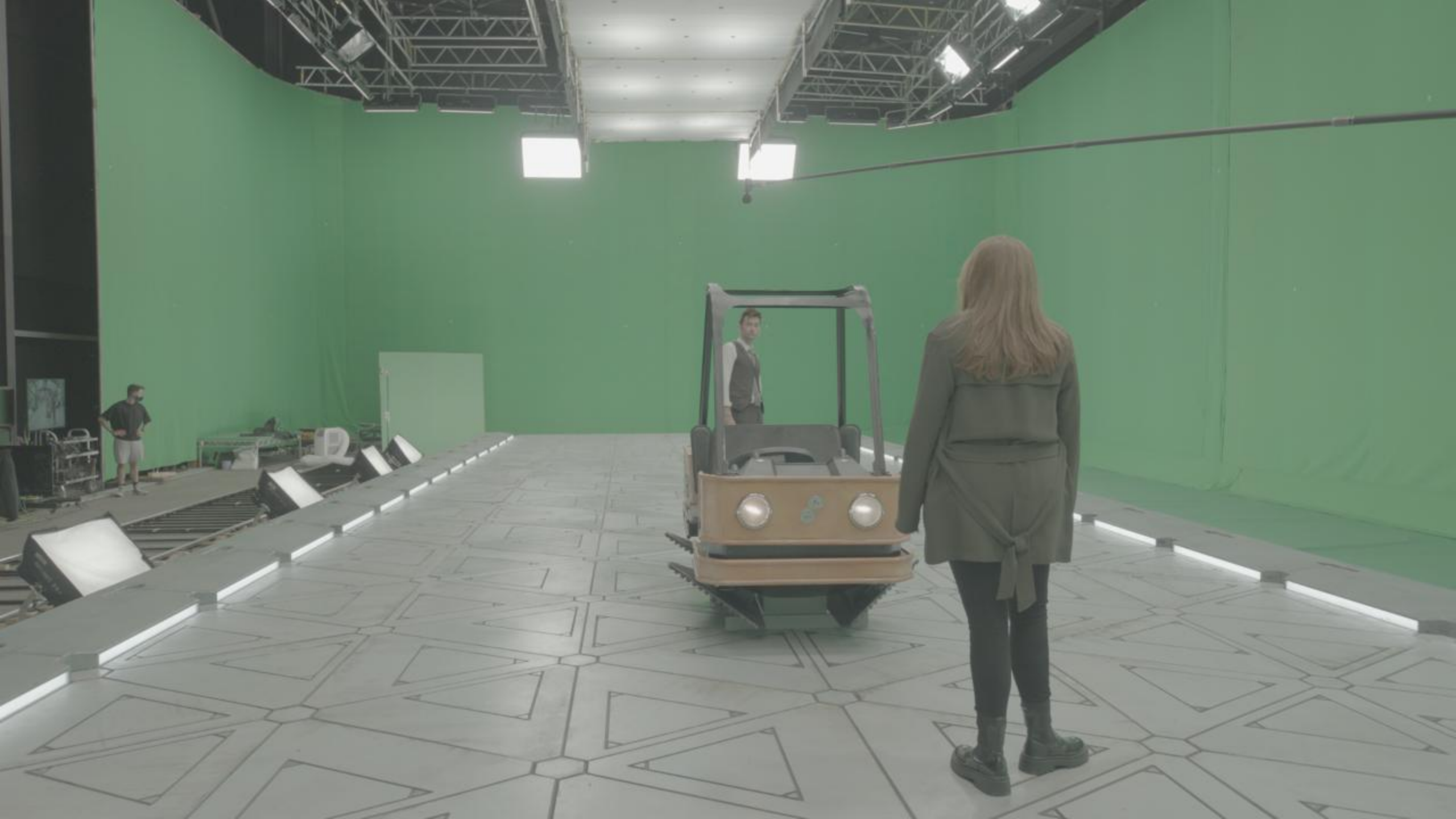
AR - Live broadcast

AR – Non-scripted

Chromakey

Chromakey


THE CAGE
