

The background features a dark blue gradient with large, overlapping, semi-transparent shapes in shades of purple, pink, and orange, creating a dynamic, abstract design.

AWS re:Invent

NOV. 27 – DEC. 1, 2023 | LAS VEGAS, NV

MAE302

How ELF reduced their carbon footprint by broadcasting on AWS

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Agenda

- 01 Jason | Sustainability within AWS, media & entertainment, and how this applies to Live Cloud Production
- 02 Zeljko | Why and how the European League of Football (ELF) innovates M&E workloads on AWS
- 03 Felix | From idea to reality: ELF's Live Cloud Production



How AWS can be a partner in your sustainability journey



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The Climate Pledge

**THE
CLIMATE
PLEDGE**



September 19, 2019 | Amazon and Global Optimism announced The Climate Pledge

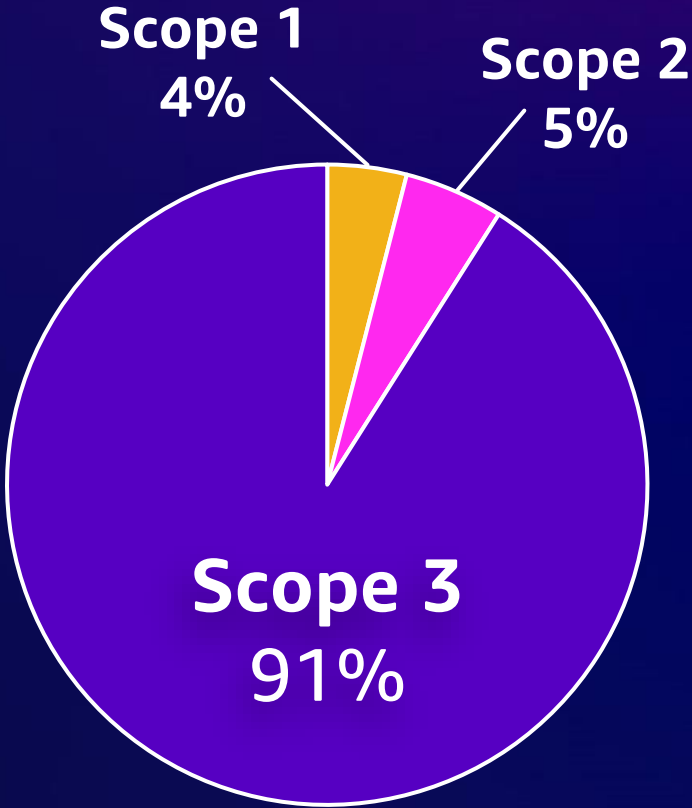
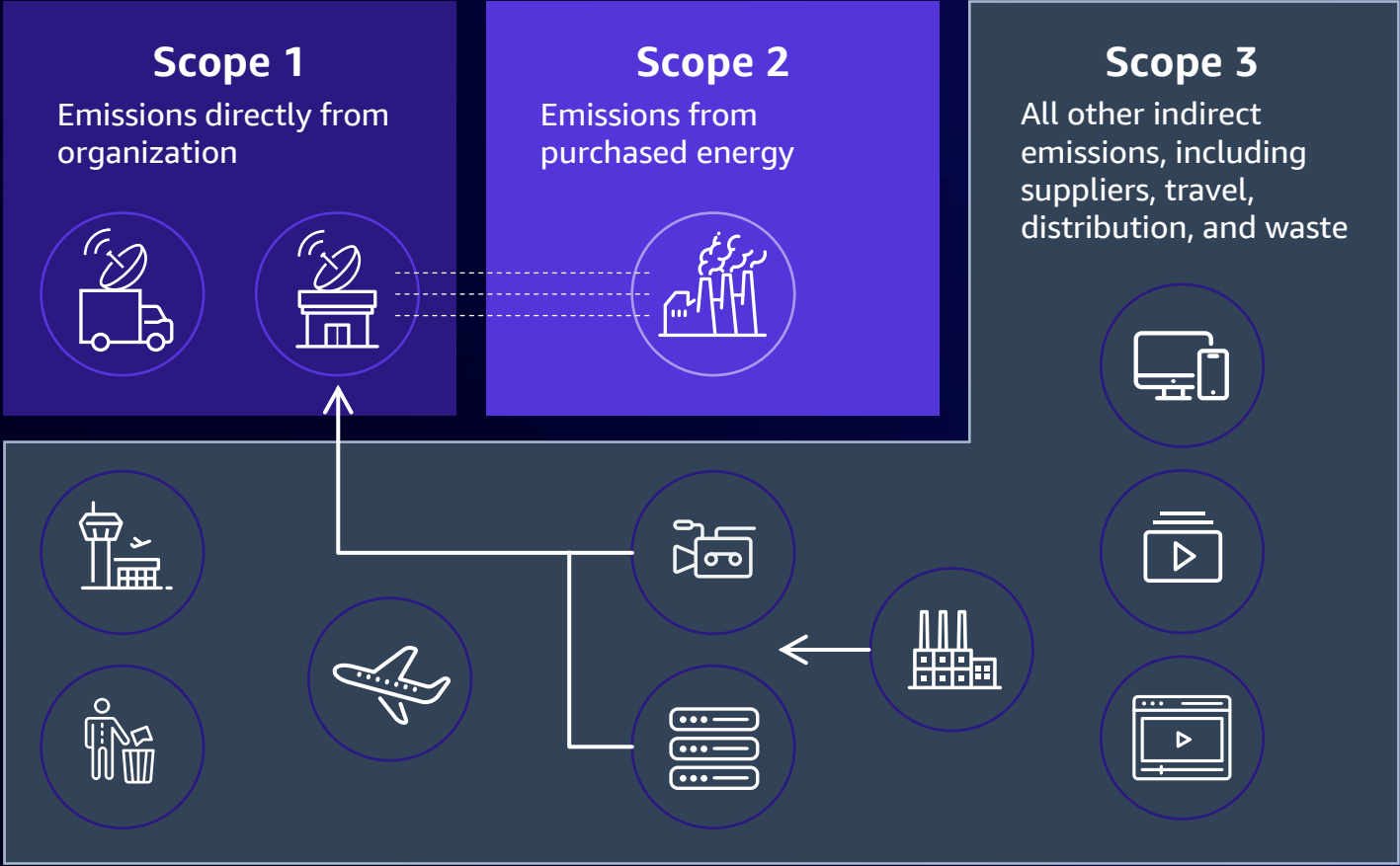
- **Commitment to meet the goals of the Paris Agreement 10 years early — and achieve net-zero carbon by 2040**
- **Areas of actions: Regular reporting, carbon elimination, credible offsets**



Media and entertainment's carbon footprint



Green House Gas (GHG) Protocol scopes



*Average of 10 major media companies

“

Travel remains the largest part of a production's footprint.

