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Introduction to Amazon Web Services

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@bok_

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- Owning the Stack
- Amazon Web Services Overview
- AWS SDK for iOS
- Alternative SDK

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“The strategy today is simple: In order to move fast, build what you can't buy or risk losing control of your fate.”

–Om Malik, Masters of their Own Destiny - 2014-02-10

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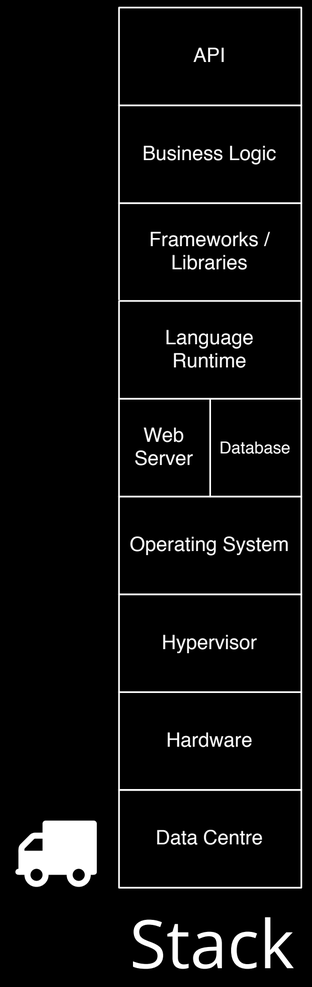
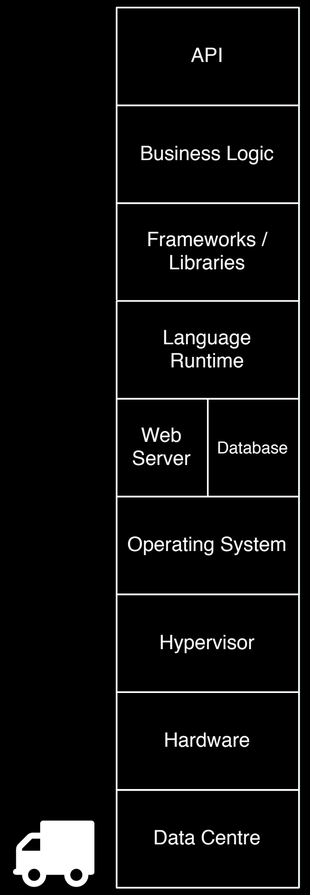
Owning the Stack



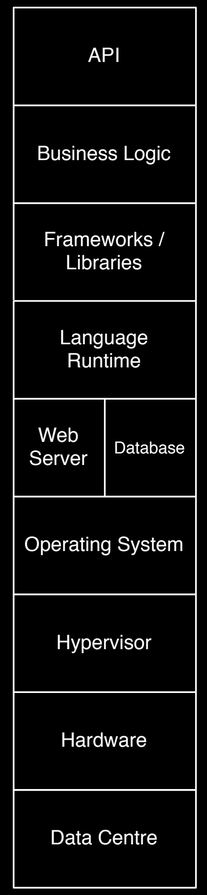
Stack

Owning the Stack

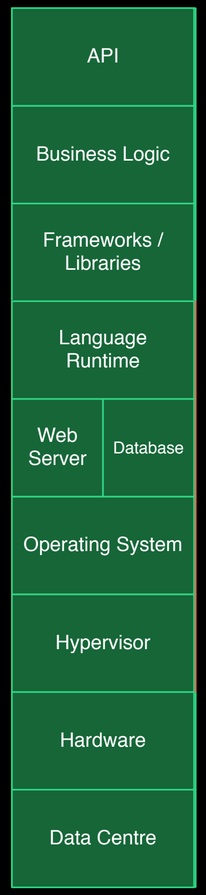


Stack

Owning the Stack



Stack



Google

Owning the Stack

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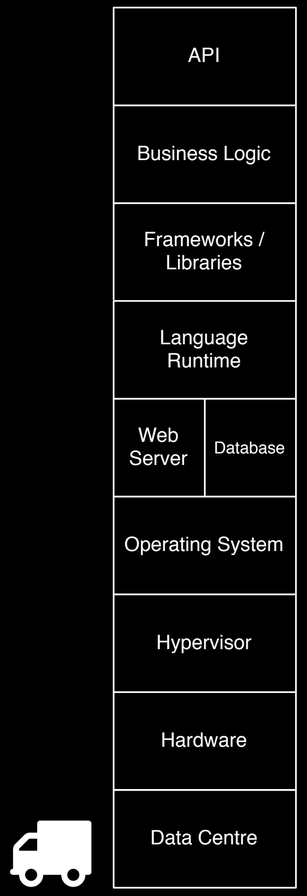
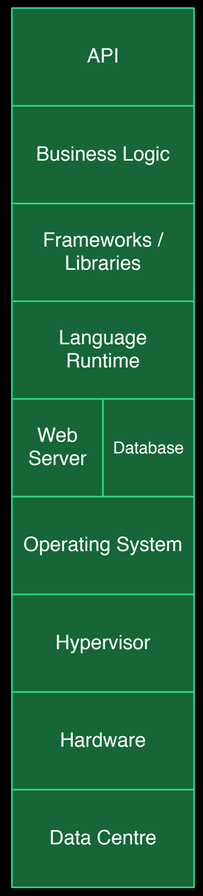


Stack



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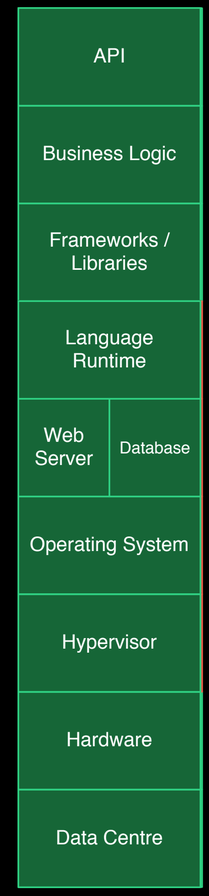
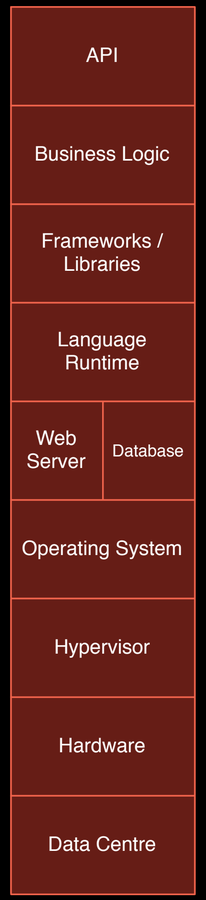


