AWS re:Invent

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Thinking serverless: From business problem to serverless solution

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About me



- James Beswick
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- Principal Developer Advocate – AWS Serverless
- Serverless geek
- Software developer and product manager
- Previously:
  - Multiple startup tech guy
  - AWS customer since 2012

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Agenda

- Where we have come from – servers
- Where to start with serverless
- Good practices of serverless design
- Whiteboarding

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Servers

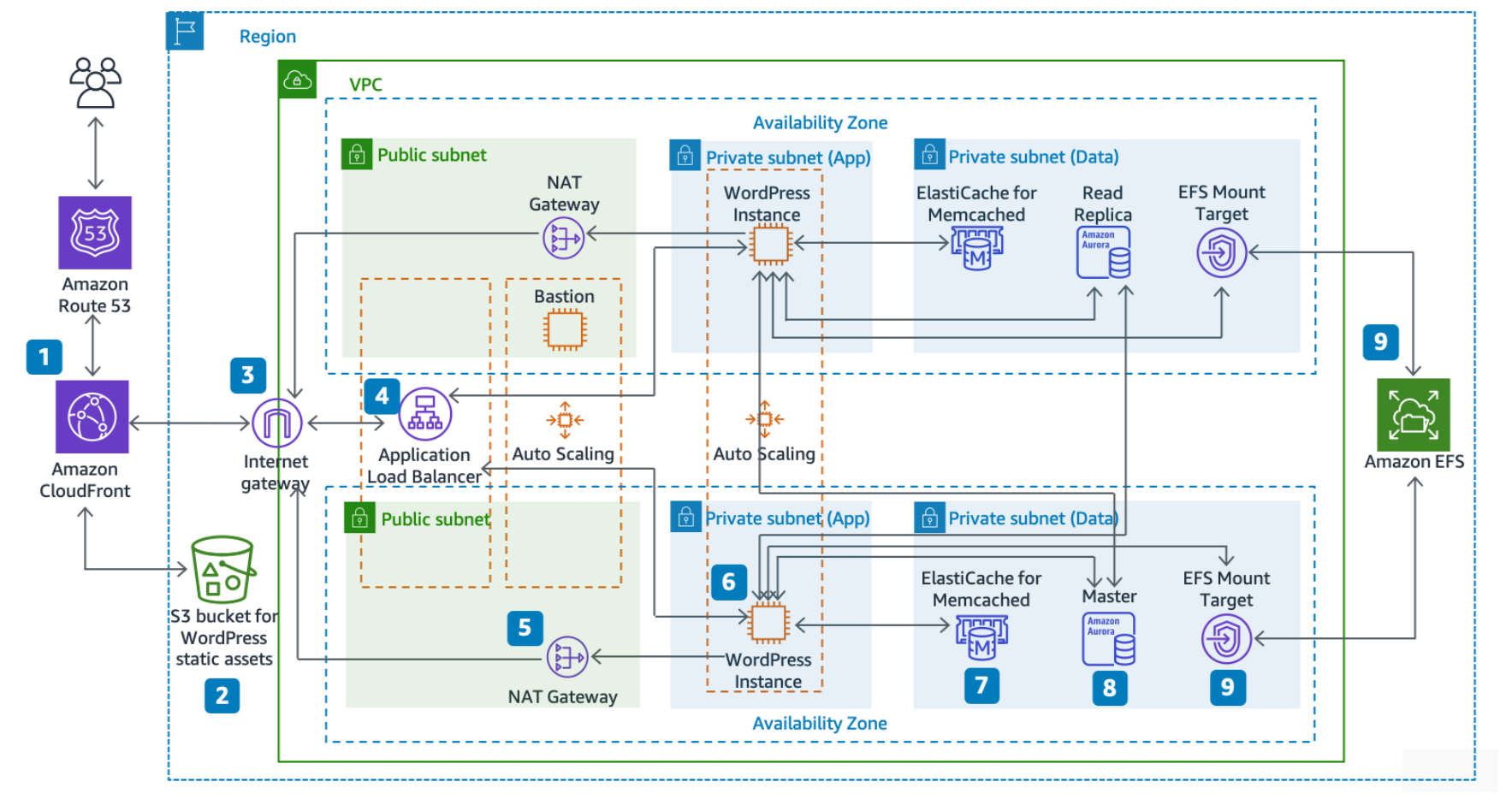
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How do we use servers?

- State management
- Monolithic container for functionality
- One version, one server
- Server is an atomic unit of thinking
- The challenges of this model

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For example: WordPress hosting on AWS



Source: https://docs.aws.amazon.com/whitepapers/latest/best-practices-wordpress/reference-architecture.html

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Where to start with serverless

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How AWS Lambda fits in

Attributes

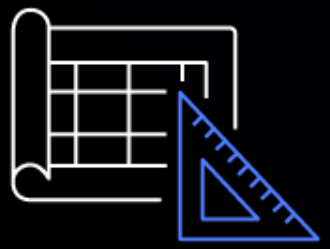
- Runs on demand
- Supports many runtimes
- Responds to events
- Stateless
- Automatically scales

Best practices

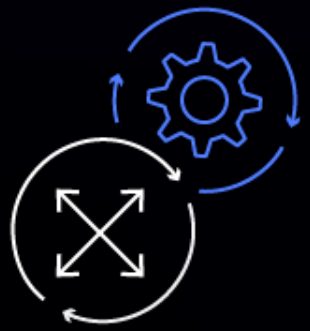
- Avoid lifting-and-shifting
- 1 Lambda function per purpose
- Keep functions small
- Choose the right runtime
- Use functions for business logic and plumbing between services
- Include security

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General approach to thinking serverlessly



Features first



Focus on events



Statelessness



Data flow



Use the services

aws

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What are serverless services?