Source: albert, Annual Review 2021
https://wearealbert.org/wp-content/uploads/2023/01/albert-AR-2021_Finalv2.pdf



A data-driven approach to sustainability strategy, enabled by cloud computing



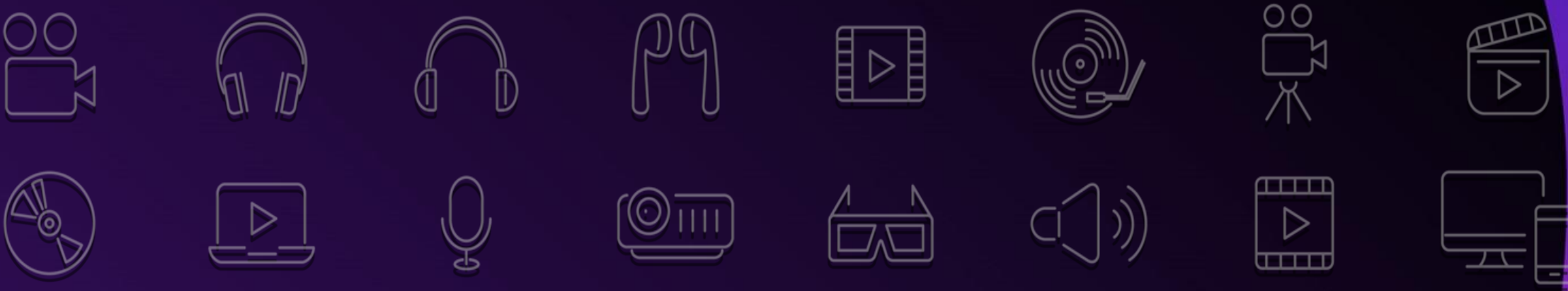
Sustainability **of** the cloud



Sustainability **in** the cloud



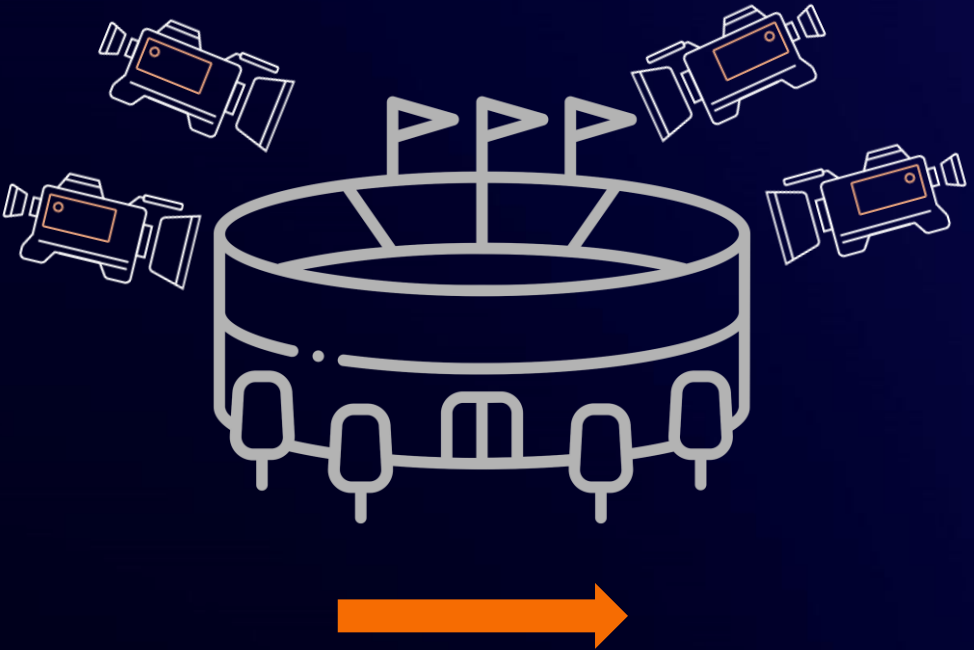
Sustainability **through** the cloud



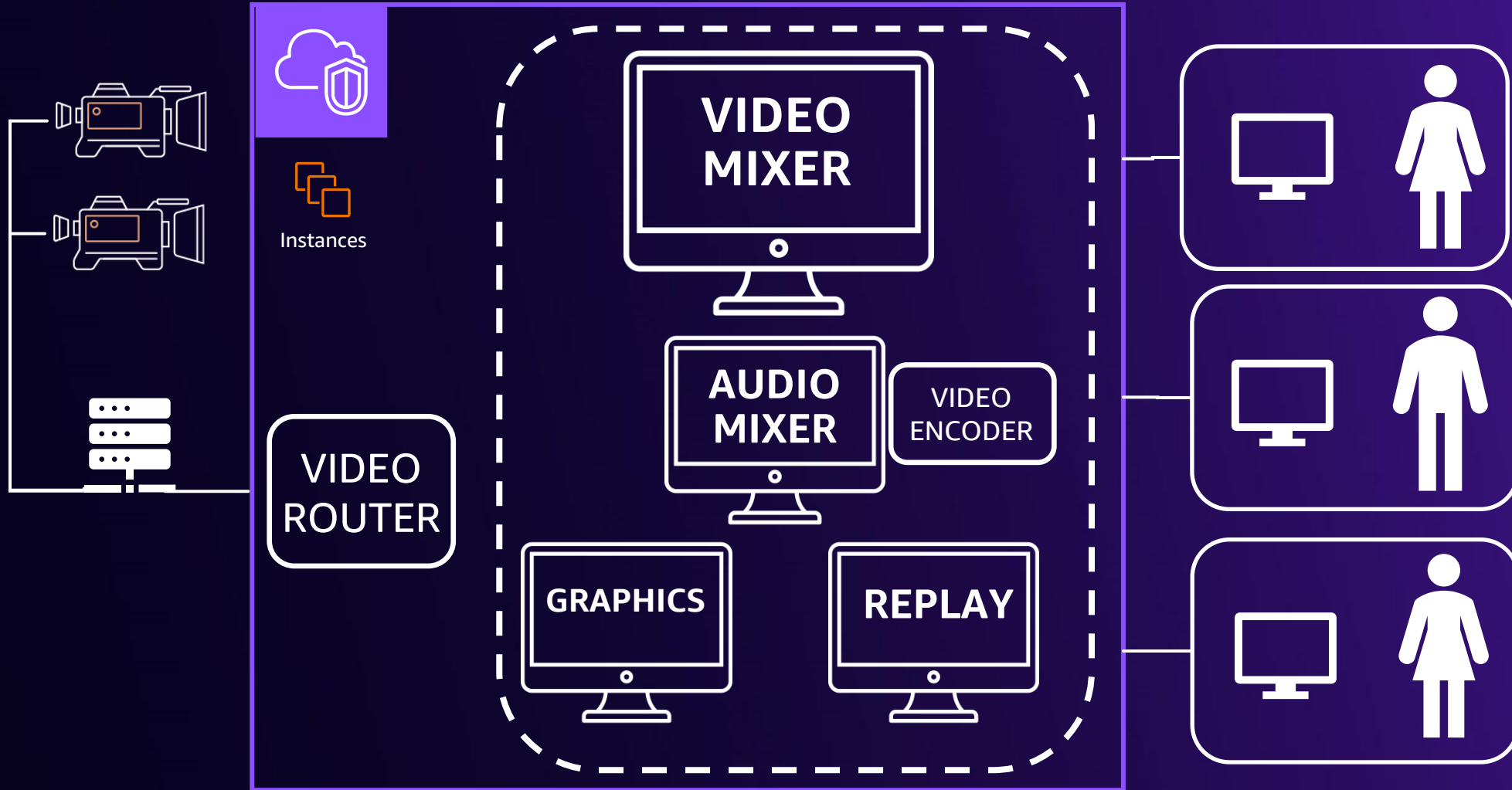
Let's dive in: Sustainability THROUGH the cloud



