
AWS
re:Invent

ARC307

Going global in minutes: Multi-Region expansion simplified

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Principal Solutions Architect
AWS

Brandon Leach
Software Architect
Autodesk

AWS re:Invent

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Agenda

- What is Multi-Region?
- Why Multi-Region?
- AWS and Multi-Region
- Who is using Multi-Region?
- Autodesk’s Approach to Multi-Region
- Demo

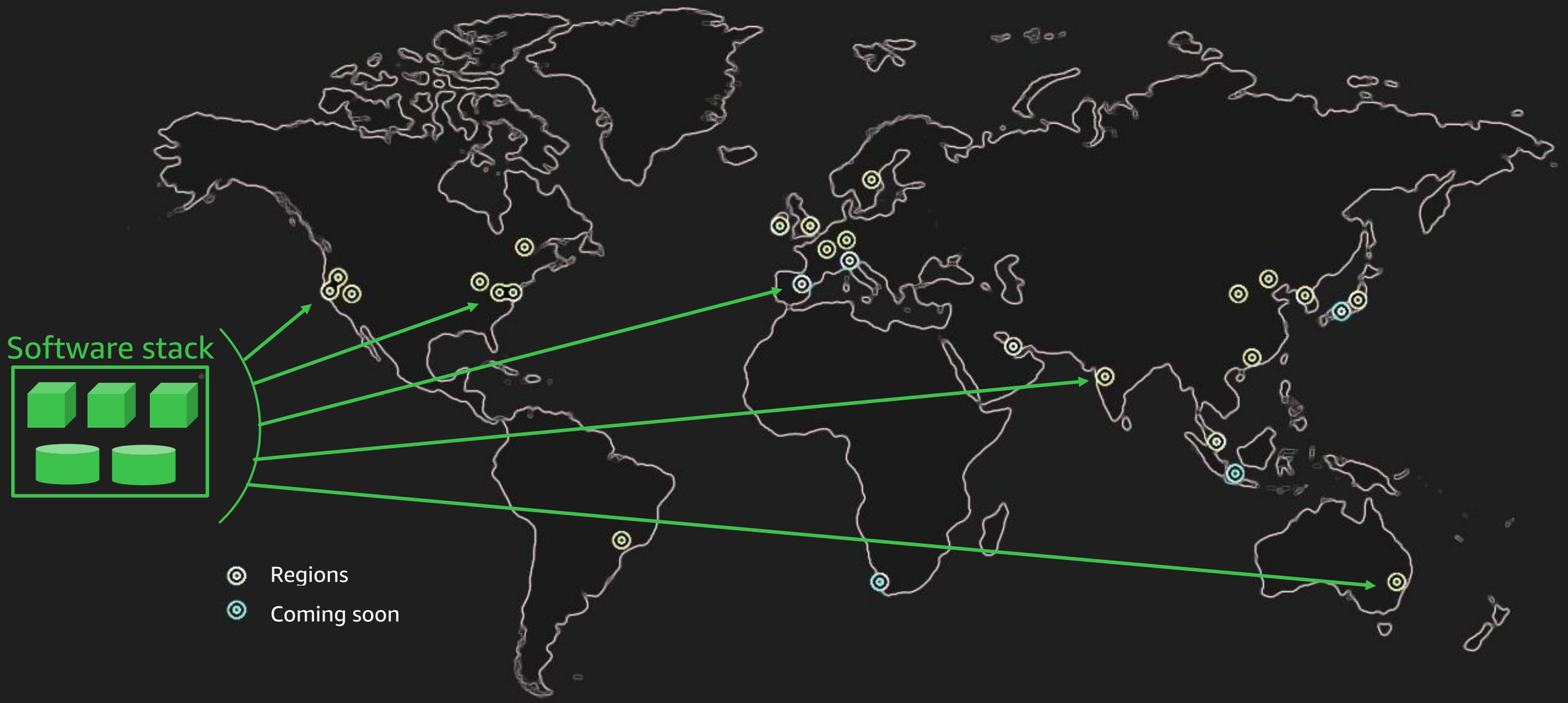


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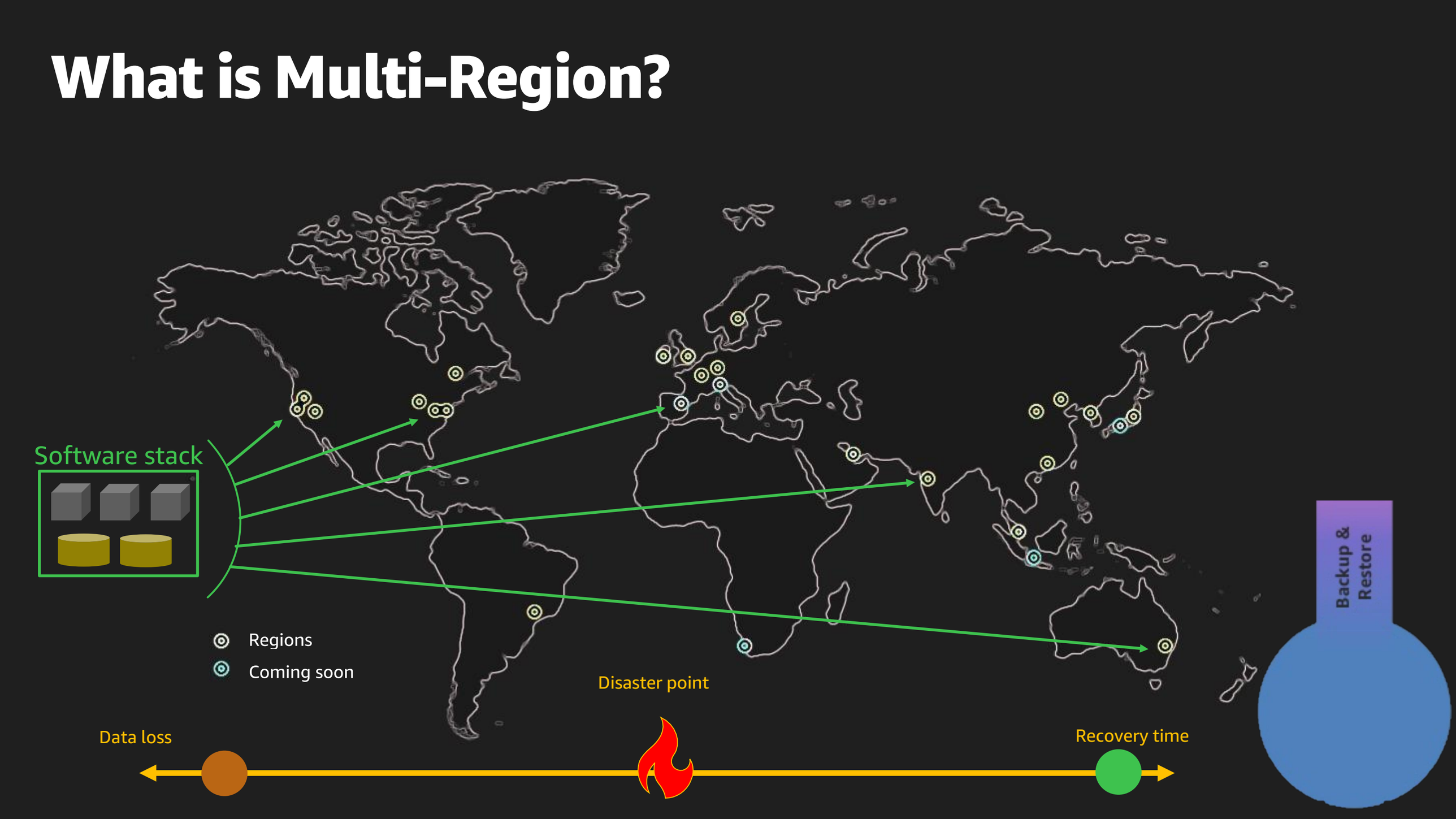
What is Multi-Region?



