
AWS
re:Invent

ARC201

Innovating on AWS in a 5G world

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Agenda

Introduction to 5G

Cross-industry 5G-enabled use cases

AWS 5G enablement for customers

Where to go for additional information and support



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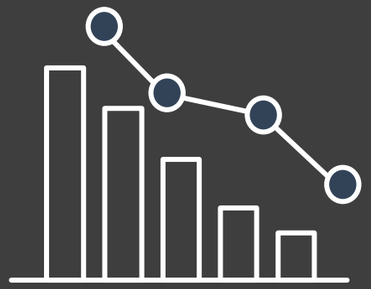
5G ushers in an era of new demand

1. Explosion of data
2. Massive Internet of Things (IoT)
3. New business models
4. Rich digital ecosystem

Gartner forecasts worldwide 5G network infrastructure revenue to reach **$4.2 billion in 2020**

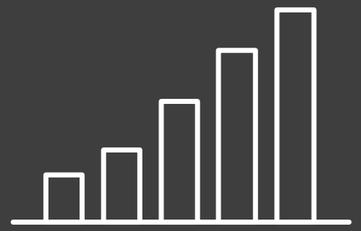
Industry analysts IHS Markit estimates 5G will enable **$12.3 trillion** of global economic output in 2035

So what makes 5G so different?



Latency

Edge servers close to the towers can reduce latency to less than 10 milliseconds



Speed

5G speeds will be up to 10 Gbps



Bandwidth

1 million devices per square kilometer, while 4G only supports up to 100,000

5G challenges for communications service providers (CSPs)

Exponential increase in radio and transport needs requiring edge cloud

Complexity of orchestration multiplied due to diverse ecosystem and need for new applications

Virtualization extending all the way to radio access network in addition to core network needs

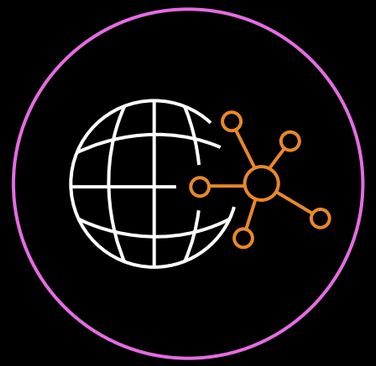
Need for 5G monetization models beyond mobile consumers

5G challenges from the customer point of view



Security

Keep devices and data secure



Connectivity

Operate at top performance with local mobility, even in remote locations

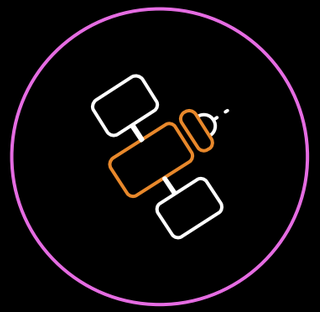


Legacy equipment

Onboard Greenfield and Brownfield devices

Reliable, low-latency, and high-performance services

5G key areas of opportunity



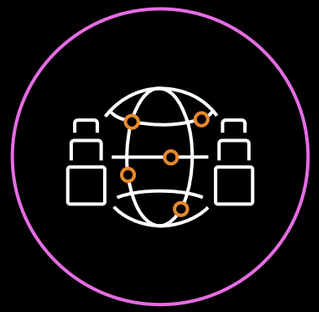
Enhanced mobile broadband

Progression with faster connections, higher throughput, and more capacity than 4G



