HELLO!

STEP INTO SERVERLESS WITH AWS & COLDFUSION

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HI, LAMBDA!

YES, THERE ARE STILL SERVERS...




SERVERLESS

NO SERVER
IS EASIER TO MANAGE
THAN NO SERVER.

SERVERLESS IS APPLICATION FUNCTIONALITY

STORAGE	S3, GLACIER, EFS
MEDIA	ELASTIC TRANSCODER, MEDIA CONVERT, MEDIA LIVE, KINESIS VIDEO STREAMS
AI	REKOGNITION, POLLY, TRANSLATE, TRANSCRIBE, COMPREHEND, LEX, SAGEMAKER
DB	RDS, DYNAMODB, AURORA, REDSHIFT
CONTAINER	ECS, FARGATE

SERVERLESS = FUNCTIONS

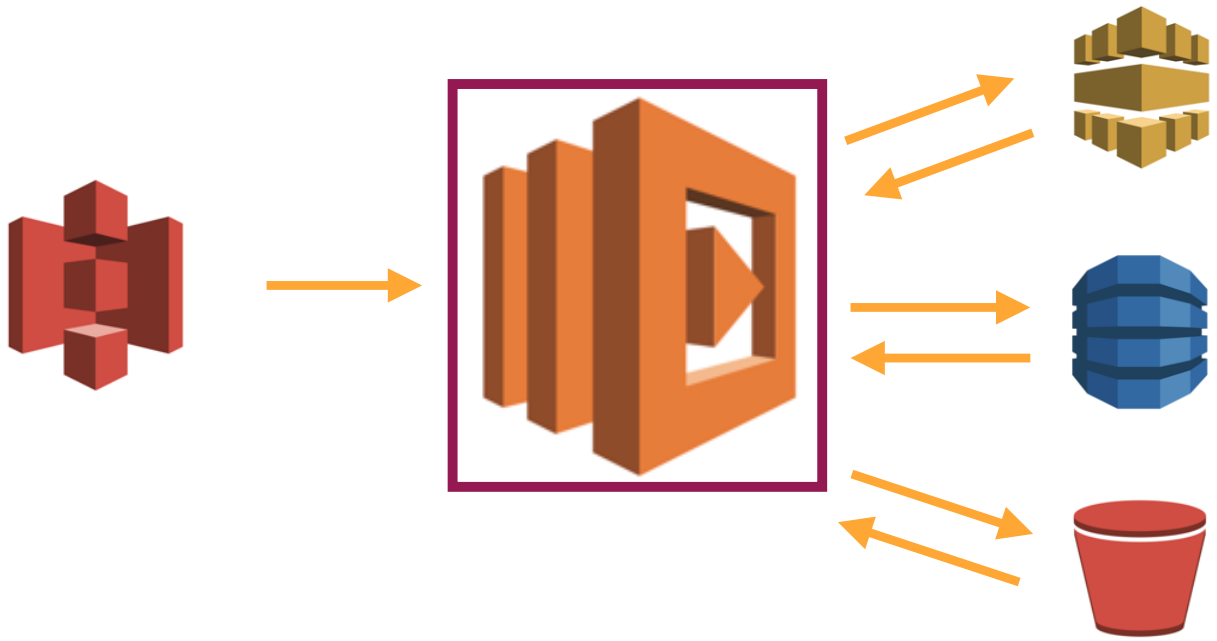
HELLO LAMBDA (NODE.JS)

```
exports.handler = (event, context, callback) => {
    var firstNumber = event.firstVal;
    var secondNumber = event.secondVal;
    var result = firstNumber * secondNumber;
    callback(null, result);
};
```

WE DON'T BUILD FUNCTIONS.
WE BUILD APPLICATIONS.

(RE)BUILDING THE MICROLITH

VIDEO TRANSCODING WORKFLOW



BRANCHING?
ERROR HANDLING?
RETRIES?

STEP FUNCTIONS

PROBLEM SOLVED!

EMBRACE AWS
EXTEND WITH COLDFUSION

EMBRACE AI SERVICES IN AWS EXTEND WITH COLDFUSION

AWS PLAYBOX APP

https://github.com/brianklaas/awsPlaybox

SORRY, NO IAM

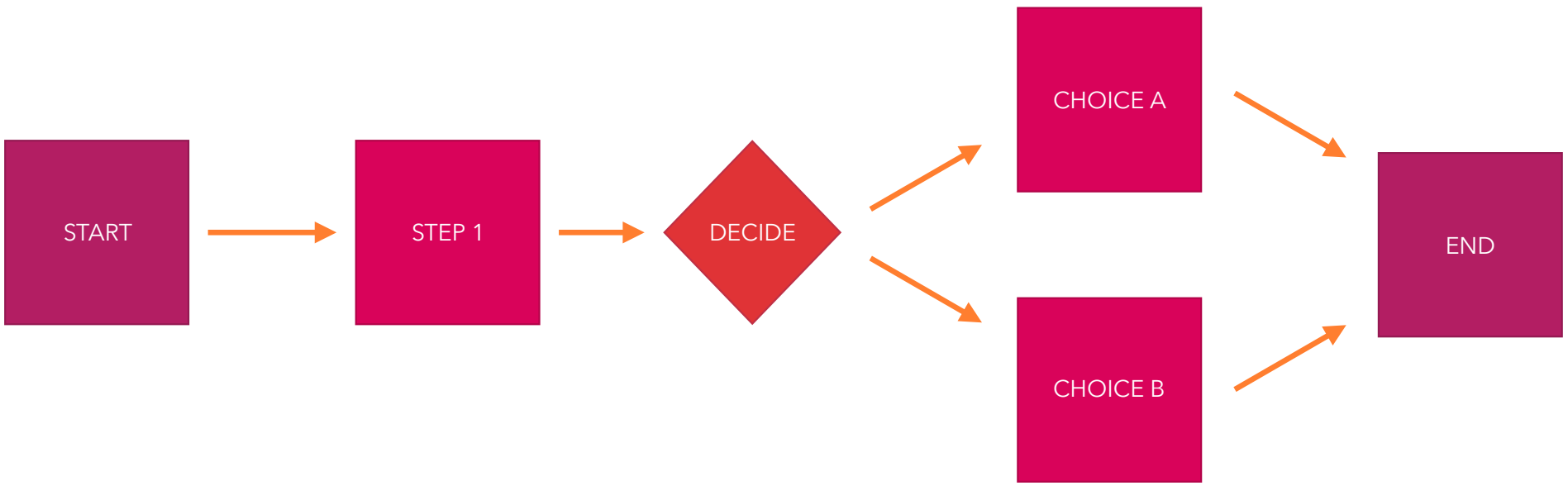
WHAT ARE STEP FUNCTIONS?

