
AWS
re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

MNE203

Sky’s journey to migrate live sports and news to AWS

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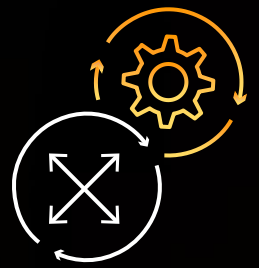
Sky

Agenda

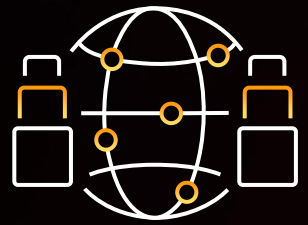
- AWS Well-Architected for M&E
- Sky’s journey from disaster to success
- Deep dive into transformation

Pillars of the AWS Well-Architected Framework

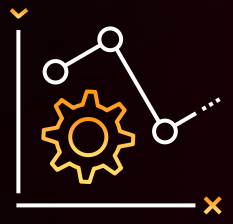


Operational Excellence

Security



Reliability

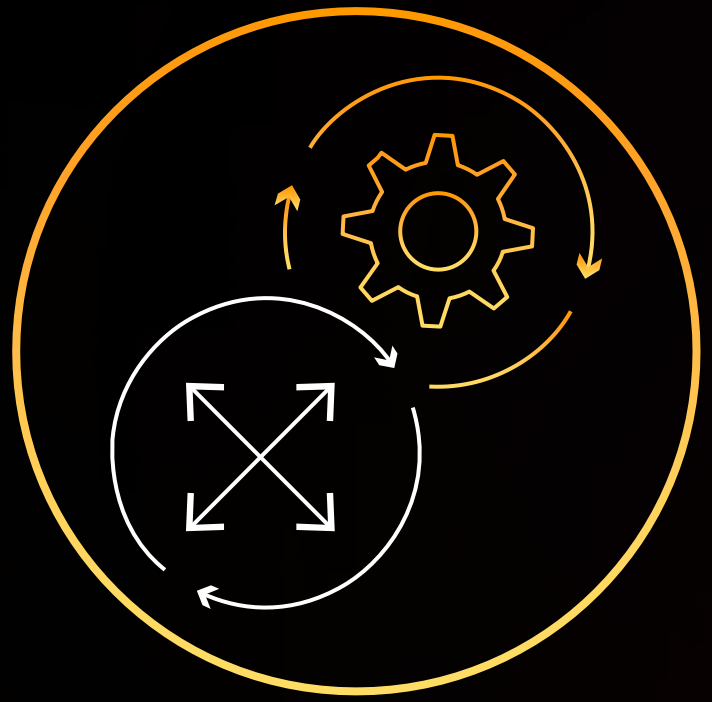


Performance Efficiency

Cost Optimization

Sustainability

Operational excellence



Perform operations as code

Make frequent, small, reversible changes

Refine operations procedures frequently

Anticipate failure

Learn from all operational failures

Security

Implement a strong identity foundation

Enable traceability

Apply security at all layers

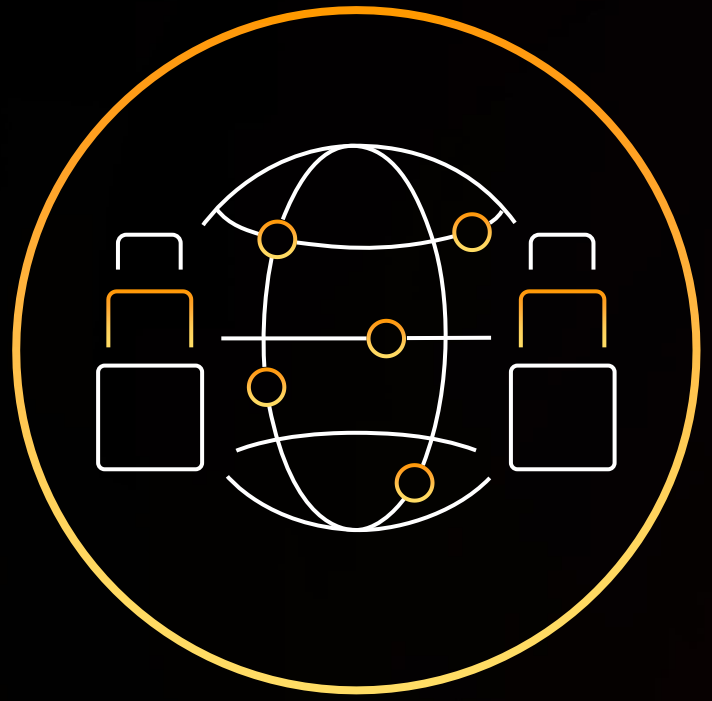
Automate security best practices

Protect data in transit and at rest

Keep people away from data

Prepare for security events

Reliability



Automatically recover from failure

Test recovery procedures

Scale horizontally to increase aggregate workload availability

Stop guessing capacity

Manage change in automation

Cost optimization

Implement cloud financial management

Adopt a consumption model

Measure overall efficiency

Stop spending money on undifferentiated heavy lifting

Analyze and attribute expenditure

Performance efficiency

Democratize advanced technologies

