INNOVATE

MODERN APPLICATIONS EDITION

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Progressively modernize your application with edge services and AWS Lambda

Etienne Münnich
Edge Specialist Solutions Architect
Amazon Web Services

Agenda

- What is the application modernization?
- How to use AWS Edge services to modernize web applications
  - Example - path based origin routing
  - Example - origin routing by client geo or device
  - Example - Blue/Green deployment
  - Example – Increase application security

What do customers experience after migration?

31%	62%	3x	69%	43%
average infrastructure cost savings*	more efficient IT infrastructure management*	more features delivered per year*	reduction in unplanned downtime*	fewer security incidents per year*

* https://aws.amazon.com/products/migration-and-transfer/

Migration and modernization patterns

Typical IT environment by migration pattern:

REHOST
Lift-and-shift to quickly capture business benefits; transform once migrated for additional value

REHOST+
Lift-and-upgrade: Windows Server Upgrade (Windows 2005/2008 to 2016)

RELOCATE
Move VMWare-based apps to VMWare Cloud on AWS (VMC)

REPLATFORM
Platform optimizations (e.g. to reduce OS/DB licensing costs)

REFACTOR
Reimagine app architecture & development

REPURCHASE
Move to SaaS

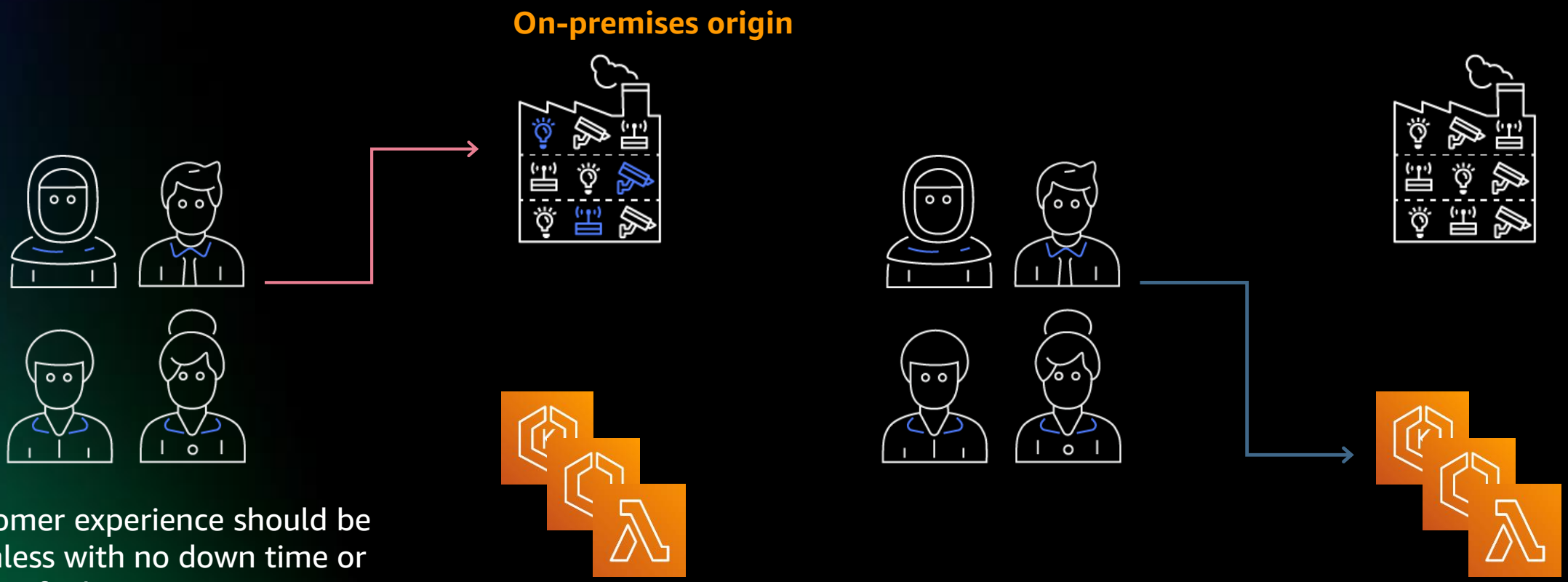
RETAIN
Not prioritized for migration

RETIRE
No longer needed

Migrations and modernization, using both patterns are important to fully realize cloud benefits. Use migrations to quickly realize value of cloud and focus modernization on business differentiating apps