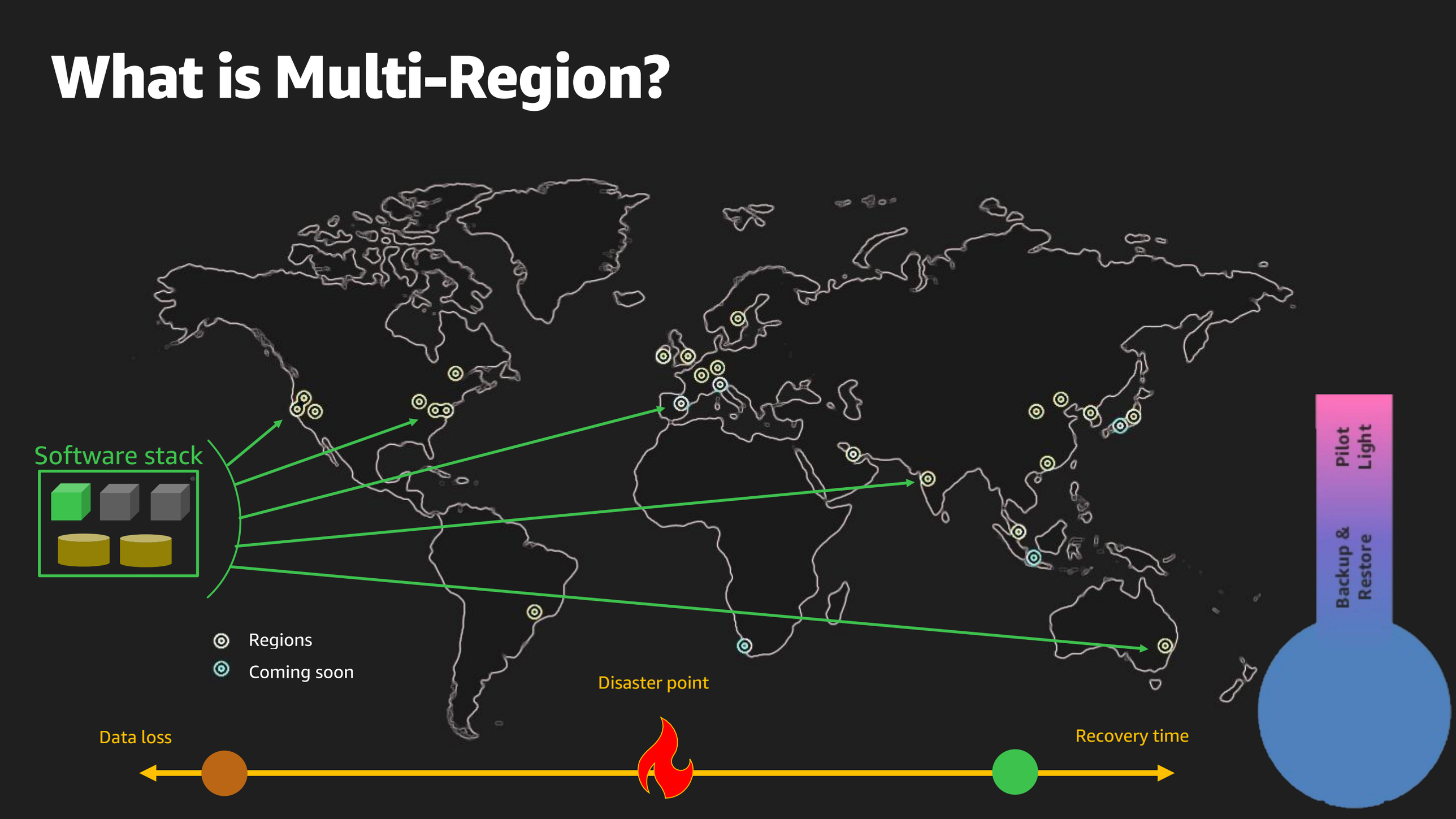
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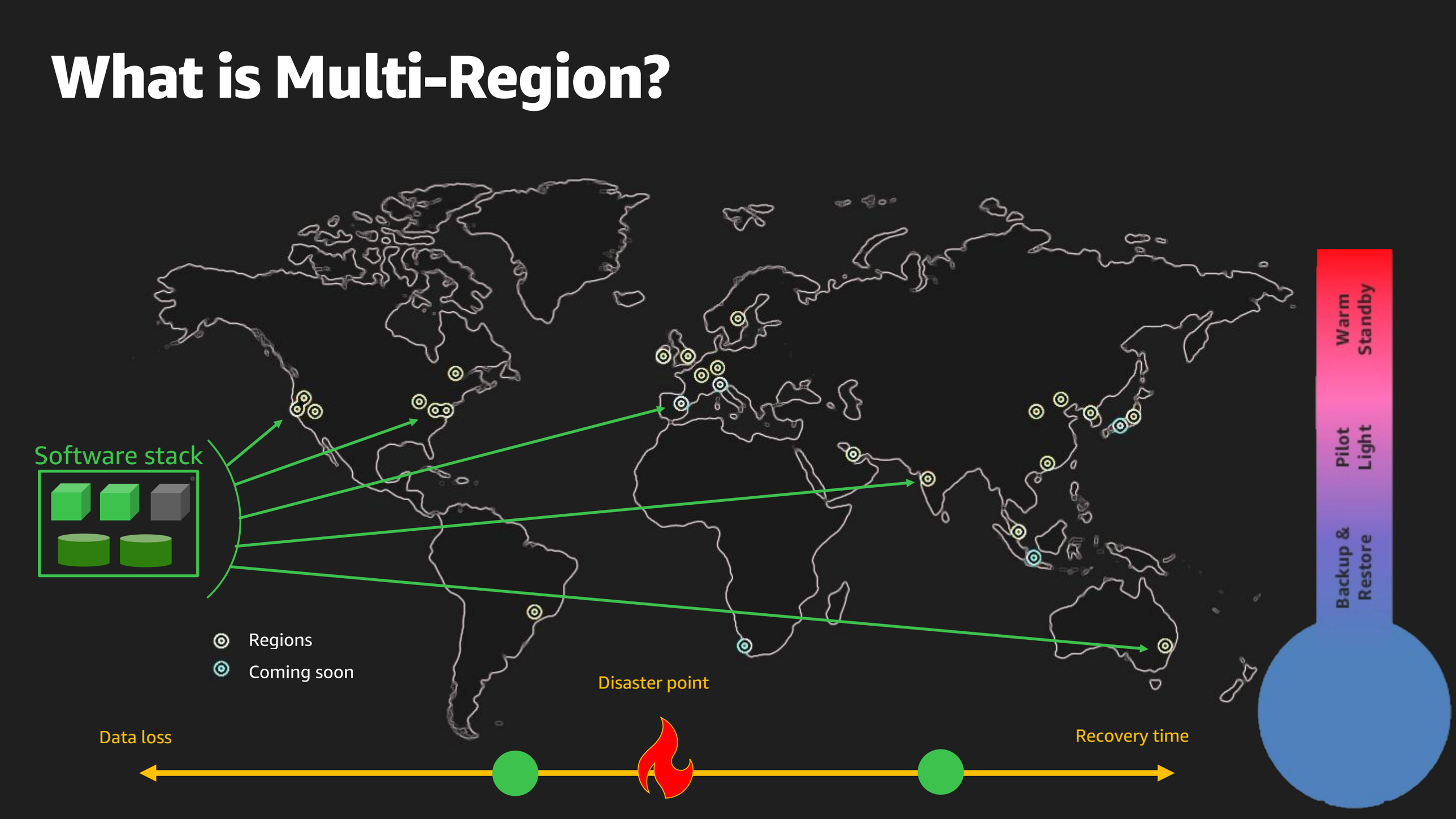
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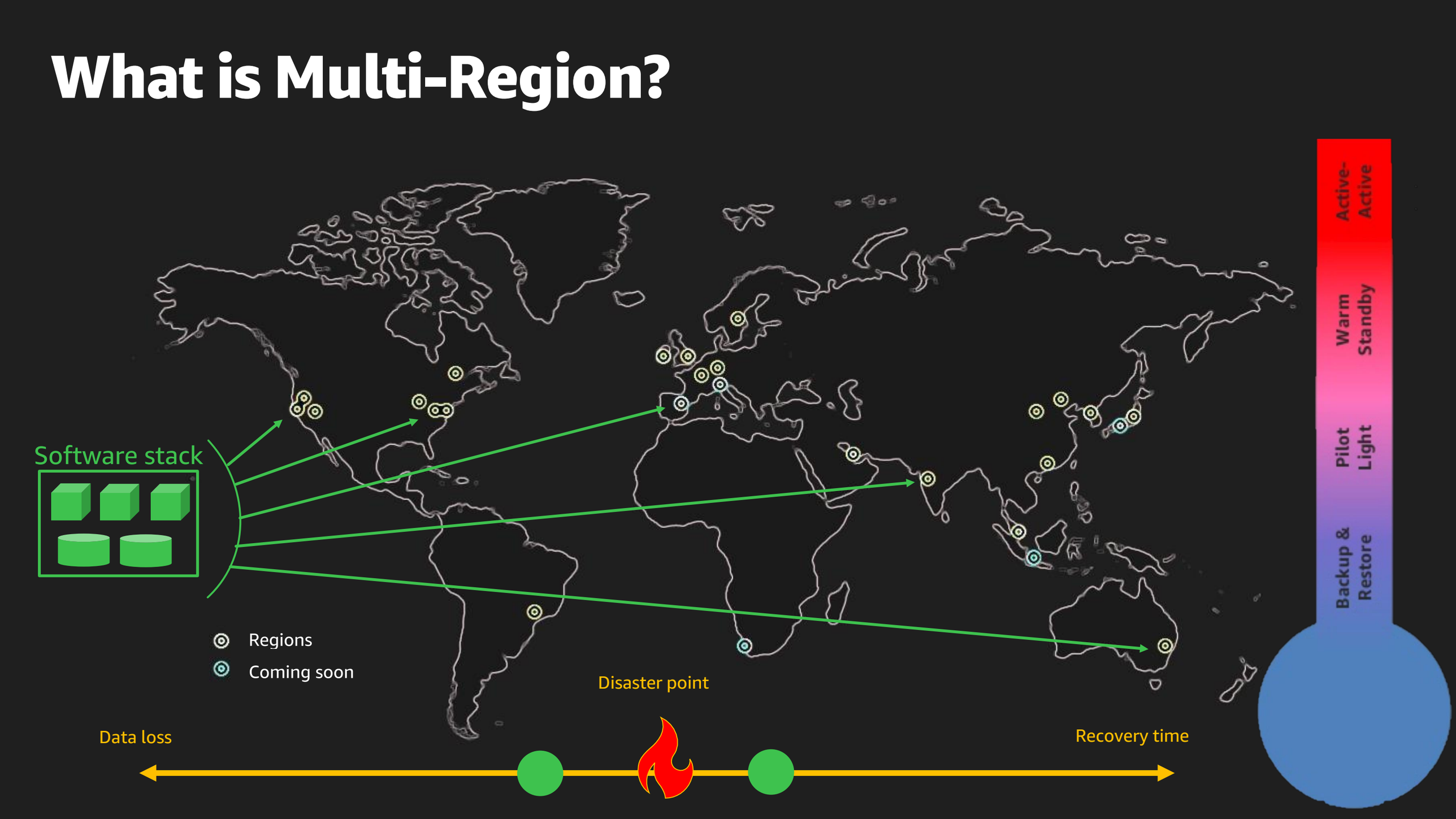
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What is Multi-Region?