Go global in minutes

Use serverless architectures

Experiment more often

Consider mechanical sympathy

Sustainability

Region selection

User behavior patterns

Software and architecture patterns

Data patterns

Hardware patterns

Development and deployment process

Customer’s story

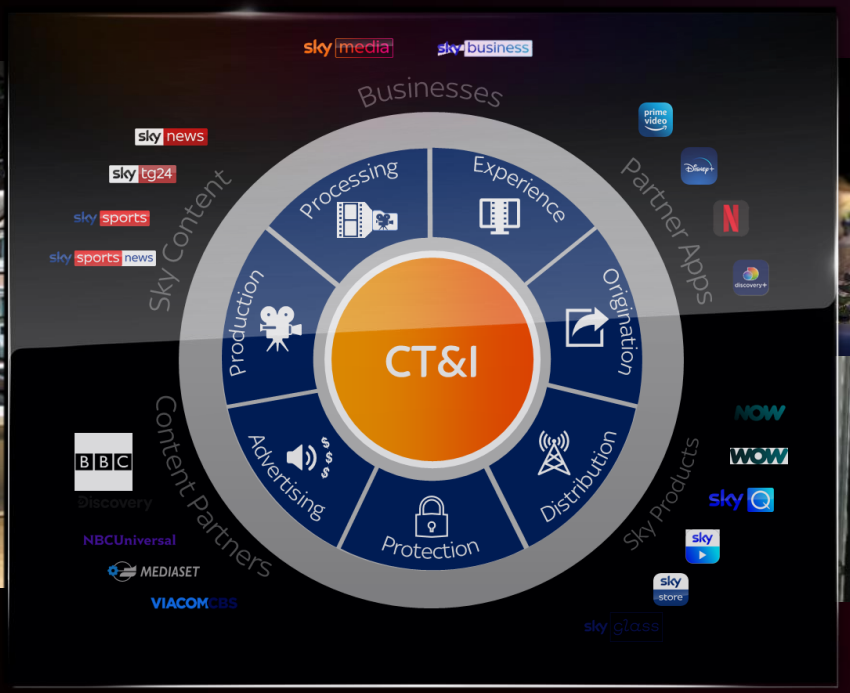
Dave Travis
Group Director of Content, Broadcast & Platforms Engineering
CT&I: Content, Technology & Innovation

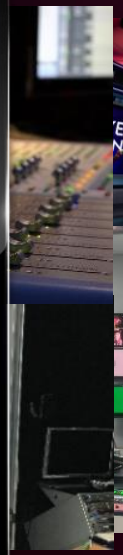
Agenda

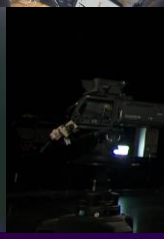
- Who is Content, Technology & Innovation (CT&I) within Sky
- Our transformation journey so far…
- Where are we today
- What are our challenges
- Case study on Cloud Production, Playout and Software Defined Headend
- Our success

About Content, Technology & Innovation

BRING CONTENT EXPERIENCES TO LIFE LIKE NEVER BEFORE…







2,750+
People

One team
Bringing together Engineering and Operations

2,000+
Channels and Content Partners

Locations
London, Chilworth, Fair Oak, Livingston Milan, Munich & Vienna.

sky CT&I
#wearecontent

Where we were...

sky
group

Complex, Costly, Inconsistent, Slow

aws

Our Target Operating Model vision

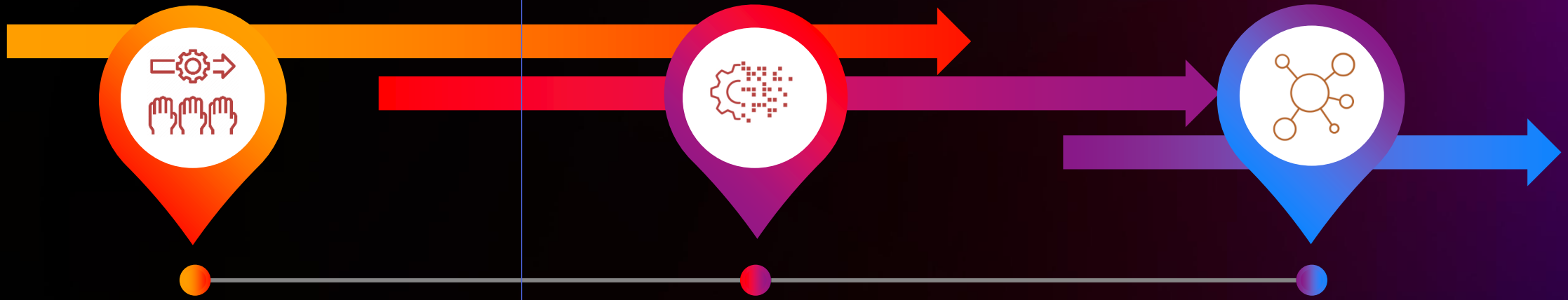
THE LENGTH OF PHASE TWO AND THREE IS HIGHLY DEPENDENT ON TECHNOLOGY DEPLOYMENT

Phase 1 (2022)
ALIGN

End of 2022

Phase 2 (2023+)
TRANSFORM

Phase 3 (2023+)
ABSTRACT



Same Operating Model

- Same KPIs
- Similar processes
- Organisation symmetry
- Best Practice Sharing
- Optimize external contracts and services
- Group funding model