Facebook

Owning the Stack



Backend as a Service

Owning the Stack

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StackMob

Powering Mobile Applications

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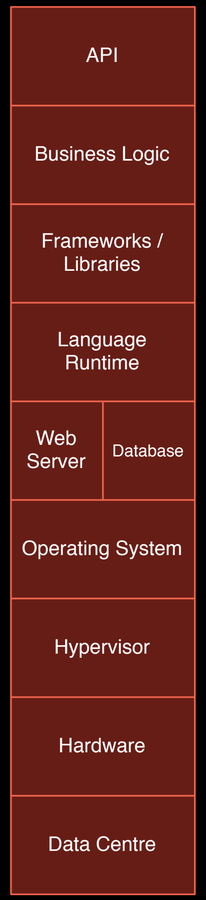
Owning the Stack



Backend as a Service

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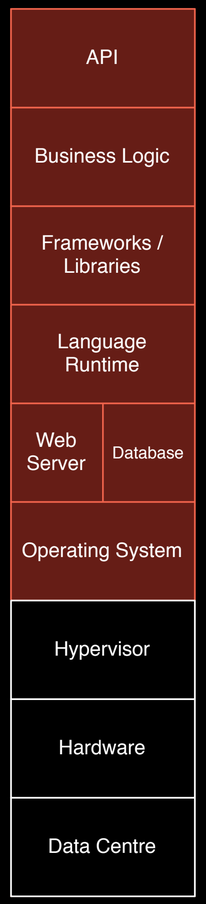
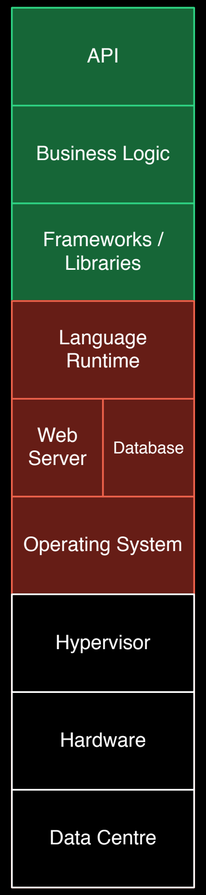
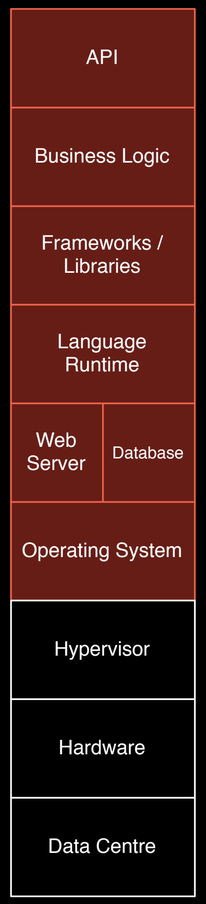


Parse / Kinvey

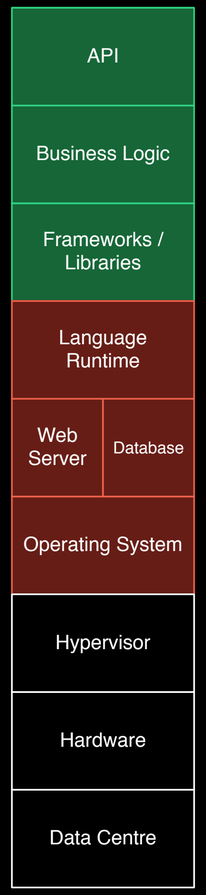


Heroku

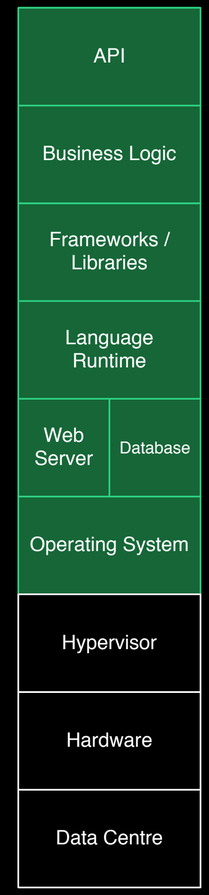
Owning the Stack



Parse / Kinvey



Heroku



AWS

Amazon Web Services

Overview

Why AWS?

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- Consumption-based billing.
- Economies of scale.
- Improve availability, durability and performance.
- Reduce overall costs.
- Self-service infrastructure.
- Easily scale up and down.
- Improve agility and time to market.