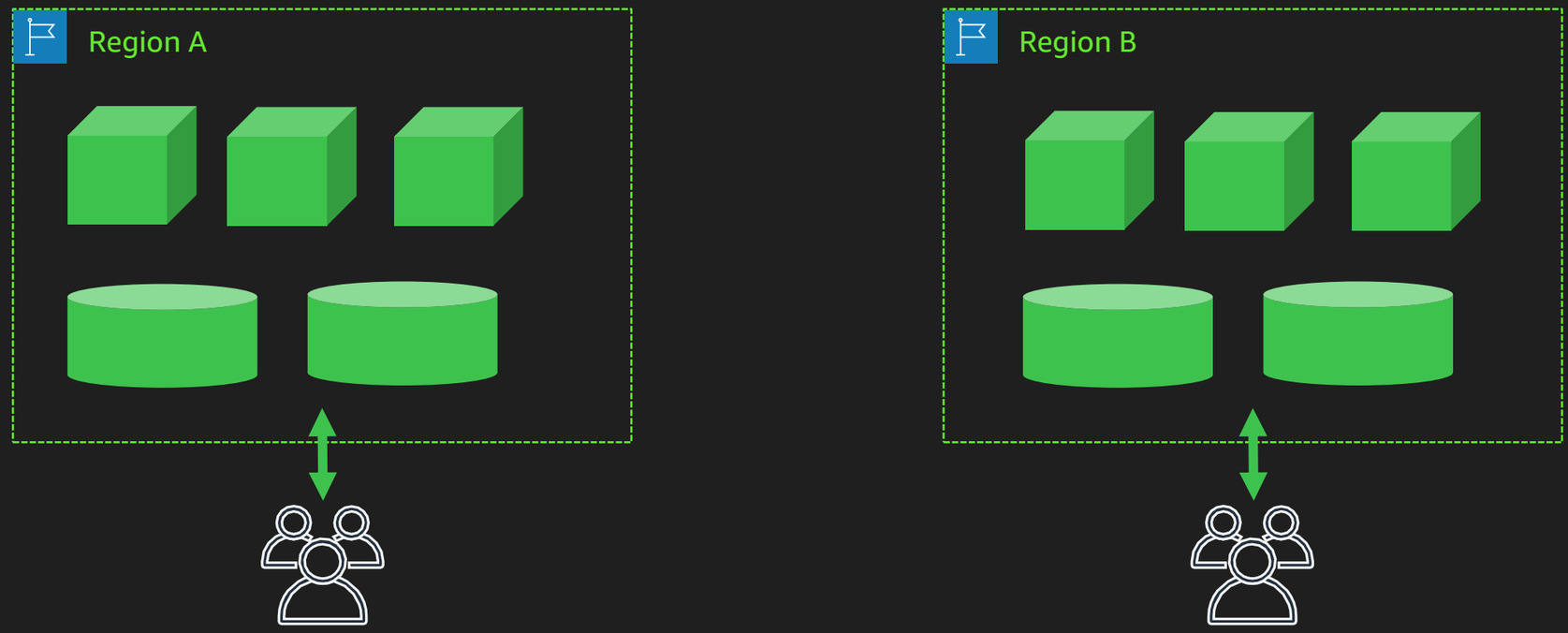
What is Multi-Region?



Why Multi-Region?

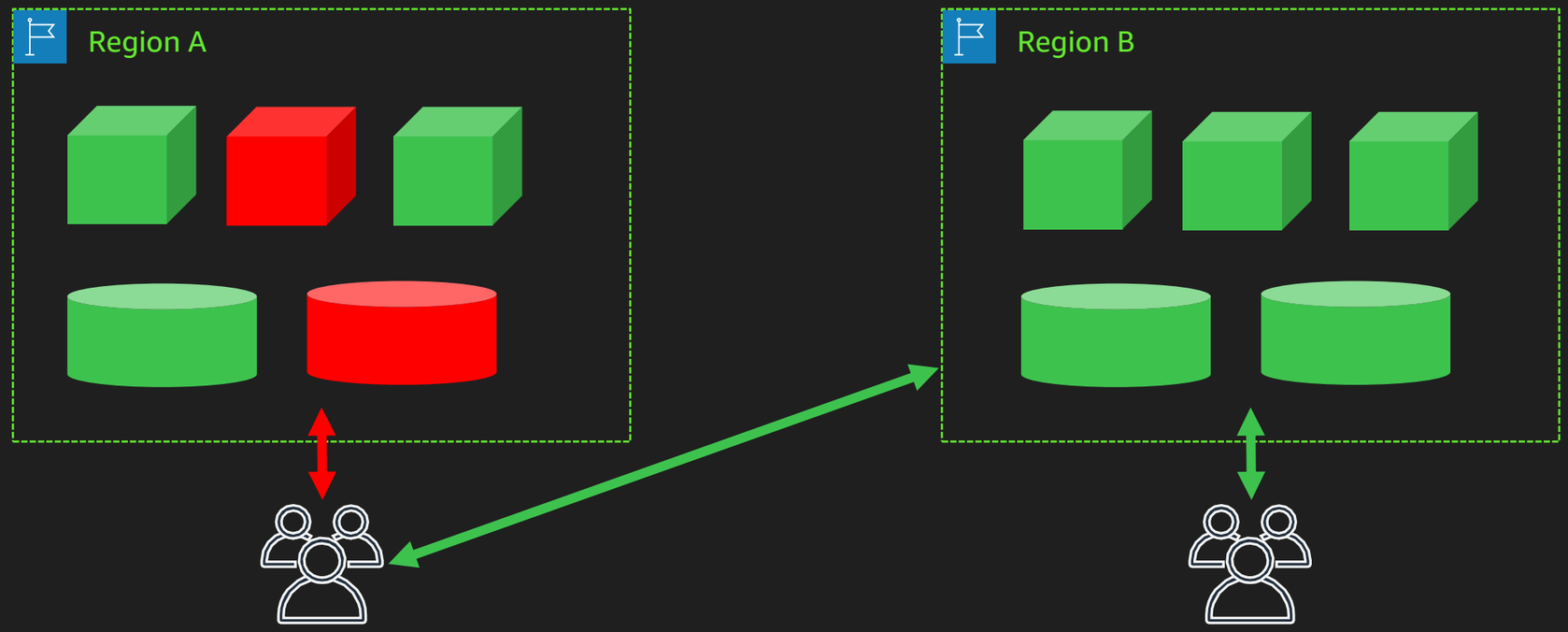
Why Multi-Region?