Same Platforms

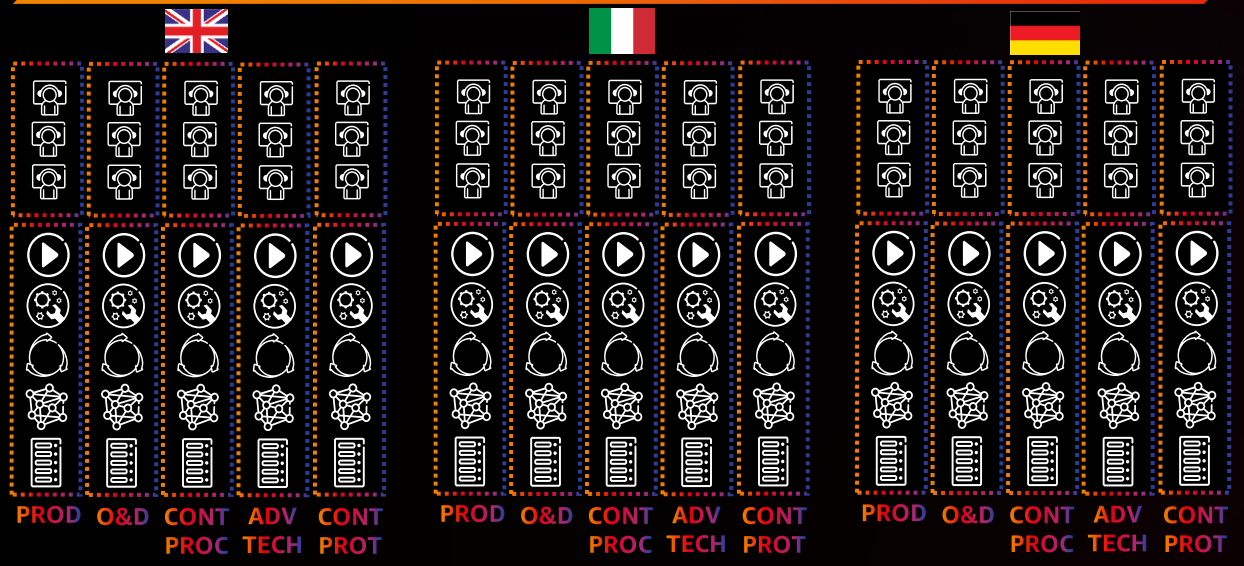
- Deploy Smart ops
- Drive standardisation & efficiency
- Drive platform convergence
- Virtually Distributed Model – work can be done in the same way for every market

Operations from anywhere

- Platforms converged – one way of working
- Ability to Abstract Operations
- Cost-efficient Hub capabilities & services