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Global Infrastructure

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Global Infrastructure

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Global Infrastructure

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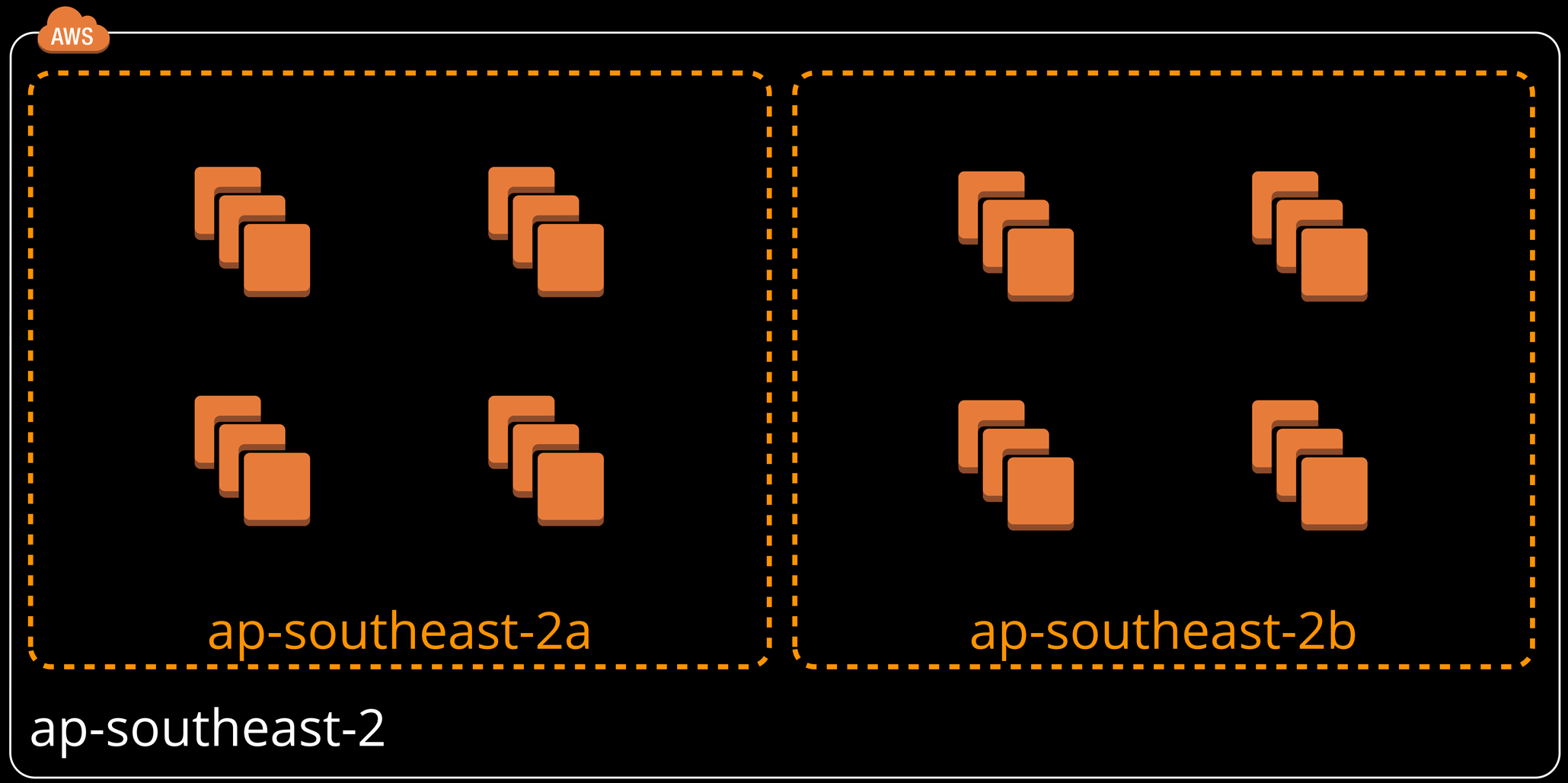
Global Infrastructure



Security

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Products

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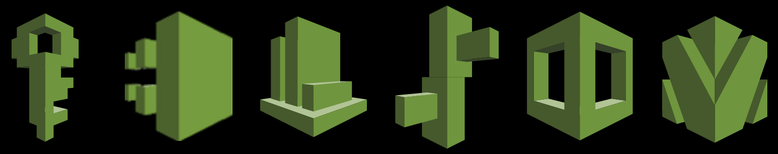
Compute and Networking

Application Services

Analytics

Storage and Content Delivery

Deployment and Management



Database

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Elastic Compute Cloud

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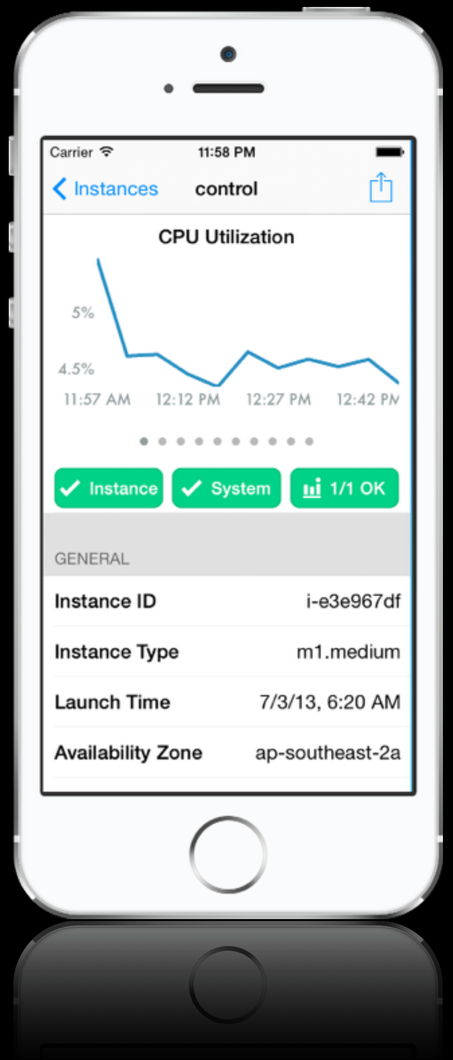
- “Virtual Servers” in the cloud, pay per hour for what you use.
- From 1 CPU with 630 MiB of RAM ($0.02 per hour).
- To 32 CPUs with 244 GiB of RAM ($8.14 per hour).
- Automatically add/remove instances to meet demand.
- Backed by the Elastic Block Store - drives from 1GB to 1TB, as many as you can handle.
- Free tier: Linux/Windows Micro instance.



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Simple Queue Service

- Guaranteed “at least once” message delivery.
- De-couple iPhone and backend.
- Asynchronous backend? Don’t pay for backend to be up all the time.
- $0.50 per 1 million SQS requests.
- Free tier: first 1 million SQS requests.

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Kinesis

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- Brand new service.
- Real-time processing of information streams.
- Useful for streaming sensor data, logs, analytics.
- Backend can scale processing as required.
- Process the entire Twitter firehose for $0.15 per hour.

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Simple Notification Service

- Supports Push Notifications, emails, and SMS (US only).
- APNS, APNS_Sandbox, GDM, ADM.
- Subscribe to topics.
- Suitable for notifications and push messages.
- $1 per 1 million push notifications.
- Free tier: first 1 million are free.

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Simple Storage Service

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- Secure file-based storage in the cloud.
- 99.999999999% durability.
- From 1 byte to 5TB per file. No account limit.
- Services like Dropbox, Netflix run off S3.
- Great for backups - archive to Glacier. (Arq)
- Run static websites from S3.
- Widely supported by FTP clients like Transmit.
- $0.094 per GB. $0.012 for Glacier.
- Free tier: first 5GB is free.

