
AWS
re:Invent

TLC302

BlueJeans' explosive growth journey with AWS during the pandemic

Daniel Li

Solutions Architect
AWS

Behruz Nassre

VP, Operations and Security
BlueJeans by Verizon

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Daniel Li
Solutions Architect
AWS



Behruz Nassre
VP, Operations and Security
BlueJeans by Verizon

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Agenda



Challenges in changing times



Architecture



What was implemented on AWS



Lessons learned



Key takeaways

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Agenda



Challenges in changing times



Architecture



What was implemented on AWS



Lessons learned

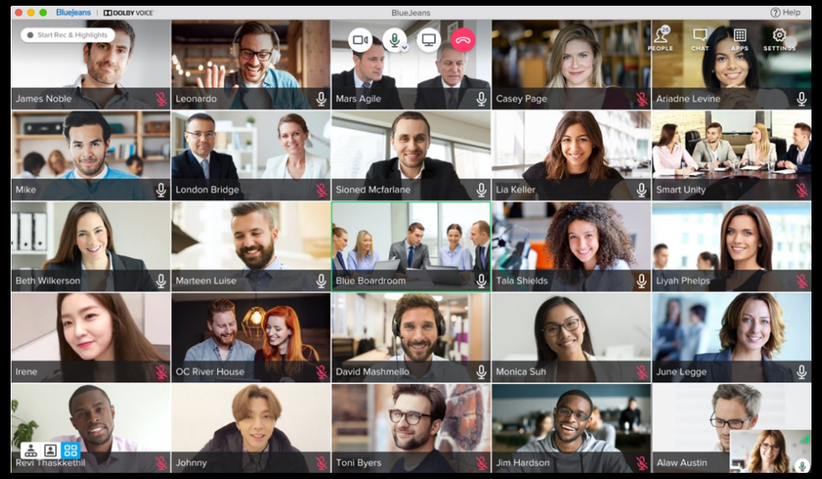


Key takeaways

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Challenges in changing times

BLUEJEANS FACED UNPRECEDENTED CHALLENGES IN MARCH ‘20



HAD HUGE VIDEO CONFERENCING USAGE SURGE GLOBALLY



INFRASTRUCTURE COMPONENTS REACHED LIMITS



DATA CENTERS COULDN’T ADD CAPACITY FAST ENOUGH



+

aws

Partnered with AWS to tackle the challenges

Tripled the capacity in three weeks

Quickly extended to more global regions

Migrated on-prem MySQL to Amazon Aurora in one week

Containerized the platform and deployed to Amazon EKS

BlueJeans by Verizon at a glance



Innovator in cloud video meetings and events

27,000 customers in over 150 countries

Became part of Verizon on May 15, 2020

Video conferencing for the digital workplace

Meetings

Collaborate efficiently with video, audio, and web conferencing from anywhere on any device

Events

Host and livestream interactive events and town halls for large global audiences

Rooms

Make any room a one-touch video, audio, and web conferencing room that is easy to use

Gateway

Cloud video interop enables access to Microsoft Teams meetings from any room system