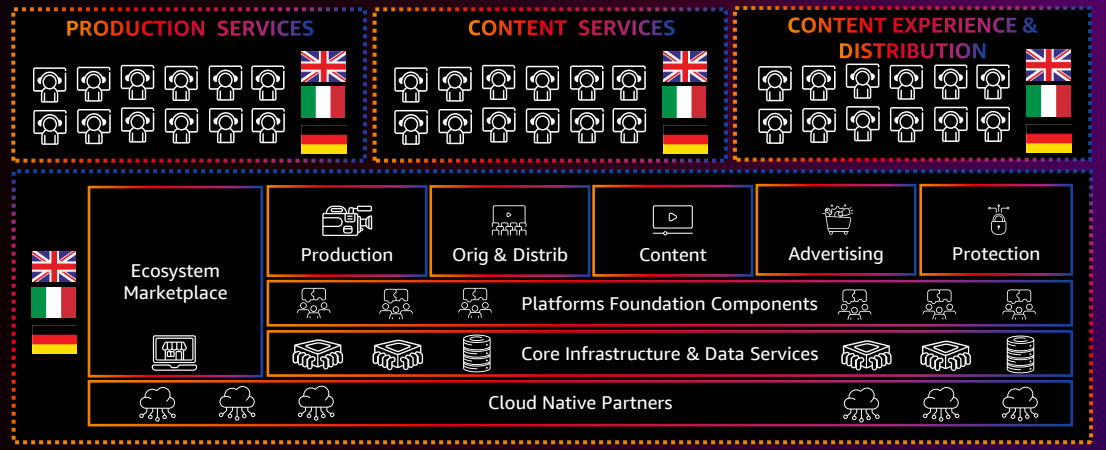
CT&I Technology Transformation Vision

LEGACY POSITION - COUNTRY SILOS



NORTH STAR - ONE PLATFORM AND OPERATIONS

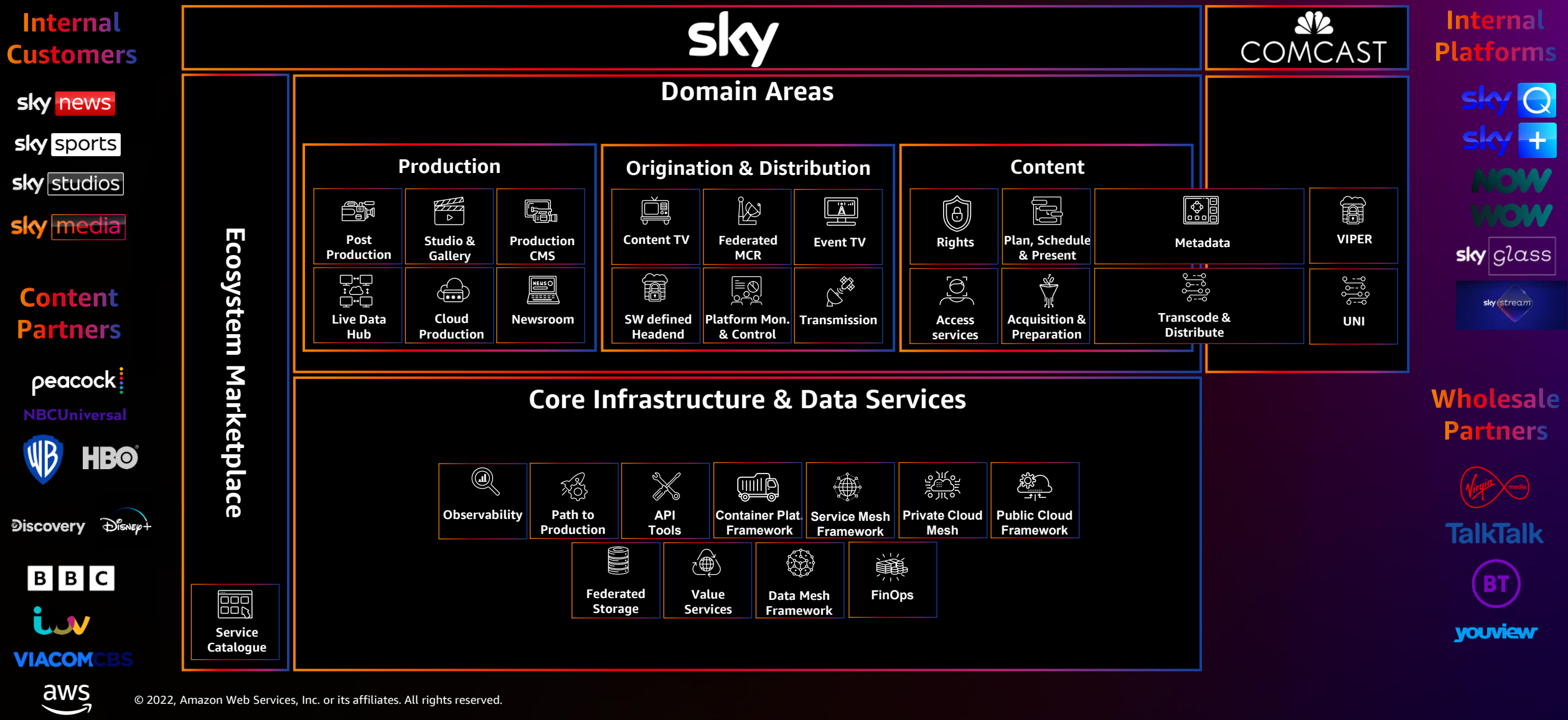
ONE SKY OPERATION



ONE TECHNLOGY PLATFORM

SPEED TO MARKET	Long lead times and slow to change (2 – 10 months)	Automated rapid deployment (from months to hours)
OPERATIONS	Resource Intensive Vertical silos, Heavily Manual	Centralized capabilities, Automated and Data-Driven
LOCATION	Multiple European Hubs with no ability to scale	Consolidated Operational Footprint
FINANCIAL	High TCO with CAPEX and continuous hardware refresh	Lower TCO with no hardware refresh (Consumption Model)
SECURITY	High quantity of audited security risks and exceptions	Ultra Mature Security Model (Continuous Patching)
SUSTAINABILITY	High CO_2	Reduced Carbon Footprint
TECH STACK	Siloed architecture with no capability to share resources	Scalable Shared Resources

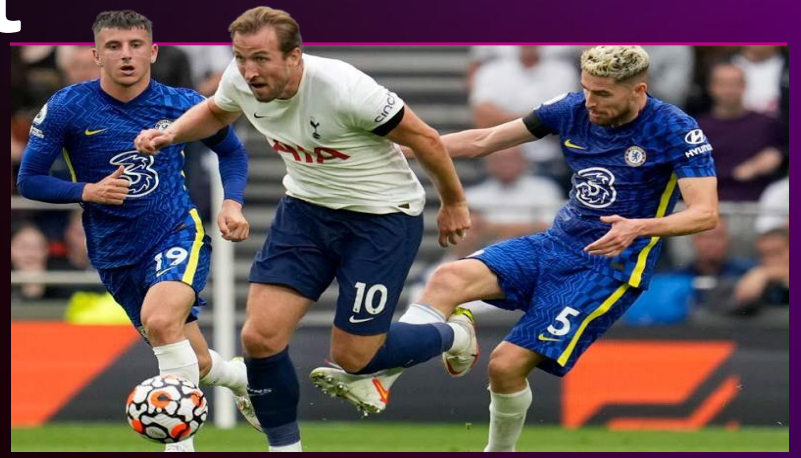
Technology Platform North Star



Sky Sustainability Commitment

As part of our COP26 partnership, Sky and the Cabinet Office worked together on the world's first elite level net zero carbon football match. Working in partnership with Tottenham Hotspur and alongside independent carbon specialists RSK and Natural Capital Partners, Sky set the target of making the match itself net zero certified.