VISUAL, SERVERLESS ORCHESTRATION

AUTOMATED, MULTI-STEP, ASYNCHRONOUS, SERVERLESS WORKFLOWS IN AWS

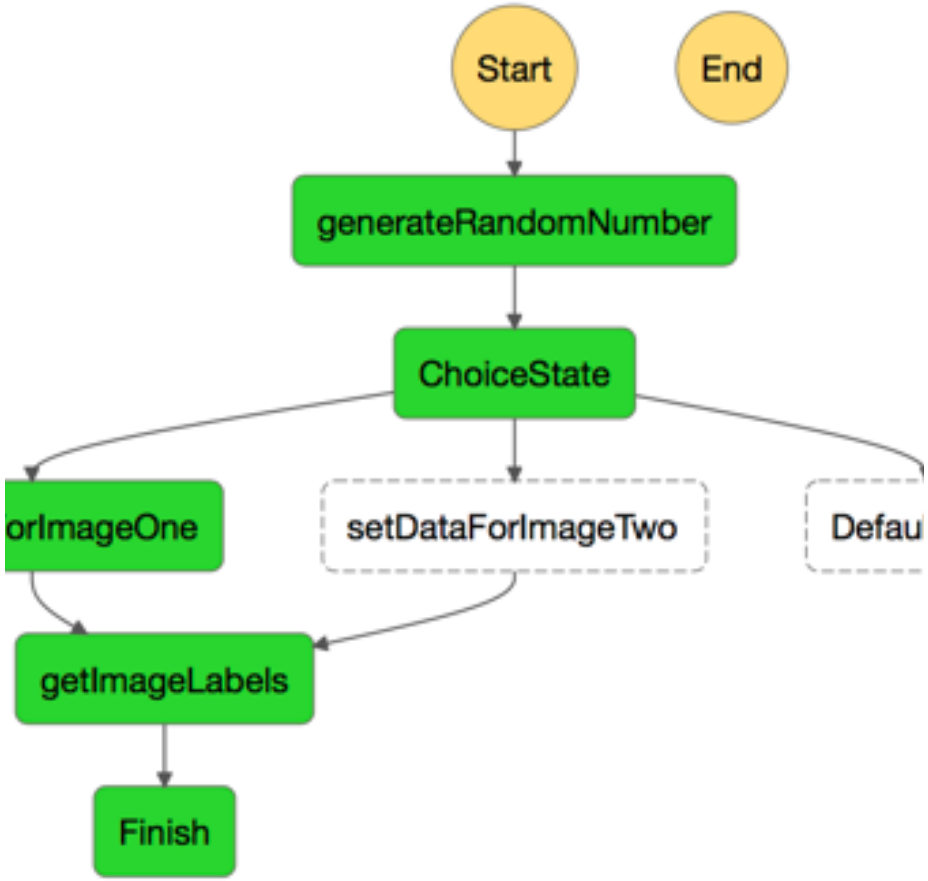
STATE MACHINES

WHAT DOES STATE-BASED WORKFLOW LOOK LIKE?



VISUAL ORCHESTRATION

- Via the AWS Console



STATE TYPES TO CHOOSE FROM

- Task
- Sequence
- Parallel
- Branch
- Wait
- Success
- Failure

STEP FUNCTIONS ARE JSON FILES

```
"StartAt": "generateRandomNumber",
"States": {
  "generateRandomNumber": {
    "Type": "Task",
    "Resource": "arn:aws:lambda:us-east-1:[redacted]:function:confDemoRandomNumber",
    "ResultPath": "$.randomNumber",
    "Next": "ChoiceState"
  },
  "ChoiceState": {
    "Type" : "Choice",
    "Choices": [
      {
        "Variable": "$.randomNumber",
        "NumericLessThanEquals": 50,
        "Next": "setDataForImageOne"
      },
      {
        "Variable": "$.randomNumber",
        "NumericGreaterThan": 50,
        "Next": "setDataForImageTwo"
      }
    ],
    "Default": "DefaultState"
  },
```

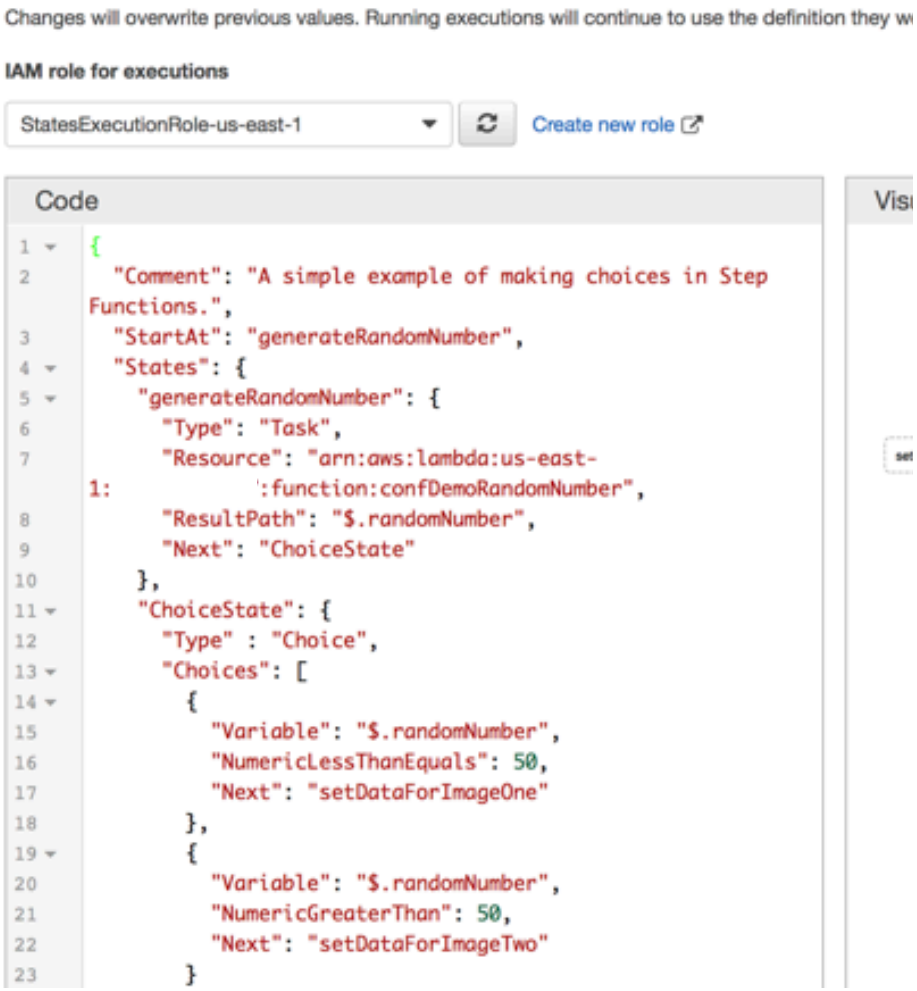
SHARE DATA BETWEEN STEPS

- Must be expressed in JSON
- Traverse with JSONPath pathing (https://github.com/json-path/JsonPath)
- Reference path: $.someVariableName
- InputPath = filter selection of current state's raw input to go into task (Lambda function)
- ResultPath = reference path to data coming out of task (Lambda function)
- OutputPath = filter selection of current task (Lambda function) result, to serve as input for next state