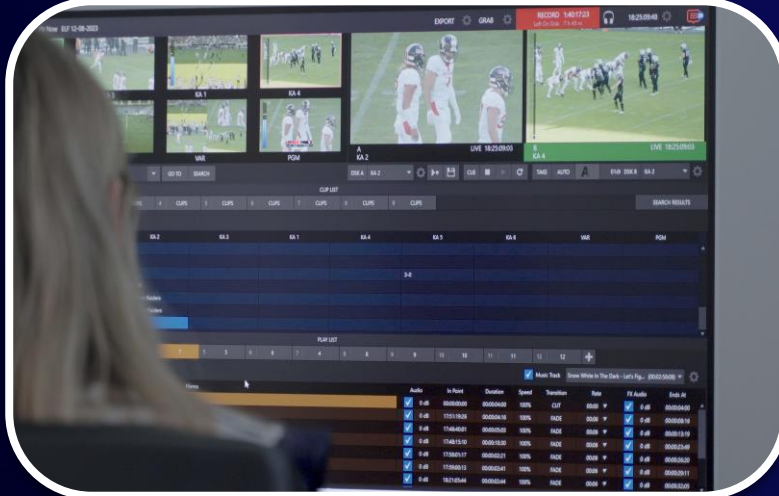
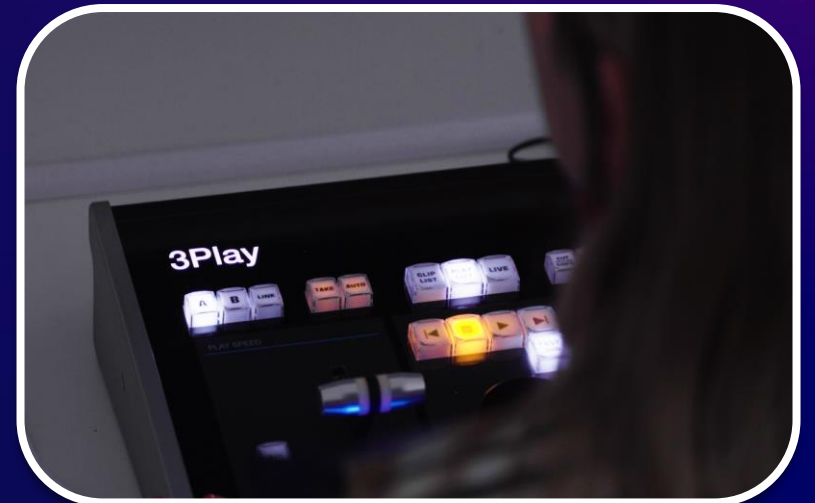
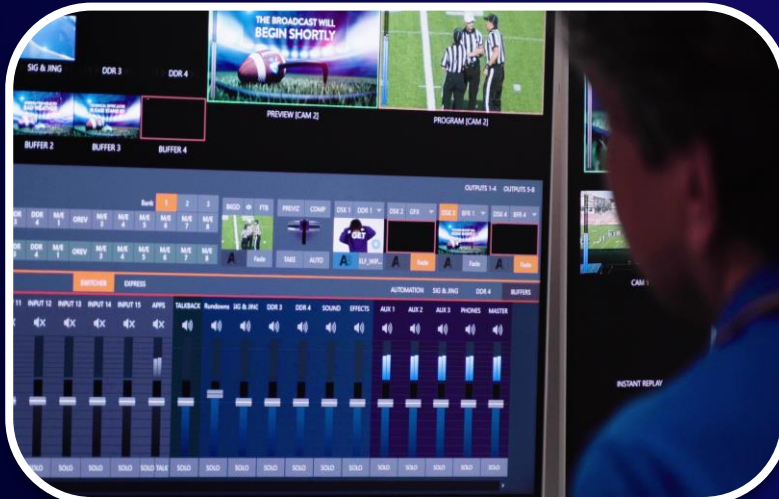
Examples of live production



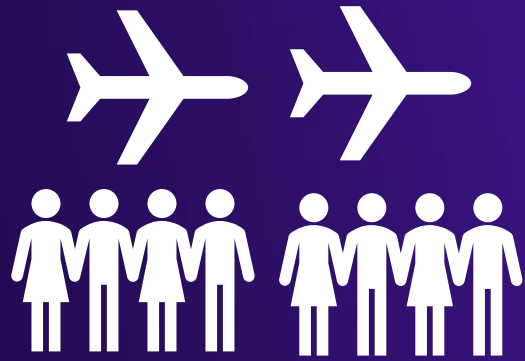
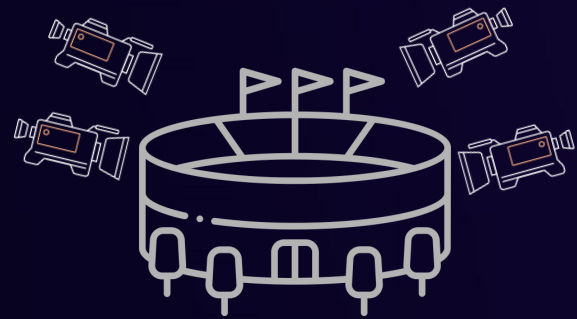
Live cloud production



ELF Live Cloud Production – Behind the scenes

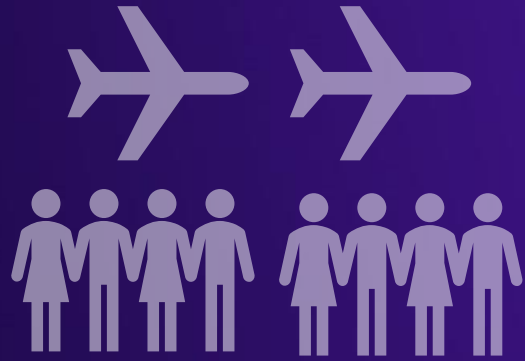
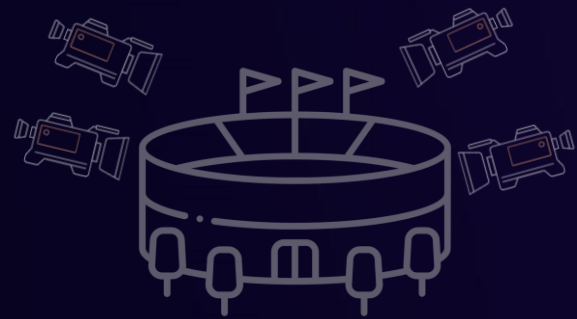


Legacy compared with Live Cloud Production

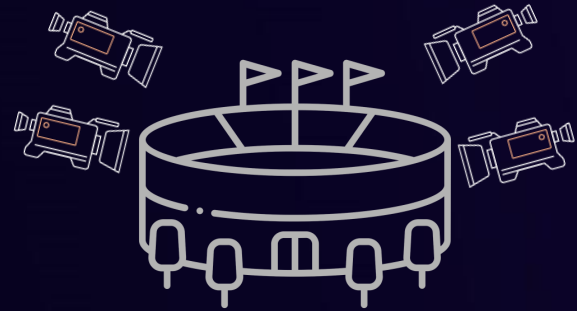


Onsite production crew

Legacy compared with Live Cloud Production



Onsite production crew

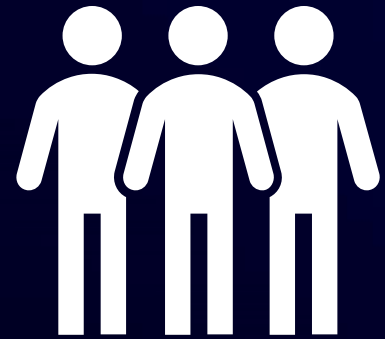


Onsite production crew



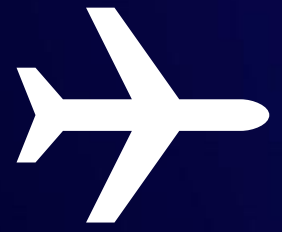
Remote production crew

Rough estimation of avoided air travel emissions



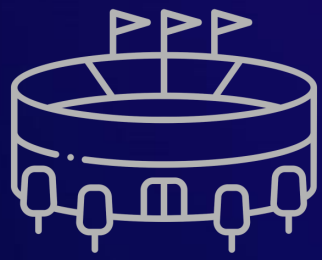
Number of people no longer traveling

x



Carbon intensity of mode of travel

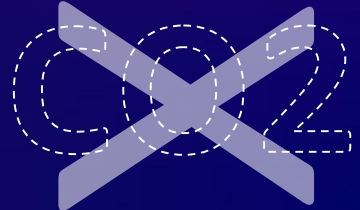
x



Number of games

≈

Avoided



Estimate of avoided emissions

5

x

.127*

Example metric tons CO2e/roundtrip flight

x

45

games with air travel

≈

28.6

metric tons CO2e

**Calculation and figures for demonstration purposes only. Actual carbon intensity from mode of travel will vary between modes and locations.*