Ultra-reliable low-latency communications

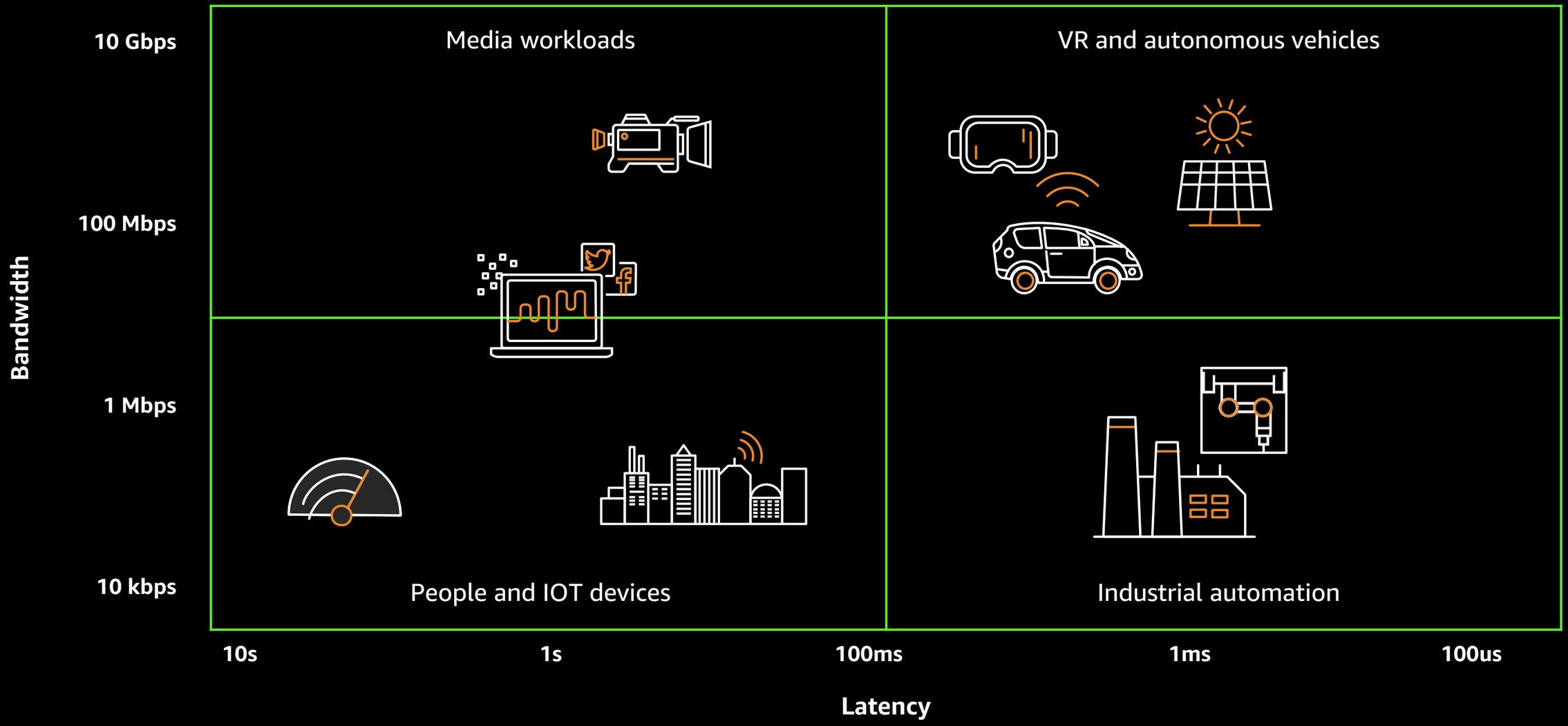
Mission-critical apps that require uninterrupted operations and data exchange



Massive machine-type communications

Massive IoT connectivity and support for billions of connected IoT devices

Evolving with latency and bandwidth



Cross-industry 5G use cases



Deliver streaming content, gaming, and VR experiences



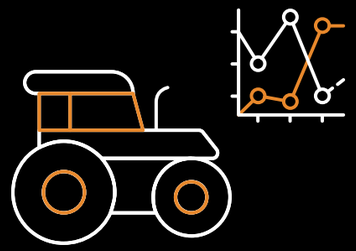
Build smarter products and user experiences in homes, buildings, and cities



Remotely monitor patient health, and wellness applications



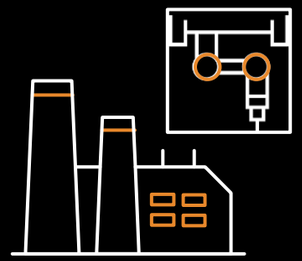
Transform transportation with connected and autonomous vehicles



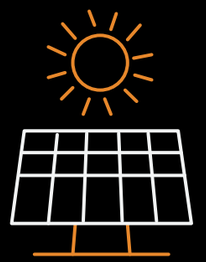
Grow healthier crops with greater efficiencies