BUILD AND VALIDATE STATE MACHINES IN THE AWS CONSOLE

- Not using the console? Use statelint

  https://github.com/awslabs/statelint



EXAMPLE WORKFLOW: DESCRIBE AN IMAGE

LAMBDA

S3

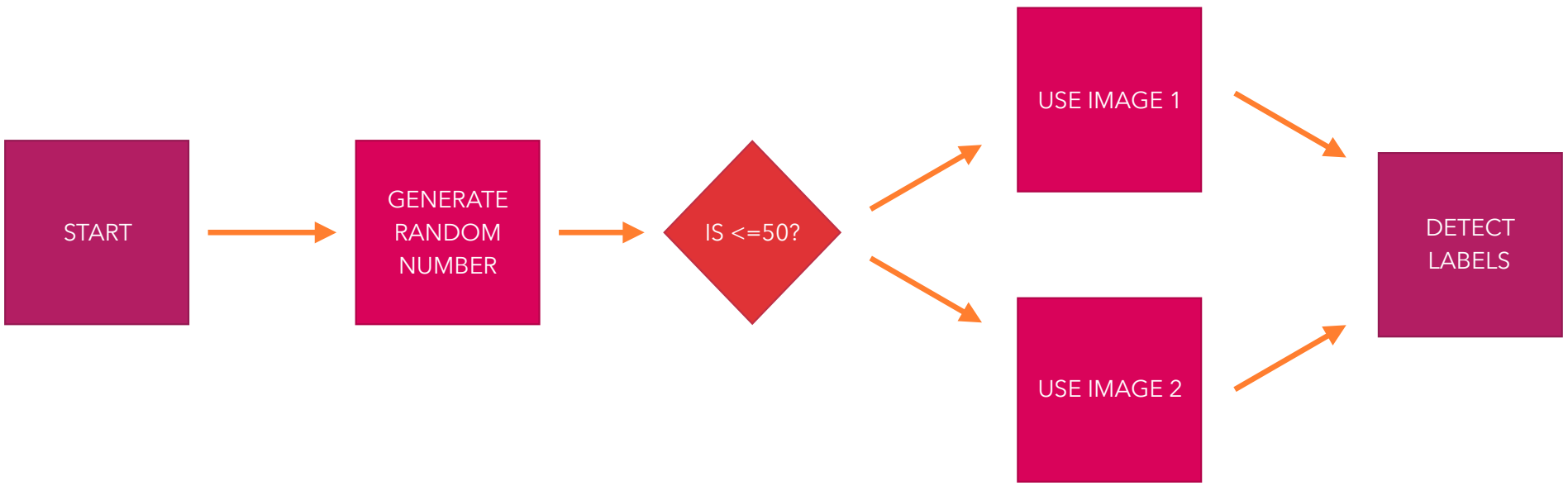
REKOGNITION

CFML!