Migrating user traffic

Migration of traffic

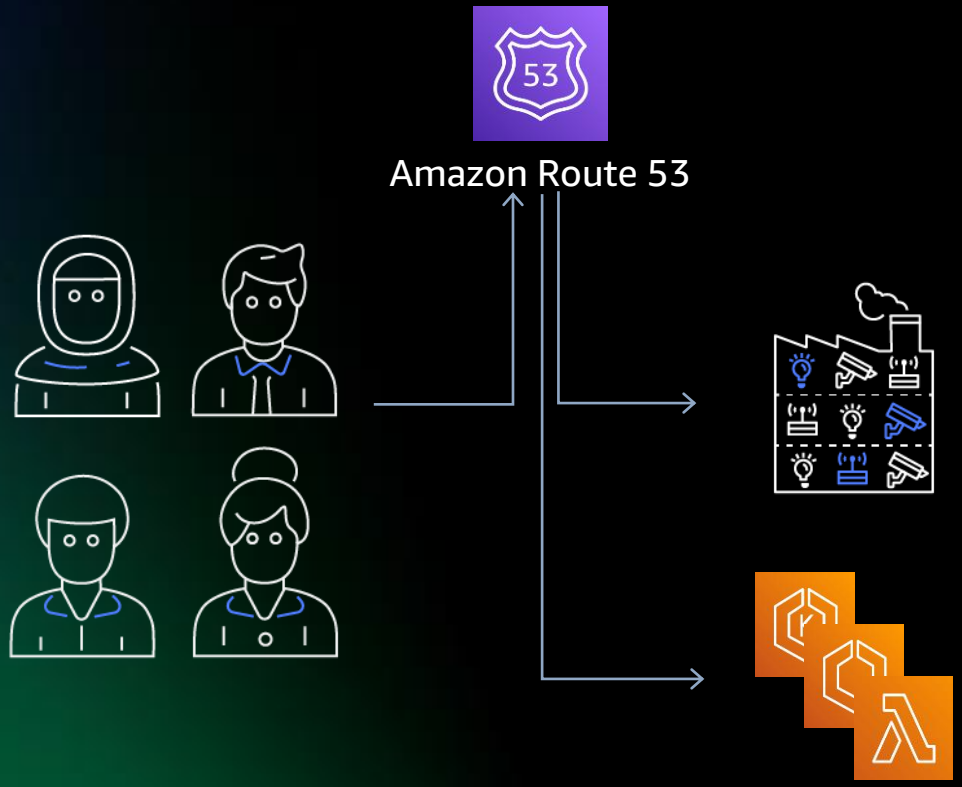


Customer experience should be seamless with no down time or system faults

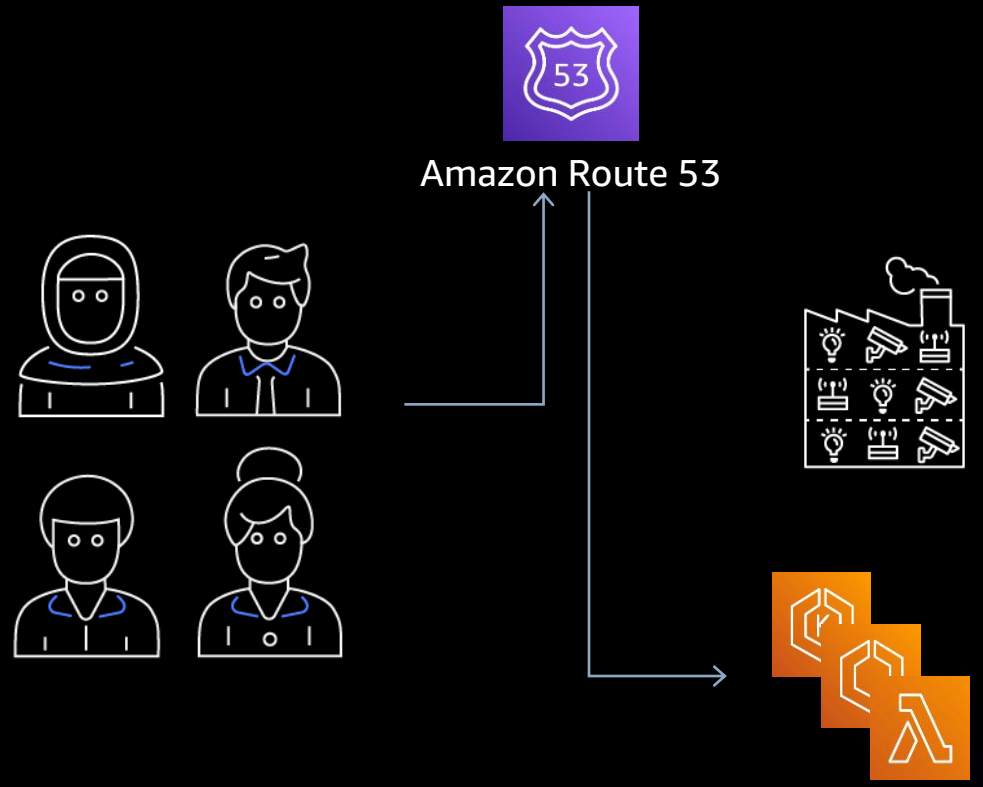
AWS Services such as:

AWS Lambda with Amazon API Gateway
AWS ECS and Kubernetes

Traffic migration with DNS record change



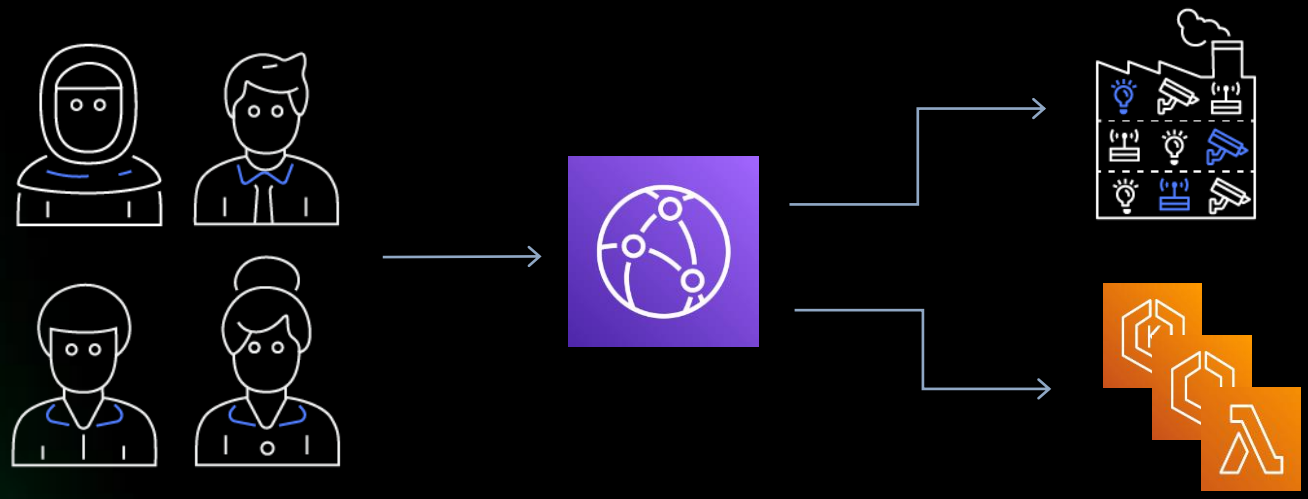
Easy switch forward/back
Weighted routing
Geo based routing