VISUAL EFFECTS BREAKDOWN
WIPE A/B
DIGITAL DISTRICT



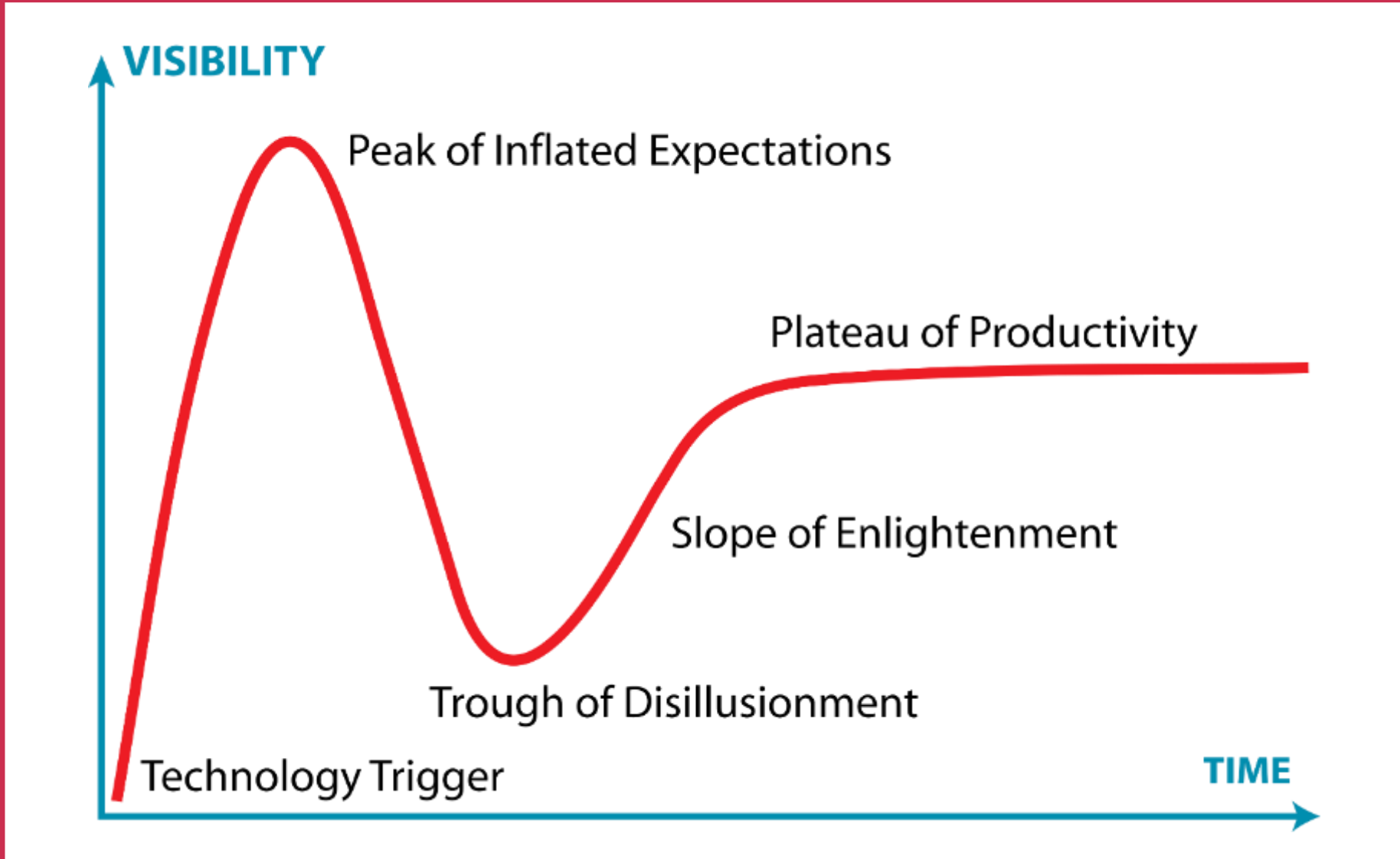
LED

In-Camera Visual Effects (ICVFX)