We measured the emissions of a match held at Tottenham Hotspur Stadium, and used this as our baseline. We cut emissions as much as possible. We then offset any emissions could not be cut with the help of Natural Capital Partners, through a community reforestation project in East Africa, which will remove carbon emissions from our atmosphere.



Our first net zero broadcast

We achieved a 70% reduction in emissions from production crew covering the match.

70% reduction

We had more production staff working remotely and used green biodiesel in our production vehicles and for the on-location generator.
Pundits and the team travelled to the match in the most sustainable way possible.

#GameZero

The Clubs slashed emissions created by players' travel by over 80% simply by powering coaches with biodiesel

Fans walked 36,000 miles and drove 225,000 miles in electric or hybrid carts to and from the game

100%

On matchday, everything at Tottenham Hotspur Stadium was powered by 100% renewable energy – electricity and green gas

94%

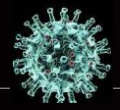
94% more vegetarian and plant-based meals were sold at this match, compared to our baseline game

It’s been a journey

LAST FOUR YEARS

2019 | 2020 | 2021 | 2022 | 2023+

Rome incident
Jun 2019



First lockdown
Mar 2020

Queen Elizabeth II died
Sep 2022

Challenges

Business Transformation

Jan 2020
Brexit

Organisation Convergence to Group

Op Model Vision

Feb 2022
Invasion of Ukraine

Ways of Working

CT&I Established

Engineering

Engineering Principles

Deployment Strategy

Storage Strategy

Data Strategy

Transformation Vision

Platforms

Metadata

Transcode & Distribute

Cloud Production

Production CMS

Content TV

SW defined Headend

Event TV

Federated MCR

sky glass

sky news

sky sports

DTH

sky cinema

sky comedy

sky max

Our Transformation Challenges

Talent & Skills

Inability to recruit the right talent and get the right skills in a competitive landscape slows the velocity of development

Culture

Transitioning from long delivery lifecycles to agile product ways of working is challenging for some of the traditional teams

Cloud Native

A large proportion of our industry vendors are not cloud-native and do not support automated deployments in Sky's cloud environments

Capacity

Due to talent shortage and internal demands on our roadmaps, there is a limited amount of capacity to execute transformation

Tech Debt

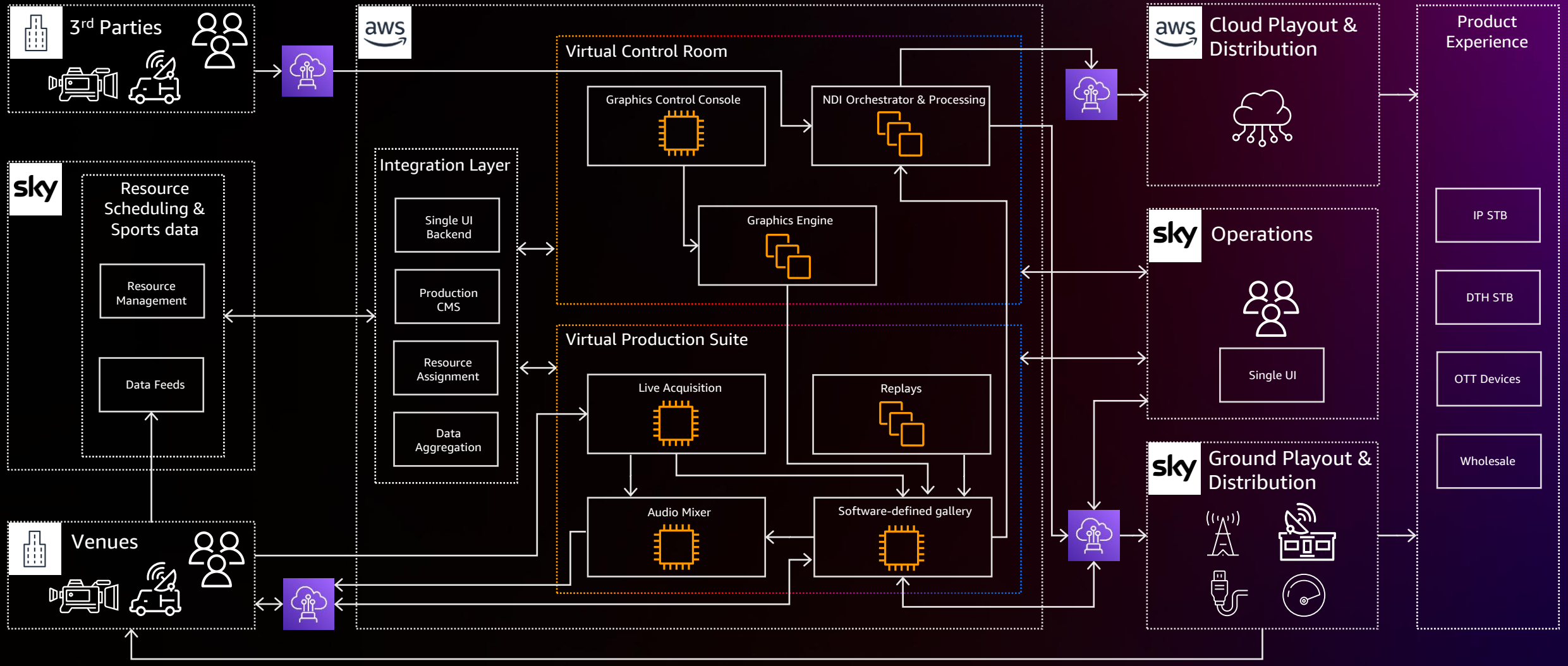
Large monoliths and legacy EOL hardware and software estate