Entire domain can be routed

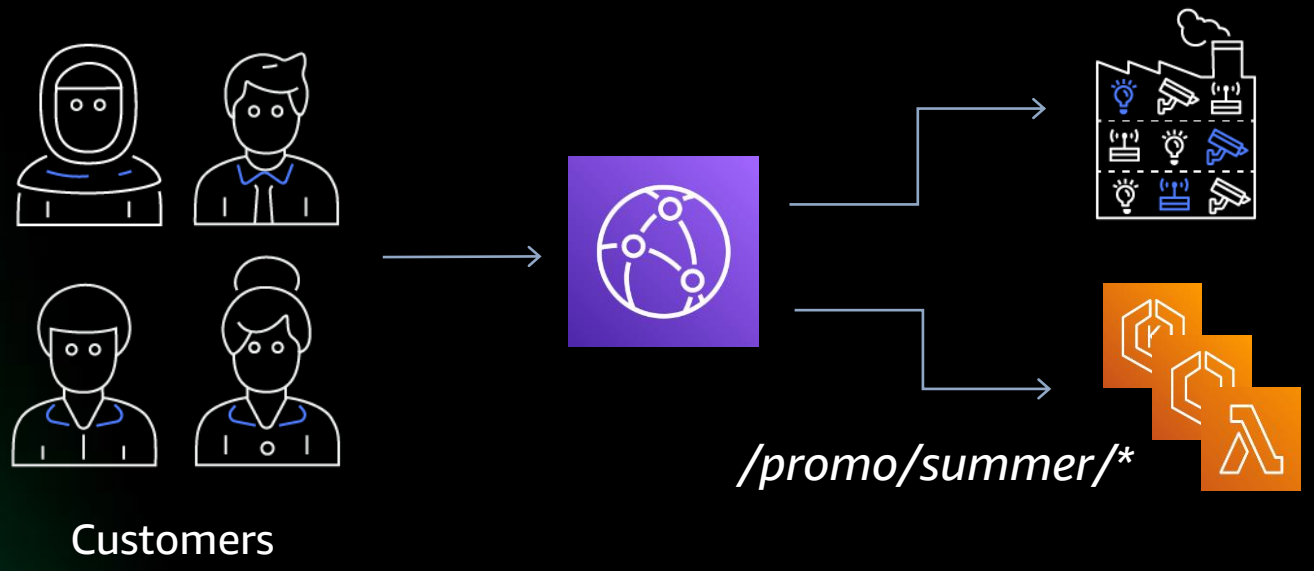
Traffic migration with reverse proxy

- Useful when running experimental module on the cloud



Path pattern based origin routing

- Useful when running experimental module on the cloud
- Progressively migrate more modules



Accelerating modernization with AWS Edge Services

Amazon CloudFront benefits

- Built-in resiliency
- Accelerate dynamic content delivery and APIs
- Deliver fast, secure websites
- Low operational overhead

- Multiple origin with path-based routing
- Geo Location-based routing
- Edge computing

Amazon CloudFront benefits

Security Benefits:

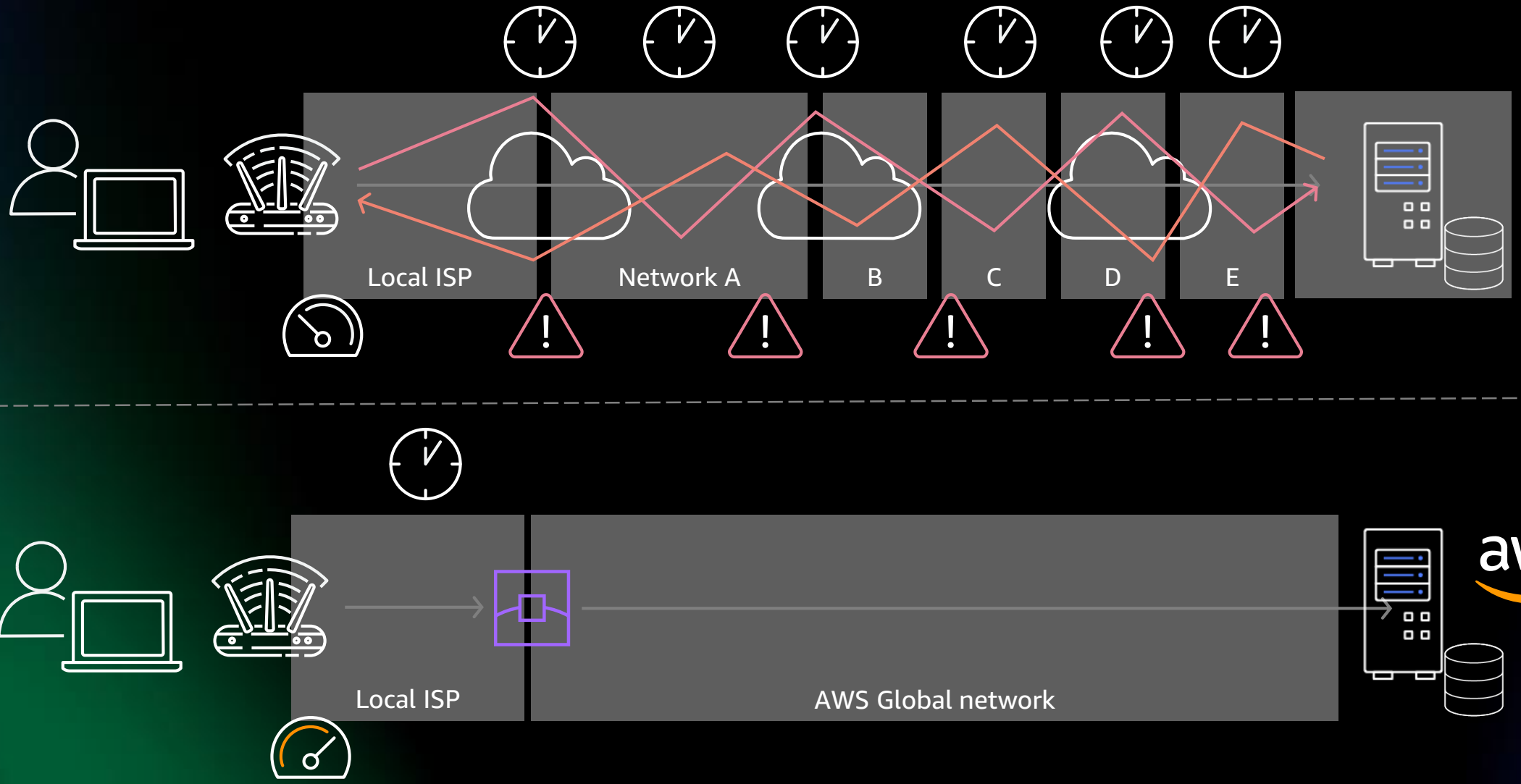
- Encryption of content and traffic
- Access controls
- Content at edge location reduces cybersecurity attack effectiveness
- Industry leading compliance standards