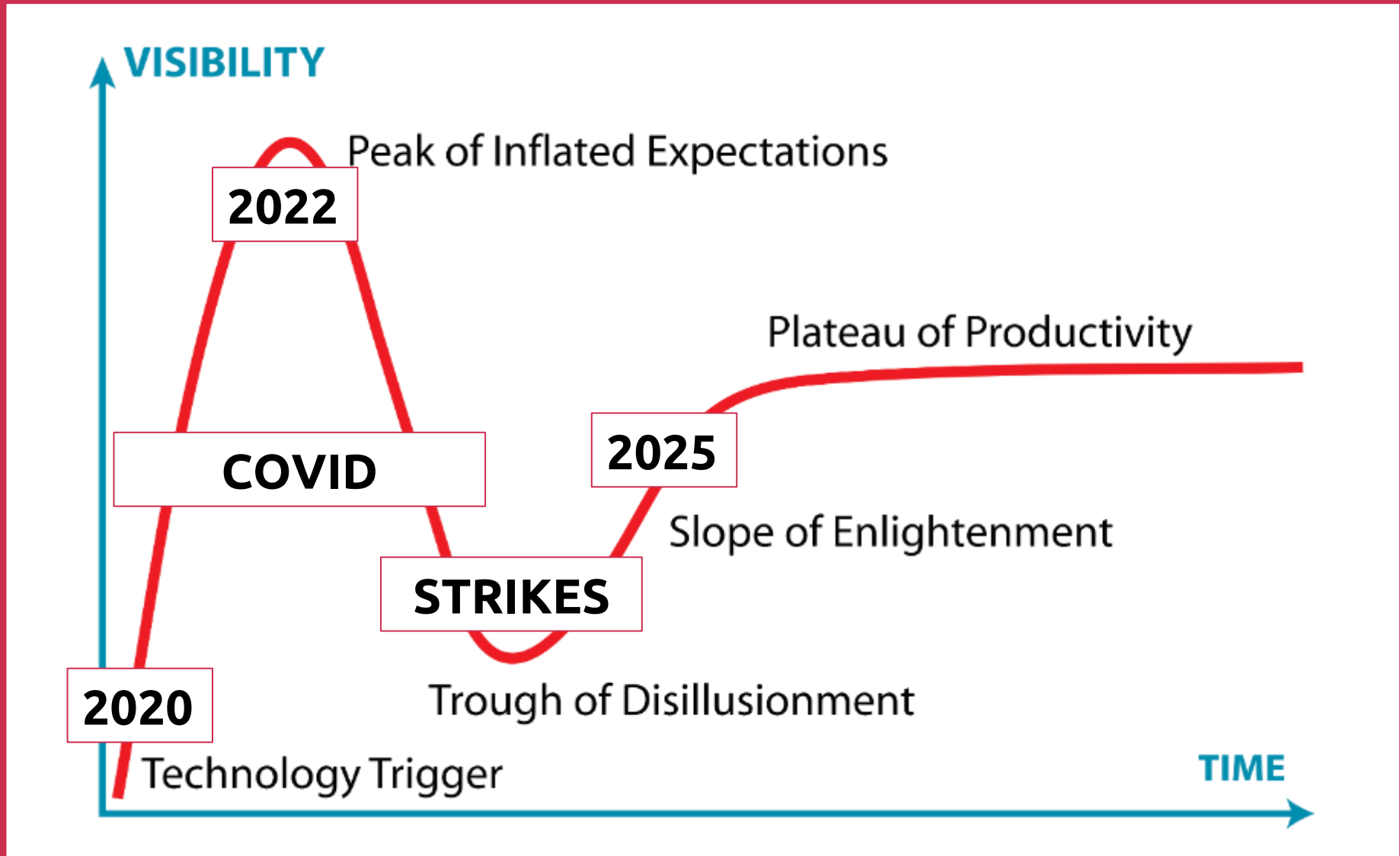
Extended Reality (XR)

Mixed Reality (MR)