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CloudFront

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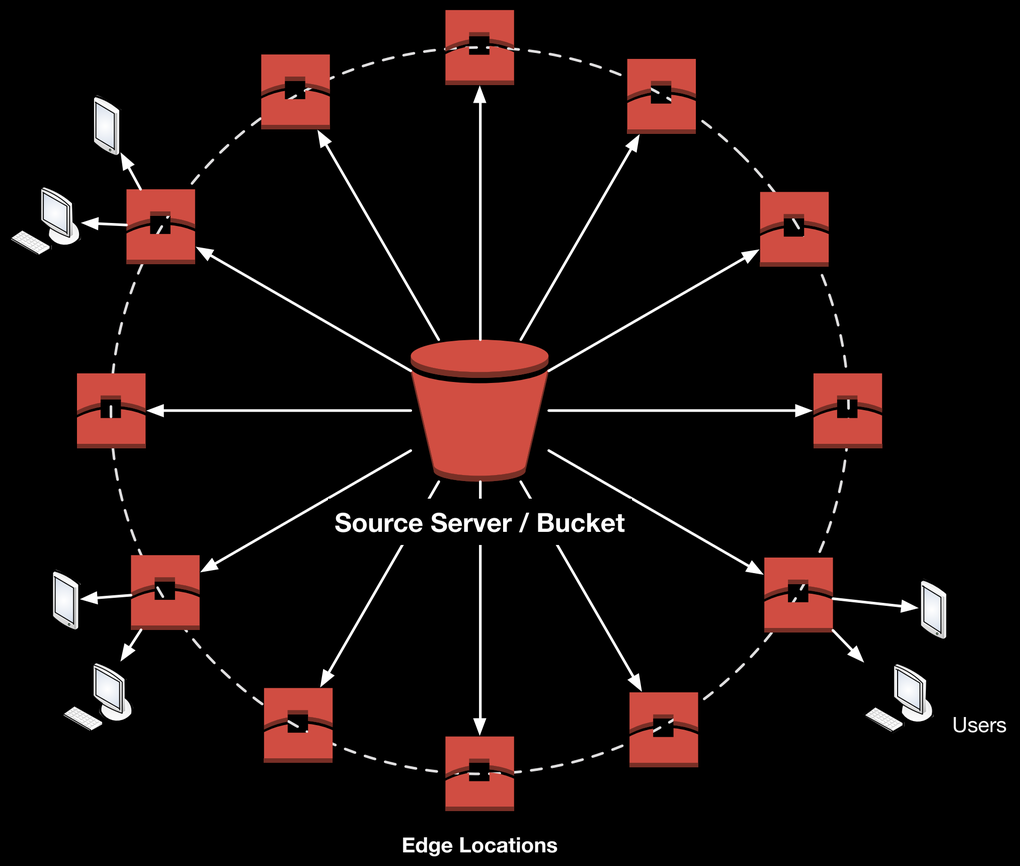

- Content Distribution Network
- Similar to Akamai, Cachefly, etc.
- Content is reverse-proxied and stored close to the end user.
- Use with S3 for ultimate easy, fast static website.
- Handles dynamic content and streaming media.
- Used by IMDB, NASA/JPL, etc.
- $0.12 - $0.25 per GB out.
- Free tier: none.

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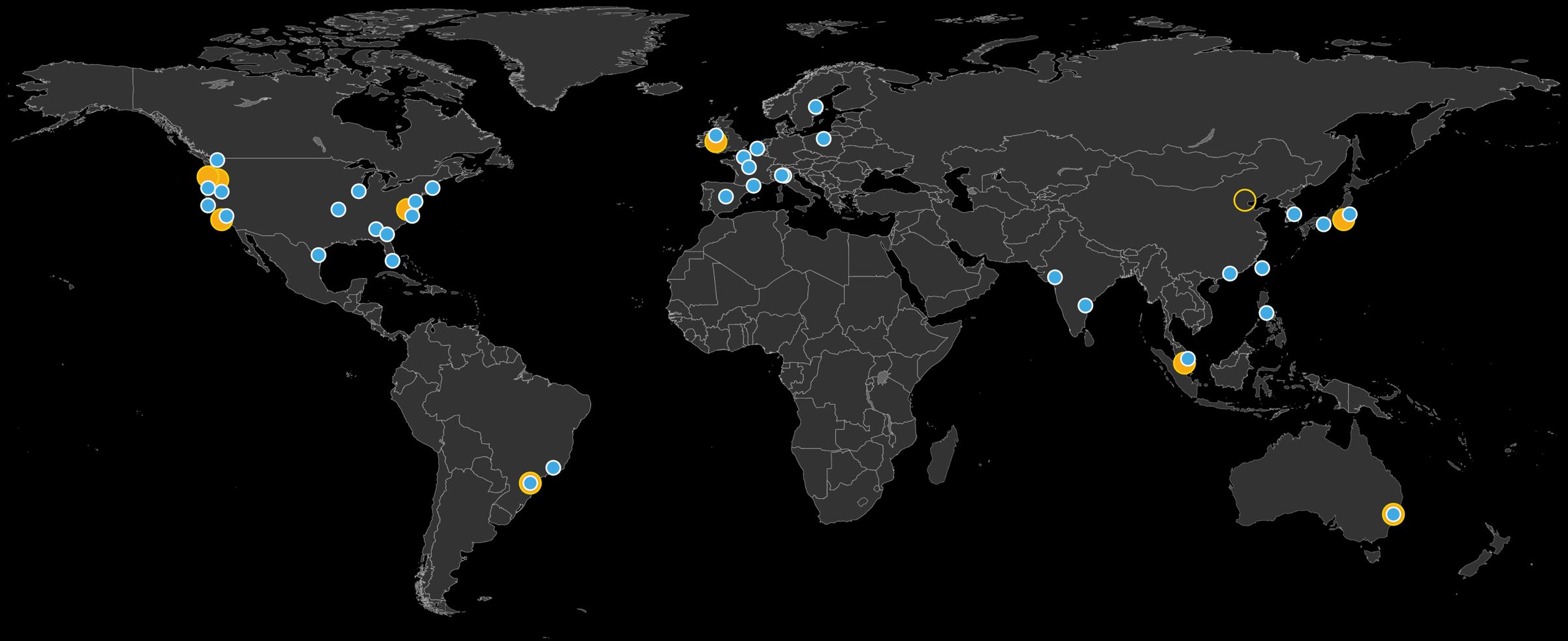
Edge Locations



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DynamoDB

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- Managed NoSQL Database
- Super fast: <10ms latency. SSD-based.
- Eventually consistent writes.
- Guaranteed scale/throughput.
- From tiny one row tables to hundreds of GB
- $0.0074 per 10 writes/second. $0.0074 per 50 reads/second. $0.285 per GB.
- Free Tier: 100MB plus 5 writes/second, 10 reads/second.