Platform overview

CLIENT LAYER

Windows	Mac	Linux	Events	IOS	Android	Rooms	Relay	WebRTC	DVR	Scheduling Clients

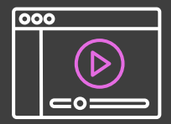


Shared Media Library



Shared WebRTC SDK

CORE PRODUCTS



Meetings



Events



Rooms



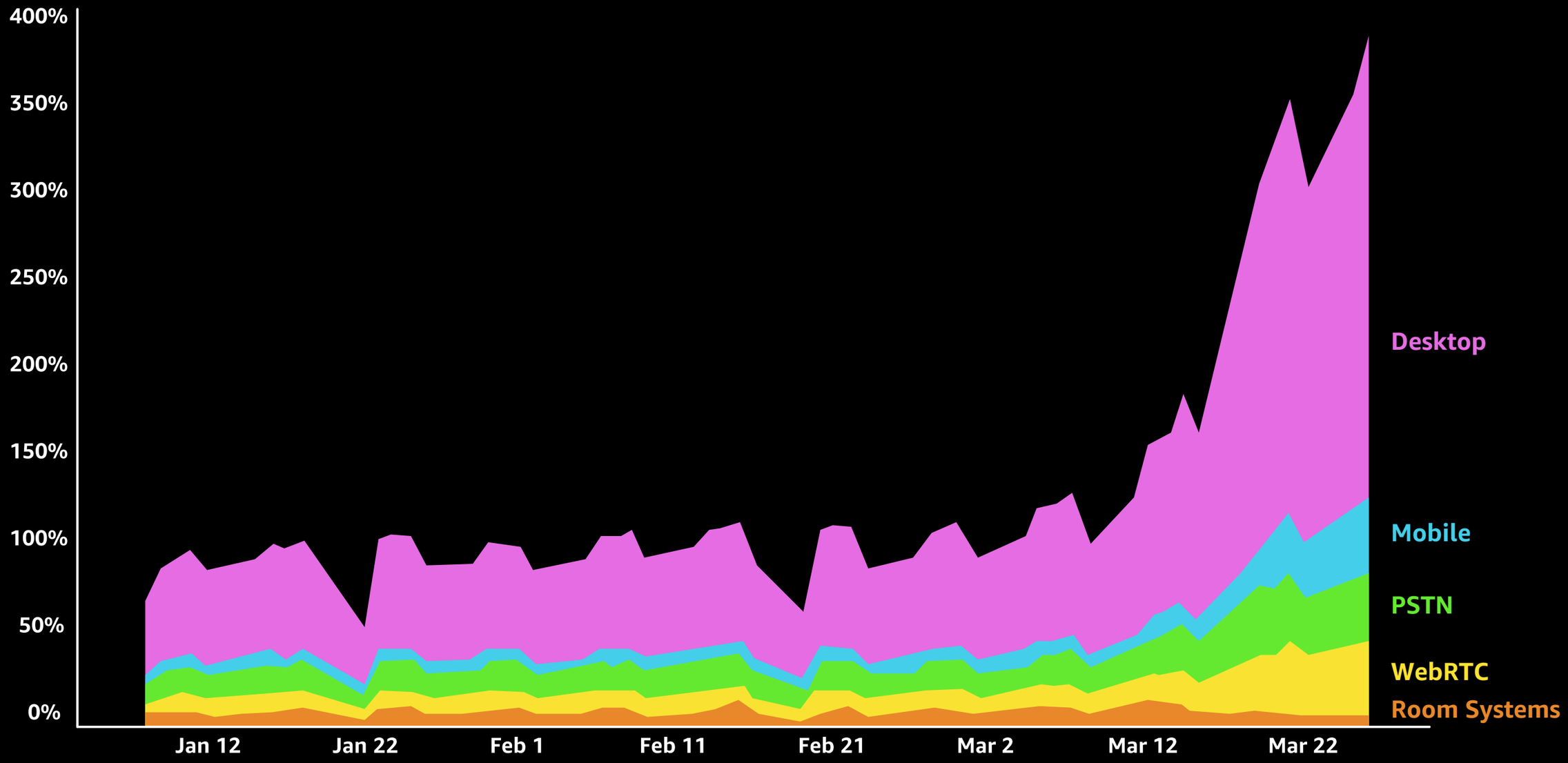
Teams Gateway

SHARED MANAGEMENT LAYER