Why and how the European League of Football (ELF) used AWS for broadcasting



RODIGER

10

The next big thing in sports in Europe

ALL EYES ON AMERICAN FOOTBALL

American football is a major emerging sport in Europe and has enjoyed great and growing popularity among fans for years



26%

interest in American football among the population in Germany



8%

increase of interest in two years (2020–2022)



>5M

registrations for NFL Germany games 2023 tickets



2nd

most popular sport in global TV broadcast

The **European League of Football** is the only professional platform with a European focus that caters to this hype

ELF is here to stay – Milestones after 3 seasons



Record
attendance:
32,500

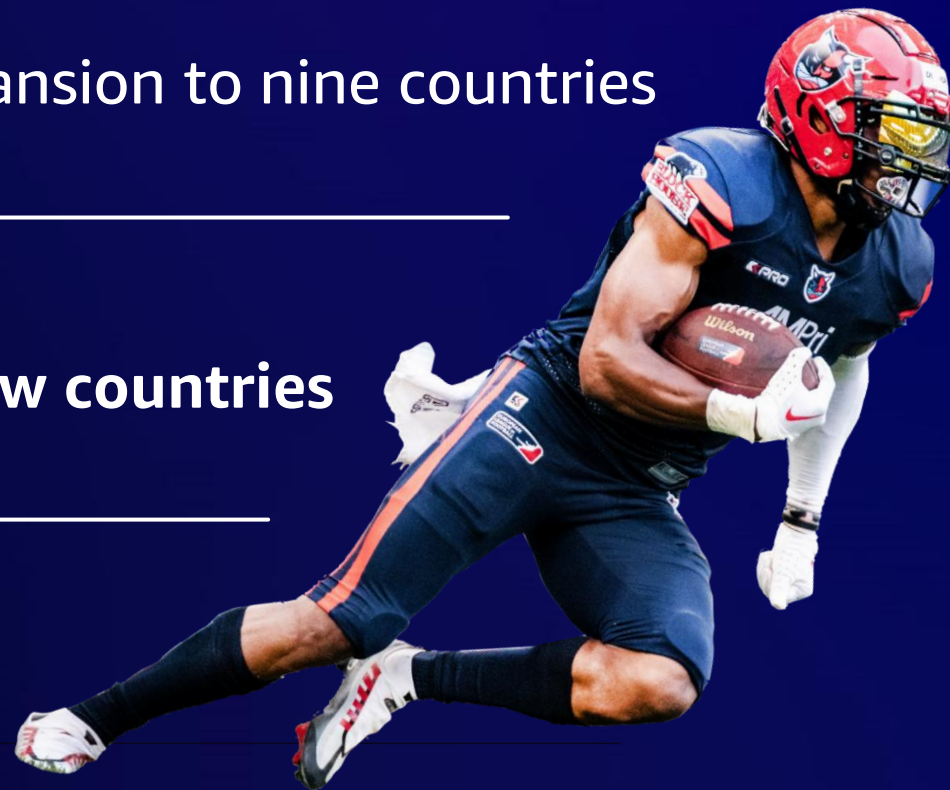
2024 55K seats at championship game

Season 2023 Expansion to nine countries

Season 2022 Expansion to five new countries



Season 2021 Inaugural season



Performance and exponential growth



DOUBLING ALL KEY PERFORMANCE INDICATORS EVERY YEAR

EMOTIONS

>100M fans in Europe
>500M households across all channels

FAMILY

38% female audience
>100 family events per season

NEXT BIG THING

2ND MOST POPULAR sport in global TV broadcast

DIVERSITY

45 NATIONS in the league with different languages and cultures

LIVE EXPERIENCE

>500 hours live content
>500K fans on site

DATA AND STATS

Tracking of every **MOVE AND ACTION**

PROFESSIONAL

158 games
1.3K licensed players
>100 doping tests per season

CONTENT

>120K database elements
>28K shared posts on social media channels



American football made in Europe



AMBITIONS TO EXPAND TO ALL OF EUROPE



Season 2023
16 teams 99
9 nations games

Season 2025
20 teams 150+
12 nations games



Why AWS? These were our four key questions

Best in class

Who is technically capable of implementing this?

Business agility

Who is bold enough to do this with eight weeks' lead time?

Innovation

Who is dedicated to innovation and always goes further for it?

Lowest pricing

Who offers us the most attractive value for money terms and conditions?



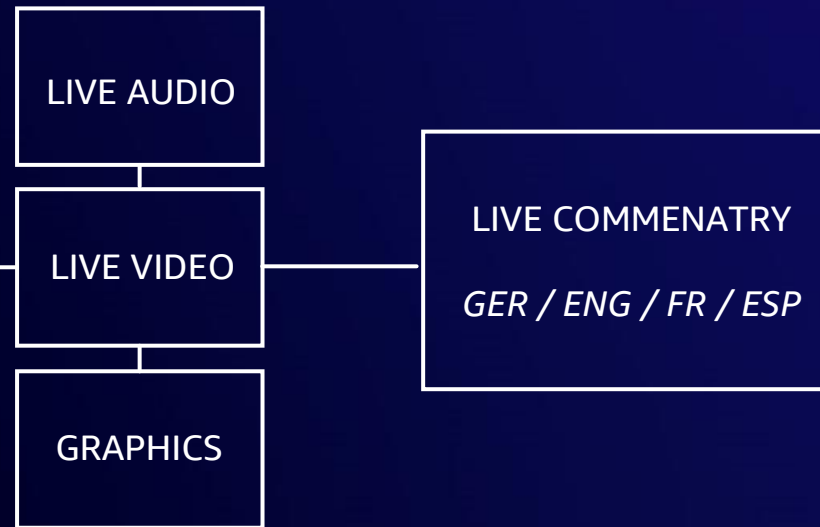
powered by **aws**

Remote production at ELF

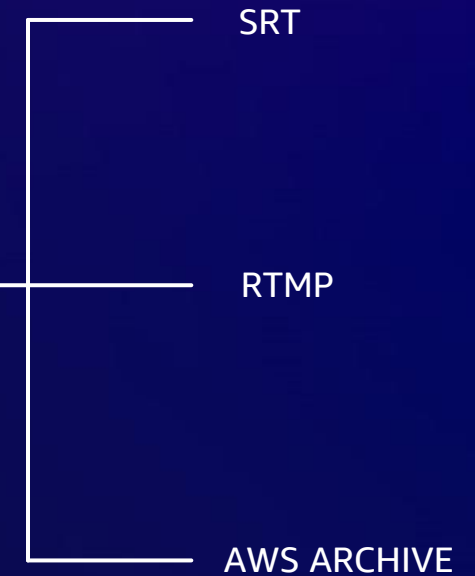
Live production – Venue



Live production – Remote composition



Live production – Distribution



A worldwide league to rely on Live Cloud Production

1. Prerequisites

- Accessibility of AWS technology
- Live Cloud Production on AWS
- Connect to AWS M&E experts
- Agile AWS account team striving for innovation