Track inventory levels and manage warehouse operations



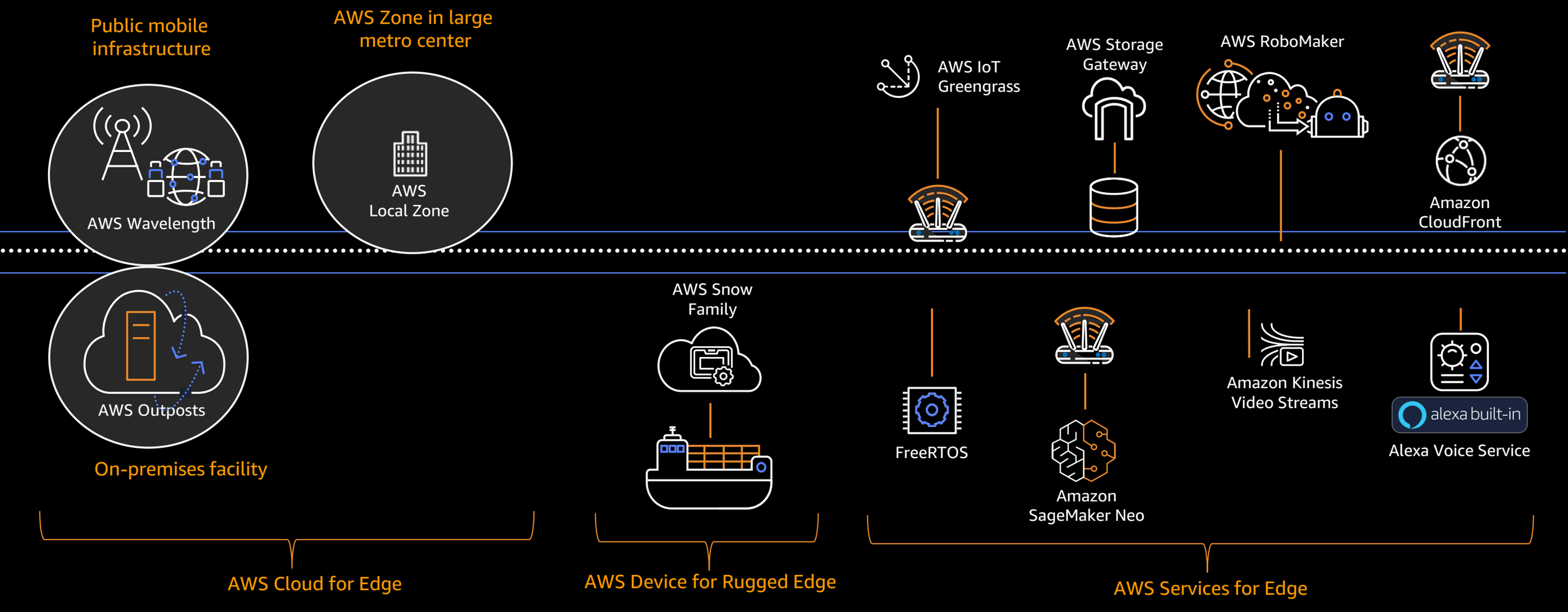
Improve the performance and productivity of industrial processes