1. Disaster recovery



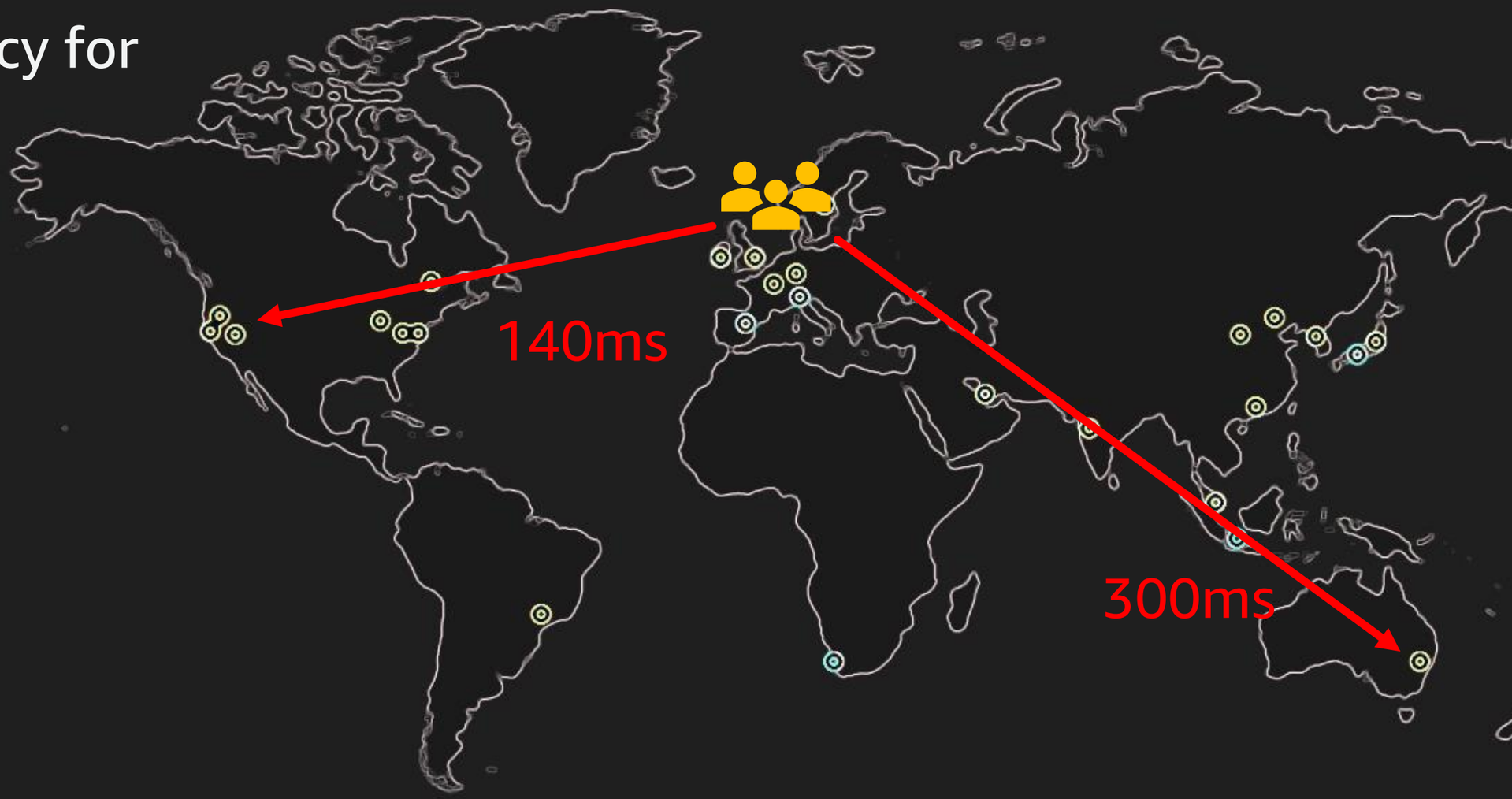
Why Multi-Region?

1. Disaster recovery



Why Multi-Region?

1. Disaster recovery
2. Improve Latency for end-users



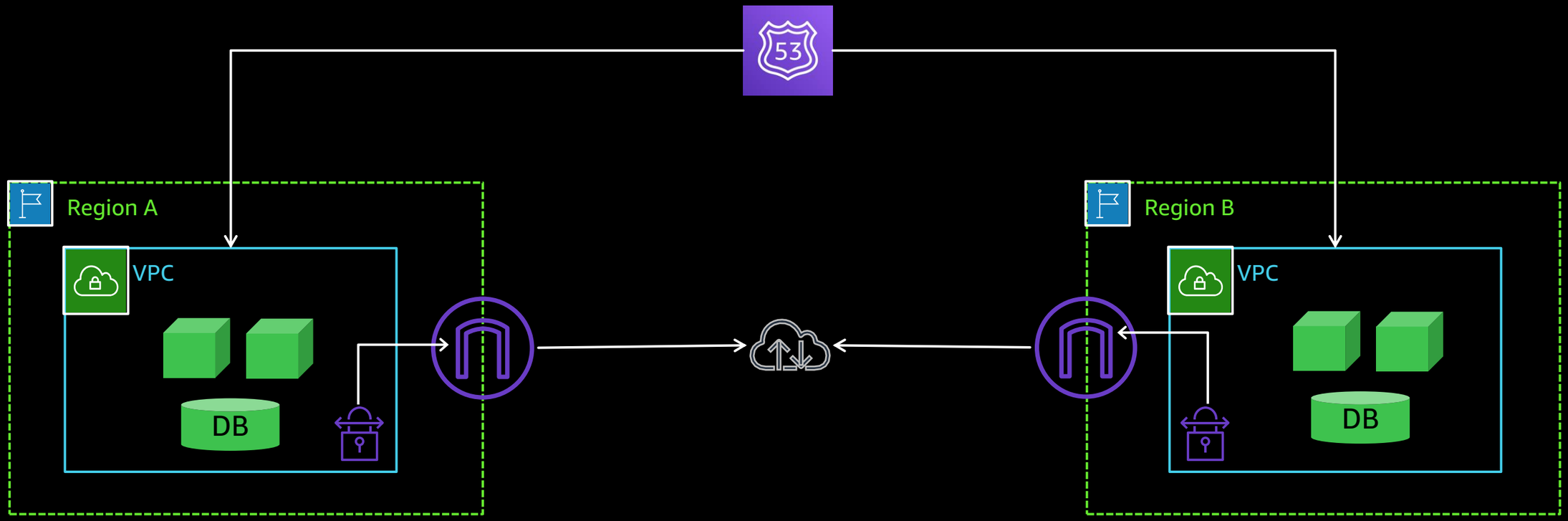
Why Multi-Region?