Fin Ops

The experience in our business functions is limited so you spend lots of time explaining what TCO is and justifying why the cloud is the right thing for the business

Case Study: Cloud Production

ARCHITECTURE



Case Study: Cloud Production

THE BUILDING OF SUSTAINABLE PRODUCTION FACILITIES IN THE CLOUD

April 2020
Easter Cricket watch-a-long

Feb 2021
Vitality Super League (117 Games)

July 2021
Indycar (17)

DPP

August 2021
EFL read Button (170)

IBC Accelerator

Nov 2021
Sky News COP26

Feb 2022
Vitality Super League

Automated deployments

Tech Summit

Boxing

Golf

2022/23 EFL

Multisport

F1

Cloud to Cloud Distribution

MAM Integration

March 2023
F1 interactive

April 2023
Cricket

Cloud to Ground Contribution

May 2023
New Sport Development

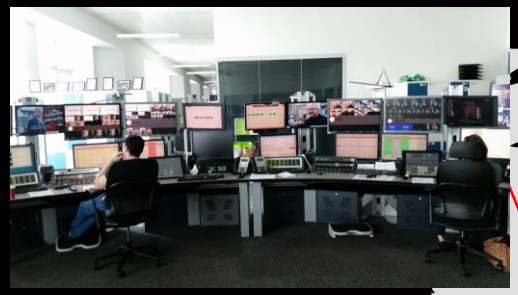
April 2023
New Sport Development

COP 26 Key Success Stats:

- New services launched in weeks rather than 6 months+
- Like for like Sky News output
- 96 hours of live coverage, available to customers on DTH, OTT and Sky Glass
- Delivery cost went from millions to a few thousand
- Reduced carbon footprint by factor of 10

Case Study: Playout

THE CHALLENGE



Problem Statement

- End of life traditional Playout Technology all based on-prem across six locations
- Locked into long hardware-based vendor agreement for 5+ years
- Inconsistent tech in each market
- Different ops teams in each market
- Different support teams in each market
- No ability to share resources
- 100s of security vulnerabilities
- 7+ months to launch a new channel
- Inconsistent approach to DR

Case Study: Playout

NOT ONE SIZE FITS ALL

CONTENT TV – 120 CHANNELS

sky max sky cinema sky atlantic
sky documentaries sky arts
sky comedy sky nature sky crime
sky showcase sky witness
sky serie sky uno sky primafila

Customers consume On Demand

- Minimal live
- Pre-rendered
- Thematic Playout
- Advanced Graphics
- Minimal last min changes
- Ops Light