Enterprise Admin	Command Center	Monitoring	Logging	Billing

Video conferencing usage surge

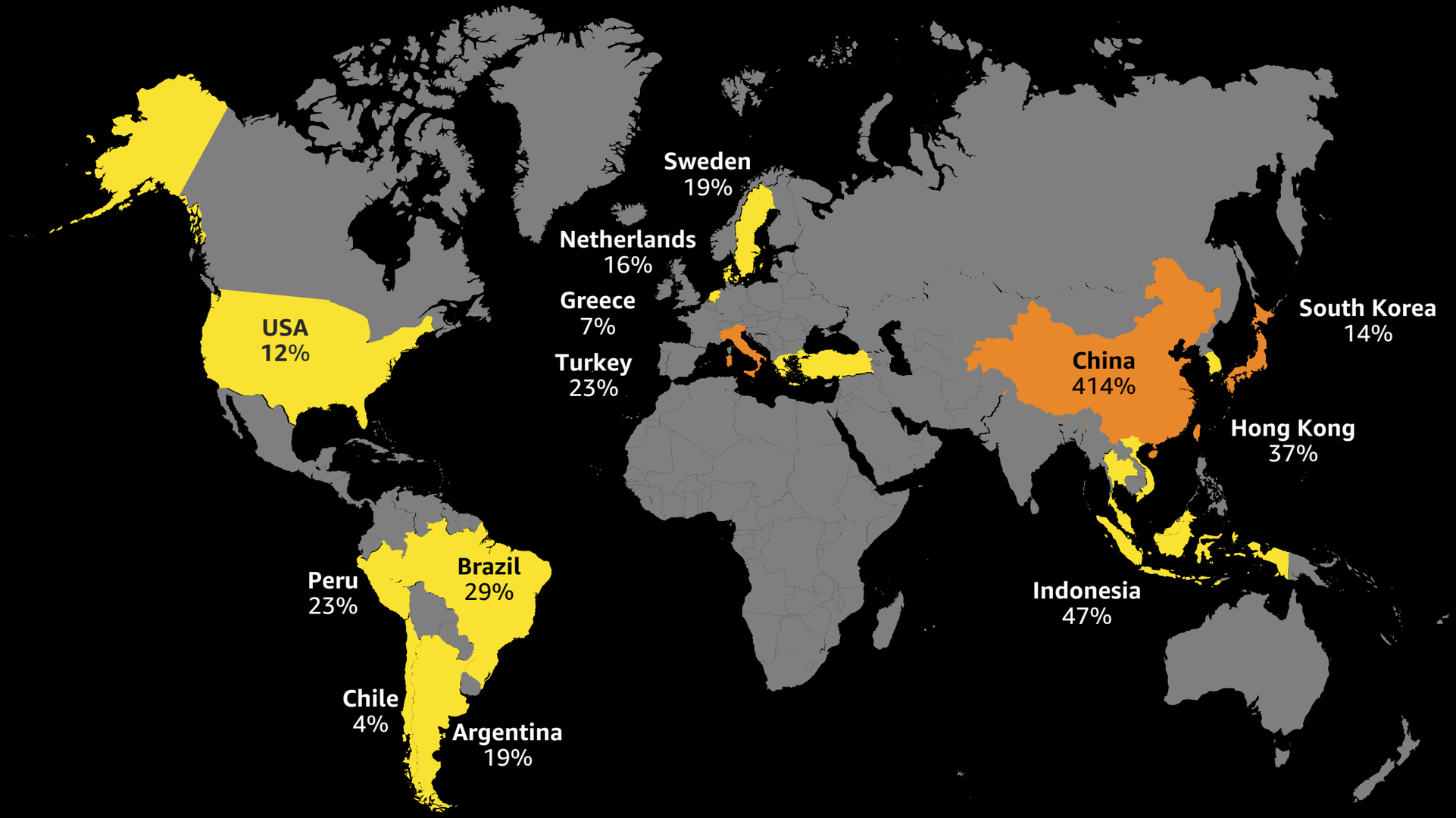
MARCH '20



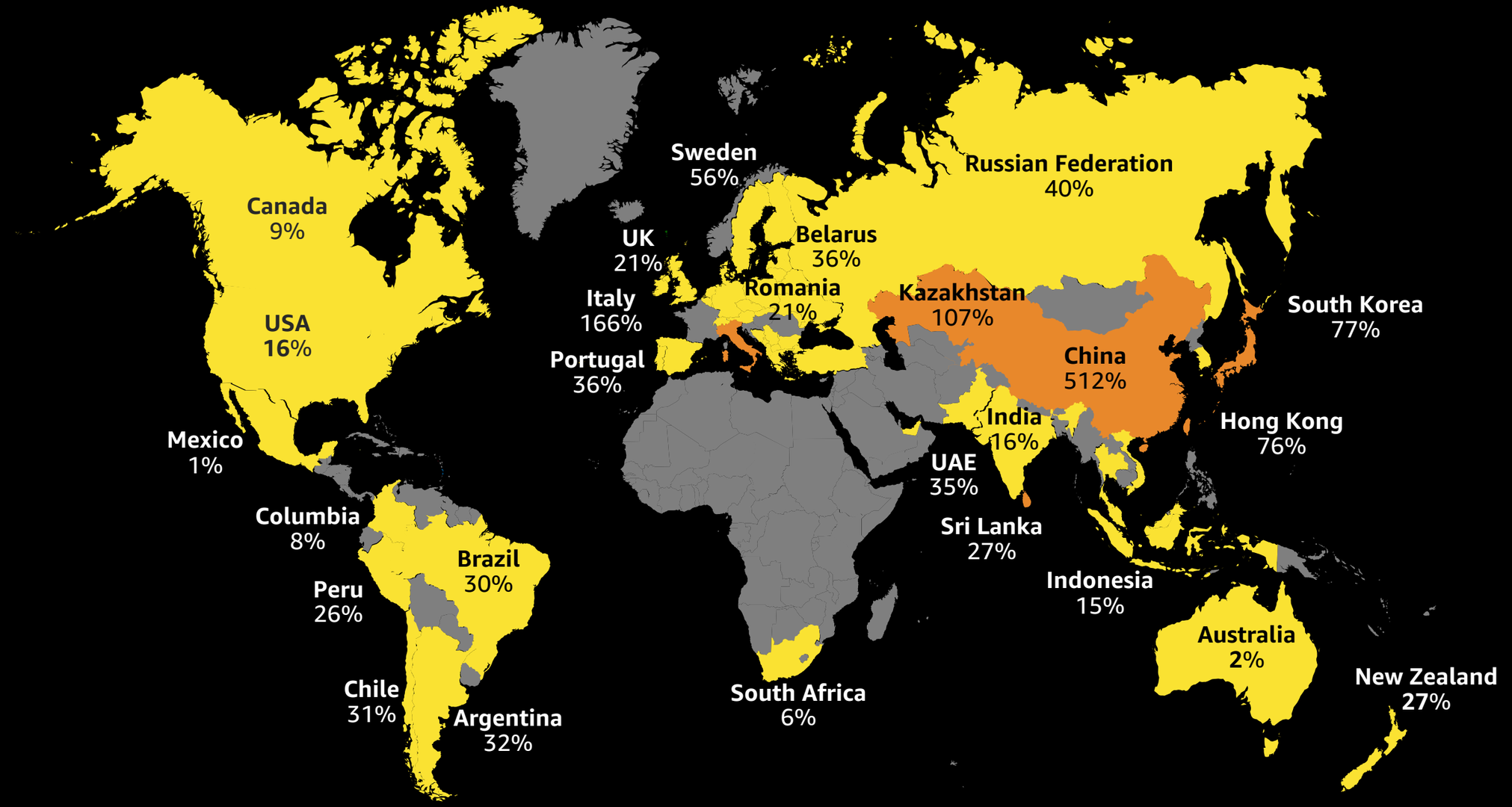
Video conferencing growth around the world



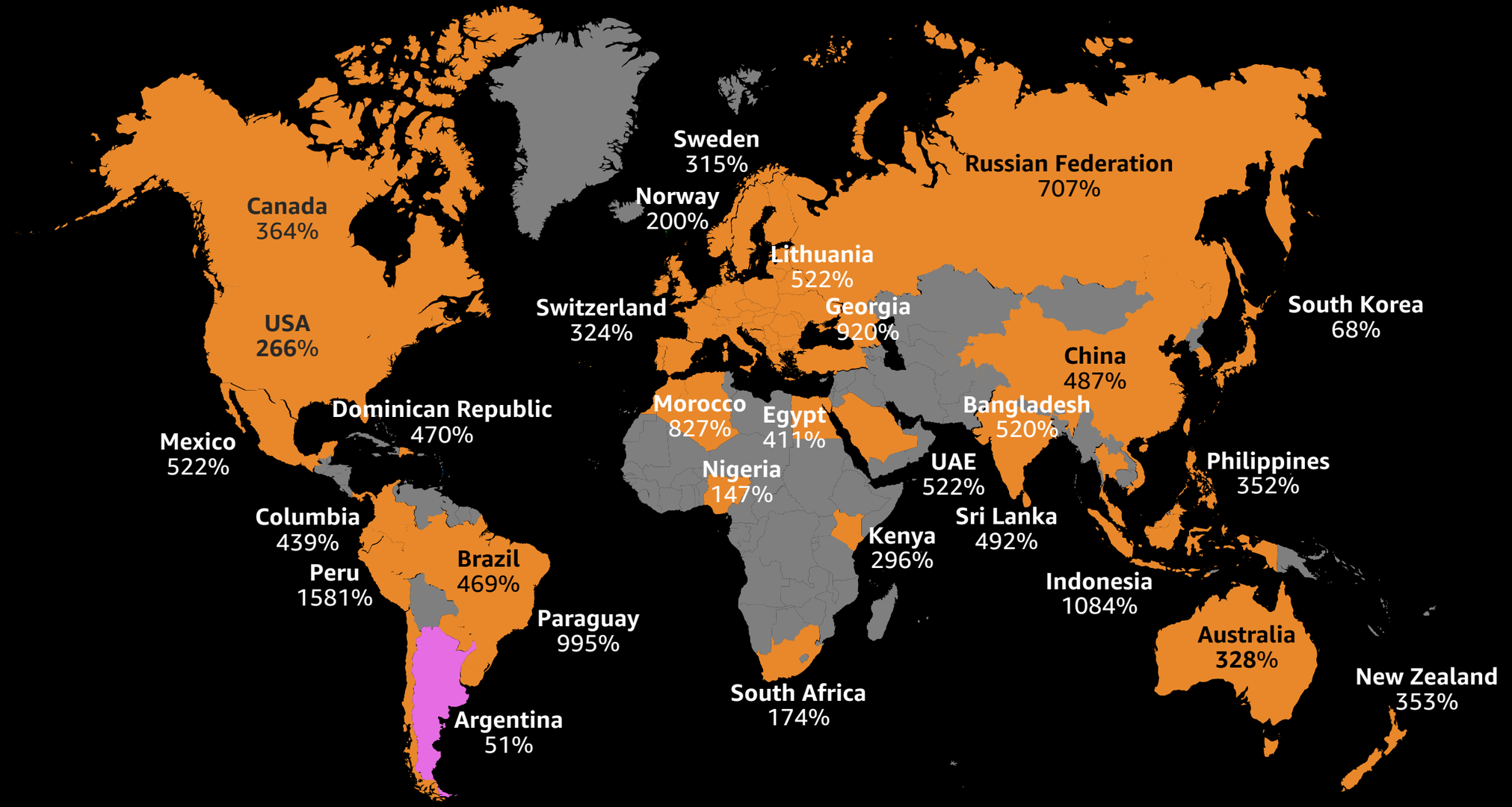
Video conferencing growth around the world