Amazon EventBridge



Amazon Simple Notification Service



Amazon Simple Queue Service



Amazon API Gateway



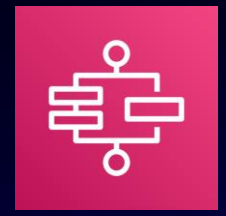
Amazon DynamoDB



AWS Lambda



Amazon S3



AWS Step Functions



Amazon Kinesis



AWS IoT Core



Amazon Elastic Transcoder

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Integrating with other AWS services



Amazon Rekognition



Amazon Comprehend



Amazon Textract



Amazon Transcribe



Amazon Translate

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Introducing AWS SAM



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AWS Serverless Application Model (AWS SAM)

- AWS CloudFormation extension optimized for serverless
- Serverless resource types: Functions, APIs, tables
- Supports anything CloudFormation supports
- Open specification (Apache 2.0)



To learn more, visit:
https://github.com/awslabs/serverless-application-model

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Example AWS SAM template

```yaml
AWSTemplateFormatVersion: '2010-09-09'
Transform: AWS::Serverless-2016-10-31

Parameters:
  TargetLanguage:
    Type: String
    Default: 'fr es it'

Resources:
  TranslationBucket:
    Type: AWS::S3::Bucket

  TranslatorFunction:
    Type: AWS::Serverless::Function
    Properties:
      CodeUri: translatorFunction/
      Handler: app.handler
      Runtime: nodejs14.x
      MemorySize: 128
      Environment:
        Variables:
          targetLanguage: !Ref TargetLanguage
      Policies:
        - S3CrudPolicy:
            BucketName: !Ref TranslationBucketName
      Events:
        FileUpload:
          Type: S3
          Properties:
            Bucket: !Ref TranslationBucket
            Events: s3:ObjectCreated:*
            Filter:
              S3Key:
                Rules:
                  - Name: suffix
                    Value: '.txt'
```

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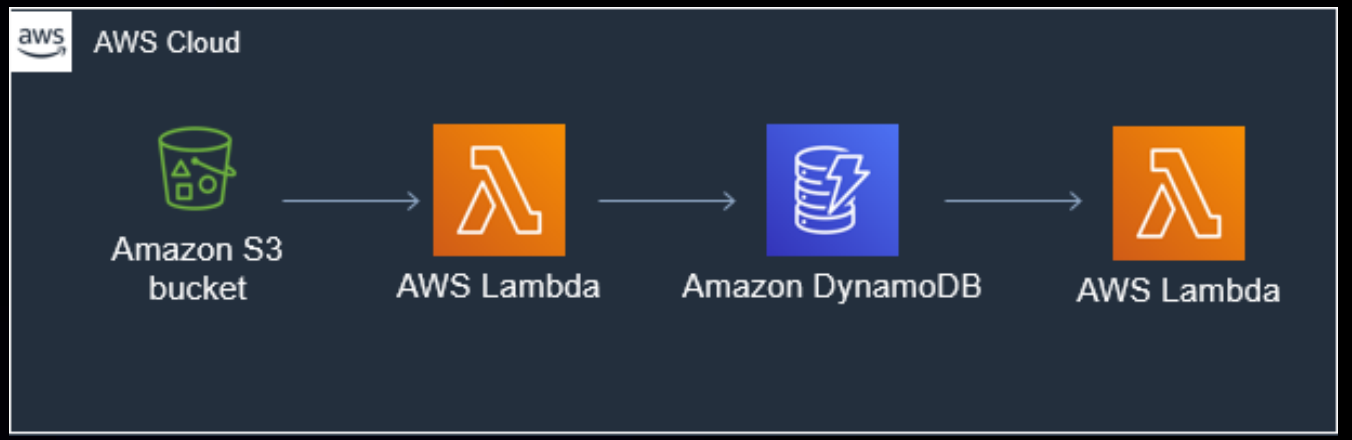
Transforms YAML into infrastructure

```yaml
AWSTemplateFormatVersion: '2010-09-09'
Transform: AWS::Serverless-2016-10-31

Parameters:
  TargetLanguage:
    Type: String
    Default: 'fr es it'

Resources:
  TranslationBucket:
    Type: AWS::S3::Bucket

  TranslatorFunction:
    Type: AWS::Serverless::Function
    Properties:
      CodeUri: translatorFunction/
      Handler: app.handler
      Runtime: nodejs14.x
      MemorySize: 128
      Environment:
        Variables:
          targetLanguage: !Ref TargetLanguage
      Policies:
        - S3CrudPolicy:
            BucketName: !Ref TranslationBucketName
      Events:
        FileUpload:
          Type: S3
          Properties:
            Bucket: !Ref TranslationBucket
            Events: s3:ObjectCreated:*
            Filter:
              S3Key:
                Rules:
                  - Name: suffix
                    Value: '.txt'
```



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Whiteboarding

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1. Form upload

Create a serverless application to support a customer review form submitted from a webpage

- Incoming responses must be translated into English
- Allow user to upload image with a response
- Email any negative comments immediately
- Only allow signed-in users to post reviews

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2. Restaurant reservations

Create a serverless application to allow restaurant customers to reserve a table by SMS text message

- Add a display showing upcoming reservations in real time
- Speak the name of a guest when ready to seat table
- Send a daily reservation email report
- Alert a legacy application when reservations are made

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3. Web application

Create a serverless web application to support a national ecommerce business

- Ensure fast performance for visitors in multiple Regions
- Allow users to create accounts (including social login)
- Support uploading and serving user videos
- Let users 'like' products and receive updates

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Wrap up

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Thank you!

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