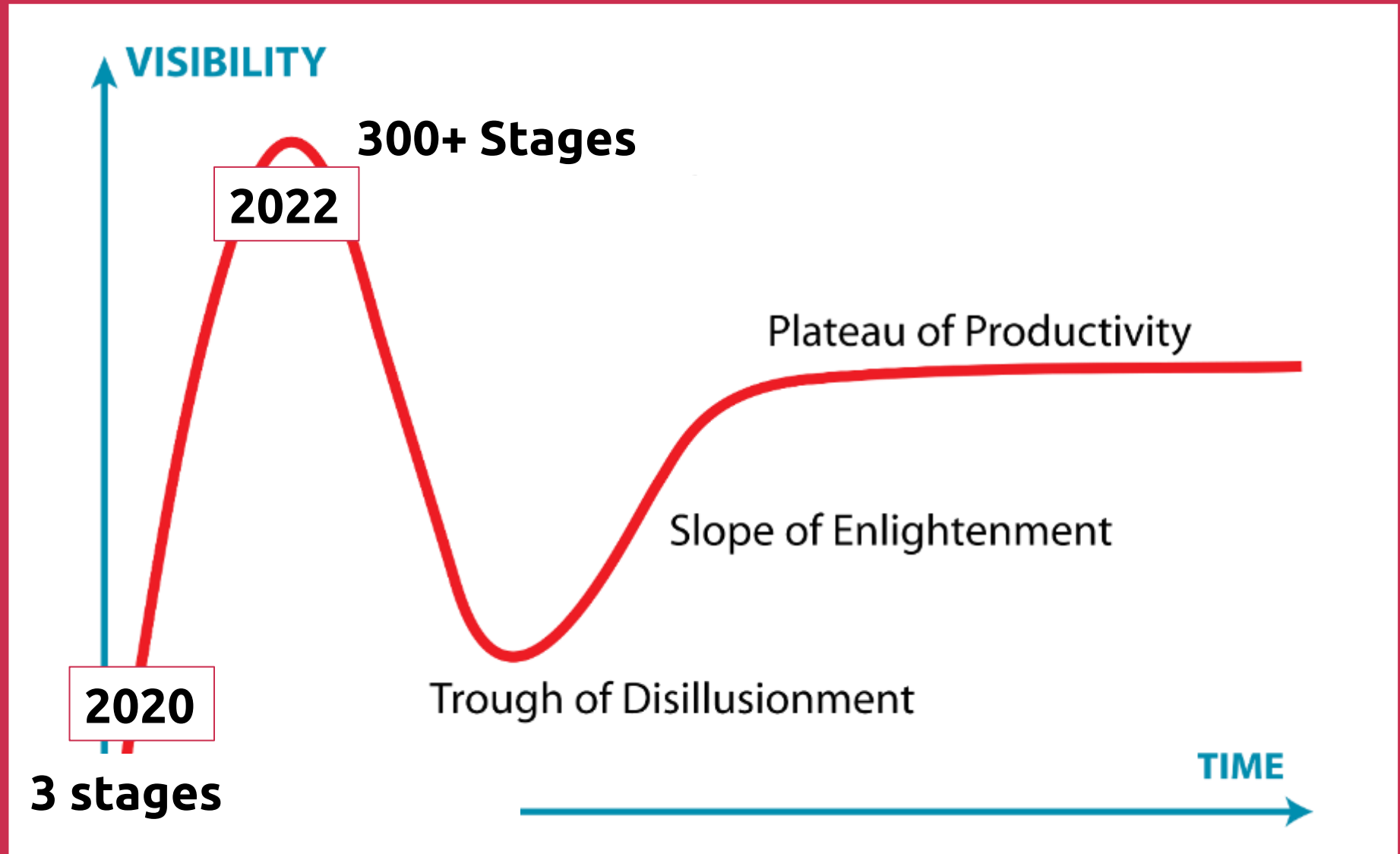
LED VP Hype


VISIBILITY
Peak of Inflated Expectations
Plateau of Productivity
Slope of Enlightenment
Trough of Disillusionment
Technology Trigger
TIME

LED VP Hype


VISIBILITY
Peak of Inflated Expectations
2022
Plateau of Productivity
COVID
2025
Slope of Enlightenment
STRIKES
2020
Trough of Disillusionment
Technology Trigger
TIME