Amazon Global Network

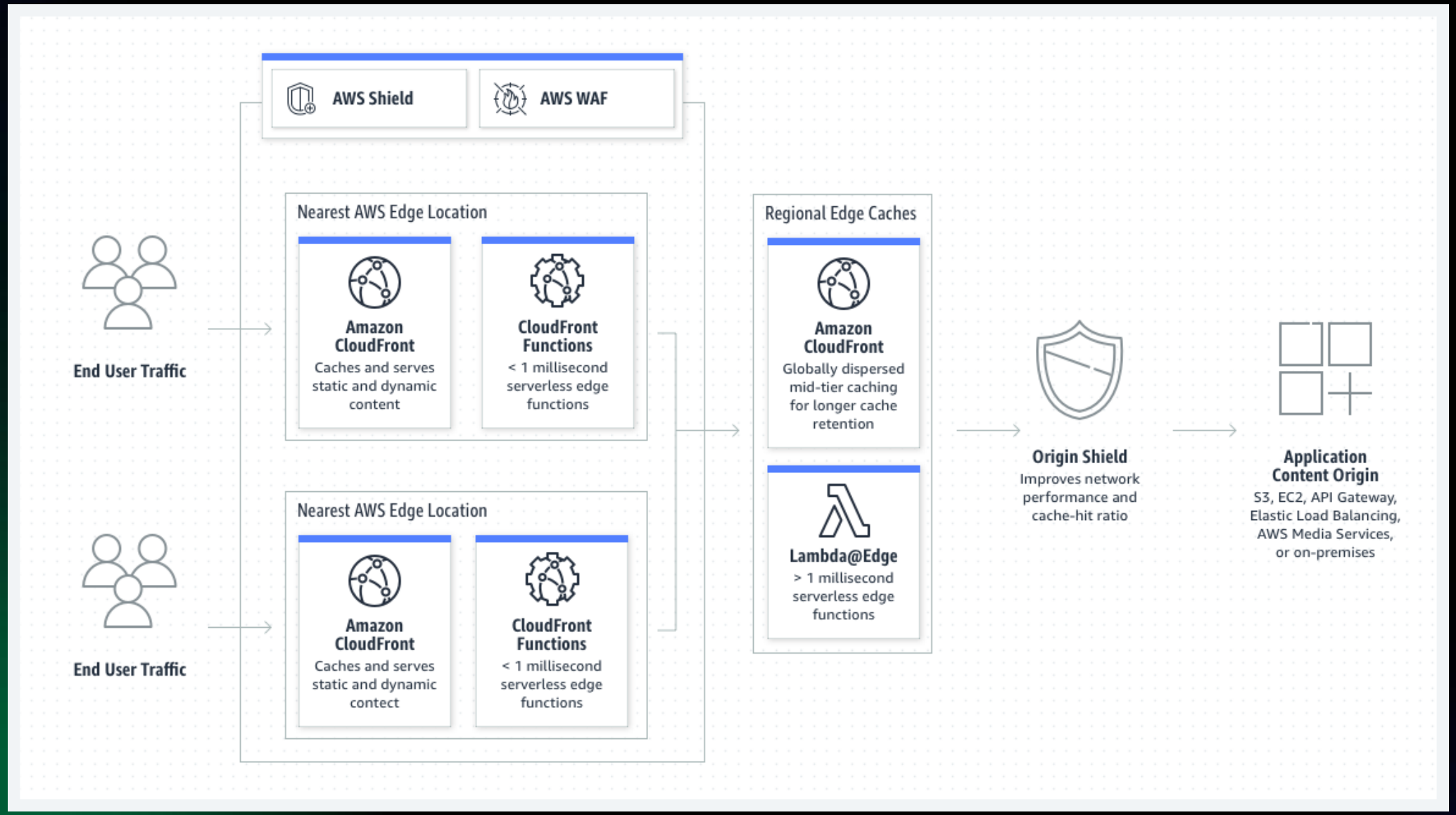
Private network capacity between all AWS Regions, except China

