
AWS
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IOT208

Unlock data insights from broadband CPE devices using AWS IoT

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Agenda

Broadband customer needs

AWS Services for CPE management

British Telecom managing CPE devices using AWS

Demo – Managing USP CPEs using AWS IoT and Serverless

Summary and call to action



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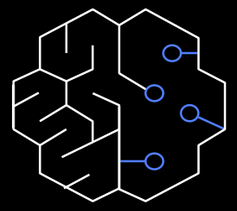
Consumers increasingly demand high-quality home broadband services

60% Consumers that will switch service providers in next 12 months for a more reliable broadband service

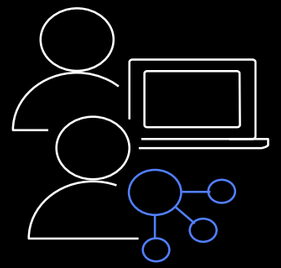
31% Households with children that are finding it difficult to work from home as a result of inconsistent broadband service



Resilient and reliable broadband service



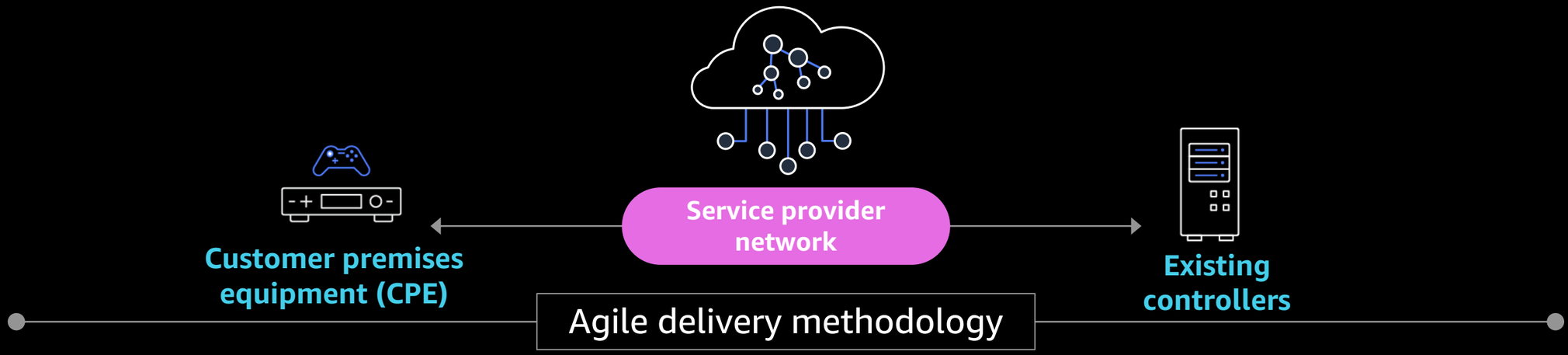
Personalized quality of experience



Better customer support and self-service

Source: EY, Ovum

Broadband service providers want to transform the way CPEs are managed



Real-time insights for improved QoE

Create a parallel data path into the cloud to gather real-time customer and operational insight

Drive operational efficiency

Use AI / ML to predict failures, augment call center support, and offer self-service

Faster to market new products

Deliver products and services faster with continuous innovation

New services and business models

Enabling CPEs as a platform for value-add services and features

Broadband Forum released USP standard to deliver on evolving customer needs



CWMP

CPE ACS

SPs see **need for lifecycle management, monitoring, and provisioning** for gateway routers; CWMP (TR-069) is born

2004 2006 2008 2016 2018 2019

TR-069 **expands to manage more** interfaces and more devices, such as STB, VoIP, and Wi-Fi



USP

USP 1.1 released with Device:2.13 – valuable for consumer electronics as well as SPs for analytics, customer self-service, onboarding, real-time IoT control, managed Wi-Fi, and more

Explosion of new technologies and challenges for both networking and consumer electronics: IoT, Wi-Fi / mesh, handling over-the-top and third-party services, and desire for end-user control; USP created in 2018