1. Disaster recovery
2. Improve Latency for end-users
3. Business requirements / compliance



AWS and Multi-Region

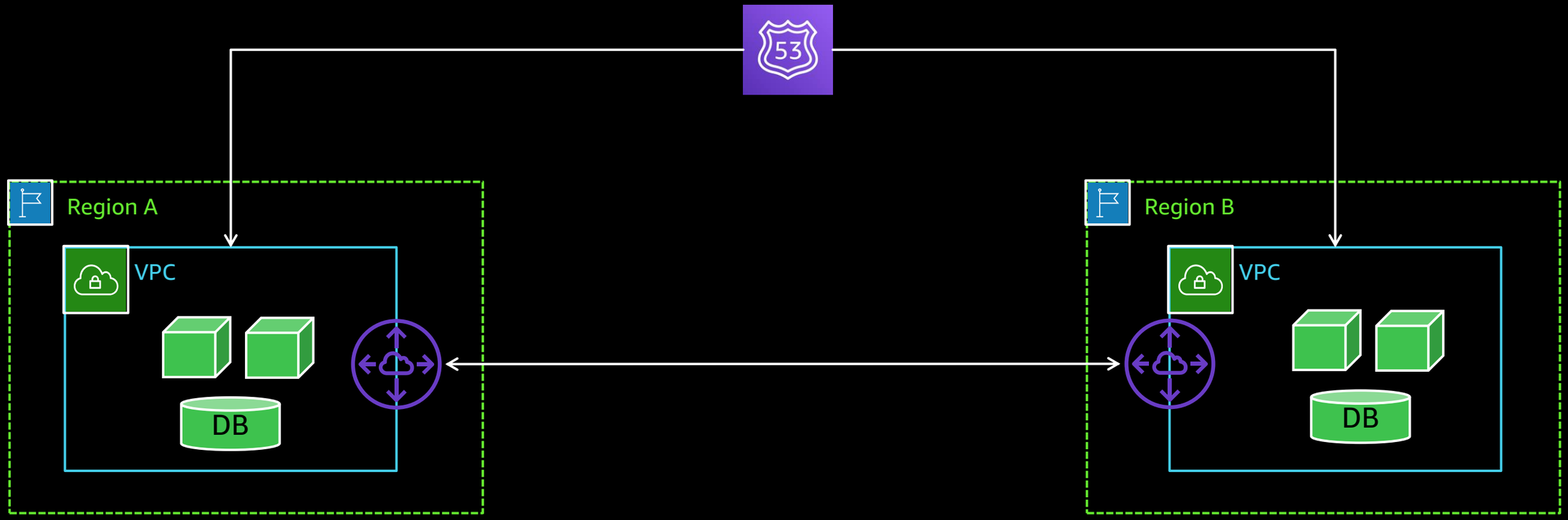
NETWORKING



AMAZON VPC + VPN

AWS and Multi-Region

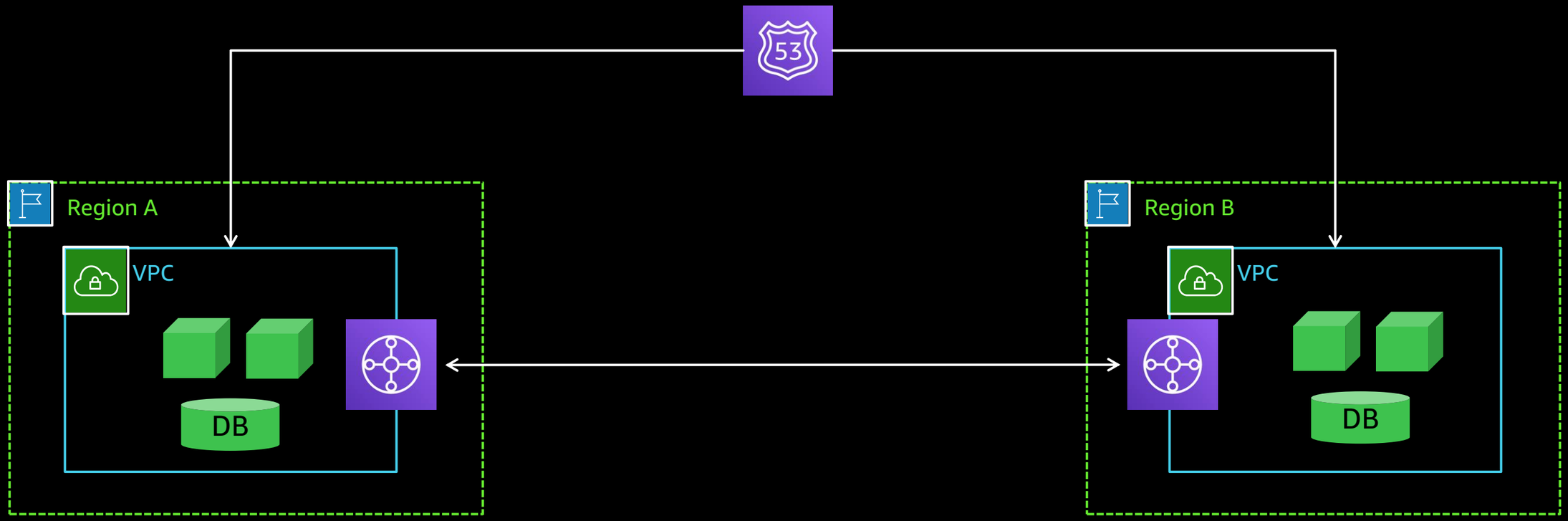
NETWORKING



INTER-REGION VPC PEERING

AWS and Multi-Region

NETWORKING



TRANSIT GATEWAYS

AWS and Multi-Region

PERSISTENCE CHALLENGES

Default Multi-AZ

Configurable for Multi-AZ


Amazon S3


Amazon EFS


Amazon Elastic Search


Amazon RDS


Amazon Aurora


Amazon DynamoDB


Amazon QLDB


Amazon ElastiCache


Amazon DocumentDB


Amazon Neptune


Amazon Kinesis


Amazon SQS


Amazon MQ


Amazon Managed Streaming Kafka

File Store

Search

RDBMS

NoSQL

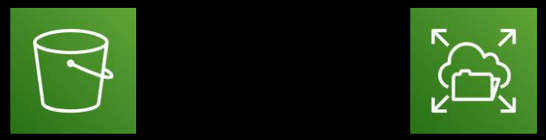
Streams

AWS and Multi-Region

PERSISTENCE CHALLENGES

Default Multi-AZ

Configurable for Multi-AZ

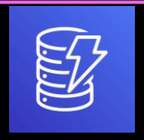

Amazon S3

Amazon EFS

Already Multi-AZ support for high availability

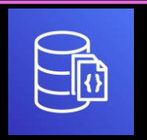

Amazon RDS


Amazon Aurora


Amazon DynamoDB


Amazon QLDB


Amazon ElastiCache


Amazon DocumentDB


Amazon Neptune


Amazon Kinesis


Amazon SQS


Amazon MQ


Amazon Managed Streaming Kafka

File Store

Search

RDBMS

NoSQL

Streams

AWS and Multi-Region

DEPLOYMENT CHALLENGES



Cloud Formation



CDK

Customer-specific









Who is doing Multi-Region?



Netflix



Autodesk



CapitalOne

Who is doing Multi-Region?

Project Nimble

- Make failing fast, fast
- Designing the right tool
  - Dark Capacity
  - Re-routing





REFERENCE: https://netflixtechblog.com/project-nimble-region-evacuation-reimagined-d0d0568254d4

Who is doing Multi-Region?

- Application Resilience
- Global Load-balancing
  - Geo-proximity to users
- Terraform deployment



REFERENCE: https://www.capitalone.com/tech/software-engineering/multi-region-deployments-with-terraform-kubernetes/

Autodesk's Approach to Multi-Region



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AUTODESK.



Image courtesy of Tesla Motors, Inc.



Image courtesy of Gensler.





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”Making our products and services available in new regions takes months, it needs to take minutes.”