2. Achievements

- Cost-effective production
- 68 out of 99 season games
- 4 studios for up to 4 parallel matches
- Improvement of fan experience
- Reduced air travel saved more than 40 tons of CO2 emissions

3. Learnings

- Well-trained staff is crucial
- Planning ahead is mission-critical
- Communication is key
- Practice, practice, practice

This is not the end – The journey has just started

TECHNOLOGY PARTNERSHIPS WITH AWS WILL ENSURE PROFESSIONALIZATION AND COMMERCIALIZATION OF EUROPEAN LEAGUE OF FOOTBALL

OPTIMIZATION

Leverage learnings and improve production and distribution



ALL MATCHES

Produce all 107 matches of season 2024 remotely



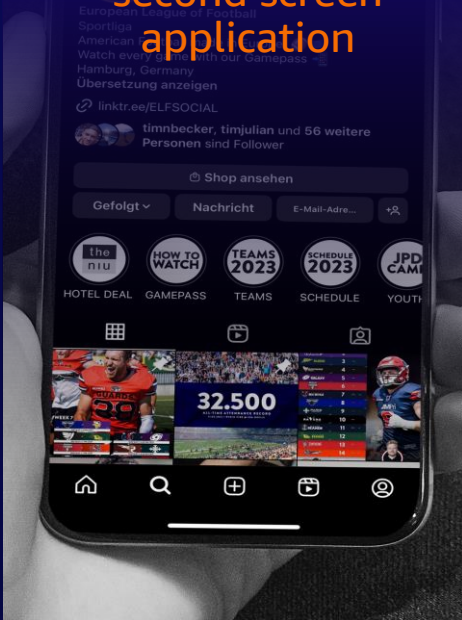
DATA AND STATS

Experiment with live-feed data



IN VENUE

Develop data-heavy second screen application



ATHLETE HEALTH

Leverage data to enhance player safety



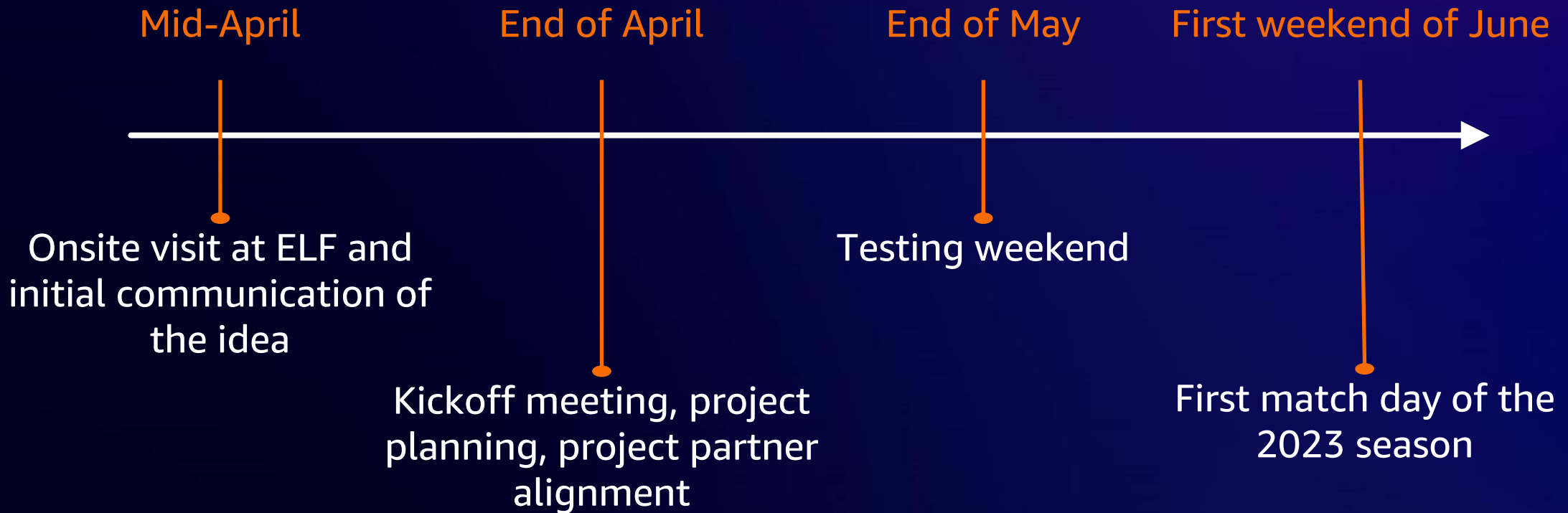
Future outlook

1. The business model of the sports industry will strongly **profit from data**
2. Smaller and niche sports will **benefit from remote technology**
3. Five years from now, the most **relevant sports leagues** and events will be produced remotely
4. The **Sports** industry **must contribute to the overall climate change movement**