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Elastic Beanstalk

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- Rapid deployment Application Container or Platform-as-a-Service solution.
- No loss in flexibility.
- Supports Node.js, PHP, Python, Ruby, .NET and Java.
- Point it at your git repository, configure environment and go.
- Beanstalk will configure EC2 Instances, Load Balancers, Databases, Auto Scaling, Self Healing and deployment for you.
- No cost for Elastic Beanstalk, pay only for resources consumed.

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AppStream

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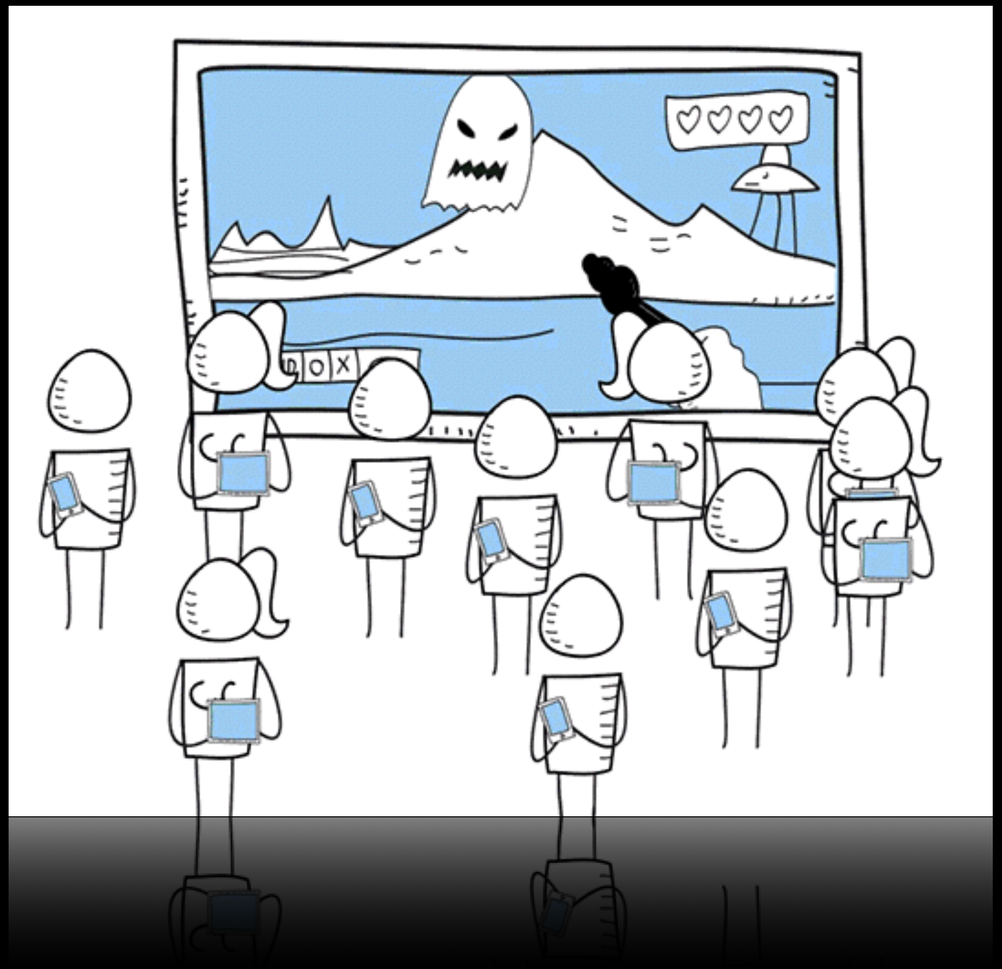

- Stream resource intensive apps and games from the cloud.
- App runs in the cloud, H.264 video is streamed to the device in real-time - throw computing power at it.
- Great for photo editing, 3D rendering (render in the cloud and stream the results).
- Limited preview release only.
- Powers the EVE Online Character Generator.

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AWS SDK and Toolkits

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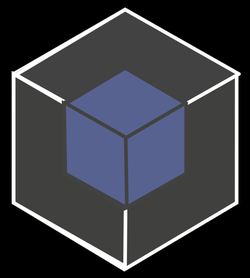
Java

Python



PHP

.NET

Ruby

NodeJS

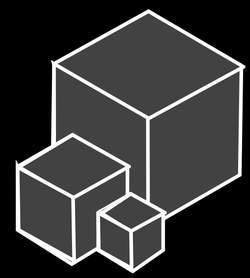
iOS

Android

Visual Studio

Ellipse

Powershell



CLI

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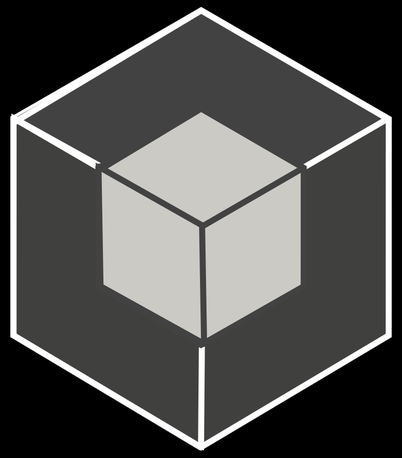