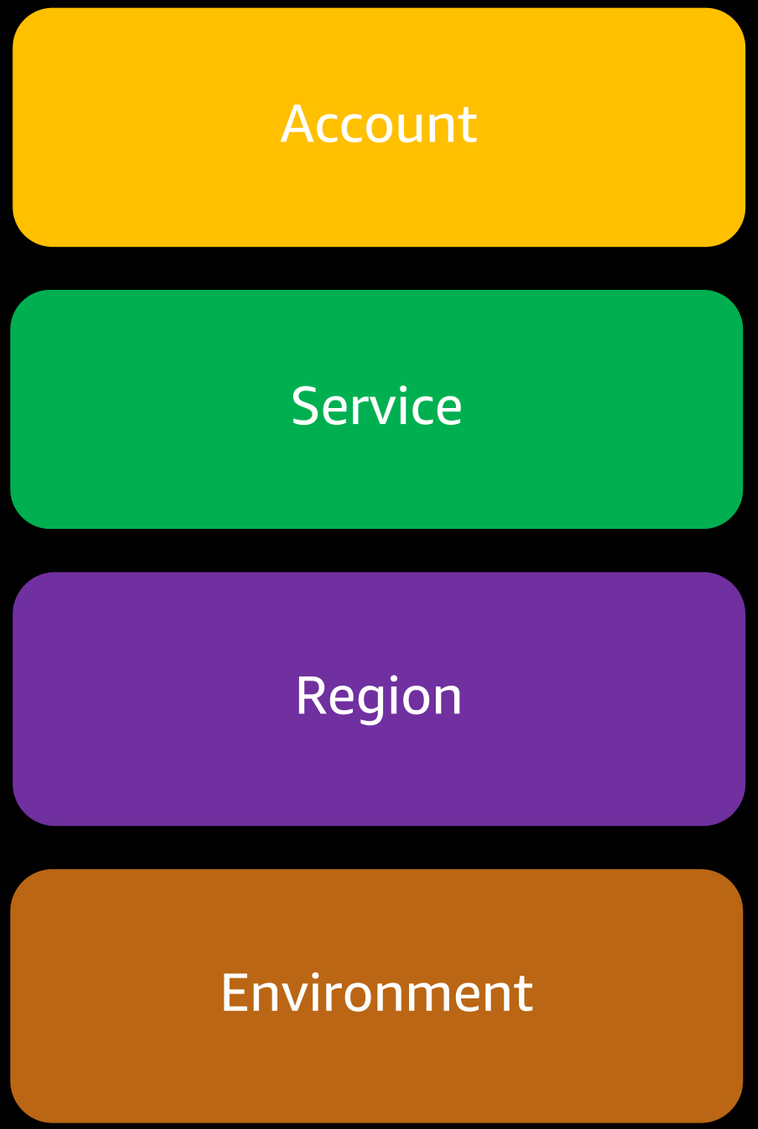
Ben Cochran

Sr. Director - Autodesk

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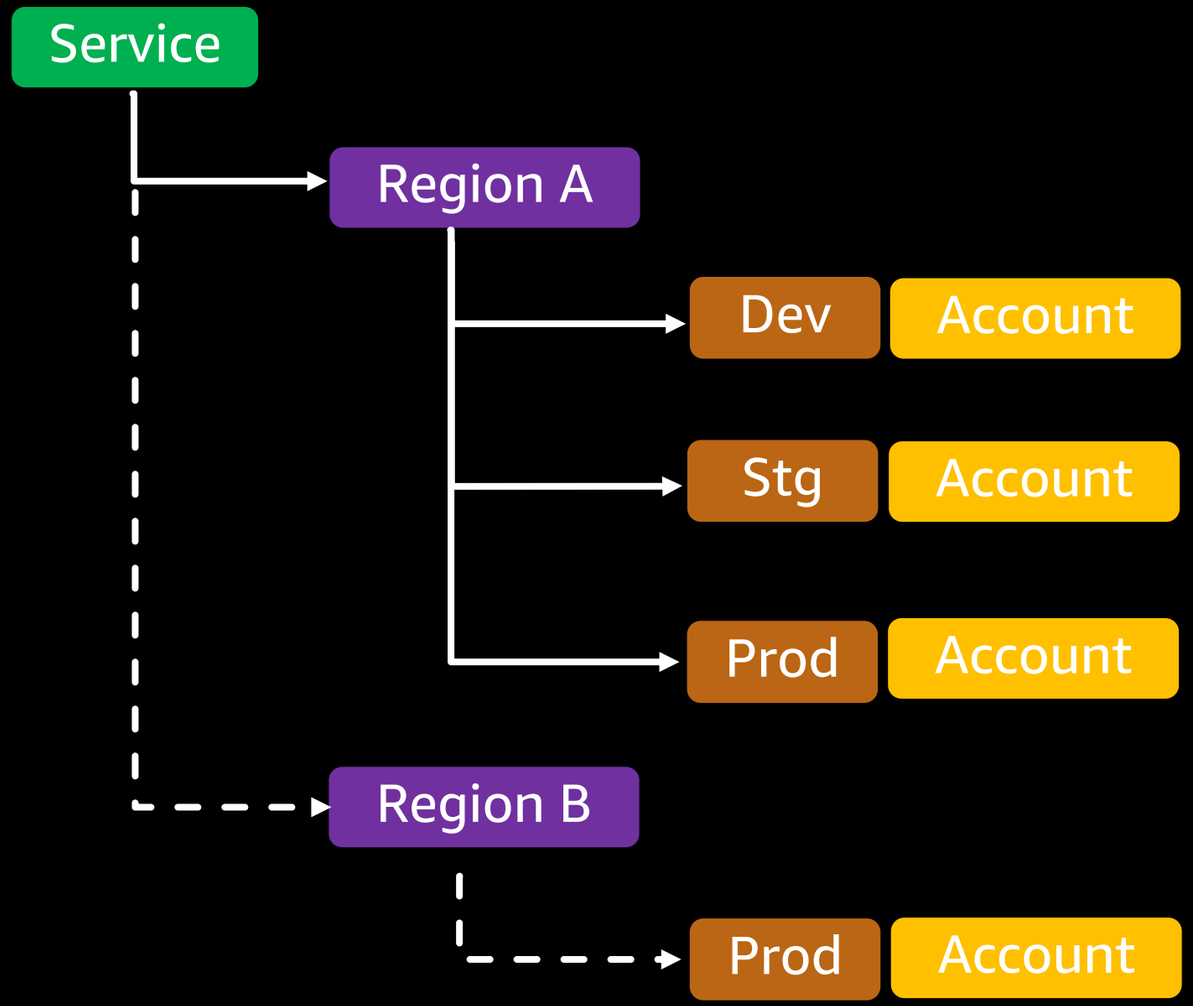
Multi-Region Account Strategy



Considerations

- **Security and Compliance**
- **Scalability**
- **Ease of Automation**
- **Billing and Tax Regimes**