Video conferencing growth around the world



Video conferencing growth around the world



Agenda



Challenges in changing times



Architecture



What was implemented on AWS



Lessons learned

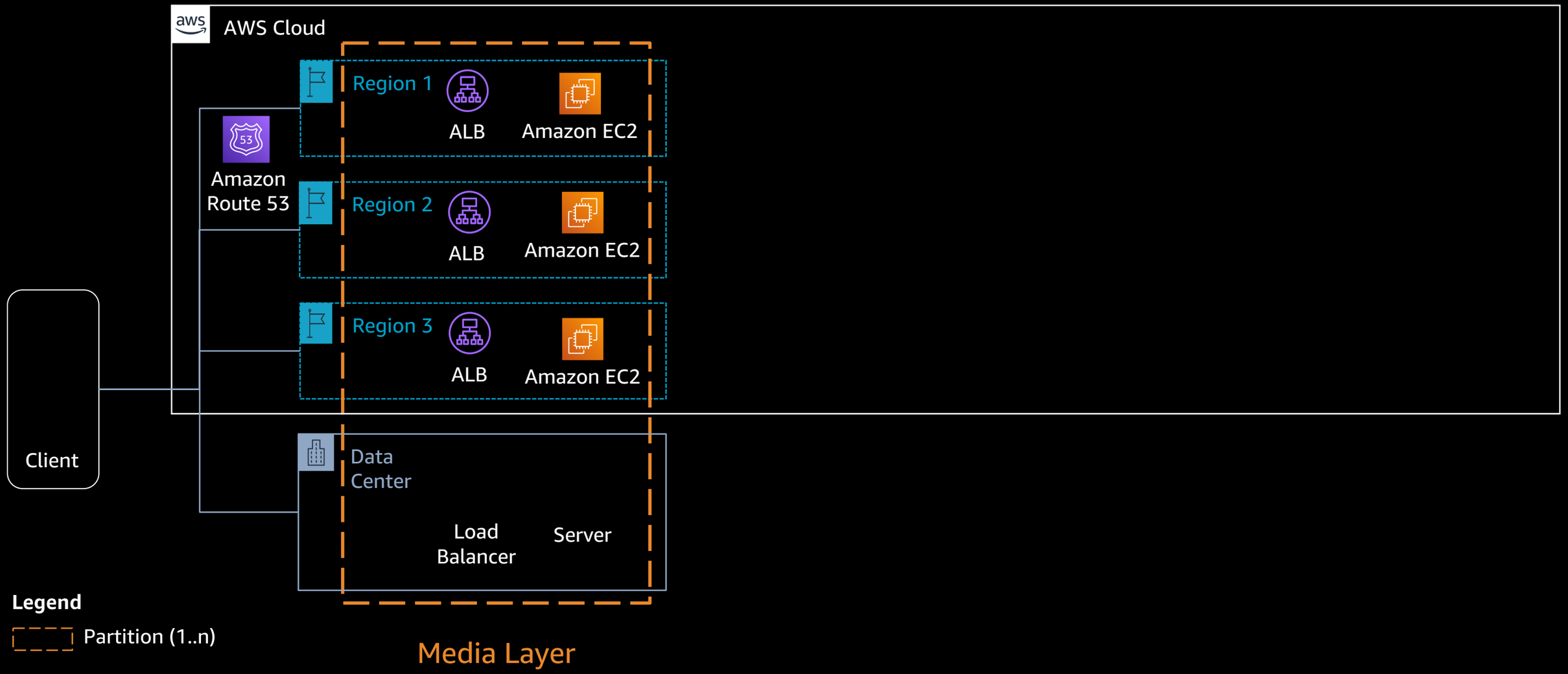


Key takeaways

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

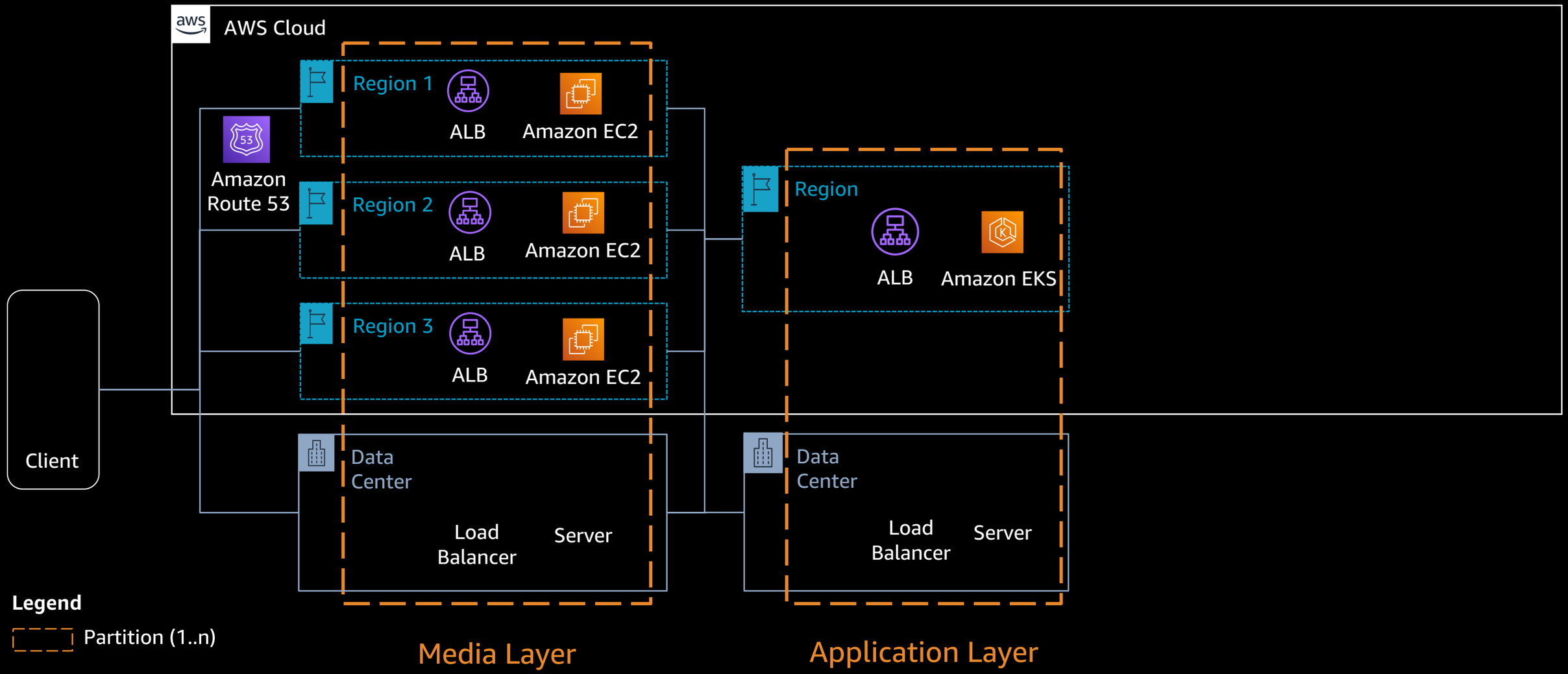
Deployment architecture