AWS SDK for iOS

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Getting Setup

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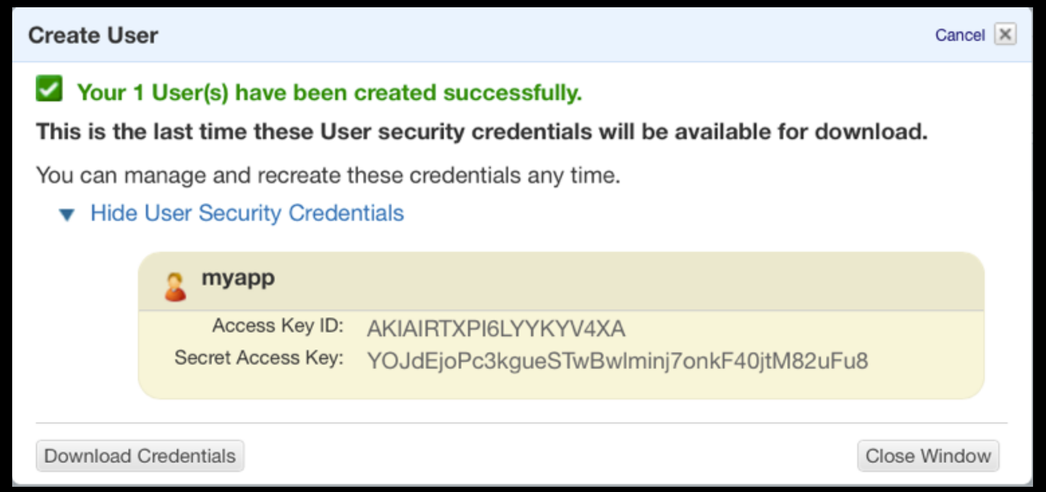
- Sign up to AWS.
- Create IAM User.
- Save Access/Secret Keys.
- Install the SDK:
  - CocoaPods.
  - Static Library.
  - Pull it in from GitHub.



Example: EC2

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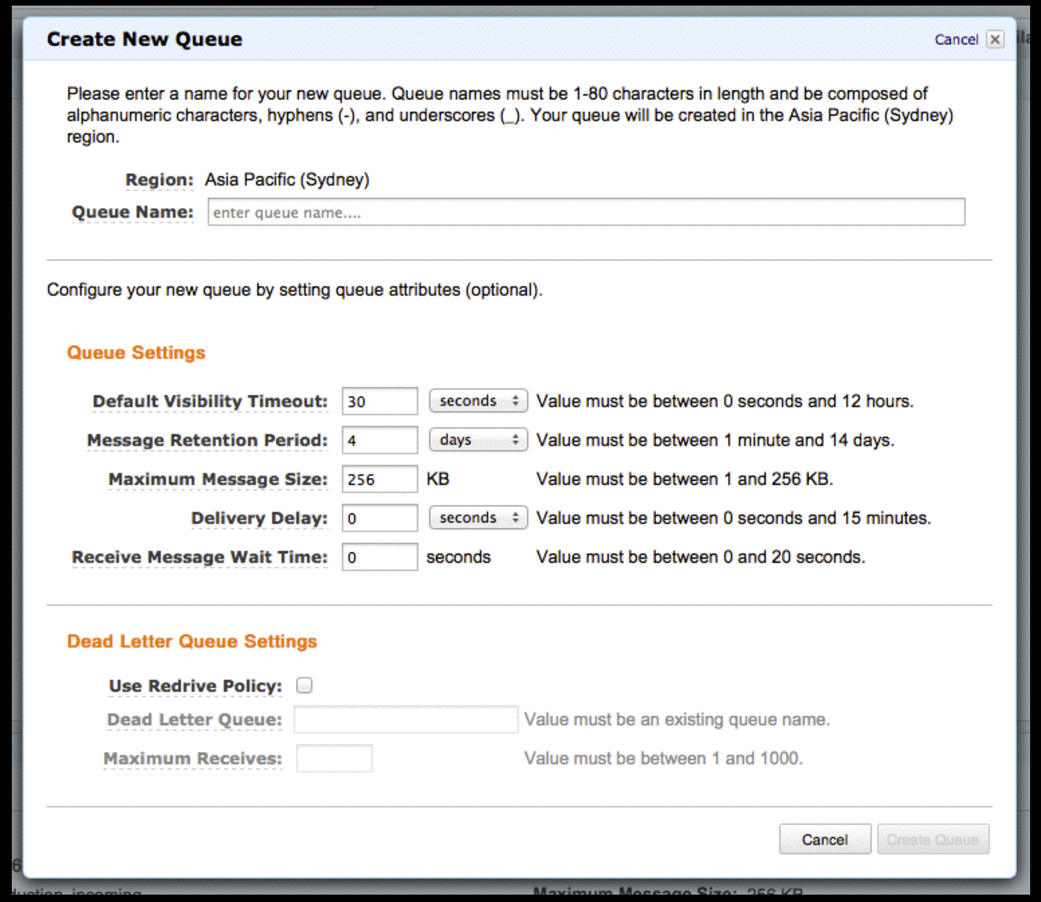
```objc
#import <AWSiOSSDK/EC2/AmazonEC2Client.h>
#import <AWSiOSSDK/AWSRuntime.h>

- (void)getRegions
{
    // Create the client
    AmazonEC2Client *client = [[AmazonEC2Client alloc] initWithAccessKey:@"xxxx" withSecretKey:@"yyyy"];
    [client setEndpoint:[AmazonEndpoints ec2Endpoint:AP_SOUTHEAST_2 secure:YES]];

    // Create the request
    EC2DescribeRegionsRequest *request = [[EC2DescribeRegionsRequest alloc] init];

    // Execute the request
    EC2DescribeRegionsResponse *response = [client describeRegions:request];

    if (response.error != nil)
    {
        // error
    } else
    {
        //
        // response.regions                NSArray of EC2Region Objects
        //
        // Each EC2Region has regionName and endpoint properties.
        //
    }
}
```

Example: EC2 (Asynchronous)


```objc
#import <AWSiOSSDK/EC2/AmazonEC2Client.h>
#import <AWSiOSSDK/AWSRuntime.h>

- (void)getRegions
{
    // Create the client
    AmazonEC2Client *client = [[AmazonEC2Client alloc] initWithAccessKey:@"xxxx" withSecretKey:@"yyyy"];
    [client setEndpoint:[AmazonEndpoints ec2Endpoint:AP_SOUTHEAST_2 secure:YES]];

    // Create the request
    EC2DescribeRegionsRequest *request = [[EC2DescribeRegionsRequest alloc] init];
    [request setDelegate:self];

    // Execute the request
    [client describeRegions:request];
}

- (void)request:(AmazonServiceRequest *)request didFailWithError:(NSError *)error
{
    // error
}

- (void)request:(AmazonServiceRequest *)request didCompleteWithResponse:(AmazonServiceResponse *)response
{
   //
   // response.regions                NSArray of EC2Region Objects
   //
   // Each EC2Region has regionName and endpoint properties.
   //
}
```