Multi-Region Account Strategy



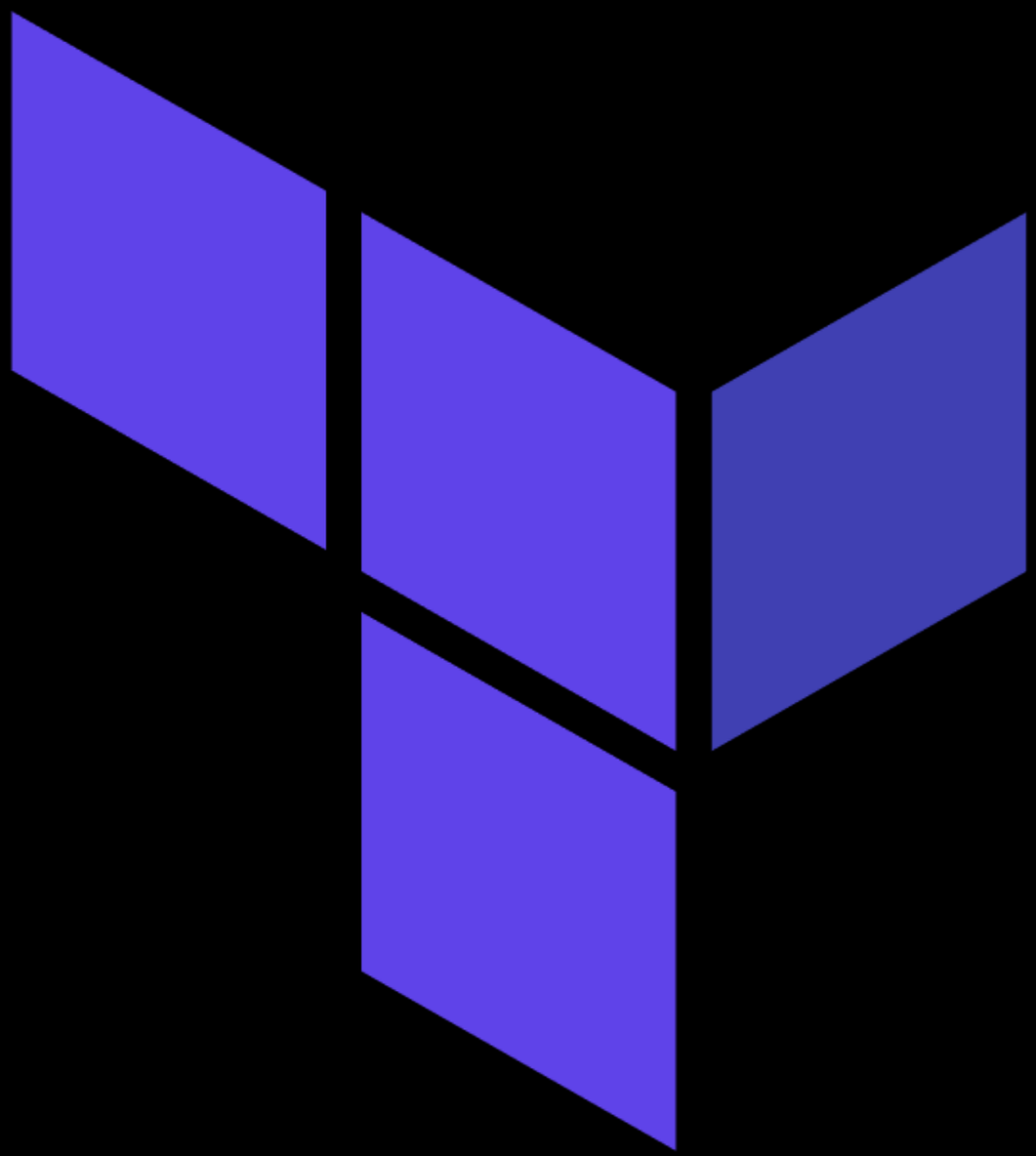
Pros

- Security and resource isolation
- Easier to automate
- Scalable
- Simplified billing per account

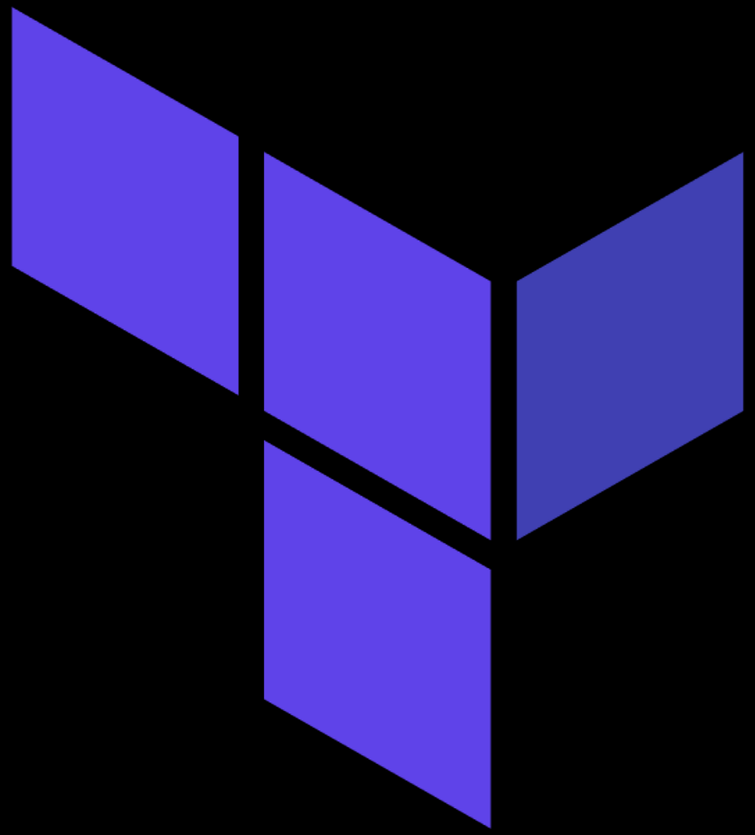
Cons

- Account setup overhead
- Networking complexity


Spinnaker




Spinnaker



APPLICATION DEFINTION FILE(s)

- Abstracts complexity of Spinnaker pipelines and Terraform
- Declarative interface for service deployment requirements with a GitOps Workflow
- Eliminates boilerplate configuration
- Integrates management of infrastructure along with code deployments

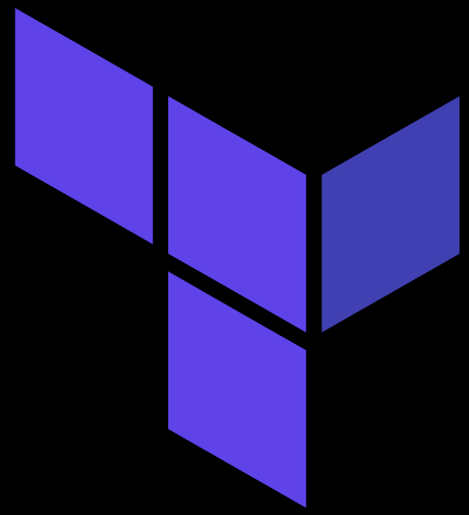
APPLICATION

DEFINTION

FILE(s)

Skipper





```yaml
---
service: exampleservice
project: testservices
schema: v1
triggers:
  - type: jenkins
    server: jenkins_server
    job: /exampleservice/job/master
notifications:
  slack:
    - channel: "my-service-channel"
  email:
    - address: "our-teams-email@autodesk.com"
pipelines:
  myapp:
    type: ec2
deploy:
  envs:
    - name: dev
      regions:
        - region: aws_region_1
    - name: stg
      regionSequencing: parallel
      approval:
        - type: manual
      regions:
        - region: aws_region_1
        - region: aws_region_2
    - name: prd
      regionSequencing: serial
      approval:
        - type: manual
      regions:
        - region: aws_region_1
        - region: aws_region_2
```

triggers: specifies the CI pipeline trigger

notifications: pipeline deployment notification configuration

type: resource type being deployed

envs: environments which you want to deploy

regions: regions which you want your service deployed for each environment

regionSequencing: multi-region deployment strategy

approval: type of approval is needed before promotion to next environment

```yaml
---
service: exampleservice
project: testservices
schema: v1
triggers:
  - type: jenkins
    server: jenkins_server
    job: /exampleservice/job/master
notifications:
  slack:
    - channel: "my-service-channel"
  email:
    - address: "our-teams-email@autodesk.com"
pipelines:
  myapp:
    type: ec2
deploy:
  envs:
    - name: dev
      regions:
        - region: aws_region_1
    - name: stg
      regionSequencing: parallel
      approval:
        - type: manual
      regions:
        - region: aws_region_1
        - region: aws_region_2
    - name: prd
      regionSequencing: serial
      approval:
        - type: manual
      regions:
        - region: aws_region_1
        - region: aws_region_2
```