MARCH '20



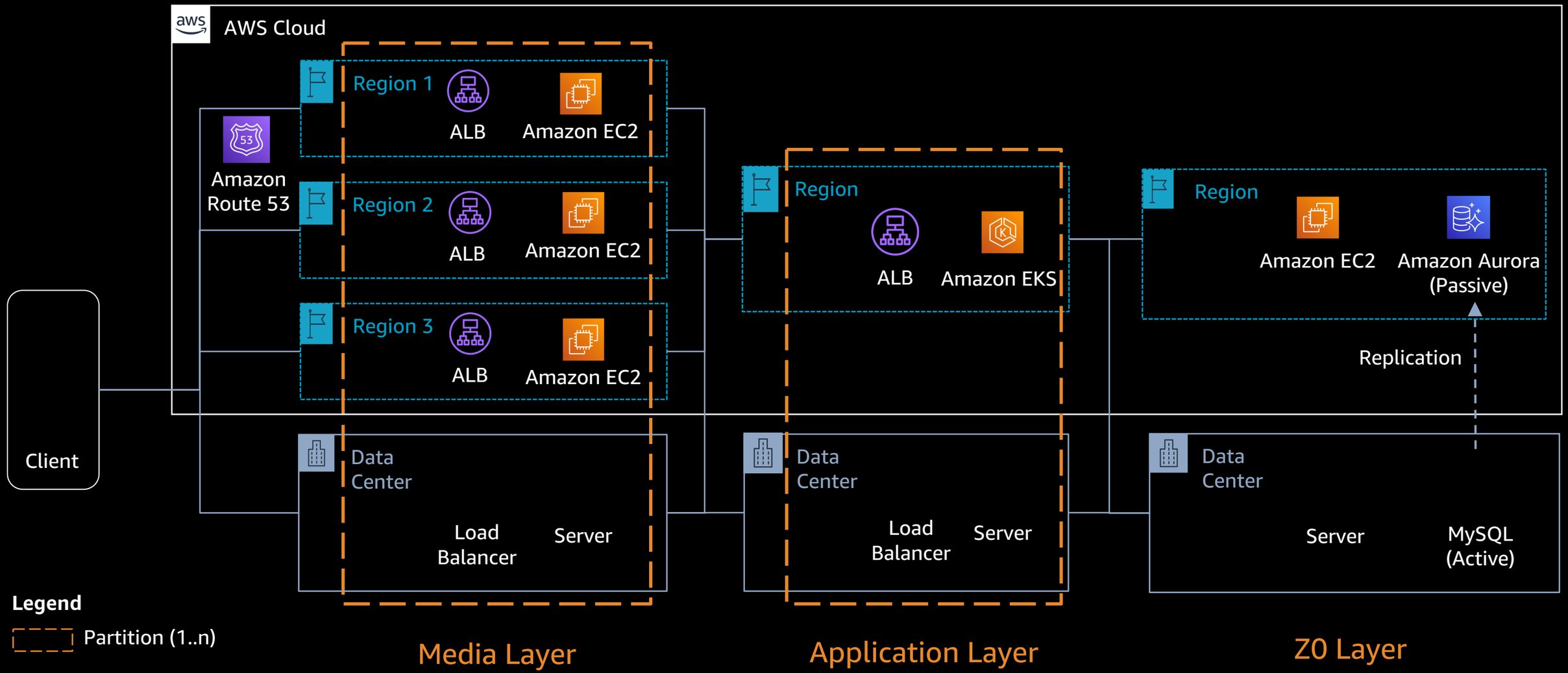
Deployment architecture

MARCH '20



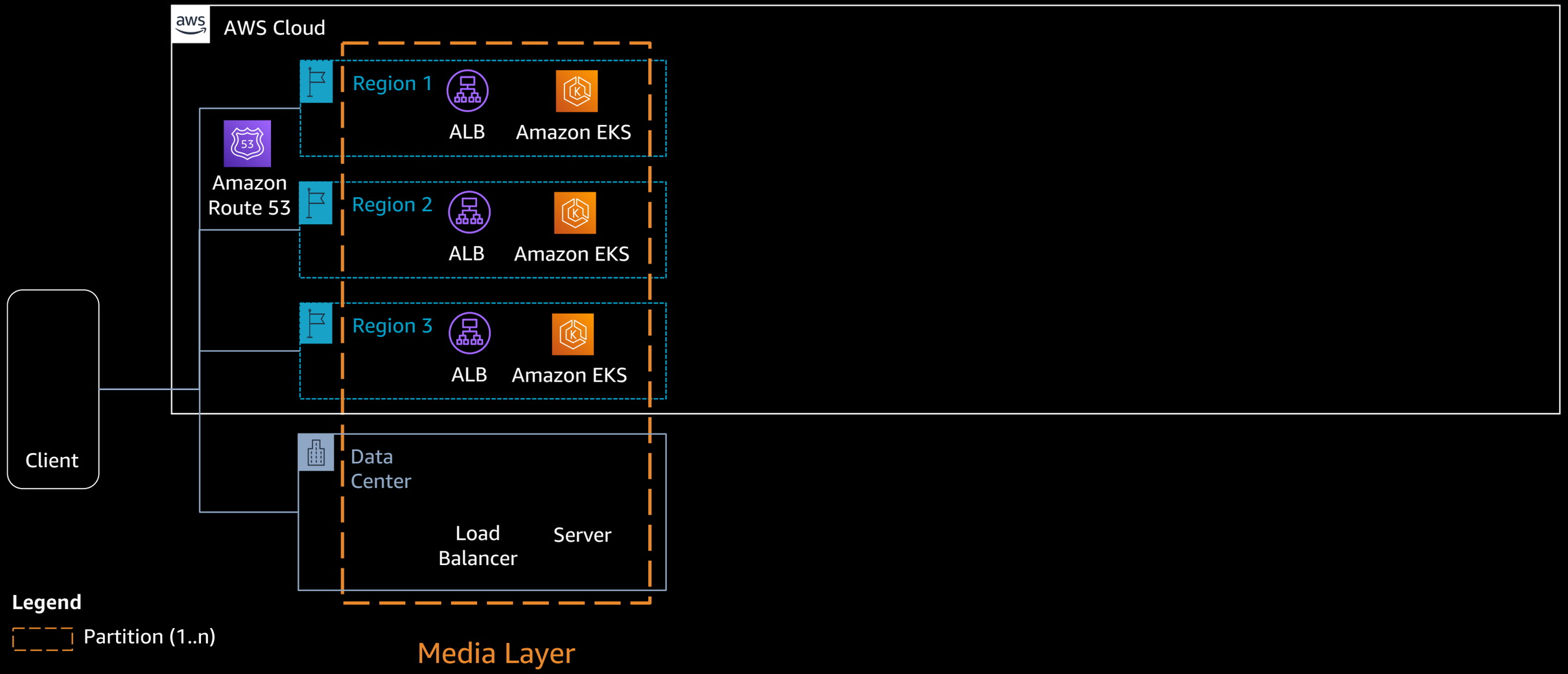
Deployment architecture

MARCH '20



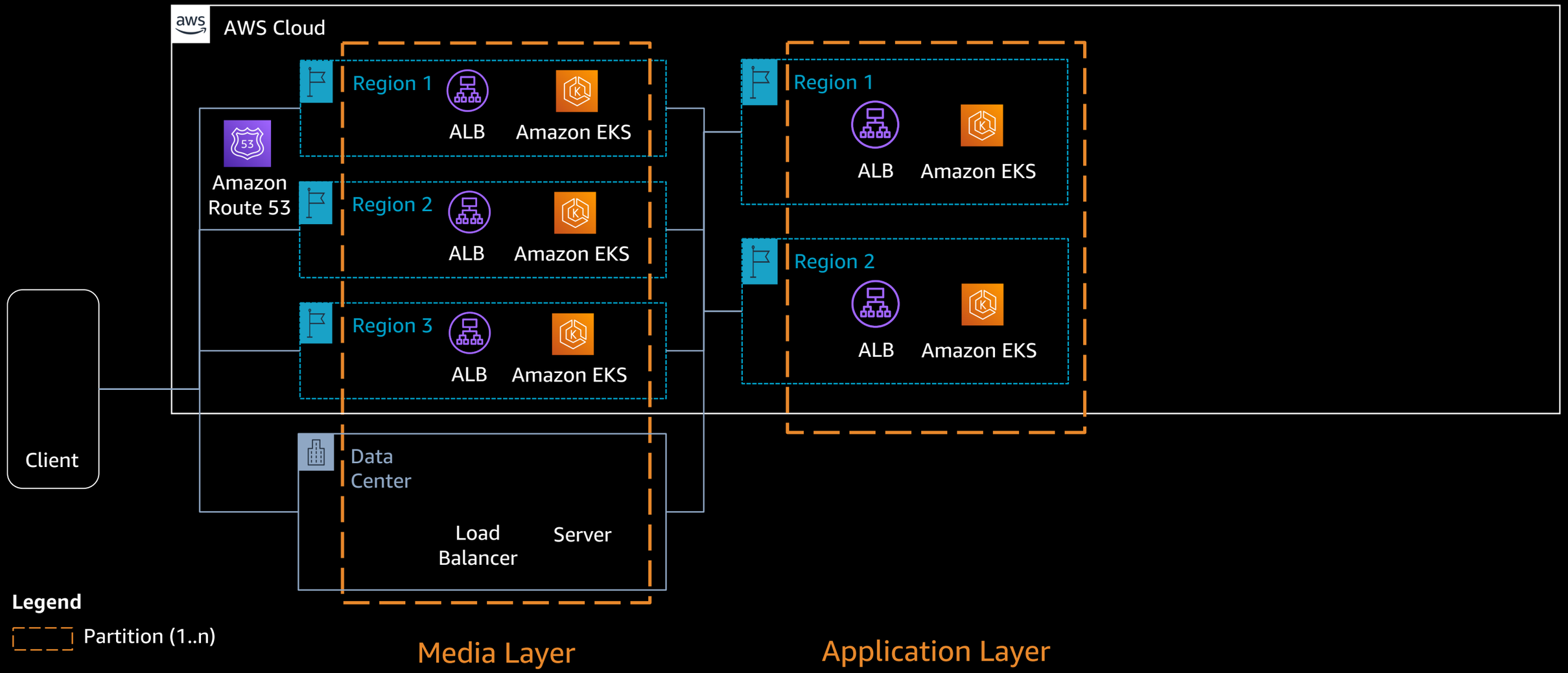
Deployment architecture

NOVEMBER '20



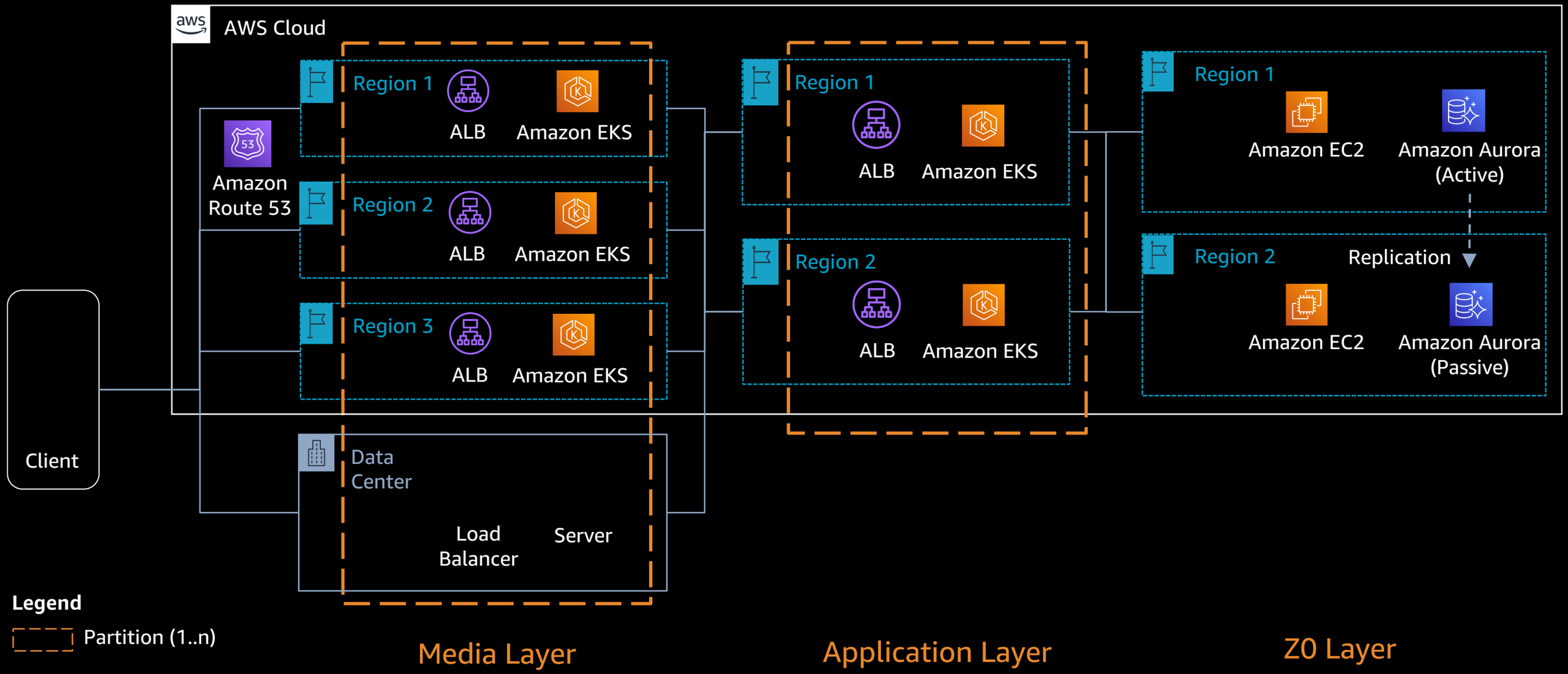
Deployment architecture

NOVEMBER '20



Deployment architecture

NOVEMBER '20



Agenda



Challenges in changing times



Architecture



What was implemented on AWS



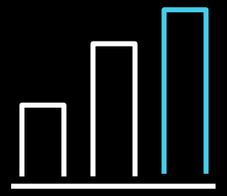
Lessons learned



Key takeaways

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

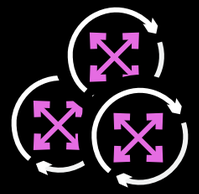
Media layer and application layer scaling



Tripled meeting capacity within three weeks



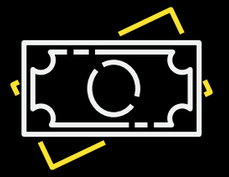
Scaled up the events platform to support 50K attendees per event



Expanded capacity in all the existing partitions in AWS overflow POPs, added more partitions, and added POPs in three new AWS regions



Provisioned EC2 instances in the Media layer using Instance Scheduler by starting with full capacity then scaling up/down on a schedule