aws

Fronting your application with edge services

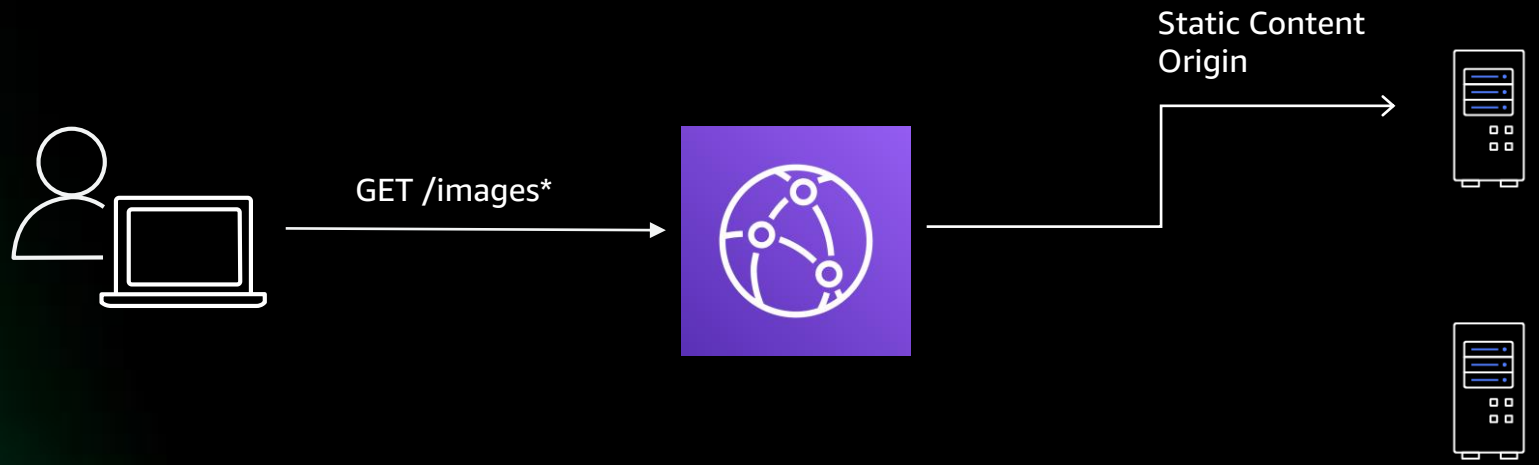


How Does Amazon CloudFront Work?



Demo – using multiple origins with path pattern

Use URI path pattern to route requests



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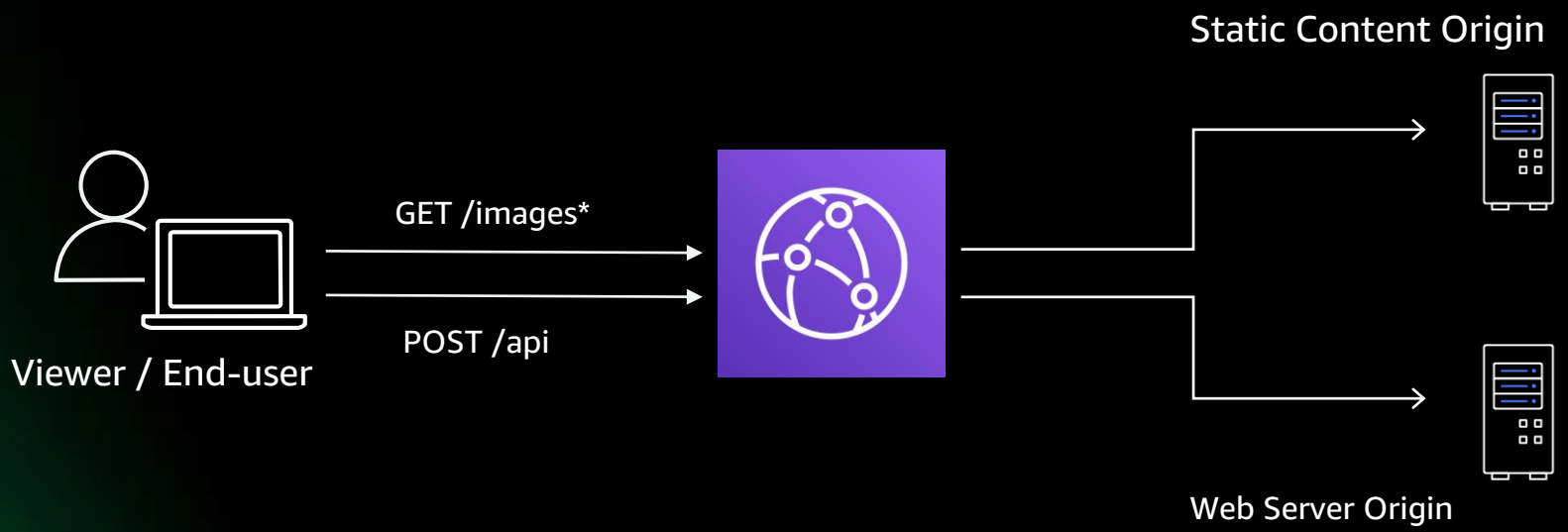
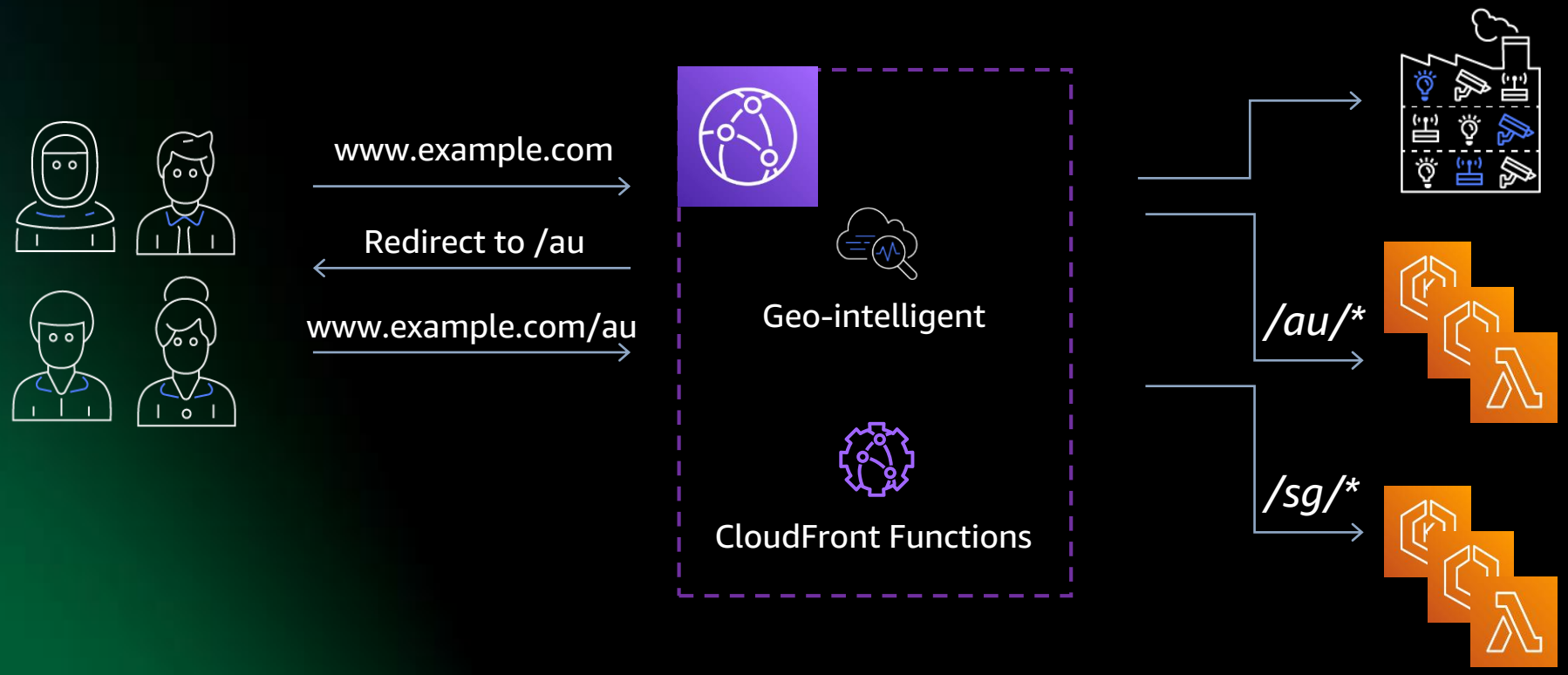