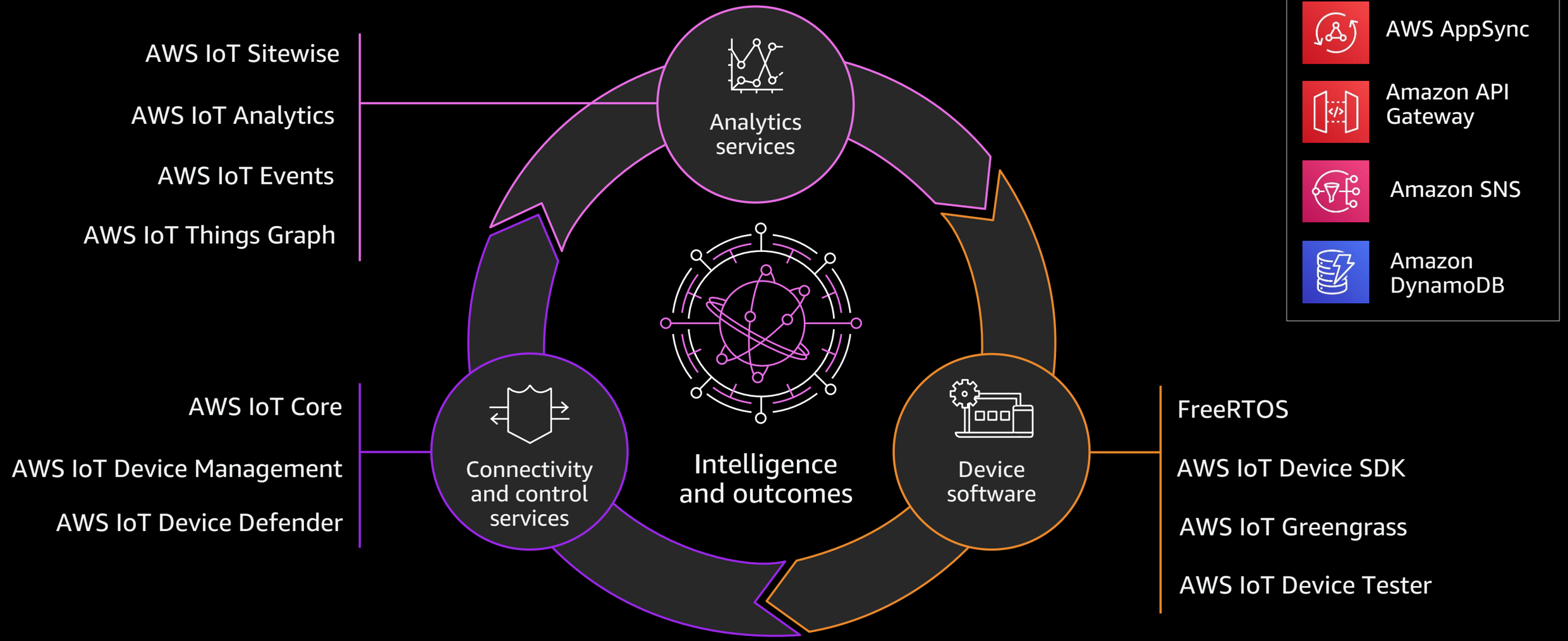


Source: Broadband Forum

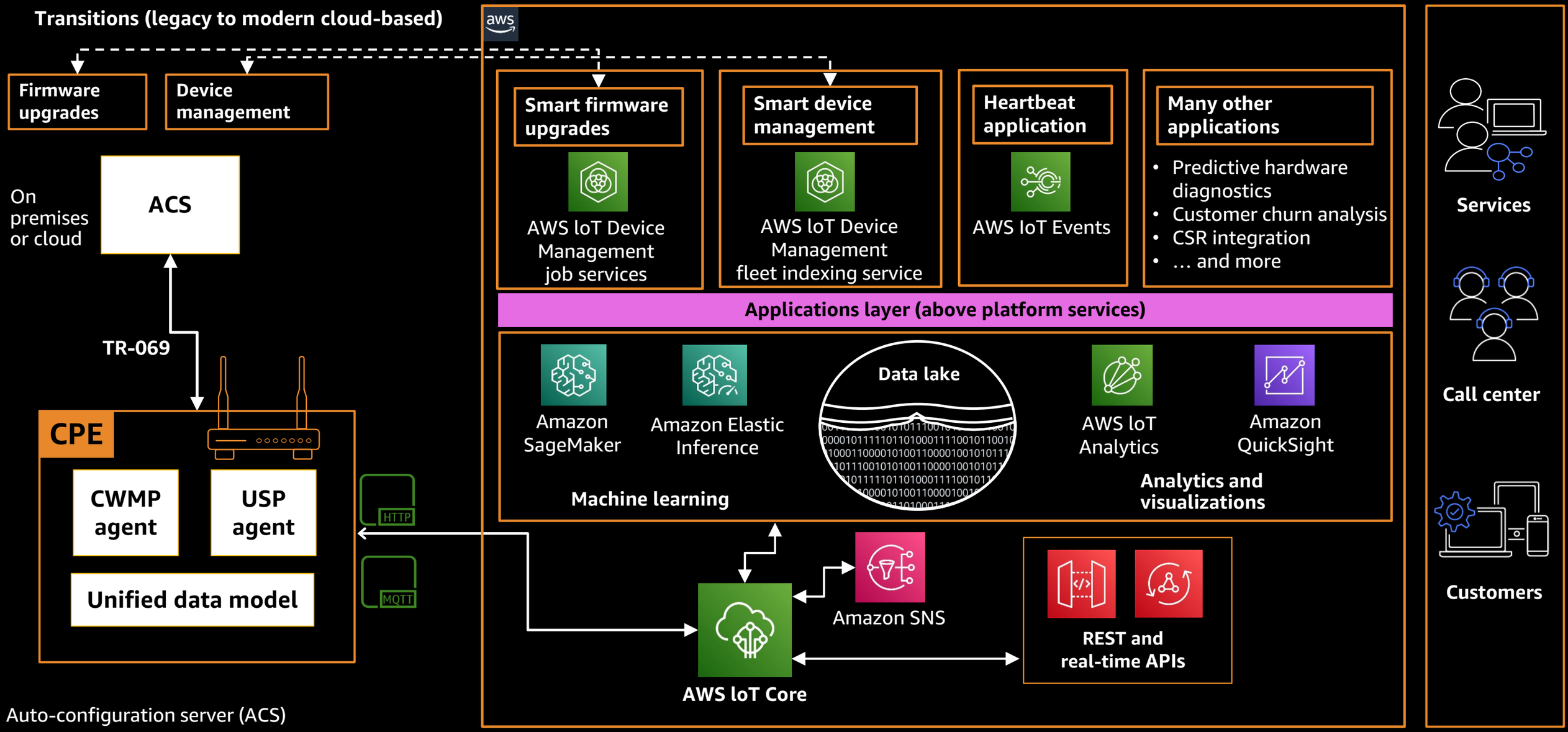
User service platform (USP) is a standardized protocol for managing, monitoring, upgrading, and controlling connected devices

USP offers real-time data ingestion, multi-controller support, containerized applications with standard APIs, and data model extensions

AWS services for CPE management



Proposed architecture for CPE management



British Telecom leveraging AWS services to manage CPE devices



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Introduction to British Telecom

BT is the UK's leading telecommunications and networks company, providing global communications services and solutions to customers in 180 countries

Within the UK, we provide broadband, TV, mobile, and fixed voice solutions to customers across consumer, business, and the public sector