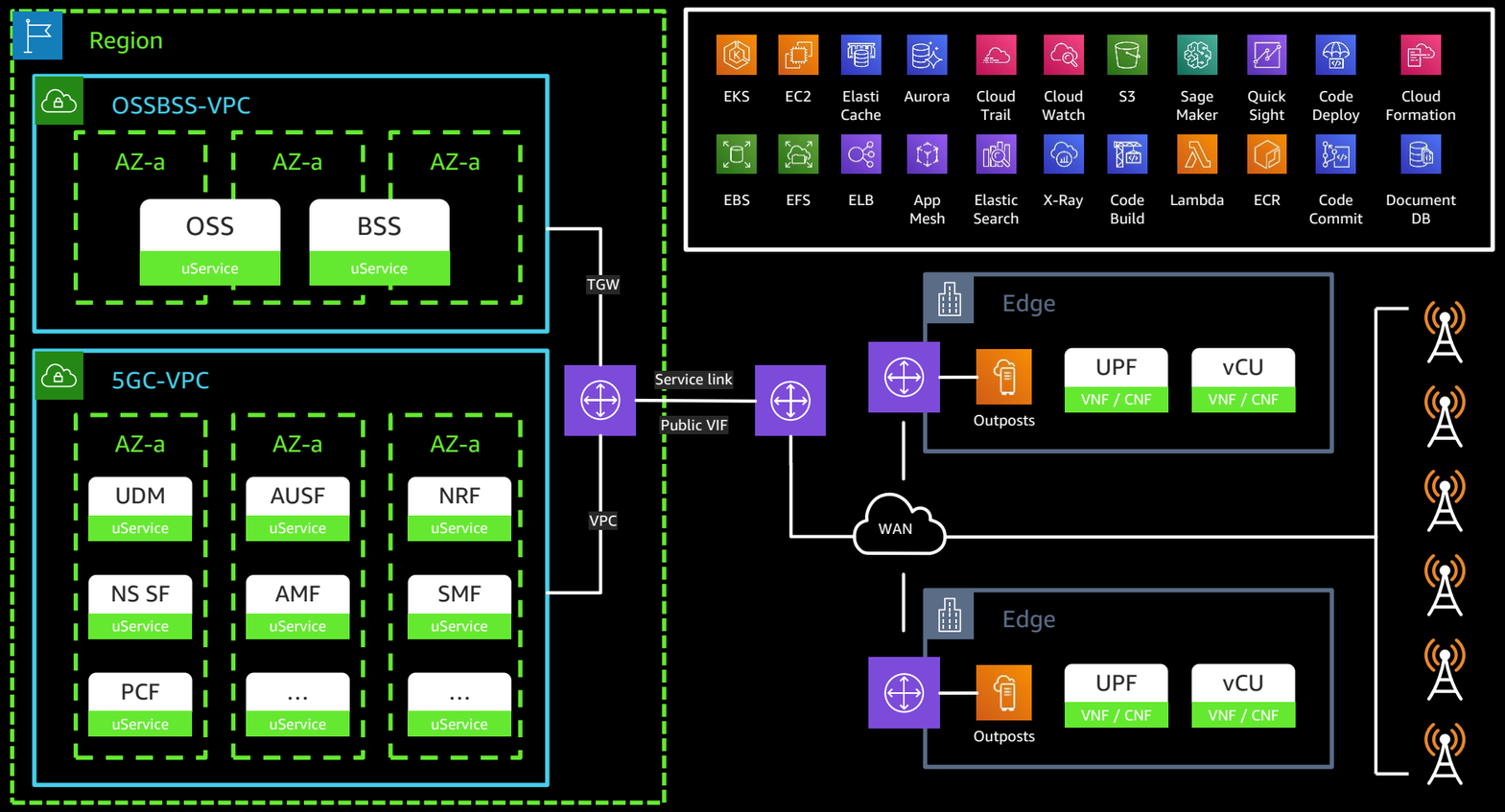
Manage energy resources more efficiently