Demo

Demo – serving content for different countries

Traffic routing by client geo

- CloudFront can redirect the request to a specific path based on client geo info
- Customer can expand the application progressively per country



Traffic routing by client geo

CloudFront-Viewer-Country-Name: United States

CloudFront-Viewer-Country-Region: MI

CloudFront-Viewer-Country-Region-Name: Michigan

CloudFront-Viewer-City: Ann Arbor

CloudFront-Viewer-Postal-Code: 48105

CloudFront-Viewer-Time-Zone: America/Detroit

CloudFront-Viewer-Latitude: 42.30680

CloudFront-Viewer-Longitude: -83.70590

CloudFront-Viewer-Metro-Code: 505

Demo Details

CloudFront geo-intelligence

CloudFront looks up the country, region, city information with client IP

Geo information can be sent to upstream as a header

Provided by CloudFront with no extra cost

CloudFront Functions

JavaScript code run at the edge location

Ability to read HTTP headers, cookies, URI, and modify

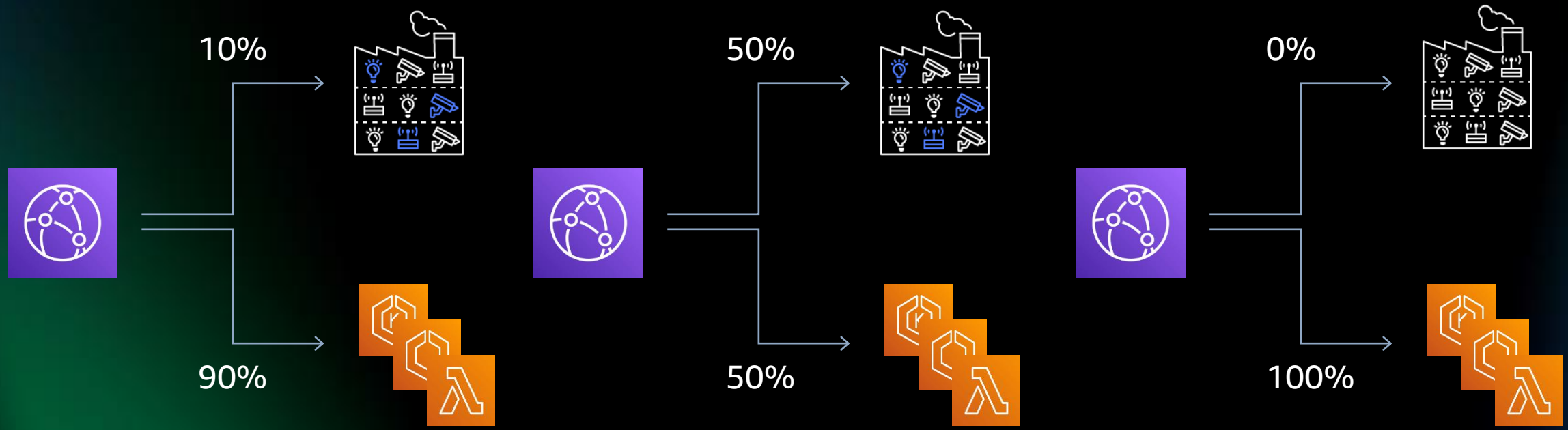
Fast (running <1ms) and scalable

Demo

Demo – blue/green deployment

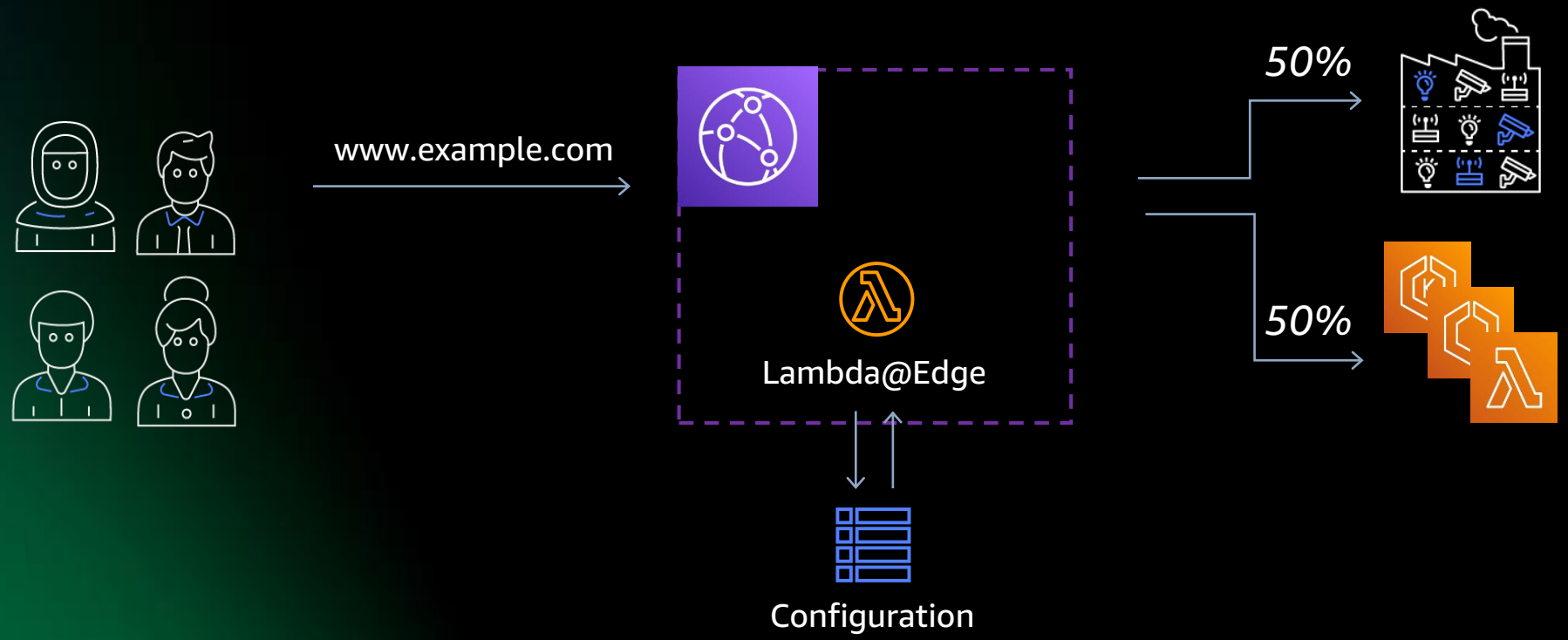
Using Amazon CloudFront to do progressive blue/green deployment

- Blue/green deployment of whole application, or certain part of applications
- Monitor error trend and roll back safely



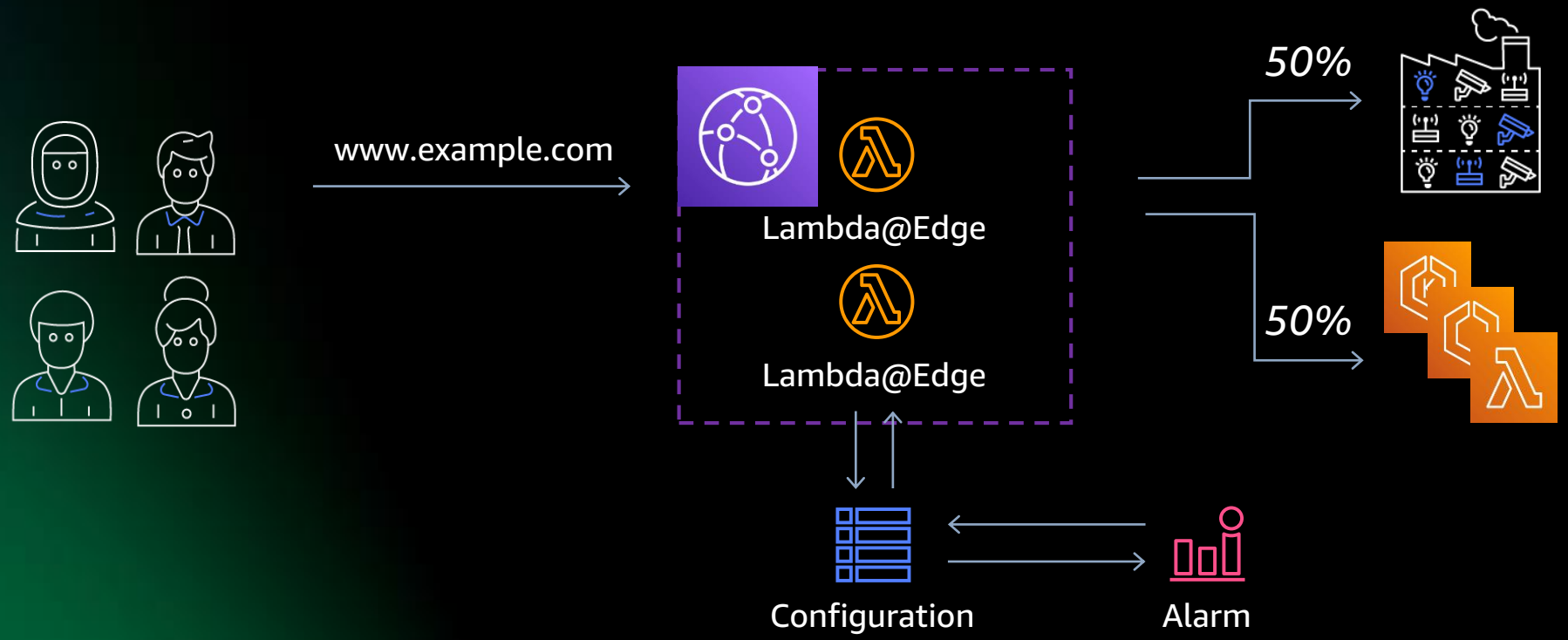
Progressive blue/green routing with Lambda@Edge

- Use a Lambda@Edge function to change the origin of the request
- Instantly switch back by changing configuration



Preserve session and automate fail back

- Use Lambda@Edge to set a cookie and use cookie to maintain session
- Automatic configuration change with alarm