BT is a clear market leader

28M
B2C
RELATIONSHIPS

1M+
B2B
RELATIONSHIPS

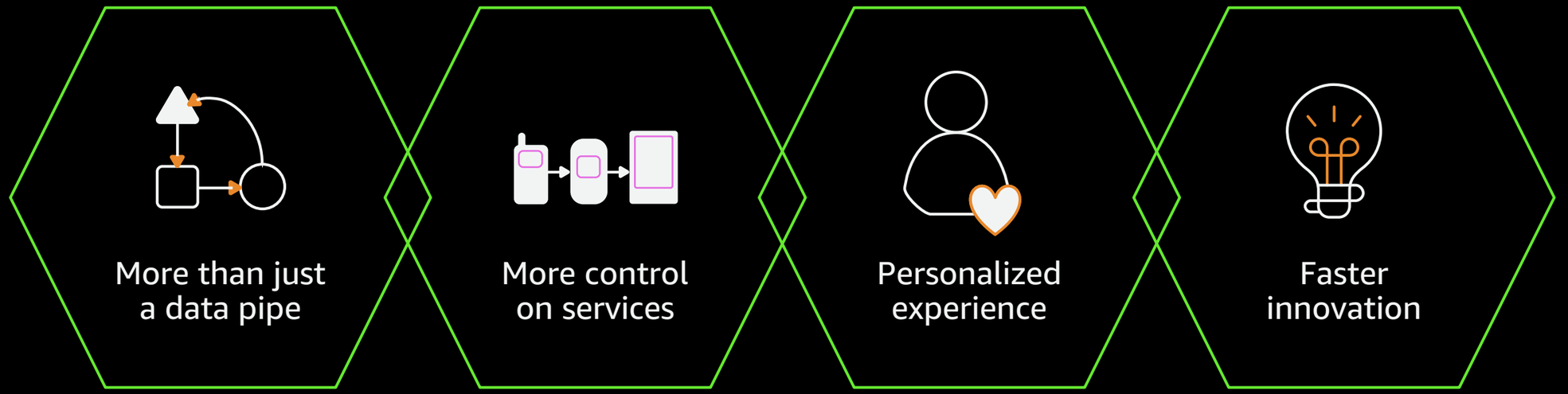
UK's largest fixed and mobile base

~9M	~14M	>50%
Broadband customers	PAYM mobile customers	Presence in UK households

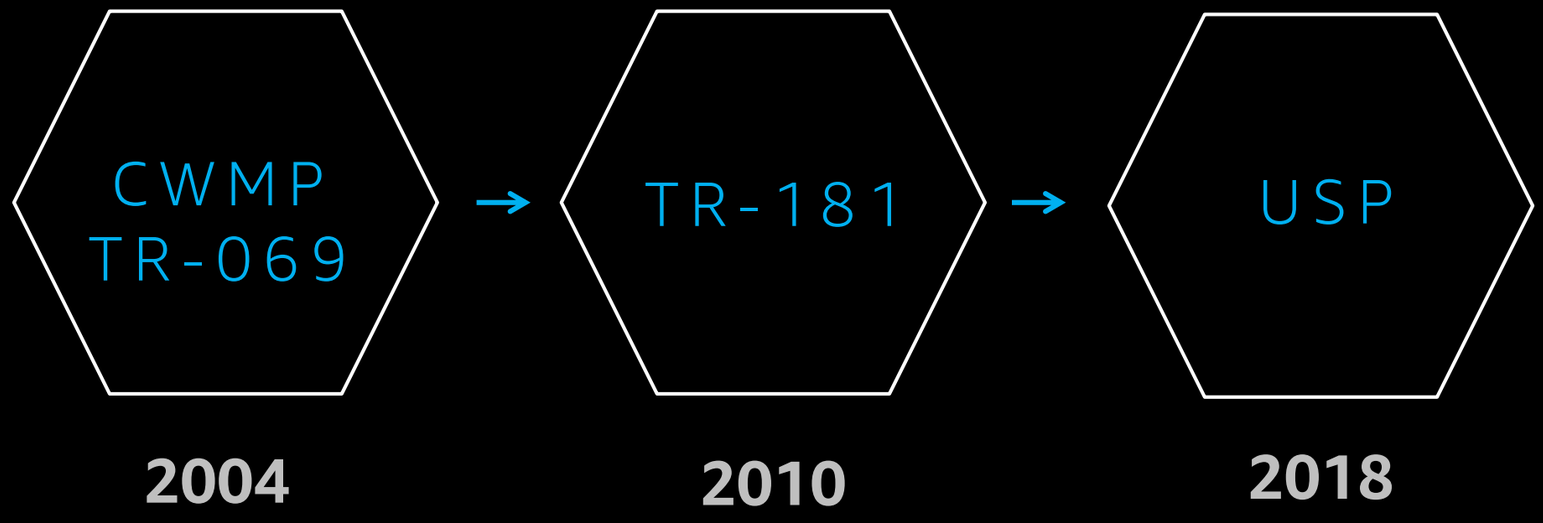
Broadband services are critical for customers

Broadband is an essential service for people and businesses who increasingly rely on the internet for a wide range of online activities