AWS for the edge

AWS OFFERS THE MOST COMPREHENSIVE PLATFORM FOR BUILDING AND DEPLOYING EDGE APPLICATIONS



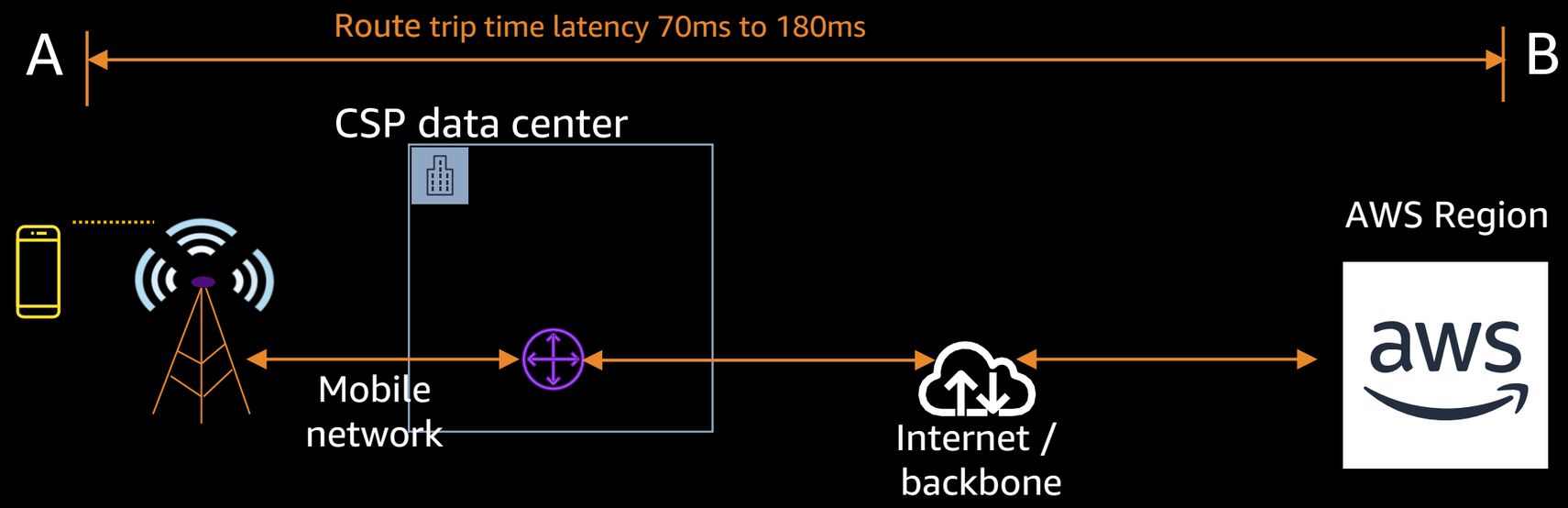
AWS architecture patterns for 5G network



- Control and User Plane Separation (CUPS)
- Stateless architecture
- Service-based architecture Microservices architecture
- Network slicing +Orchestration / automation
- Multi-access edge computing

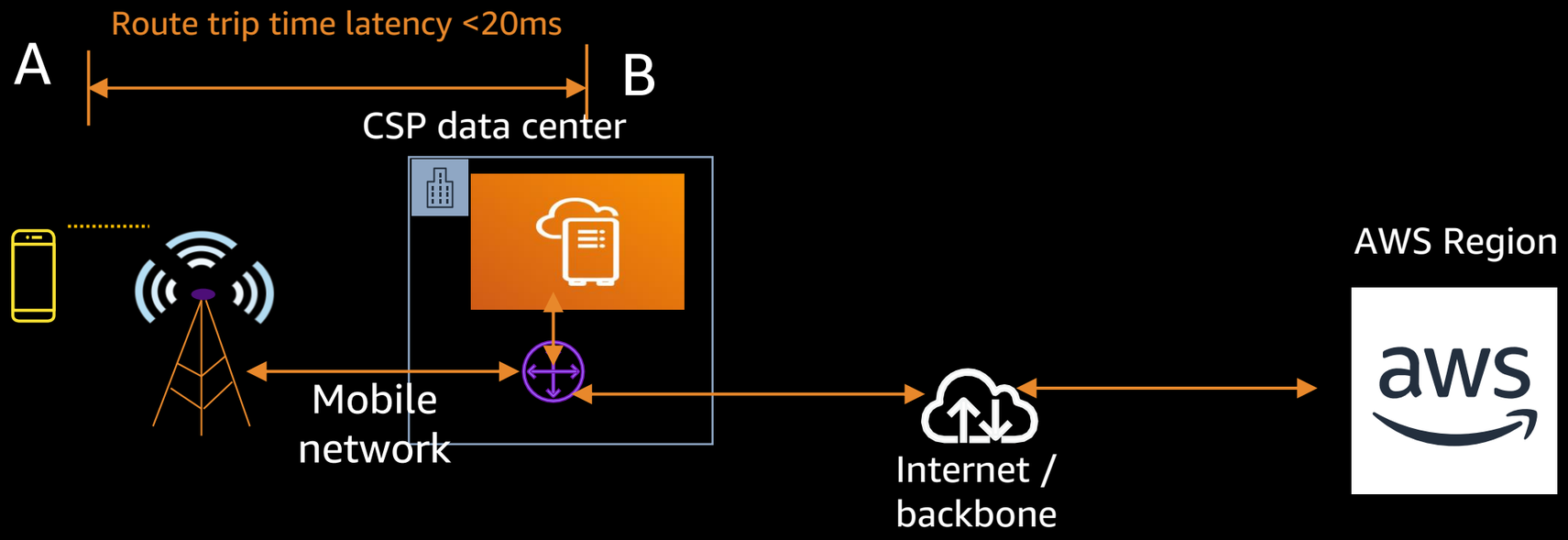
5G Network Evolution with AWS
https://d1.awsstatic.com/whitepapers/5g-network-evolution-with-aws.pdf