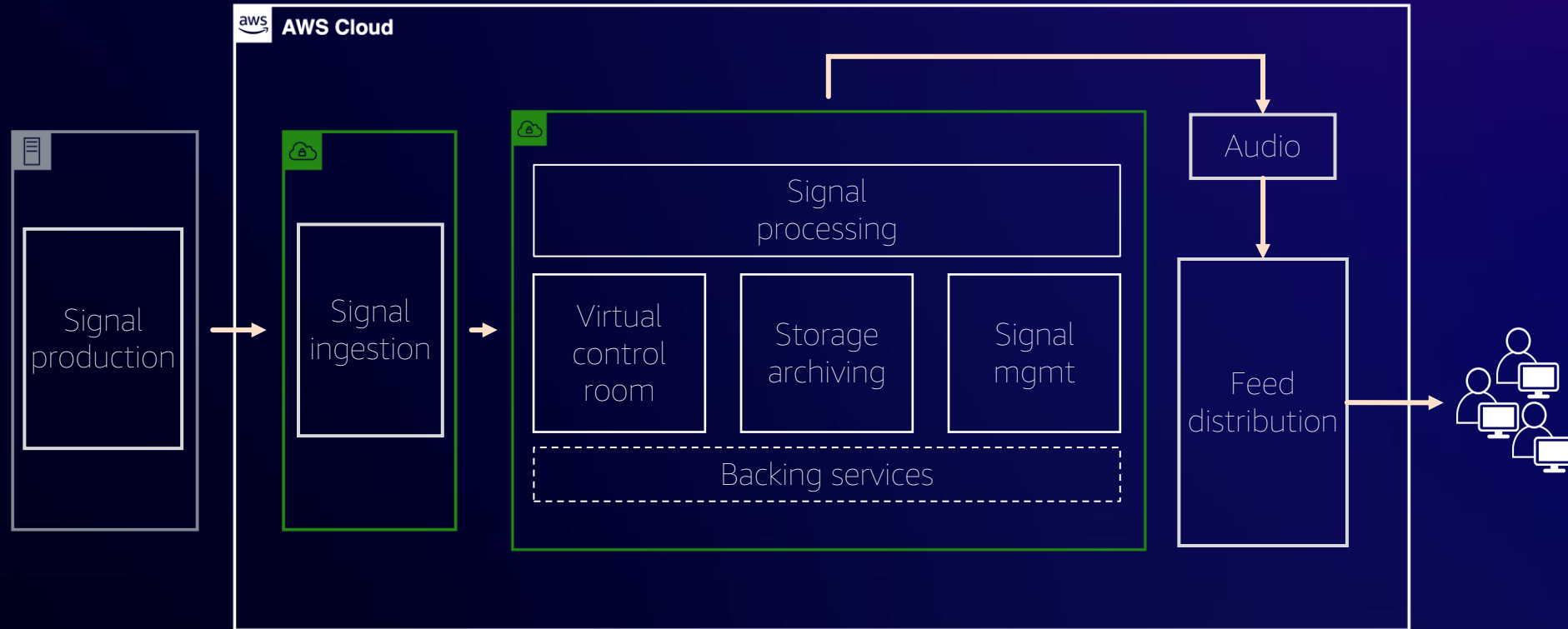


From idea to reality – ELF's live cloud production pipeline

7 weeks until 1st matchday



ELF's live cloud production pipeline architecture



5G transmission for signal production

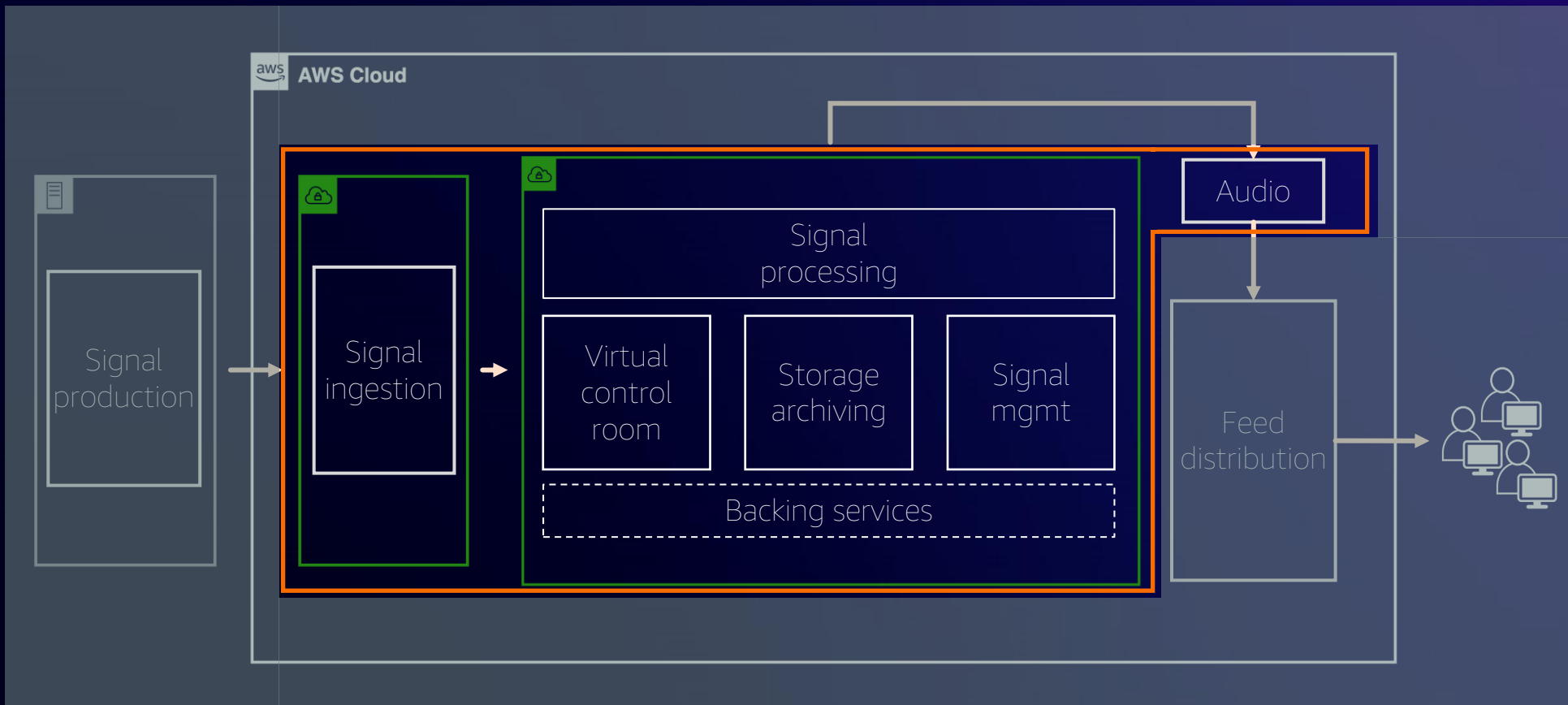


- 6 cameras
- 5G transmission

2 LiveU LU800
Up to 50 HEVC
Decouple signal transmission from stadium infrastructure



Sustainability 'of' and 'in' the cloud



'of'...

- Specialized instance types
- AWS Frankfurt region

'in'...