sky

EVENT TV – 80 CHANNELS

NEWS

sky news sky sports news

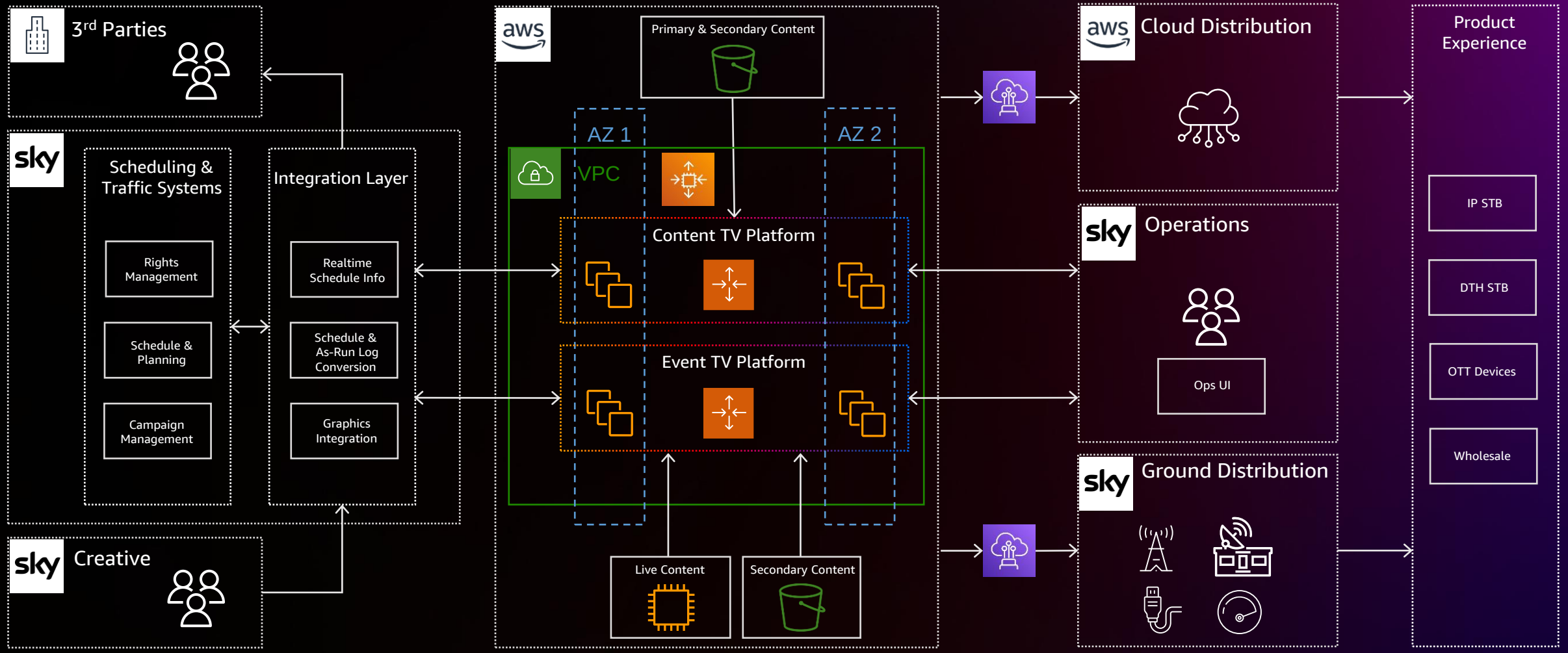
SPORT & LIVE SHOWS

Customers consume as it happens

- Predominately live
- High level of interaction between playout and production teams
- Advanced Graphics
- Lots of last min changes
- Ops Heavy

Case Study: Playout

ARCHITECTURE



Case Study: Software Defined Encoding

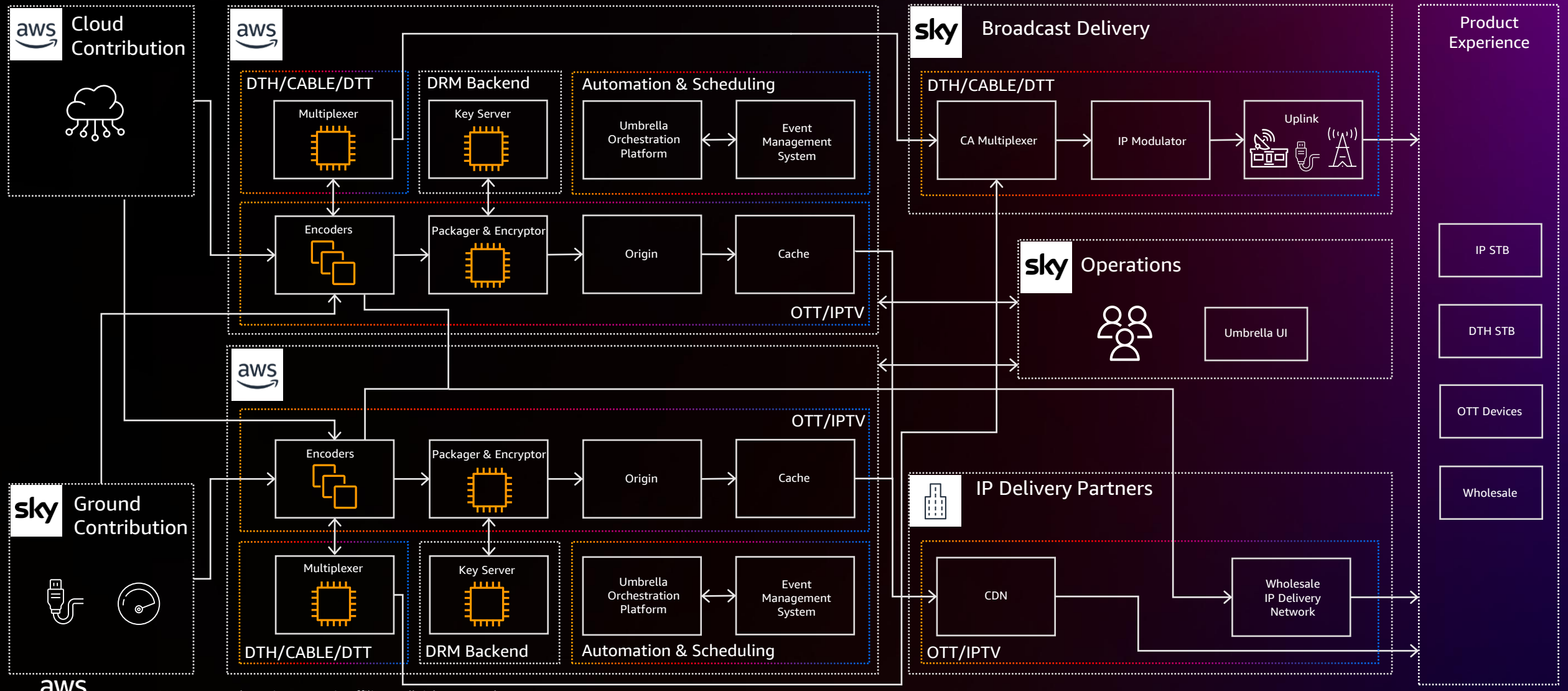
THE CHALLENGE

Problem Statement

- End of Life Headend Technology all based on premises
- Locked into long hardware-based vendor agreements in excess of 5+ years
- Inconsistent technology used in each market
- Local support teams managing one site
- No ability to scale resources
- Facility in each market
- 100s of security vulnerabilities
- Very long lead times to launch new service typically 7+ months
- Inconsistent approach to disaster recovery across the markets