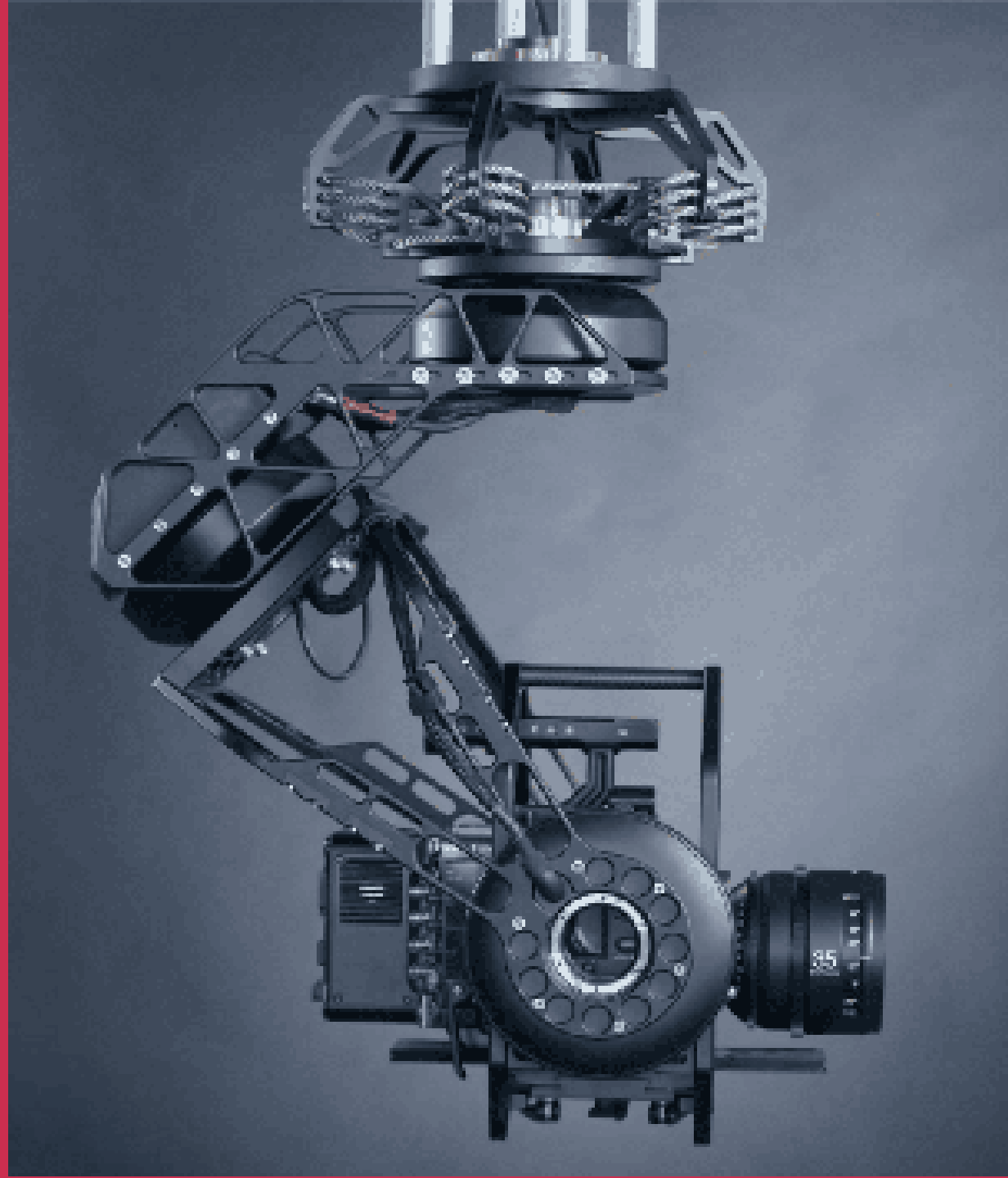
LED VP Hype


VISIBILITY
300+ Stages
2022
Plateau of Productivity
Slope of Enlightenment
Trough of Disillusionment
2020
3 stages
TIME

Future of VP

VP is here to stay...

- Money talks!
- Storytelling...
- Another tool in the box
- Shrinking knowledge gap



AI and VP

Pre-production

- Content creation
- Pre-visualisation

Production

- Segmentation
- Tracking / calibration
- Mo-Cap

Post-production

- Automating editing
- VFX / Compositing

mo-sys

Thank you

James Uren – Technical Director, Mo-Sys

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Fireside Chat: ‘Holodeck or The Matrix? - A look into the crystal ball of content‘

Matt Stagg

MTech Sport

Prof David Crawford

University of Essex & Ravensbourne University

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