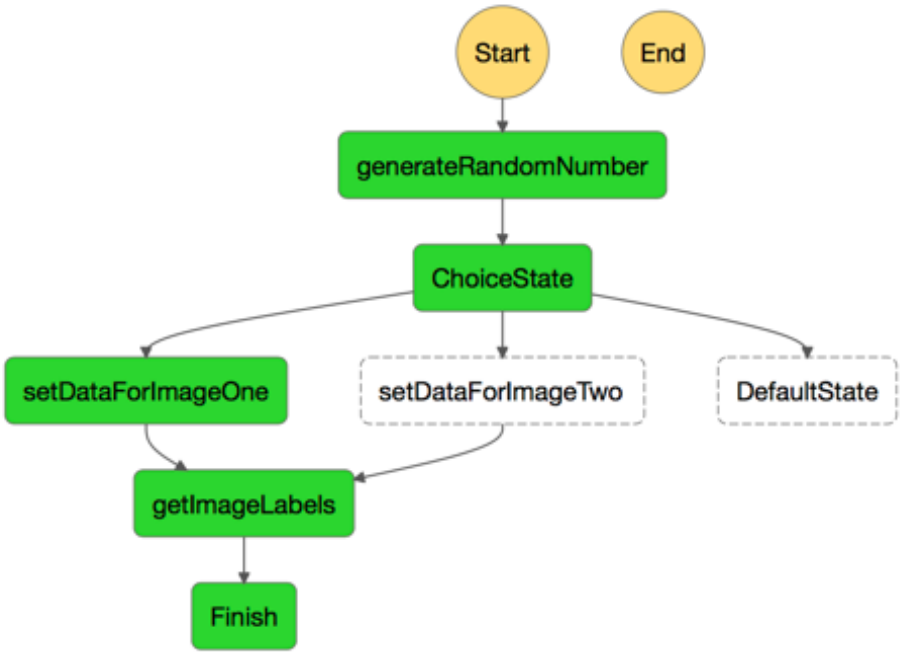
STATE TYPES IN THE EXAMPLE

- Task
- Choice
- Pass
- Fail
- Succeed

WORKFLOW OVERVIEW



EXECUTION DIAGRAM

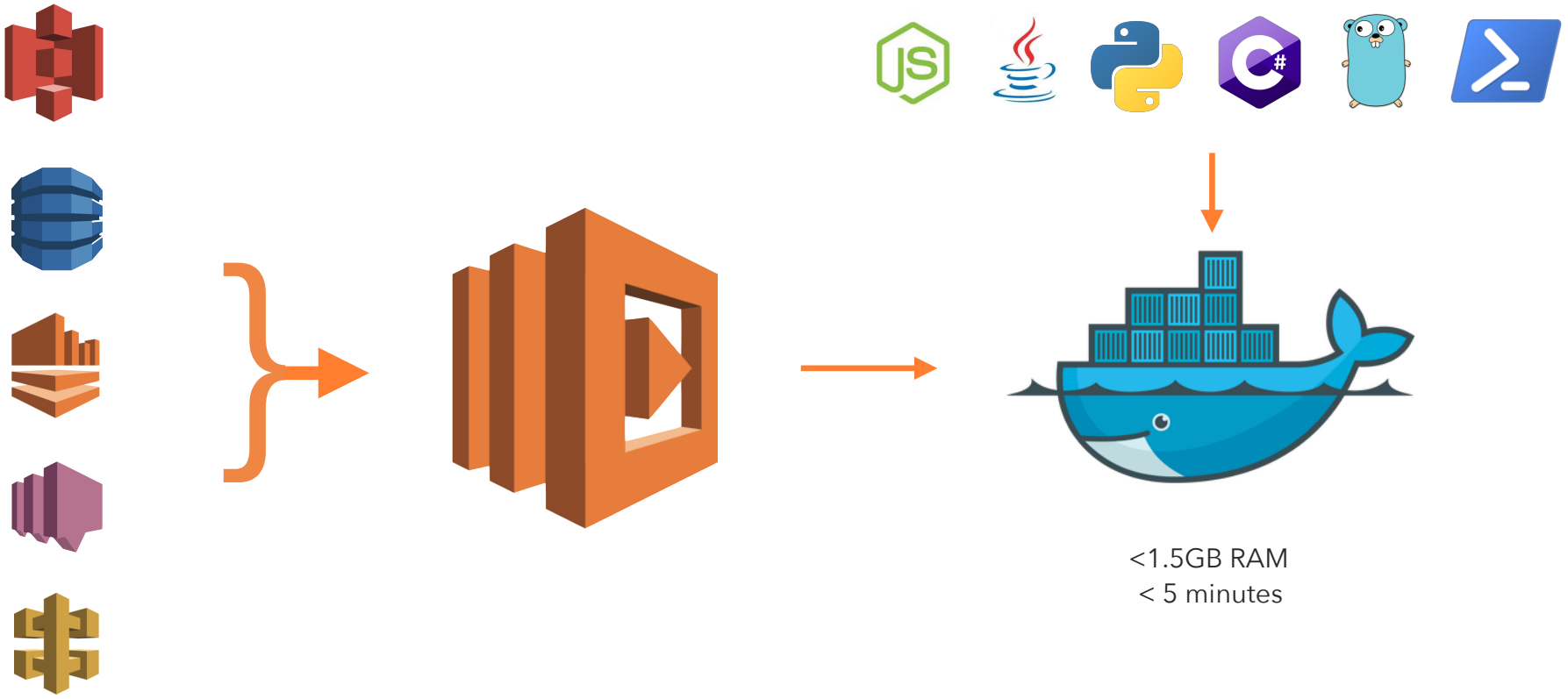


EXAMPLE 1: DESCRIBING AN IMAGE

TASK STATES

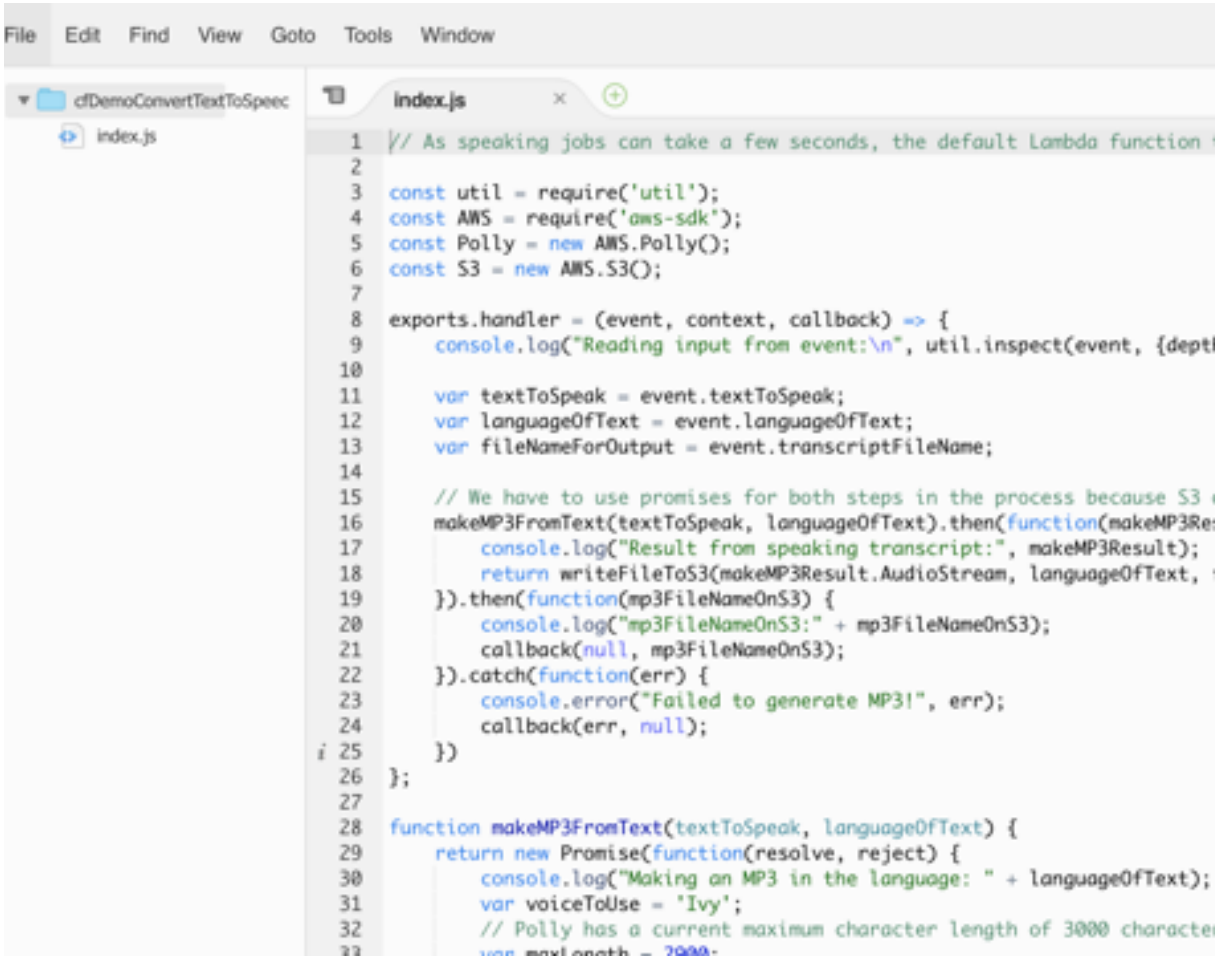
```
"States": {
   "generateRandomNumber": {
     "Type": "Task",
     "Resource": “arn:aws:lambda:us-east-1:XXXXXXXX:function:generateRandomNumber",
     "ResultPath": "$.randomNumber",
     "Next": "ChoiceState"
   },
```

HOW DOES LAMBDA WORK?



WRITING CODE FOR LAMBDA

- Upload a ZIP containing source and dependencies
  - Must zip the folder contents, not the containing folder
  - 50MB size limit
- Point to a ZIP on S3
- Code using Cloud9 Editor in the console



GENERATE RANDOM NUMBER FUNCTION

```
exports.handler = (event, context, callback) => {
    var min = event.min ? event.min : 1;
    var max = event.max ? event.max : 100;
    var result = Math.floor(Math.random() * (max - min)) + min;
    callback(null, result);
};
```

EXAMPLE 1: DESCRIBING AN IMAGE

TASK STATES

```
"States": {
   "generateRandomNumber": {
     "Type": "Task",
     "Resource": “arn:aws:lambda:us-east-1:XXXXXXXX:function:generateRandomNumber",
     "ResultPath": "$.randomNumber",
     "Next": "ChoiceState"
   },
```

CHOICE STATES

```
"ChoiceState": {
    "Type" : "Choice",
    "Choices": [
     {
       "Variable": "$.randomNumber",
       "NumericLessThanEquals": 50,
       "Next": "setDataForImageOne"
     },
     {
       "Variable": "$.randomNumber",
       "NumericGreaterThan": 50,
       "Next": "setDataForImageTwo"
     }
    ],
    "Default": "WhyAreWeHereState"
```

COMPARATORS FOR CHOICE STATES

StringEquals
StringLessThan
StringGreaterThan
StringLessThanEquals
StringGreaterThanEquals
NumericEquals
NumericLessThan
NumericGreaterThan
NumericLessThanEquals
NumericGreaterThanEquals
BooleanEquals
TimestampEquals
TimestampLessThan
TimestampGreaterThan
TimestampLessThanEquals
TimestampGreaterThanEquals
And
Or
Not

CHOICE STATES

```
"ChoiceState": {
    "Type" : "Choice",
    "Choices": [
     {
       "Variable": "$.randomNumber",
       "NumericLessThanEquals": 50,
       "Next": "setDataForImageOne"
     },
     {
       "Variable": "$.randomNumber",
       "NumericGreaterThan": 50,
       "Next": "setDataForImageTwo"
     }
    ],
    "Default": "WhyAreWeHereState"
```

EXAMPLE 1: DESCRIBING AN IMAGE

PASS STATES

```
"setDataForImageOne": {
    "Type" : "Pass",
    "Result": { "s3Bucket": "conferencedemobucket", "s3Key": "images/familyFaces.jpg" },
    "Next": "getImageLabels"
  },

“setDataForImageTwo": {
    "Type" : "Pass",
    "Result": { "s3Bucket": "conferencedemobucket", "s3Key": "images/dogForLabels.jpg" },
    "Next": "getImageLabels"
  },
```

REKOGNIZING THE IMAGE

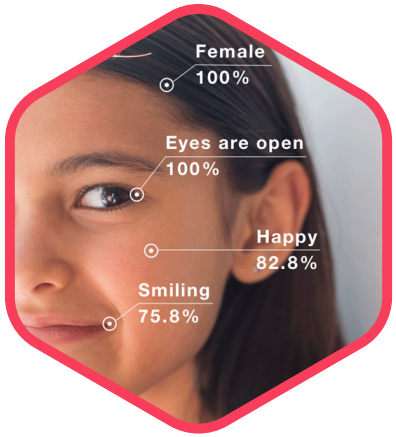
```
"getImageLabels": {
    "Type" : "Task",
    "Resource": “arn:aws:lambda:us-east-1:XXXXXXXX:function:detectLabelsForImage",
    "Next": "Finish"
  },
```


REKOGNITION

WHAT CAN REKOGNITION DO?