Used Spot instances to reduce costs

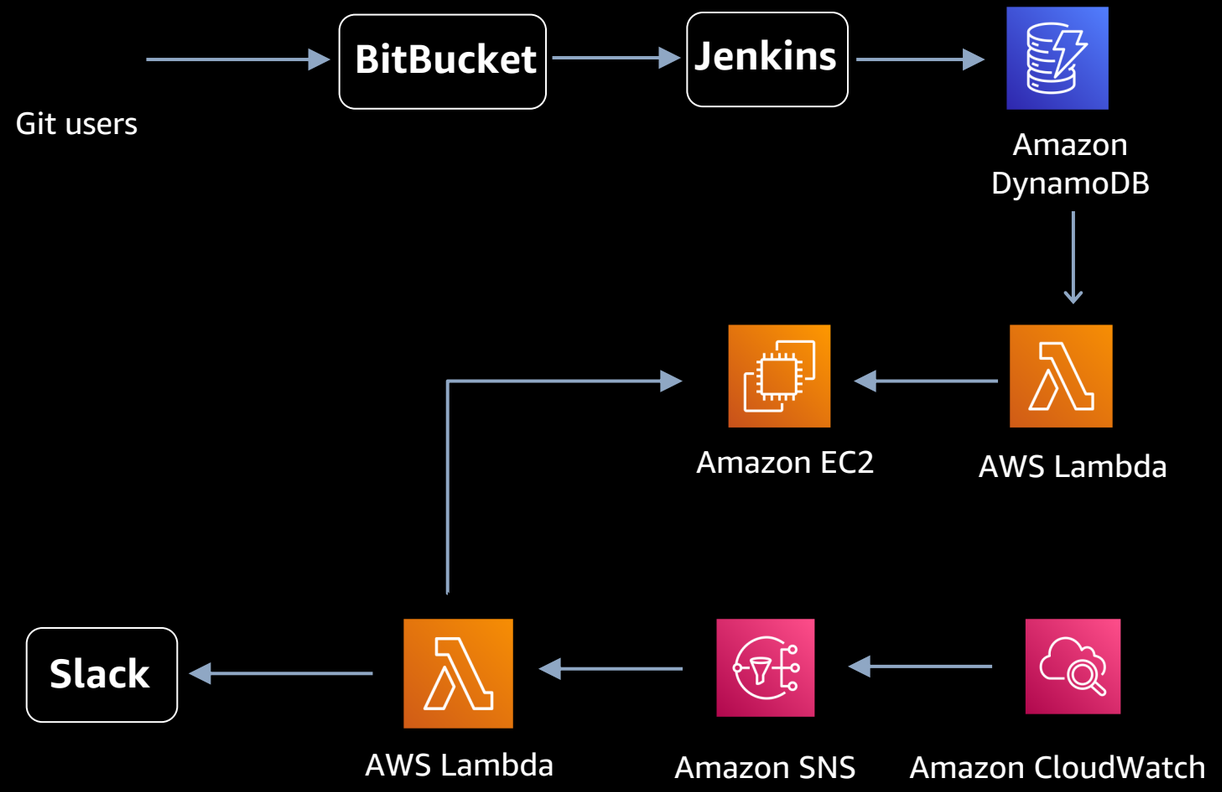
Instance scheduler

Instances need to be pre-provisioned based on schedule

Schedules are per partition and are stored in DynamoDB for a defined region

Supports multiple schedules to adjust the capacity to match with the traffic patterns

Gracefully drains the calls on the Spot instance using Lambda function before it shuts down



Database scaling

Challenges

- Due to hardware limitation, connection limit on the writer server was up to 4.5k–5k
- Heavy write operations during peak caused MySQL replication lag, because they parallelized on the writer but serialized on the replicas

Solutions

- Migrated on-prem MySQL to Amazon Aurora
- Set default max_connections to 7k for the largest instance which can be extended to 16k

Benefits

- Resolved the max connections issue
- Aurora Replicas have virtually no replication lag
- Better failover and HA

Agenda



Challenges in changing times



Architecture



What was implemented on AWS



Lessons learned



Key takeaways

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Lessons learned with Spot instances

Gracefully handle Spot instance **termination**

Design applications to use **multiple types** of Spot instances

Fallback to **on-demand** when Spot instances are not available

Find the **right ratio** of on-demand and Spot instances

Database migration approach

Percona Xtrabackup

Moved the on-premises DB Backups with Percona mydumper/myloader to the Aurora cluster. At the time of this migration import of Percona Xtrabackup from S3 was not available on the Aurora 2.0 engine

Aurora Cluster

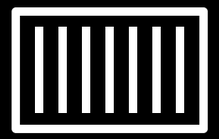
Set up an Aurora cluster to be in sync with the on-premises database

Native MySQL Replication

Minimal downtime migration using continuous native MySQL binary log replication from the on-premises database (Active) to the Aurora cluster (Passive)

Switched to Aurora Infrastructure

Switched the application clients over to the new Aurora infrastructure using Amazon Route 53 and promoted the Aurora cluster as Primary (Active)



Modernizing with containers

Started to containerize the applications before **March ‘20**

Paused during the surge

Completed containerization in **October ‘20**

Standardized on Kubernetes and deployed to **Amazon EKS**

Agenda



Challenges in changing times



Architecture



What was implemented on AWS



Lessons learned



Key takeaways

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Business results

Connected 5x more daily average users at peak-pandemic than pre-pandemic

Expanded customer base from 13,000 to 27,000 organizations

Grew sales bookings over 100% y/y

Saved 48.6 million metric tons of CO2 emissions and 266 billion miles of travel



“The trust that our customers put in BlueJeans motivates us to leave no stone unturned as we help each other get through this crisis. We value AWS’s partnership in helping us scale to meet the needs of this unique moment.”

Alagu Periyannan

CTO and Co-Founder,
BlueJeans by Verizon

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.

Thank you!



AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.



Please complete the session survey

AWS re:Invent

© 2020, Amazon Web Services, Inc. or its affiliates. All rights reserved.