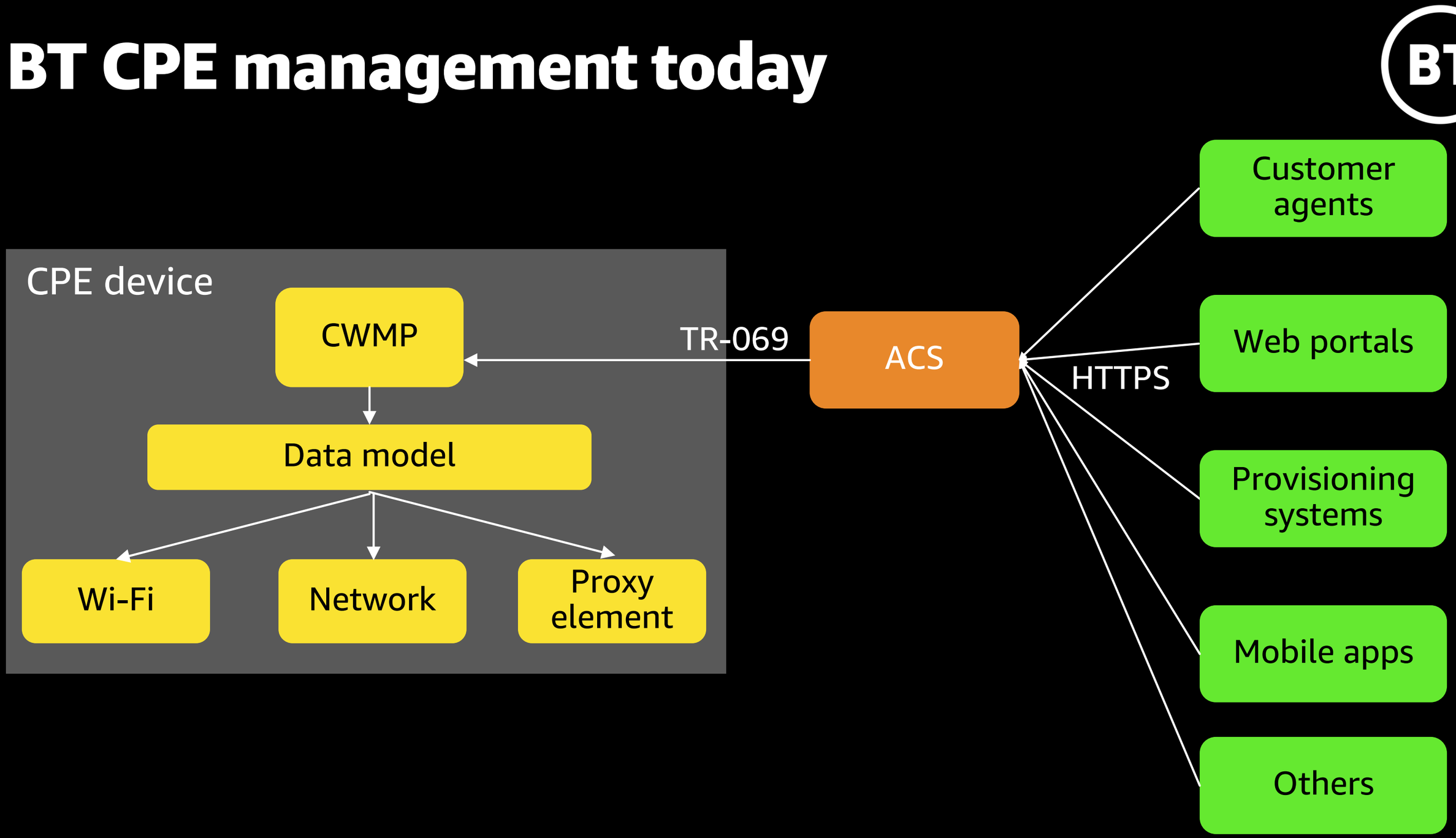
This is creating high expectations for internet service providers to innovate faster and offer improved quality of experience