triggers: specifies the CI pipeline trigger

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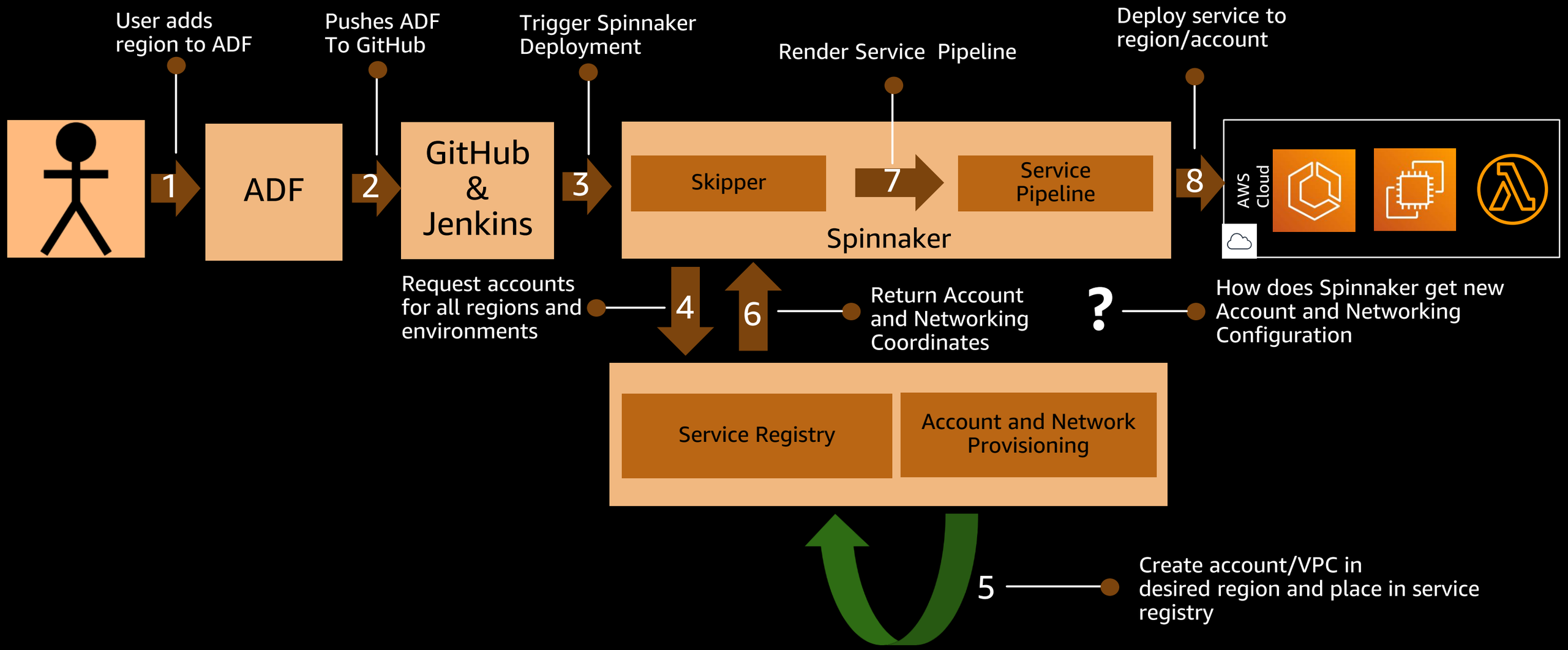
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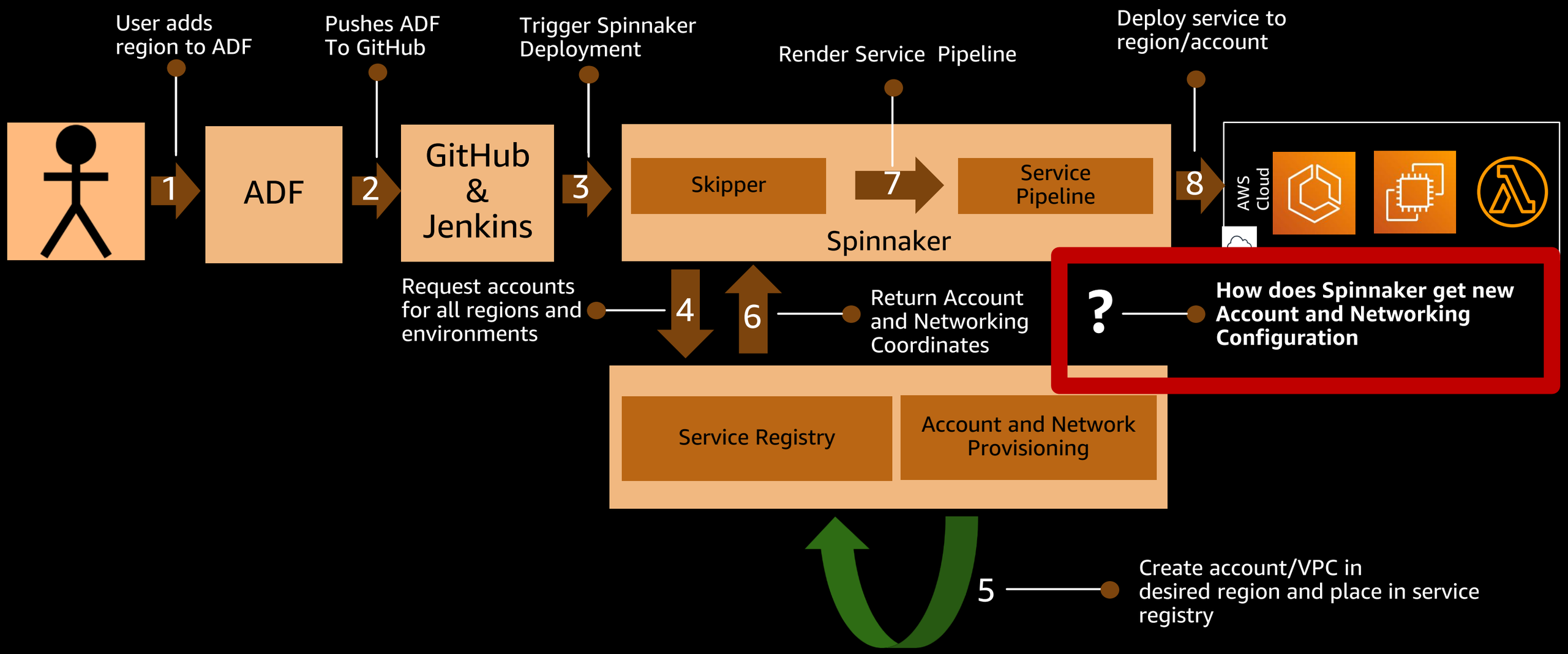
regionSequencing: multi-region deployment strategy

approval: type of approval is needed before promotion to next environment

Detailed End to End Flow



Detailed End to End Flow



Collaboration

AUTODESK

aws professional services

armory

Dynamic Account Registration



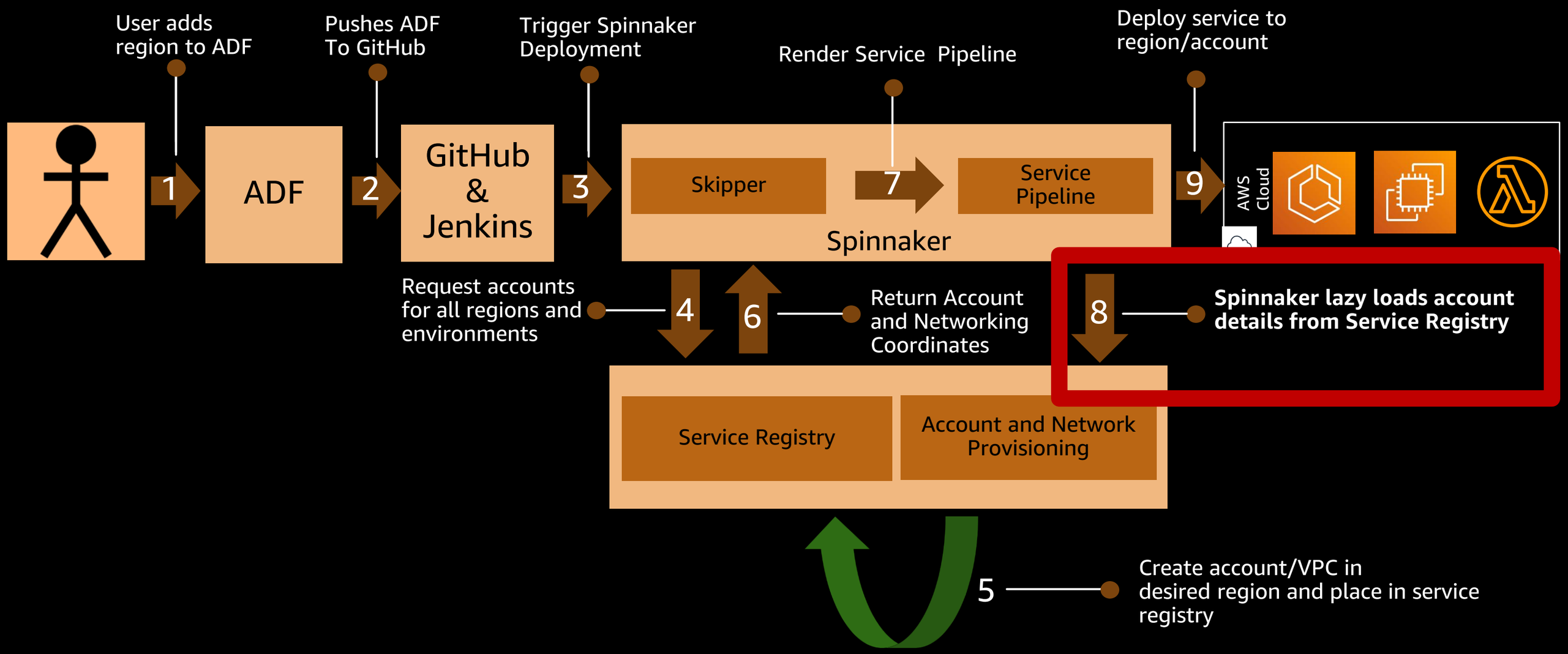
+



Automating new account integration

New account onboarding workflows

Detailed End to End Flow



Thank you!



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