SQS Example



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SQS: Send Message


```
#import <AWSiOSSDK/SQS/AmazonSQSClient.h>
#import <AWSiOSSDK/AWSRuntime.h>


// Create the client
AmazonSQSClient *client = [[AmazonSQSClient alloc] initWithAccessKey:@"xxxx" withSecretKey:@"yyyy"];
[client setEndpoint:[AmazonEndpoints sqsEndpoint:AP_SOUTHEAST_2 secure:YES]];

// Create the request
SQSSendMessageRequest *request = [[SQSSendMessageRequest alloc] init];
[request setQueueUrl:@"https://sqs.ap-southeast-2.amazonaws.com/account/queuename"];
[request setMessageBody:@"Put your message body here."];

// Execute the request
SQSSendMessageResponse *response = [client sendMessage:request];

if (response.error != nil)
{
    // error

} else
{
    // response.mD5OfMessageBody              // MD5 digest of the message body
    // response.messageId                     // Unique identifier for the message
}
```

SQS: Receive Message


```objc
// Create the request
SQSReceiveMessageRequest *request = [[SQSReceiveMessageRequest alloc] init];
[request setQueueUrl:@"https://sqs.ap-southeast-2.amazonaws.com/account/queuename"];
[request setMaxNumberOfMessages:@1];

// Execute the request
SQSReceiveMessageResponse *response = [client receiveMessage:request];

if (response.error != nil)
{
    // error

} else
{
    // response.messages                NSArray of SQSMessage objects
    //
    // SQSMessage:
    //      .messageId                  Unique identifier for message
    //      .receiptHandle              Used for deleting the message
    //      .mD5OfBody                  MD5 Digest of message body
    //      .body                       Actual message body
}
```

SNS Example

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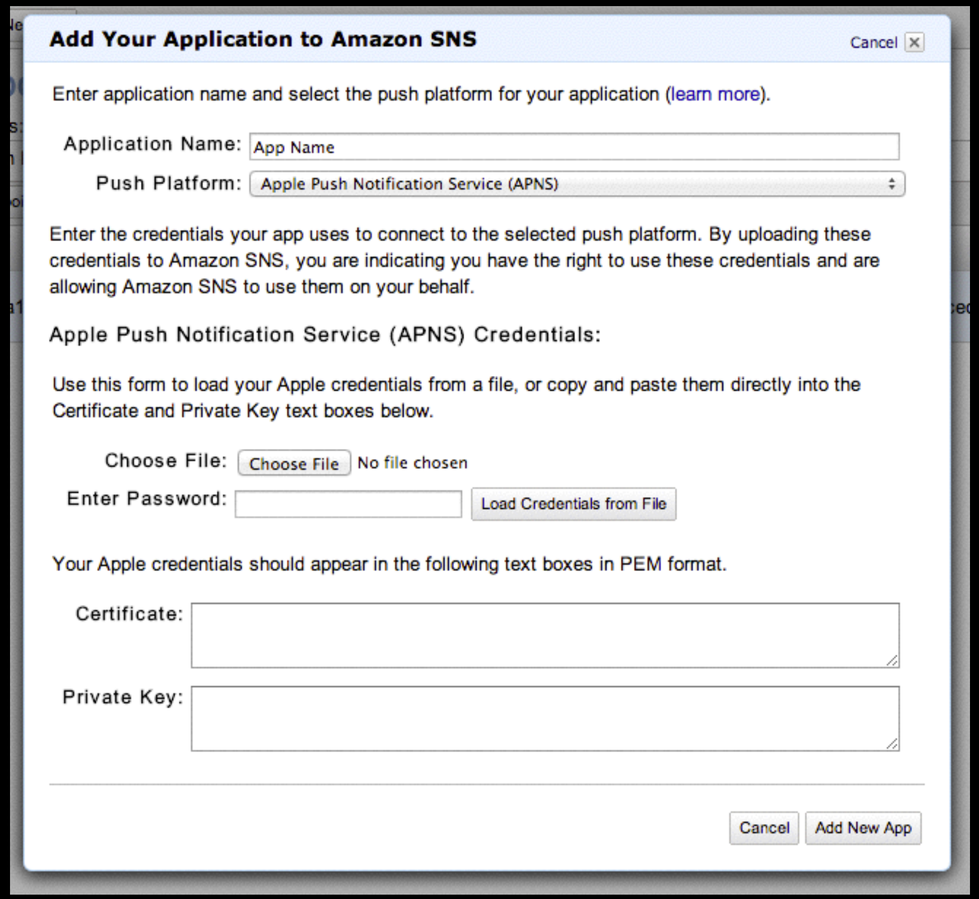

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SNS: Subscribe to Push Notifications


```
- (BOOL)application:(UIApplication *)application didFinishLaunchingWithOptions:(NSDictionary *)launchOptions
{
    [application registerForRemoteNotificationTypes:UIRemoteNotificationTypeAlert|UIRemoteNotificationTypeBadge|
UIRemoteNotificationTypeSound];
    return YES;
}

- (void)application:(UIApplication *)application didRegisterForRemoteNotificationsWithDeviceToken:(NSData *)deviceToken
{
    AmazonSNSClient *client = [[AmazonSNSClient alloc] initWithAccessKey:@"xxx" withSecretKey:@"yyy"];
    SNSCreatePlatformEndpointRequest *request = [[SNSCreatePlatformEndpointRequest alloc] init];
    NSString *stringToken = [deviceToken hexadecimalRepresentation];
    [request setToken:stringToken];
    [request setCustomUserData:[[[UIDevice currentDevice] identifierForVendor] UUIDString]];
    [request setPlatformApplicationArn:@“arn:aws:sns:us-east-1:123456789012:app/APNS/App-Name"];

    [client createPlatformEndpoint:request];
}
```

SNS: Send Push Notification

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```
// Create the request
SNSPublishRequest *request = [[SNSPublishRequest alloc] init];
[request setTargetArn:@“arn:aws:sns:us-east-1:262192482026:endpoint/APNS_SANDBOX/Kestrel-Sandbox/
5910b677-612b-3cec-a3a3-e476fe5e73d1"];
[request setMessage:@"Message body."];