DETECT IMAGE ELEMENTS

IDENTIFY FACES



ANALYZE/MATCH FACES

IDENTIFY TEXT

DETECT LABELS FOR IMAGE (NODE.JS)

```
var params = {
    Image: {
      S3Object: {
        Bucket: srcBucket,
        Name: srcKey
      }
    },
    MaxLabels: 10,
    MinConfidence: 70
  };
```

```
rekognition.detectLabels(params)
.promise().then(function (data) {
      data.s3Bucket = srcBucket;
      data.s3Key = srcKey;
      callback(null, data);
  }).catch(function (err) {
      callback(err);
  });
```

H

EXAMPLE 1: DESCRIBING AN IMAGE

WHAT DOES RECOGNITION TELL US?

Here are the labels:

- Architecture — 90%
- Building — 90%
- Castle — 90%
- House — 90%
- Housing — 90%
- Mansion — 90%
- Palace — 90%
- Gazebo — 84%
- Altar — 82%
- Pagoda — 57%
- Shrine — 57%
- Temple — 57%
- Worship — 57%
- Monastery — 52%
- Church — 51%
- Cathedral — 51%

END STATES

```
"WhyAreWeHereState": {
    "Type": "Fail",
    "Cause": "We really should not have ended up here from a numeric value decision."
  },

  "Finish": {
    "Type": "Succeed"
  }
```

SO WHERE DOES CF COME IN?

IS THE SCHEDULER AND EXECUTOR

YOUR CFML NEEDS TO:

- Make an execution request
- Get the ARN of the execution for follow–up
- Check on completion
- If complete, get the results

USING THE AWS JAVA SDK

- Add to cfusion/lib:
  - aws-java-sdk-1.11.xxx.jar
  - jackson-annotations-2.6.0.jar
  - jackson-core-2.6.7.jar
  - jackson-databind-2.6.7.1.jar
  - joda-time-2.8.1.jar

MAKE AN EXECUTION REQUEST

```
arnOfFunctionToInvoke = “arn:aws:states:us-
east-1:XXXXXXXXX:stateMachine:confDemoSimpleDecisionMachine”

executionRequest = CreateObject('java',
‘com.amazonaws.services.stepfunctions.model.StartExecutionRequest').init();

executionRequest.setStateMachineArn(arnOfFunctionToInvoke);

executionResult = stepFunctionService.StartExecution(executionRequest);
```

GET ARN OF EXECUTION

```
executionResult = stepFunctionService.StartExecution(executionRequest);

executionARN = executionResult.getExecutionARN();
```

CHECK ON COMPLETION

```
describeExecutionRequest = CreateObject('java',
'com.amazonaws.services.stepfunctions.model.DescribeExecutionRequest').init();

describeExecutionRequest.setExecutionArn(executionARN);

executionResult = stepFunctionService.describeExecution(describeExecutionRequest);
```

IF COMPLETE, GET THE RESULTS

```
stepFunctionResult.status = executionResult.getStatus();

if (stepFunctionResult.status IS 'SUCCEEDED') {

    stepFunctionResult.finishedOn = executionResult.getStopDate();

    stepFunctionResult.output = DeserializeJSON(executionResult.getOutput());

}
```

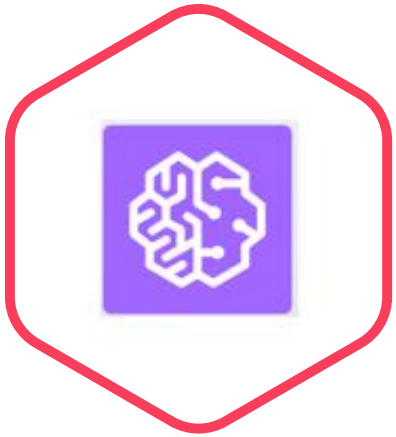
ASYNCHRONOUS STATUS CHECKING

- Scheduled task
- Persist execution ARNs

EXAMPLE WORKFLOW: TRANSCRIBE AND TRANSLATE A VIDEO

LAMBDA

TRANSCRIBE



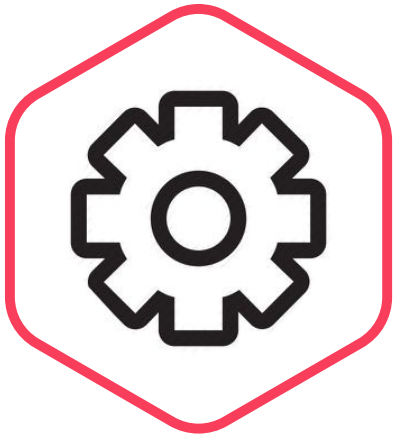
TRANSLATE

POLLY

WHY IS THIS USEFUL?