- On-demand in alignment with matchdays
- Amazon S3 lifecycle policies

Third-party integrations



LIVEU

PORTAL

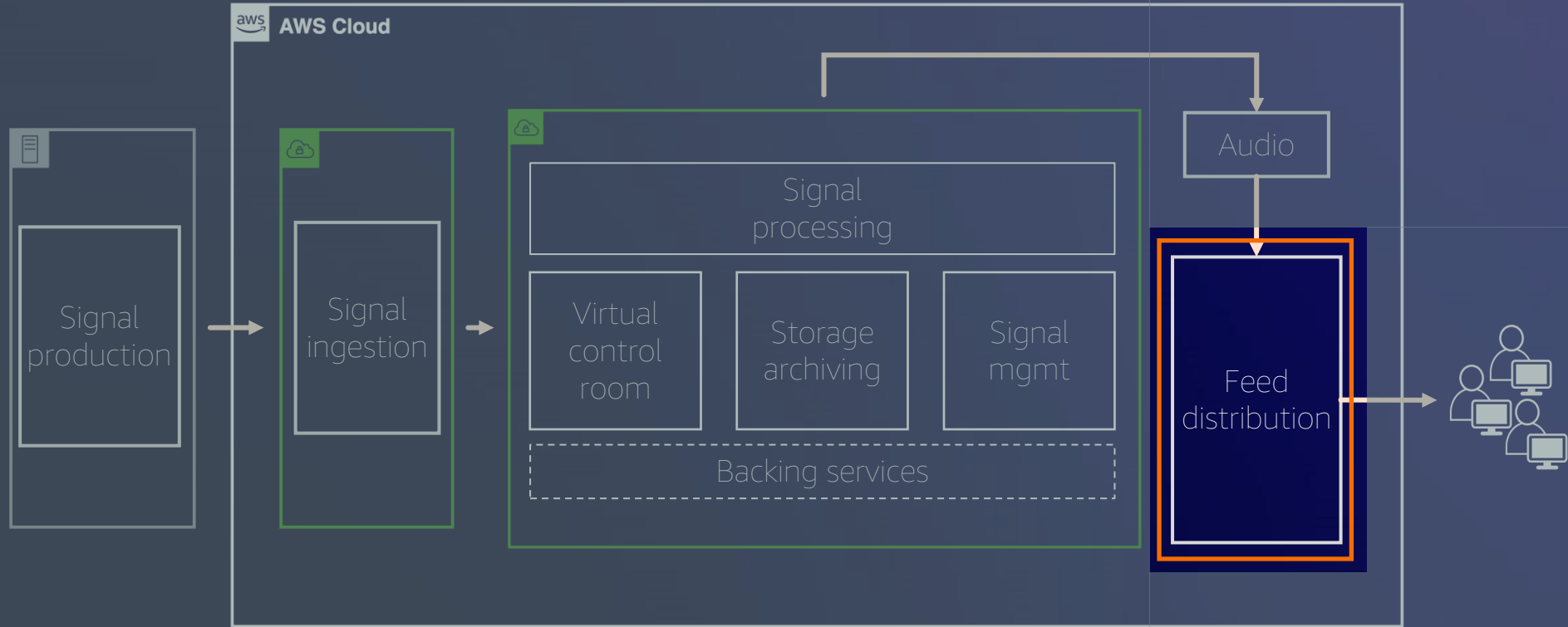
vizrt

Spalk

novel media



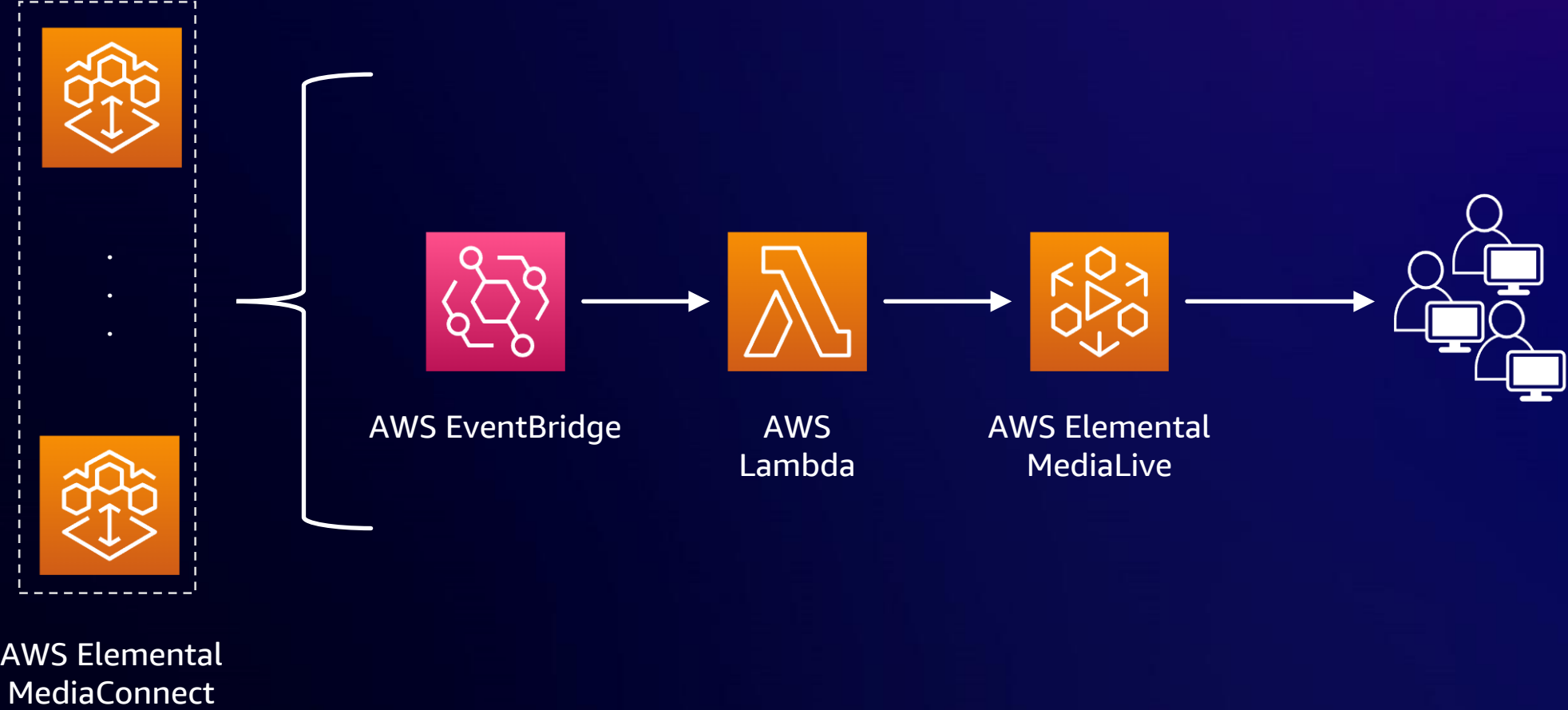
Automation of feed distribution



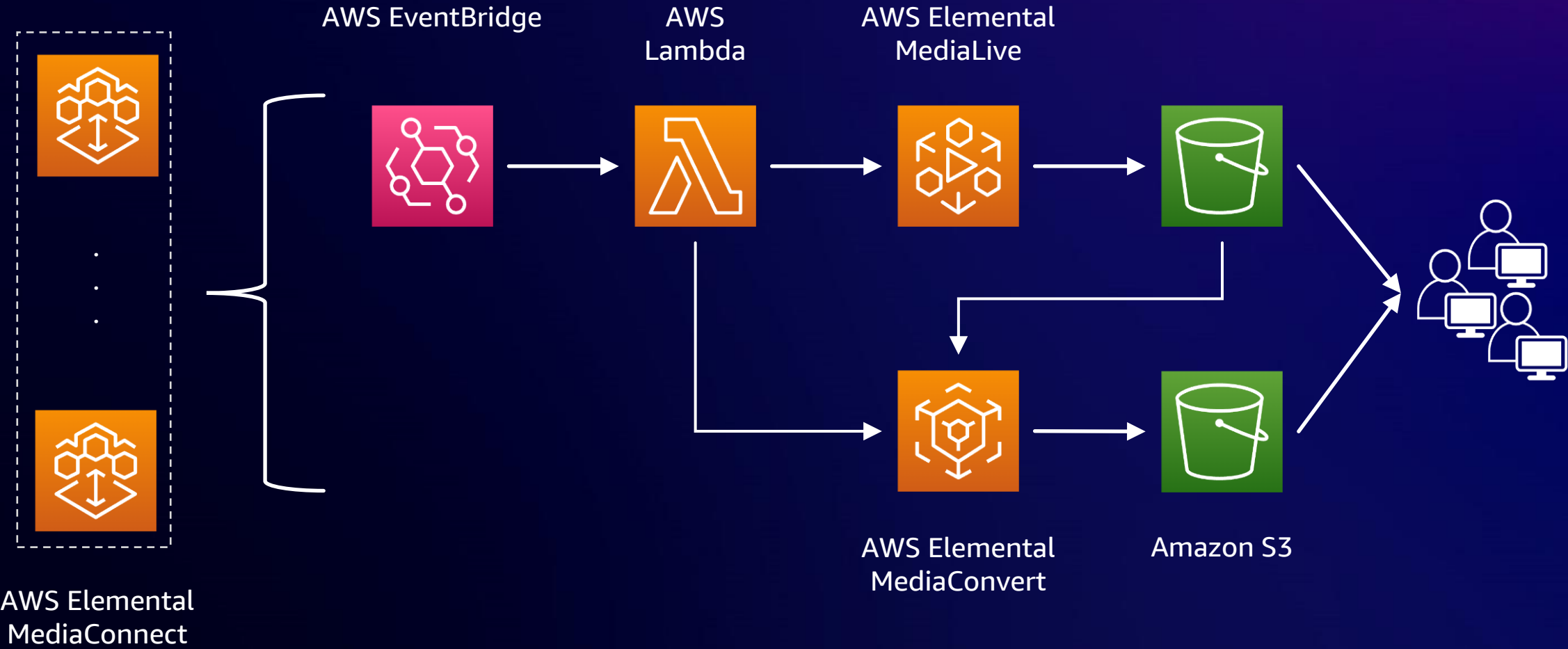
'Challenge' ...
Up to 10 feeds and 4
languages in parallel
per match
→ operational complexity