Evolution of CPE management protocols

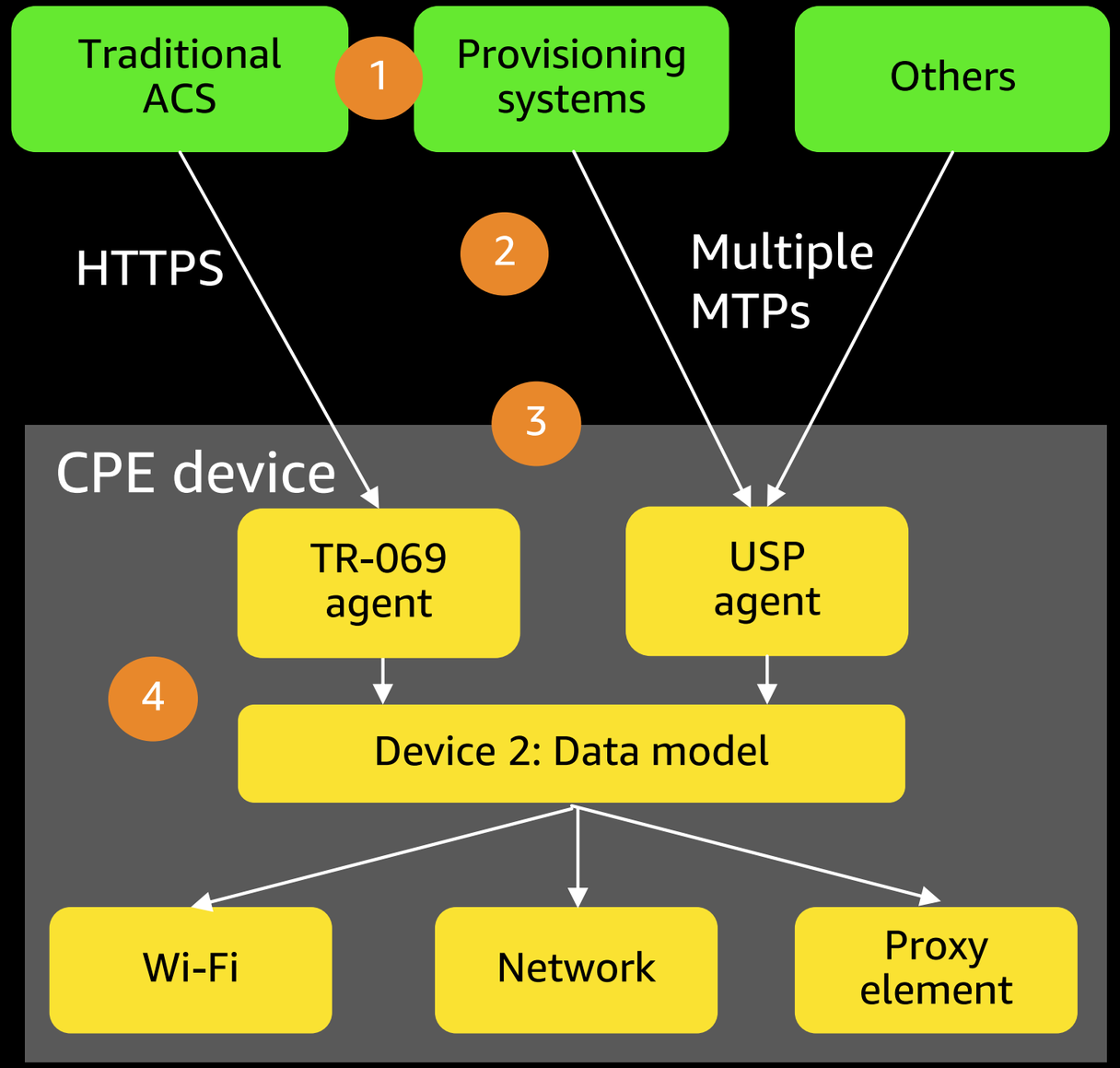


BT CPE management today



USP creates open platform for value services

1. Unlike TR-069, USP supports multiple controllers, enabling all users to co-exist in an open ecosystem
2. USP extends the support to multiple Message Transport Protocols (MTPs), including MQTT, Websockets, STOMP, and CoAP
3. Always-on persistent connection with CPE devices reduces handshakes and collects real-time data insights
4. Common data model allows both TR-069 and USP to co-exist perfectly in one deployment, making the migration of CPEs to new standard with zero impact