ACCESSIBILITY

EFFICIENCY



UTILITY

INTERNATIONALIZATION

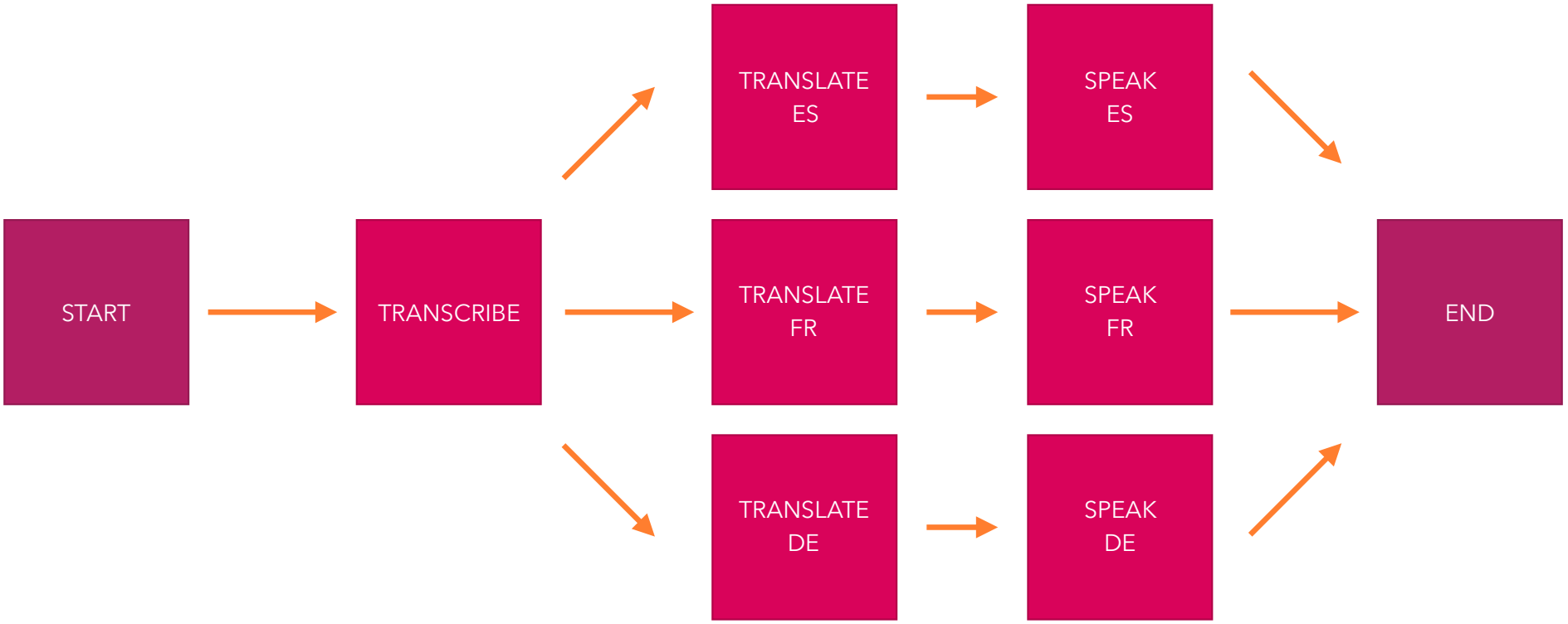
NEW STATE TYPES IN THE EXAMPLE

- Task with Retries
- Wait
- Parallel

EXECUTION DIAGRAM

- Wait loop
- Parallel execution

WORKFLOW OVERVIEW



THROTTLING

RETRIES ARE KEY TO HANDLING THROTTLED SERVICES

KICKOFF TASK

```
"transcribeMP4": {
    "Type": "Task",
    "Resource": "arn:aws:lambda:us-east-1:XXXXXXXXX:function:cfdemoStartTranscribeJob",
    "Next": "WaitForTranscriptionComplete",
    "Retry": [
     {
       "ErrorEquals": [ "States.ALL" ],
       "IntervalSeconds": 30,
       "MaxAttempts": 3,
       "BackoffRate": 10
     }
   ] }
```

TRANSCRIBE

AWS TRANSCRIBE

- Accepts MP4, MP3, WAV, FLAC
- Understands English (US), Spanish (US)
- Transcriptions with punctuation
- Recognizes multiple speakers
- Timestamp each word
- Supports custom vocabulary for discipline–specific words
- $0.0004 per second
- 60 minutes free per month

START TRANSCRIPTION JOB TASK

```
var returnData = {
    jobName: event.jobName
}

var params = {
    LanguageCode: 'en-US',
    Media: {
      MediaFileUri: event.srcFile
    },
    MediaFormat: event.mediaType,
    TranscriptionJobName: event.jobName
}
```

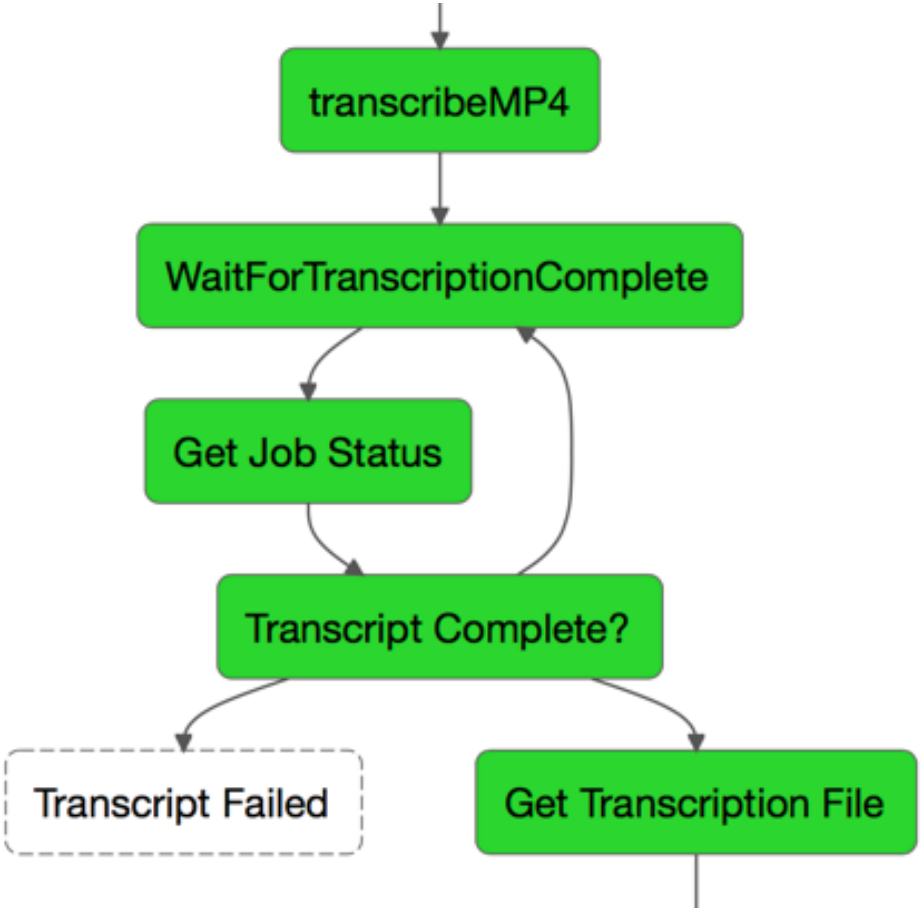
```
Transcribe.startTranscriptionJob(params, function(err, data) {
    if (err) {
      console.log(err, err.stack);
      callback(err, null)
    } else {
      console.log(data);          // successful response
      callback(null, returnData);
    }
  });
```

HOW DO WE HANDLE FULLY ASYNCHRONOUS TASKS?

CAPLINE HEADER ELEMENT

LOOPING IN A STEP FUNCTION

- Wait
- Check job status
- Job status done?



LOOPING IN STEP FUNCTIONS

```
"WaitForTranscriptionComplete": {
    "Type": "Wait",
    "Seconds": 30,
    "Next": "Get Job Status"
},
 "Get Job Status": {
    "Type": "Task",
    "Resource": "arn:aws:lambda:us-
east-1:XXXXXXXX:function:cfdemoCheckTranscribeJobStatus",
    "Next": "Transcript Complete?"
  },
```

```
"Transcript Complete?": {
   "Type": "Choice",
   "Choices": [
    {
     "Variable": "$.jobStatus",
     "StringEquals": "FAILED",
     "Next": "Transcript Failed"
    },
    {
     "Variable": "$.jobStatus",
     "StringEquals": "COMPLETED",
     "Next": "Get Transcription File"
    }
   ],
   "Default": "WaitForTranscriptionComplete"
  }
```

WAIT STATES

- Seconds
- Timestamp
- Expiration date
- Timestamp path (variable)
  - "TimestampPath": "$.expirationdate"

LOOPING IN STEP FUNCTIONS

```
"WaitForTranscriptionComplete": {
    "Type": "Wait",
    "Seconds": 30,
    "Next": "Get Job Status"
},
"Get Job Status": {
    "Type": "Task",
    "Resource": "arn:aws:lambda:us-east-1:XXXXXXXX:function:cfdemoCheckTranscribeJobStatus",
    "Next": "Transcript Complete?"
},
```

```
"Transcript Complete?": {
    "Type": "Choice",
    "Choices": [
     {
       "Variable": "$.jobStatus",
       "StringEquals": "FAILED",
       "Next": "Transcript Failed"
     },
     {
       "Variable": "$.jobStatus",
       "StringEquals": "COMPLETED",
       "Next": "Get Transcription File"
     }
    ],
    "Default": "WaitForTranscriptionComplete"
}
```