Architecture pattern for ultra-low latency



Latency from mobile end device to AWS Region:

- Depends on the hops over the internet
- Not predictable



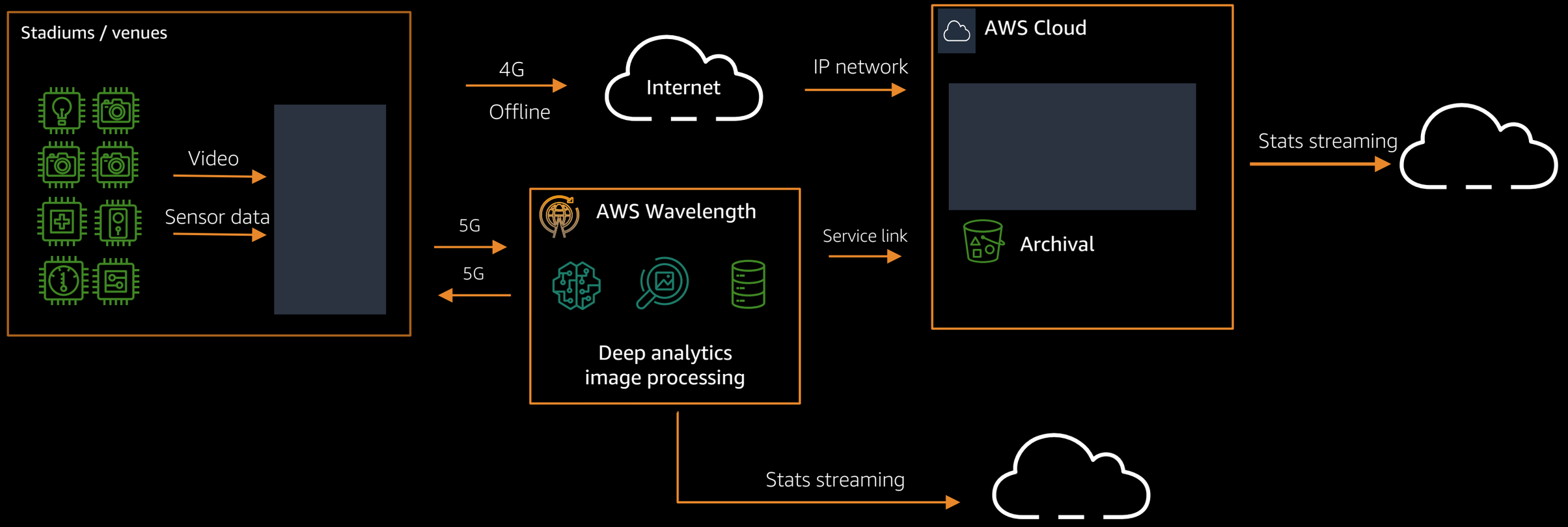
Latency from mobile end device to AWS Wavelength:

- Need not have to traverse the internet
- Stay within the mobile network
- Predictable

Architecture pattern for analytics at the edge

Use case: Real-time tracking of players, speed, and direction of ball
Platform: Overlaid on live streams, inference consumed by game stats
Devices: Cameras and sensors across the stadium, players, and equipment