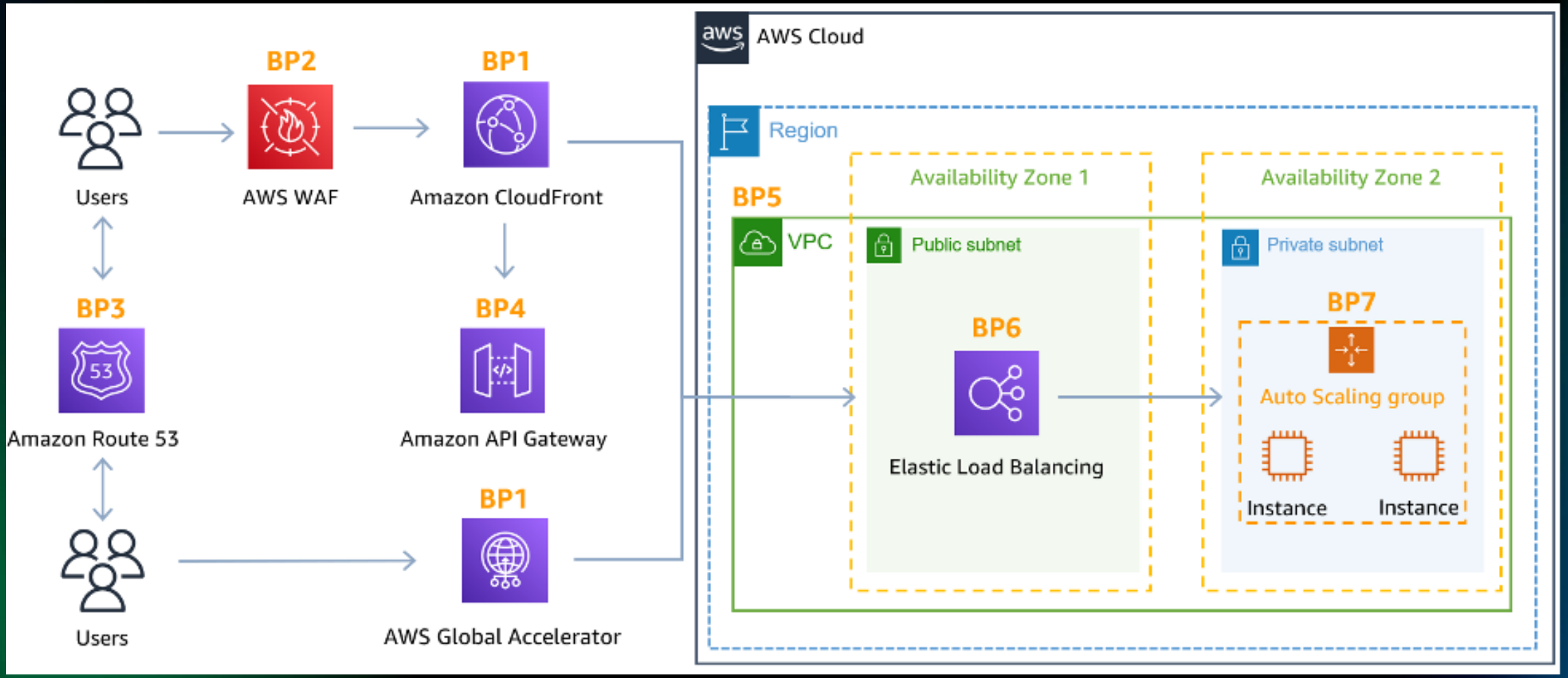


Demo

Demo – Adding WAF protections

Increase web application security

- Add pre-built WAF rules to help protect websites
  - Amazon IP Reputation list, Core rule set, known bad inputs and SQLi Database protections



Demo

Resources

Getting Started with Amazon CloudFront
https://docs.aws.amazon.com/AmazonCloudFront/latest/DeveloperGuide/GettingStarted.SimpleDistribution.html

Code references and examples

- Blue/Green Testing Example: https://github.com/aws-samples/ab-testing-at-edge
- Amazon CloudFront Functions Examples: https://github.com/aws-samples/amazon-cloudfront-functions
  - Redirect
  - Add headers
  - Verify JWT tokens

Resources

AWS Web Application Firewall Rule groups to protect web applications

Baseline rule groups - Core rule set (CRS) managed rule group - https://docs.aws.amazon.com/waf/latest/developerguide/aws-managed-rule-groups-baseline.html#aws-managed-rule-groups-baseline-crs

Baseline rule groups - Known bad inputs managed rule group - https://docs.aws.amazon.com/waf/latest/developerguide/aws-managed-rule-groups-baseline.html#aws-managed-rule-groups-baseline-known-bad-inputs

IP reputation rule groups - https://docs.aws.amazon.com/waf/latest/developerguide/aws-managed-rule-groups-ip-rep.html

Use-case specific rule groups - SQL database managed rule group - https://docs.aws.amazon.com/waf/latest/developerguide/aws-managed-rule-groups-use-case.html#aws-managed-rule-groups-use-case-sql-db

Visit the Modern Applications resource hub

Dive deeper with these resources to help you develop an effective plan for your modernization journey.

- Build modern applications on AWS
- Business value of cloud modernization
- An introduction to event-driven architectures
- Accelerate full-stack web and mobile app development
- Determining the total cost of ownership: Comparing serverless and server-based technologies
- Building event-driven architectures with AWS
- Continuous learning, continuous modernization

https://tinyurl.com/modern-apps-aws

Visit resource hub

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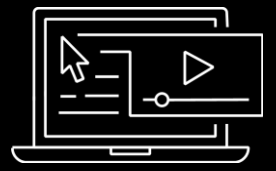
Achieve key milestones and plan your next steps with the AWS Modern Application skills training



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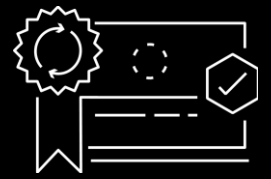

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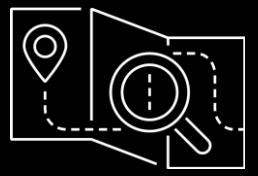
AWS Certified DevOps – Professional



Create a self-paced learning roadmap
AWS ramp-up guide - Developer
AWS ramp-up guide - DevOps

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