CHECKING THE JOB STATUS

```
var params = { TranscriptionJobName: jobName }
var request = Transcribe.getTranscriptionJob(params, function(err, data) {
    if (err) {  // an error occurred
        callback(err, null);
    } else {  // successful response, return job status
        var returnData = {
            jobName: jobName,
            jobStatus: data.TranscriptionJob.TranscriptionJobStatus,
            transcriptFileUri: data.TranscriptionJob.Transcript.TranscriptFileUri,
            transcriptFileName: jobName
     };
     callback(null, returnData);
     }
});
```

LOOPING IN STEP FUNCTIONS

```
"WaitForTranscriptionComplete": {
    "Type": "Wait",
    "Seconds": 30,
    "Next": "Get Job Status"
},
"Get Job Status": {
    "Type": "Task",
    "Resource": "arn:aws:lambda:us-
east-1:XXXXXXXX:function:cfdemoCheckTranscribeJobStatus",
    "Next": "Transcript Complete?"
  },
```

```
"Transcript Complete?": {
  "Type": "Choice",
  "Choices": [
   {
    "Variable": "$.jobStatus",
    "StringEquals": "FAILED",
    "Next": "Transcript Failed"
   },
   {
    "Variable": "$.jobStatus",
    "StringEquals": "COMPLETED",
    "Next": "Get Transcription File"
   }
  ],
  "Default": "WaitForTranscriptionComplete"
}
```

GETTING THE TRANSCRIPTION RESULT

- Transcript does not go into a bucket you own!
- Time limited URI returned from getTranscriptionJob()

"TranscriptFileUri": “https://s3.amazonaws.com/aws-transcribe-us-east-1-prod/683830609677/confDemo-1523559305156/asrOutput.json?X-Amz-Security-Token=FQoDYXdzEEoaDFIZWqjw%2FgCc3kQGWSK3A43rTlruH70hezLPxIDyUEk%2Fk9Ga%2F6eRg7Hwpe5WpMoQQ0it…”

- Token is tied to account that generated the Transcribe job
- Grab and move to S3 for future use

- OR…set OutputBucketName (added July, 2018)

SAVING THE TRANSCRIBE OUTPUT

```
getTranscript(transcriptFileUri).then(function(getTranscriptResponse) {
        return writeTranscriptToS3(getTranscriptResponse,transcriptFileName);
}).then(function(filePathOnS3) {
        var returnData = {
            transcriptFilePathOnS3: filePathOnS3,
            transcriptFileName: transcriptFileName
        };
        callback(null, returnData);
}).catch(function(err) {
        callback(err, null);
})
```

PROMISE ALL THE THINGS!

```
function getTranscript(transcriptFileUri) {
  return new Promise(function(resolve, reject) {
    https.get(transcriptFileUri, res => {
      res.setEncoding("utf8");
      let body = "";
      res.on("data", data => {
        body += data;
      });
      res.on("end", () => {
        body = JSON.parse(body);
        let transcript = body.results.transcripts[0].transcript;
        resolve(transcript);
      });
      res.on("error", (err) => {
        reject(Error(err));
      });
    });
  });
```

```
function writeTranscriptToS3(transcript,transcriptFileName) {
  return new Promise(function(resolve, reject) {
    let filePathOnS3 = 'transcripts/' + transcriptFileName + '.txt';
    var params = {
      Bucket: 'conferencedemobucket',
      Key: filePathOnS3,
      Body: transcript
    };
    var putObjectPromise = S3.putObject(params).promise();
    putObjectPromise.then(function(data) {
      resolve(filePathOnS3);
    }).catch(function(err) {
      reject(Error(err));
    });
  });
}
```

EXECUTION DIAGRAM

- Wait loop
- Parallel execution

PARALLEL TASKS

- Significantly speed workflow execution
- Cannot be dynamically generated

PARALLEL TASKS

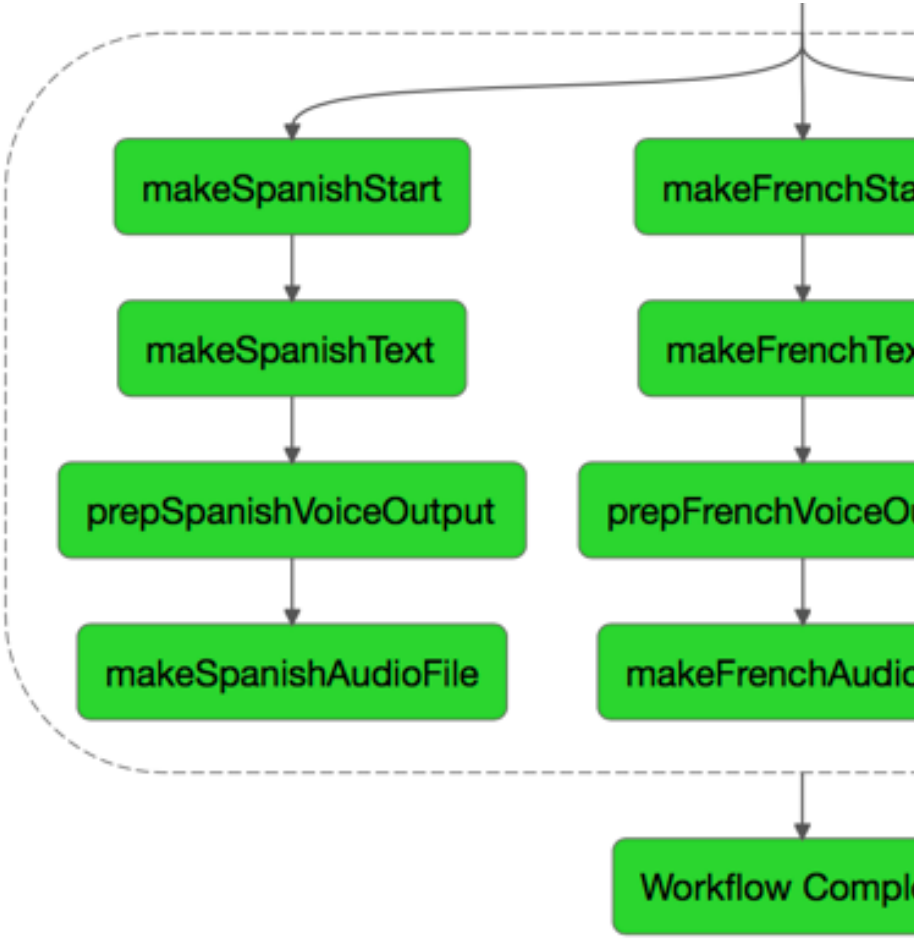
```
"Make Versions": {
  "Type": "Parallel",
  "Next": "Workflow Complete",
  "Branches": [
    {
      "StartAt": "makeSpanishStart",
      "States": {
        "makeSpanishStart": {},
        "makeSpanishText": {},
        "makeSpanishAudioFile": {}
    }, // end branch
    {
      "StartAt": "makeFrenchStart",
      "States": {
        {
          "makeFrenchStart": {},
          "makeFrenchText": {},
          "makeFrenchAudioFile": {}
      }, // end branch
  ] }
```

Parallel Branch 1

Parallel Branch 2

STEPS IN EACH PARALLEL TASK

- Define which language to use (Pass)
- Translate text (Task)
- Prep translated text for speech (Task)
- Speak translated text (Task)