Customer case studies

















https://aws.amazon.com/wavelength/

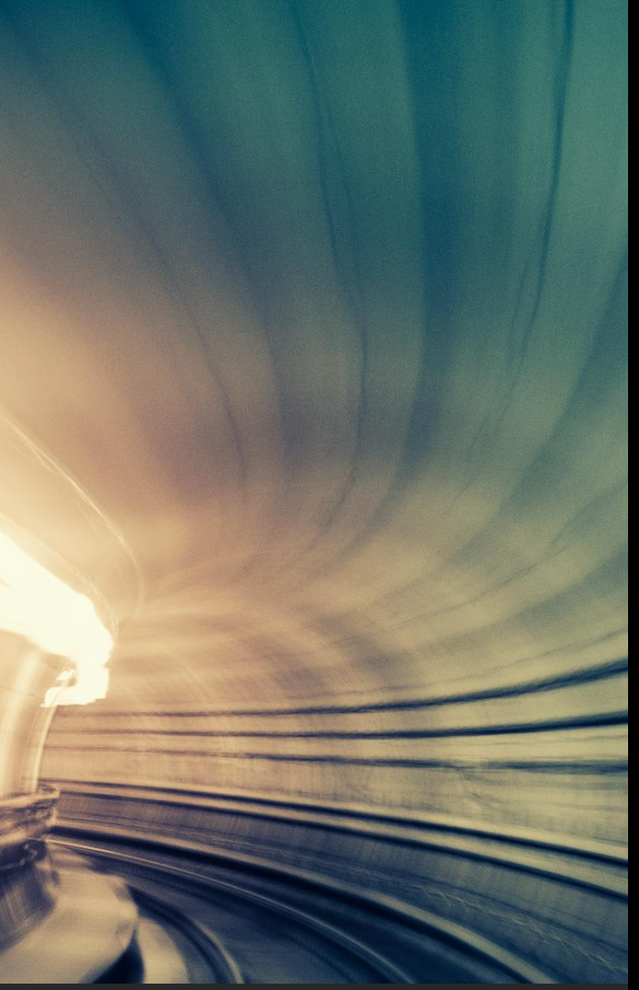
Architecture resources

AWS Well-Architected Framework
The official best practices for architecting in the AWS Cloud
aws.amazon.com/architecture/well-architected

AWS Well-Architected Labs
Hands-on labs to help you learn, measure, and build using architectural best practices
wellarchitectedlabs.com

AWS Architecture Center
Official AWS repository for all architecture resources
aws.amazon.com/architecture

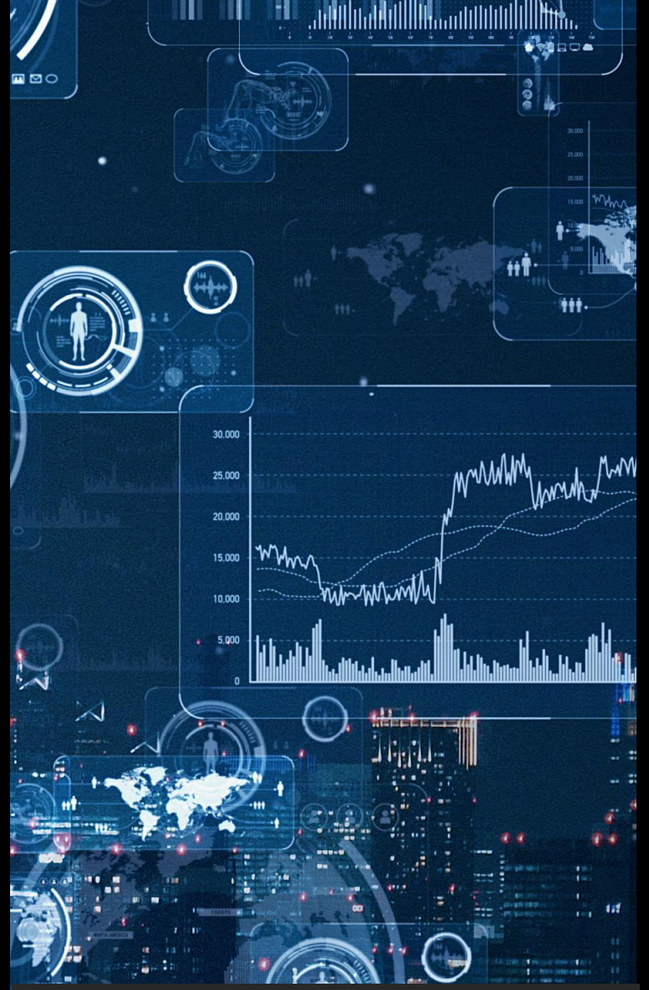
AWS Solutions Library
Vetted reference implementations and well-architected patterns
aws.amazon.com/solutions



5G addresses the emerging need for low latency, high speed, more bandwidth, and edge data processing



Customers aspire toward 5G capabilities enabling new value and experiences



AWS 5G capabilities deliver unparalleled advantages to both CSPs and other users



The broad set of AWS 5G capabilities helps future-proof our users' investments and accelerates their pace of innovation

Thank you!



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