'Solution' ...
Serverless start/stop
automation based on
AWS media services

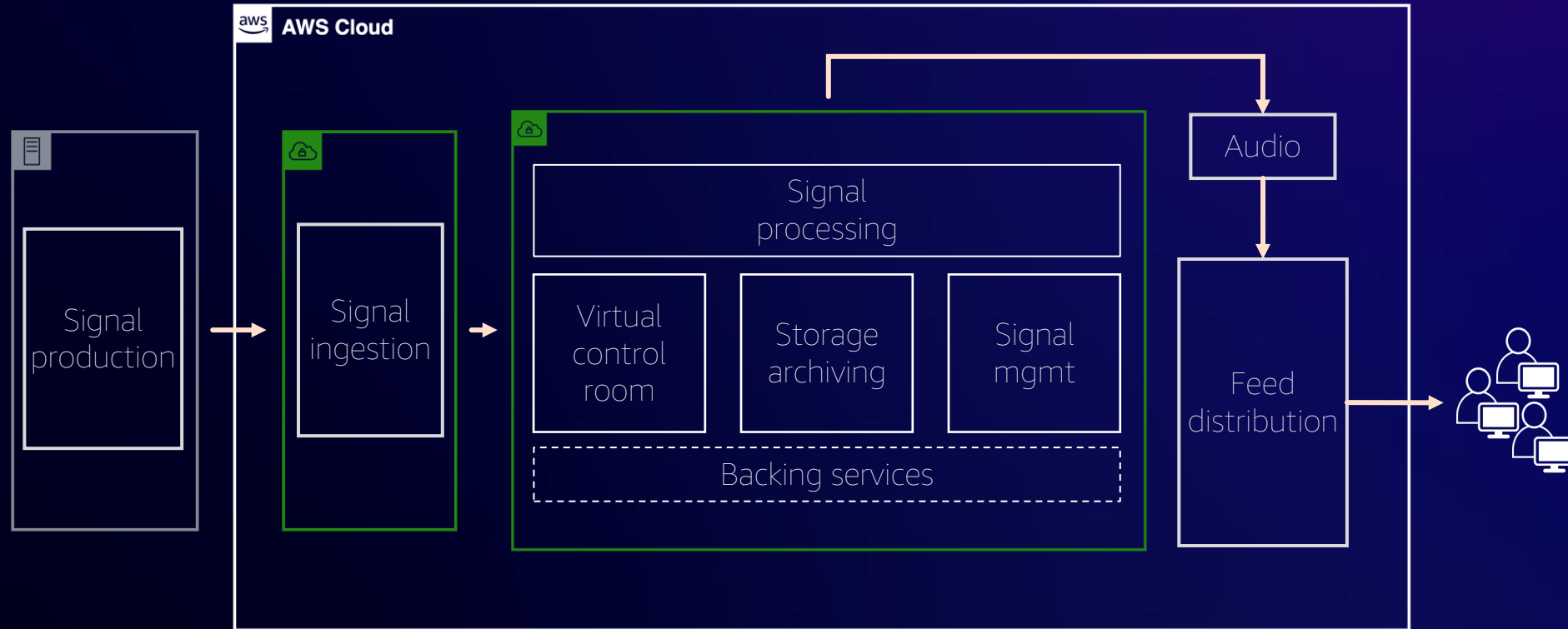
Starting the feeds



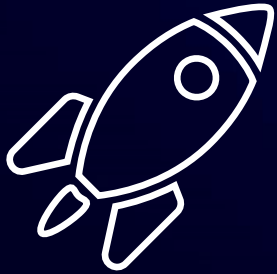
Stopping the feeds



ELF's live cloud production pipeline architecture



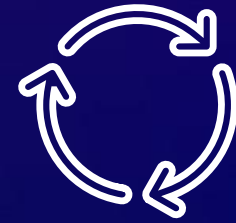
Key takeaways



Remote production is a
starting point



Be **fan-centric**



Economics,
performance **and**
emissions reduction

Call to action

- 01 Realize easy wins by leveraging the sustainability **of** and **in** the cloud
- 02 Be bold enough to reinvent the sustainability of your business **through** the cloud
- 03 Remember you are not alone; be brave enough to start your sustainability journey **right now**

Thank you!



Please complete the session survey in the mobile app



[AWS broadcast solutions](#)



[The Climate Pledge website](#)

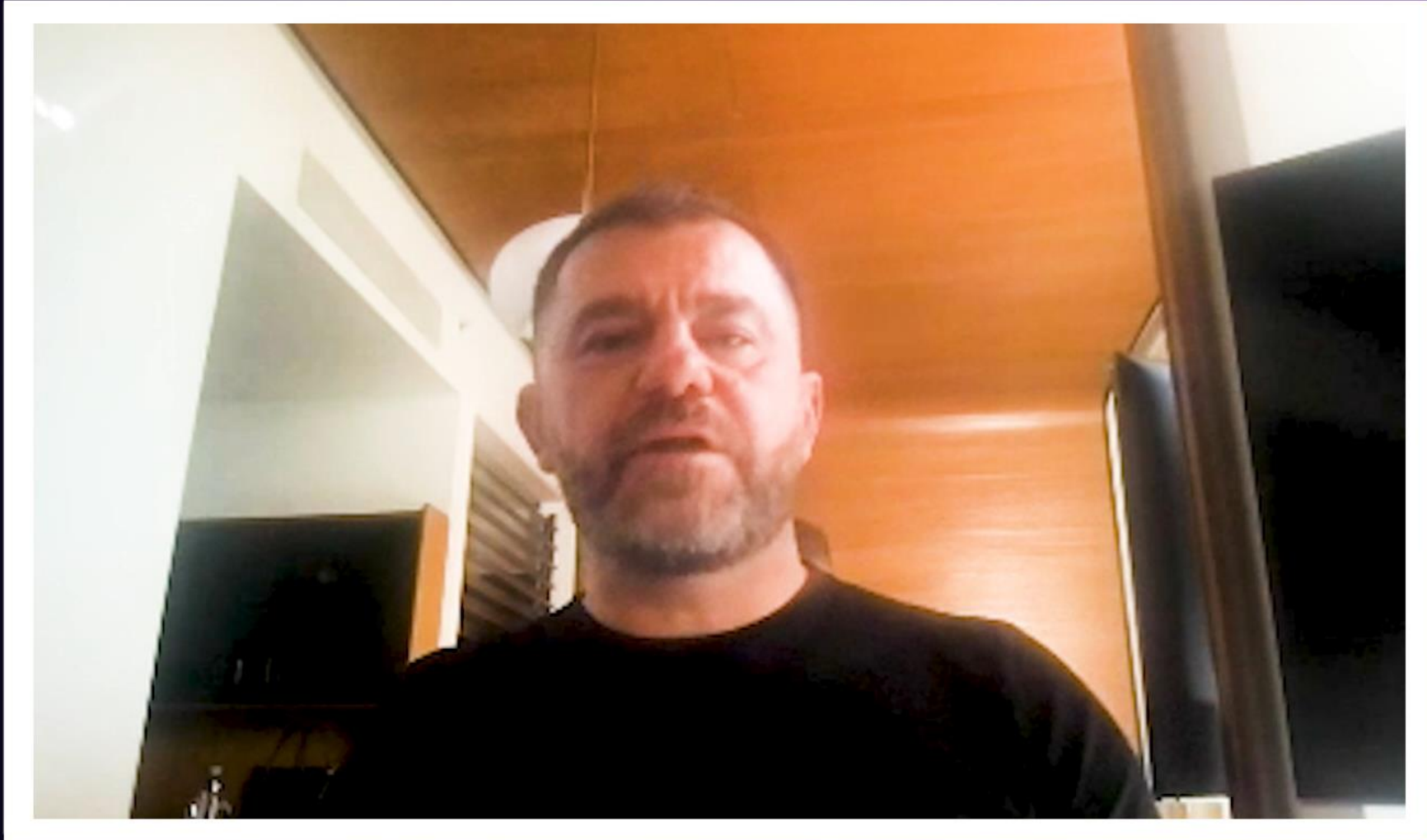


[AWS sustainability of the cloud](#)



[AWS Well-Architected Framework: Sustainability pillar](#)





Zeljko Karajica
CEO, European League of Football