// Execute the request
SNSPublishResponse *response = [client publish:request];

if (response.error != nil)
{
    // error

} else
{
    // response.messageId              Unique identifier for message
}
```

S3: Upload Example


```objc
- (void)takeAndUploadPhoto
{
    UIImagePickerController *controller = [[UIImagePickerController alloc] init];
    [controller setSourceType:UIImagePickerControllerSourceTypeCamera];
    [controller setDelegate:self];
    [self.navigationController presentViewController:controller animated:YES completion:NULL];
}

- (void)imagePickerController:(UIImagePickerController *)picker didFinishPickingMediaWithInfo:(NSDictionary *)info
{
    AmazonS3Client *client = [[AmazonS3Client alloc] initWithAccessKey:@"xxx" withSecretKey:@"yyy"];
    UIImage *image = [info objectForKey:UIImagePickerControllerEditedImage] ?: [info
objectForKey:UIImagePickerControllerOriginalImage];

    if (image != nil) {
        S3PutObjectRequest *request = [[S3PutObjectRequest alloc] initWithKey:@"photo.jpg" inBucket:@"MyS3Bucket"];
        [request setContentType:@"image/jpeg"];
        [request setData:UIImageJPEGRepresentation(image, 0.9f)];

        S3PutObjectResponse *response = [client putObject:request];
        if (response.error != nil) {
            // error handling
        }
        else {
            // success handling
        }
    }
    [self.presentedViewController dismissViewControllerAnimated:YES completion:NULL];
}
```

DynamoDB NSIncrementalStore


```
- (NSPersistentStoreCoordinator *)persistentStoreCoordinator
{
    if (_persistentStoreCoordinator != nil) {
        return _persistentStoreCoordinator;
    }

    [NSPersistentStoreCoordinator registerStoreClass:[AWSPersistenceDynamoDBIncrementalStore class]
                                        forStoreType:AWSPersistenceDynamoDBIncrementalStoreType];

    NSDictionary *tables = @{ @"Entity1": @"table1", @"Entity2": @"table2" };
    NSDictionary *hashKeys = @{ @"Entity1": @"hashKeyAttribute1", @"Entity2": @"hashKeyAttribute2" };
    NSDictionary *versionKeys = @{ @"Entity1": @"versionAttribute", @"Entity2": @"versionAttribute" };
    AmazonDynamoDBClient *client = [[AmazonDynamoDBClient alloc] initWithCredentials:nil];

    NSDictionary *options = @{
                              AWSPersistenceDynamoDBTableMapper: tables,
                              AWSPersistenceDynamoDBHashKey: hashKeys,
                              AWSPersistenceDynamoDBVersionKey: versionKeys,
                              AWSPersistenceDynamoDBClient: client
                              };

    NSError *error = nil;
    _persistentStoreCoordinator = [[NSPersistentStoreCoordinator alloc] initWithManagedObjectModel:[self managedObjectModel]];
    if (![_persistentStoreCoordinator addPersistentStoreWithType:AWSPersistenceDynamoDBIncrementalStoreType configuration:nil URL:nil
options:options error:&error]) {
        // error handling
    }

    return _persistentStoreCoordinator;
}
```

Official SDK Support

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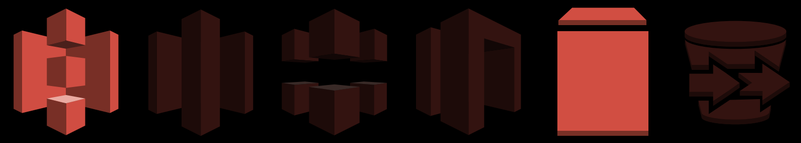
Compute and Networking

Application Services

Analytics

Storage and Content Delivery



Deployment and Management

Database

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AWS SDK for iOS

Unsigned Apps Edition

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Benefits

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- Fully asynchronous.
- Completion blocks instead of delegates.
- Strongly Typed. Enums instead of NSStrings.
- Built out of Mantle. Supports <NSCopying> and <NSCoding> of all objects. Serialisable to JSON.
- Uses KissXML and MantleXMLAdapter. Serialisable to XML.
- Built on NSOperations and NSURLSessions. Use familiar tools to control communications with AWS.

Unsigned Apps SDK Support

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Compute and Networking

Application Services

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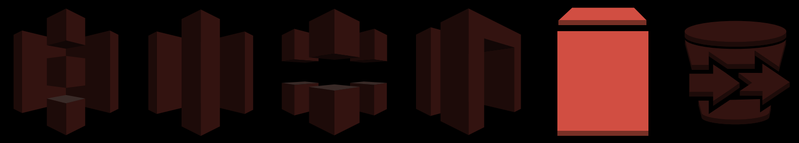
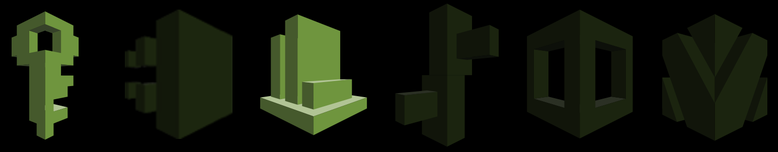


Deployment and Management



Database

Example: Starting an EC2 Instance


```objc
#import <UAAWSSDK/UAEC2.h>


// Create the request
UAEC2StartInstancesRequest *request = [[UAEC2StartInstancesRequest alloc] init];
[request addInstanceID:@"i-12345678"];

// Execute the request
[request invokeWithOwner:self completionBlock:^(UAEC2StartInstancesResponse *response, NSError *error) {

    if (error != nil) {
        // error handling
    }
    else {
        // do something with response
    }
}];
```

Example: Waiting for Instance to Start


```objc
// Create the request
UAEC2DescribeInstancesRequest *request = [[UAEC2DescribeInstancesRequest alloc] init];
[request addInstanceID:@"i-12345678"];

// Execute the request, wait until the instance has started
[request waitWithOwner:self
   untilValueAtKeyPath:@"reservations.@unionOfObjects.instances.@unionOfObjects.state"
             isInArray:@[ @(UAEC2InstanceStateRunning) ]
       completionBlock:^(UAEC2DescribeInstancesResponse *response, NSError *error) {
    if (error != nil) {
        // do something with the error
    }
    else {
        // do something with the instance
    }
}];
```

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Questions?

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