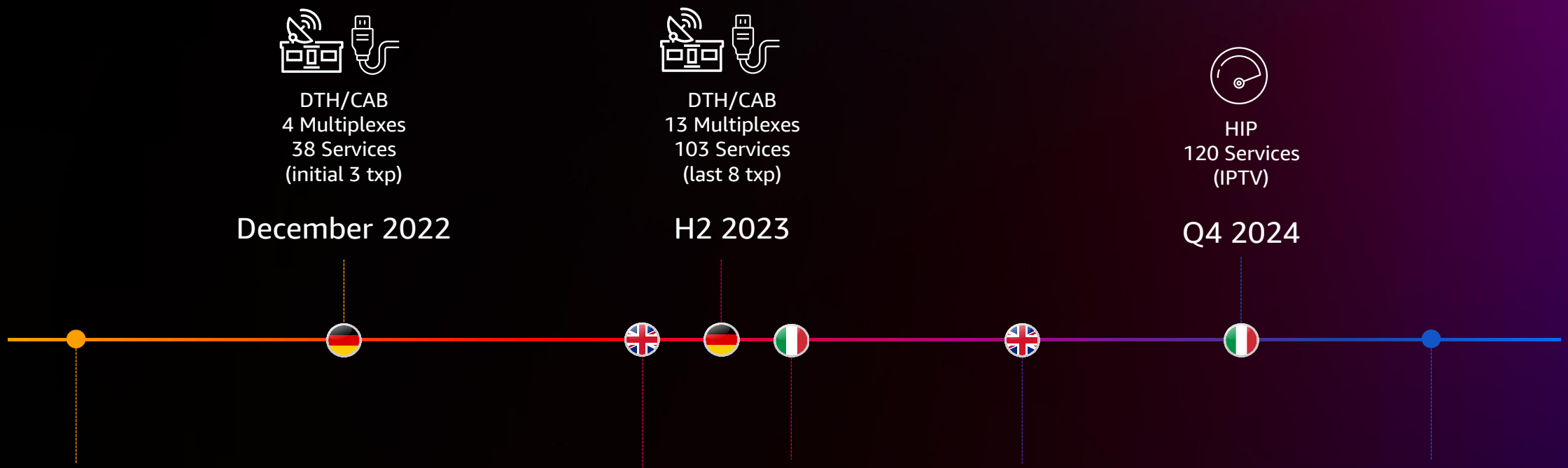
Case Study: Software Defined Encoding

ARCHITECTURE



Case Study: Software Defined Encoding

ROADMAP



Success

THE OUTCOME SO FAR!

Business Efficiency
- Rapid deployment – Multiple months to days
- Streamlined operations – One team
- Reduced carbon footprint – 50% saving

Quality & Performance
- Industry leading customer quality
- Improved uptime
- Preventative maintenance
- Ability to innovate and try new technology easier and most effectively

Risk Mitigation
- Mature security model – Weekly continuous patching
- Active / Active business continuity
- No more hardware refreshes

Deep dive into transformation

Our Engineering Principles

Think Cloud

- Design cloud native solutions and when not possible, use cloud enabling formats and transport mechanisms
- Avoid lock in. Make sure technologies are portable

Think Data

- Ensure all platforms follow the Data Mesh approach
- Make sure data is put to work not just for dashboarding but to benefit customers

AI / ML

- Introduce AI-assisted processes at all levels to drive enhanced observability & automation
- Design smart operations with assisted AI processes
- Use AI/ML to manage content and enrich metadata

Deployment Automation

- Ensure vendor applications are cloud-native and not lift and shift
- Integrate vendor applications into our CICD so we can automate their applications end to end

Ways of Working

- Improve collaboration and favor knowledge sharing
- Operations are critically important partners and part of our shared journey
- DevOps is about ownership: You build it, you run it!
- Think the platform you are building is a product that is continuous

Reliability

- Resiliency by design ensuring all functionality either has an active / active architecture or has the capability to spin up a backup system in another environment when required

Scalability

- New services available within days
- Additional capacity available in hours
- Ability to burst workloads on demand

Security by Design

- Deploy in compliancy with Sky/Comcast security standards
- Fully integrated authentication, virus protection and vulnerability scanning
- Ability to patch and update systems on a continuous basis

Share & Leverage Resources

- Multi-tenanted & common platforms
- Reusable technology stacks across group
- Leverage the CT&I / Comcast Concourse CICD

Reduced Complexity

- Drive Content Platform convergence across territories and across Group
- Develop a single support model across group

WE ARE BUILDING A BOLD, INNOVATIVE TEAM THAT PROVIDES ENHANCED SERVICES ON COMMON PLATFORMS

Thank you!

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