AWS services fit perfectly to BT's vision for the future of broadband services



AWS IoT Core for data ingestion over MQTT and rules engine

Cloud-first approach leveraging a broad set of AWS services

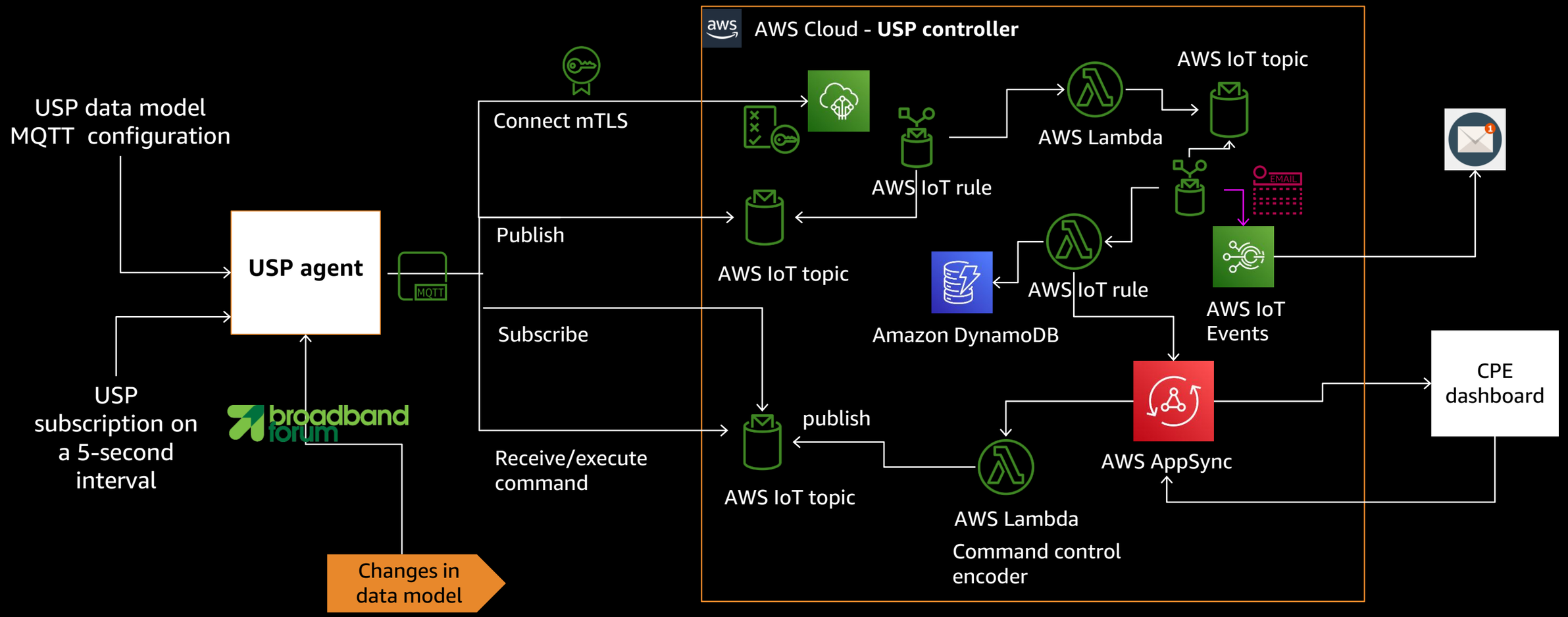
Multi-layer security and trust

We got started with a proof of concept (PoC)

With a plan to achieve a clear set of objectives in less than 1 week:

1. Prove technical and business viability for USP CPE management
2. Well-architected design ready to scale
3. Working e2e system built quickly leveraging AWS services

Managing CPE devices with AWS: PoC architecture



What's next on the BT and AWS journey?

- Build on PoC – no road blockers, but areas to improve and work together on
  - Ingesting and parsing protobuf data
  - Review architecture to scale to millions of devices