DEFINE WHAT LANGUAGE TO USE

```
"makeSpanishStart": {
        "Type": "Pass",
        "Result": "es",
        "ResultPath": "$.languageToUse",
        "Next": "makeSpanishText"
},
```

TRANSLATE ENGLISH TEXT

```
"makeSpanishText": {
    "Type": "Task",
     "Resource": “arn:aws:lambda:us-east-1:XXXXXXXX:function:cfdemoTranslateText",
    "Next": "prepSpanishVoiceOutput",
    "Retry": [
        {
              "ErrorEquals": [ "States.ALL" ],
              "IntervalSeconds": 60,
              "MaxAttempts": 3,
              "BackoffRate": 5
        }
   ] }
```

TRANSLATE

AWS TRANSLATE

- To/from English only
  - Arabic (ar)
  - Chinese (Simplified) (zh)
  - French (fr)
  - German (de)
  - Portuguese (pt)
  - Spanish (es)
- Limit of 5000 characters per 10 seconds
- $15 per million characters
- 2 million characters free per month

TRANSLATING TEXT

```
getTranscriptFile(transcriptFileOnS3).then(function(getTranscriptResponse) {
    return translateText(getTranscriptResponse, languageToUse);
}).then(function(translatedTextObj) {
    var returnData = {
        translatedText: translatedTextObj.TranslatedText,
        languageOfText: languageToUse,
        sourceTranscriptFileName: sourceTranscriptFileName
    }
    callback(null, returnData);
}).catch(function(err) {
    callback(err, null);
})
```

TRANSLATING TEXT

```
function translateText(textToTranslate, languageToUse) {
    return new Promise(function(resolve, reject) {
        // Current maximum length for translation of 5000 chars
        var maxLength = 4500;
        var trimmedString = textToTranslate.substr(0,
maxLength);
        // We don't want to pass in words that are cut off
       trimmedString = trimmedString.substr(0,
Math.min(trimmedString.length, trimmedString.lastIndexOf("
")));
        var params = {
            SourceLanguageCode: 'en',
            TargetLanguageCode: languageToUse,
            Text: trimmedString
        };
        Translate.translateText(params, function(err, data) {
            if (err) {
                reject(Error(err));
            } else {
                console.log("Successful translation:\n");
                resolve(data);
            }
        });
    });
}
```

TRANSLATE ENGLISH TEXT

```
"makeSpanishText": {
    "Type": "Task",
     "Resource": “arn:aws:lambda:us-east-1:XXXXXXXX:function:cfdemoTranslateText",
    "Next": "prepSpanishVoiceOutput",
    "Retry": [
        {
              "ErrorEquals": [ "States.ALL" ],
              "IntervalSeconds": 60,
              "MaxAttempts": 3,
              "BackoffRate": 5
        }
   ] }
```

PREPARING THE TRANSLATED TEXT FOR SPEECH

```
"prepSpanishVoiceOutput": {
        "Type": "Task",
        "Resource": “arn:aws:lambda:us-east-1:XXX:function:cfDemoPrepTranslatedTextForSpeech",
        "Next": "makeSpanishAudioFile"
}
```

VARIABLE REASSIGNMENT IN STEP FUNCTIONS IS A PAIN

REASSIGNING VARIABLES

```
exports.handler = (event, context, callback) => {
    var textToSpeak = event.translatedText;
    var languageOfText = event.languageOfText;
    var transcriptFileName = event.sourceTranscriptFileName;

    var returnData = {
        textToSpeak: textToSpeak,
        languageOfText: languageOfText,
        transcriptFileName: transcriptFileName
    }
    callback(null, returnData);
};
```

TURNING TEXT INTO SPEECH

```
"makeSpanishAudioFile": {
        "Type": "Task",
        "Resource": "arn:aws:lambda:us-east-1:XXXXXXX:function:cfDemoConvertTextToSpeech",
        "Retry": [
          {
            "ErrorEquals": [ "States.ALL" ],
            "IntervalSeconds": 60,
            "MaxAttempts": 3,
            "BackoffRate": 5
          }
        ],
        "End": true
      }
```

POLLY

AWS POLLY

- Male and female voices in
  - Danish
  - Dutch
  - English (AU, GB, GB-WLS, IN, US)
  - French (FR, FR-CA)
  - German
  - Icelandic
  - Italian
  - Japanese
  - Korean
  - Mandarin Chinese (female only)
  - Norweigan
  - Polish
  - Portuguese (BR, PT)
  - Romanian
  - Russian
  - Spanish (ES, US)
  - Swedish
  - Turkish
  - Welsh
- Limit of 100 requests per second
- $4 per 1 million characters for speech
- 5 million characters free per month

TURNING TEXT INTO SPEECH

```
makeMP3FromText(textToSpeak, languageOfText).then(function(makeMP3Result) {
    return writeFileToS3(makeMP3Result.AudioStream, languageOfText, fileNameForOutput);
}).then(function(mp3FileNameOnS3) {
    var returnData = {};
    returnData["mp3FileNameOnS3-"+languageOfText] = mp3FileNameOnS3
    callback(null, returnData);
}).catch(function(err) {
    callback(err, null);
})
```

TURNING TEXT INTO SPEECH

```
function makeMP3FromText(textToSpeak, languageOfText) {
    return new Promise(function(resolve, reject) {
        var voiceToUse = 'Ivy';
        // Polly has a current maximum character length of 3000 characters
        var maxLength = 2900;
        var trimmedText = textToSpeak.substr(0, maxLength);
        switch(languageOfText) {
            case 'es':
                voiceToUse = (Math.random() >= 0.5) ? "Penelope" : “Miguel";  break;
            case 'fr':
                voiceToUse = (Math.random() >= 0.5) ? "Celine" : “Mathieu";  break;
            case 'de':
                voiceToUse = (Math.random() >= 0.5) ? "Vicki" : “Hans";  break;
        }
```

TURNING TEXT INTO SPEECH

```
var params = {
    OutputFormat: "mp3",
    SampleRate: "8000",
    Text: trimmedText,
    VoiceId: voiceToUse
}
var speakPromise = Polly.synthesizeSpeech(params).promise();
speakPromise.then(function(data) {    // successfully created MP3 stream
    resolve(data);
}).catch(function(err) {
    reject(Error(err));
});
```

TURNING TEXT INTO SPEECH

```
"makeSpanishAudioFile": {
        "Type": "Task",
        "Resource": "arn:aws:lambda:us-east-1:XXXXXXX:function:cfDemoConvertTextToSpeech",
        "Retry": [
         {
           "ErrorEquals": [ "States.ALL" ],
           "IntervalSeconds": 60,
           "MaxAttempts": 3,
           "BackoffRate": 5
         }
        ],
        "End": true
      }
```

EXECUTION DIAGRAM

- Wait loop
- Parallel execution

SO WHERE DOES  COME IN?

IS THE SCHEDULER AND EXECUTOR

YOUR CFML NEEDS TO:

- Make an execution request
- Get the ARN of the execution for follow–up
- Check on completion
- If complete, get the results
- CF2018: Futures?

3 DAYS

PRODUCTION IMPROVEMENTS

- Improved handling of service limitations
- Logical chunking / chunk stitching
- Search video via Elasticsearch

GO DO!

AWS Playbox
https://github.com/brianklaas/awsPlaybox

Using the AWS Java SDK in CFML
https://brianklaas.net/

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