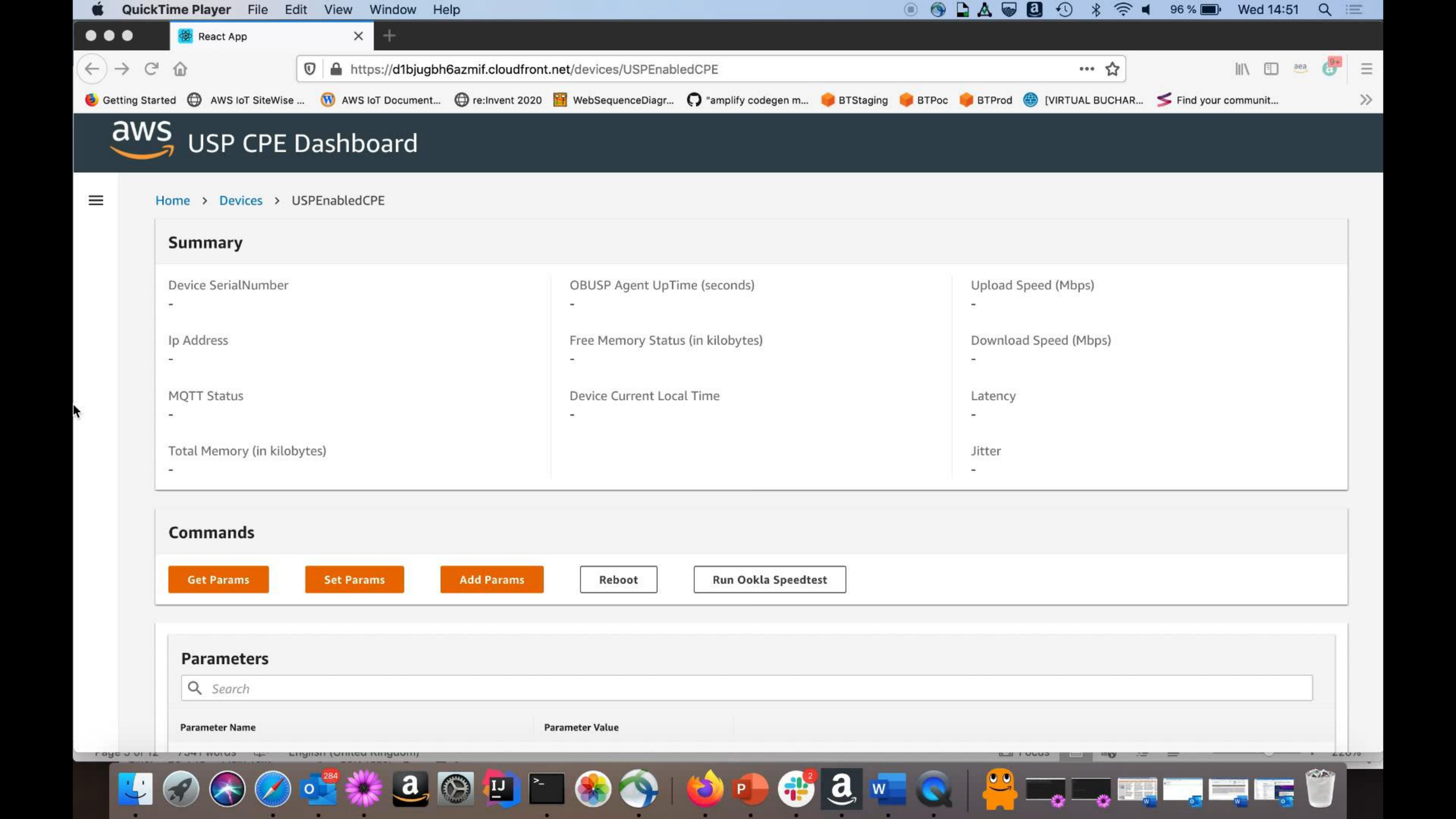
- Exciting new solutions
  - Leveraging data to improve insights both during development pipeline and in the field
  - Smarter rollouts – using data to drive prioritization of firmware rollout
  - Application management
  - Data-driven workflows – action via USP on data collected and analyzed

Demo – Managing USP CPEs using AWS IoT and serverless



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96 % Wed 14:51
React App
https://d1bjugbh6azmif.cloudfront.net/devices/USPEnabledCPE
Getting Started
AWS IoT SiteWise ...
AWS IoT Document...
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WebSequenceDiagr...
"amplify codegen m...
BTStaging
BTPoc
BTProd
[VIRTUAL BUCHAR...
Find your communit...
aws
USP CPE Dashboard
Home > Devices > USPEnabledCPE
Summary
Device SerialNumber
-
Ip Address
-
MQTT Status
-
Total Memory (in kilobytes)
-
OBUSP Agent UpTime (seconds)
-
Free Memory Status (in kilobytes)
-
Device Current Local Time
-
Upload Speed (Mbps)
-
Download Speed (Mbps)
-
Latency
-
Jitter
-
Commands
Get Params
Set Params
Add Params
Reboot
Run Ookla Speedtest
Parameters
Search
Parameter Name
Parameter Value

Evolving the CPE management architecture

- Automated onboarding process for USP CPE devices with AWS
- OTA updates using AWS IoT Device Management (IoT jobs)
- Evolve data ingestion flows
- Analytics and visualizations for proactive service management and outage prevention
- End-user control APIs
- Early notifications – highlight and fix issues before customers report them


AWS IoT Device Management


AWS IoT Events


Amazon Elasticsearch Service (Amazon ES)


Amazon Timestream


Amazon Kinesis


Amazon API Gateway

Summary and call to action

- Broadband service providers are faced with ever-increasing demand to improve customer experience and reduce operational costs
- AWS provides building blocks to easily manage CPE devices and leverage data to create service differentiation
- Service providers can leverage AWS IoT capabilities to innovate with existing TR-069 and new USP CPE devices
- How to get started
  - Broadband Forum USP Specifications https://usp.technology/specification/
  - USP agent https://github.com/BroadbandForum/obuspa
  - AWS IoT https://aws.amazon.com/iot/



Thank you!

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