Cloud Computing - the basics

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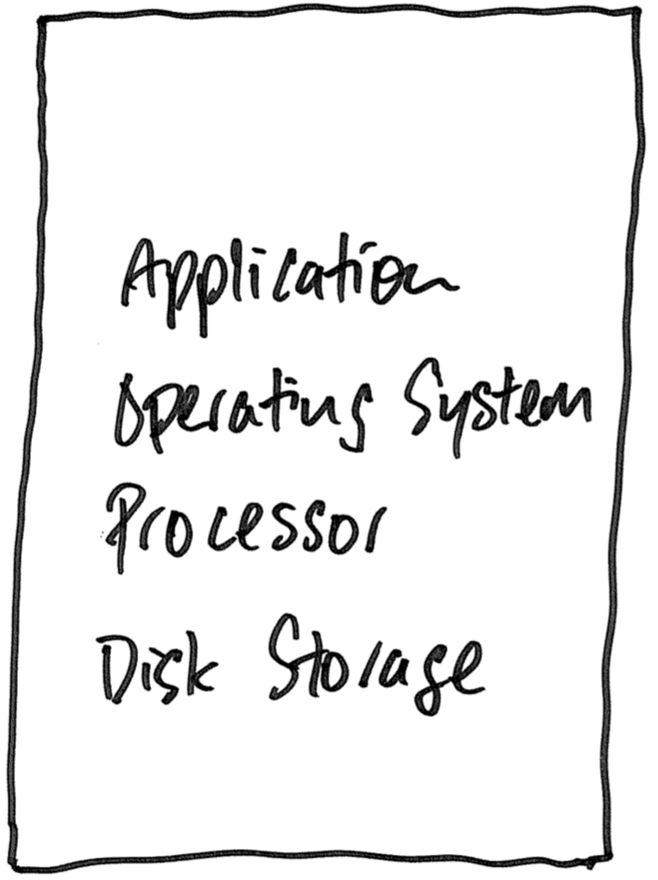
Privacy and Data Protection Deputy Commissioner
Office of the Victorian Information Commission

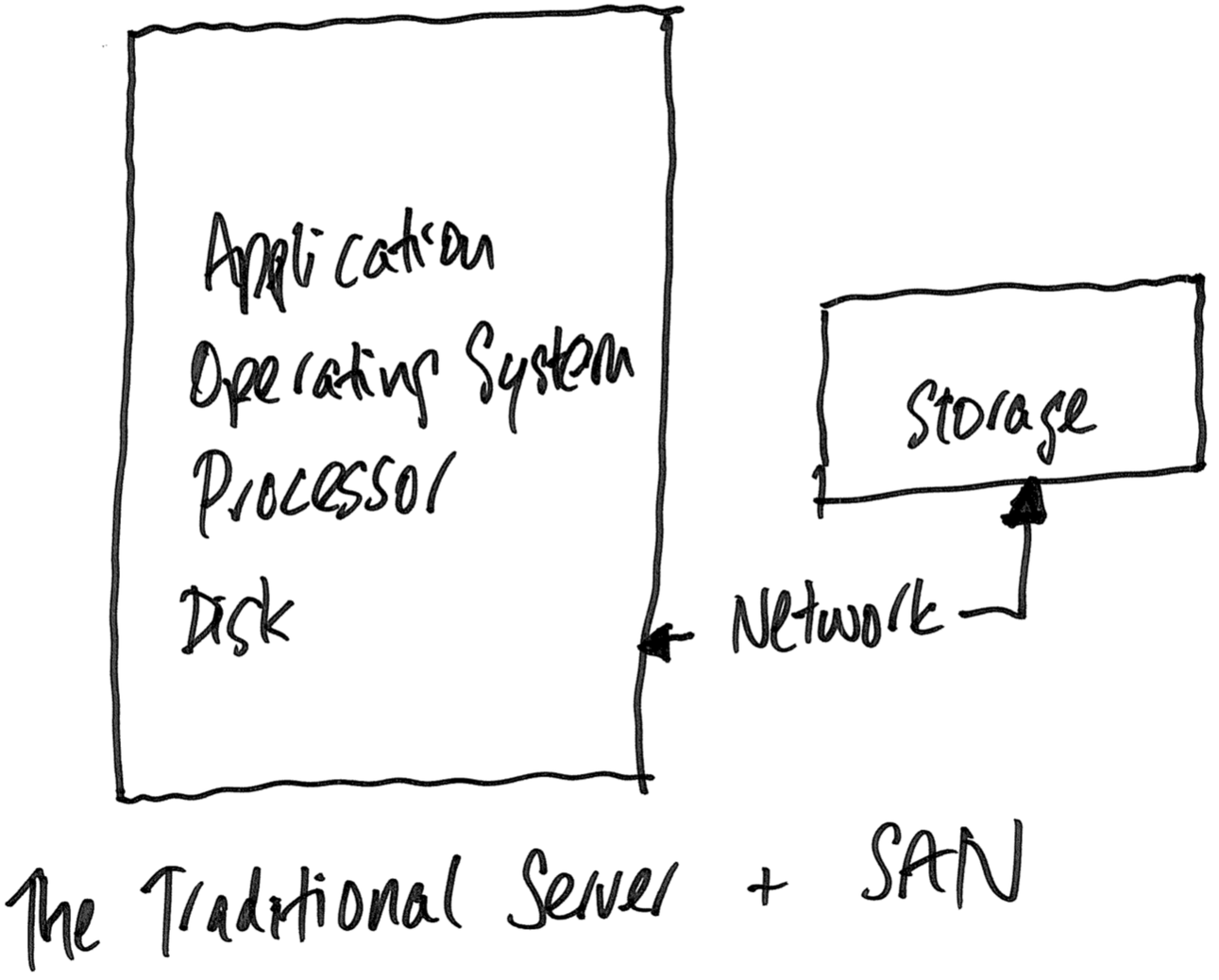
Victorian Privacy Network Meeting
State Library of Victoria 9 October 2019

What is “cloud computing,” anyway?

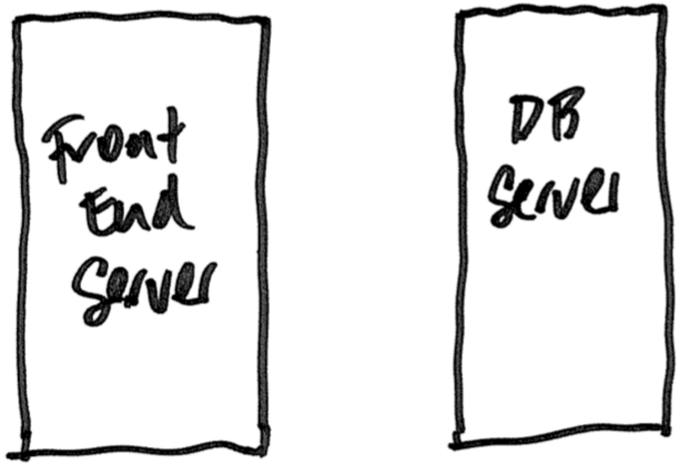
OVIC
Office of the Victorian
Information Commissioner



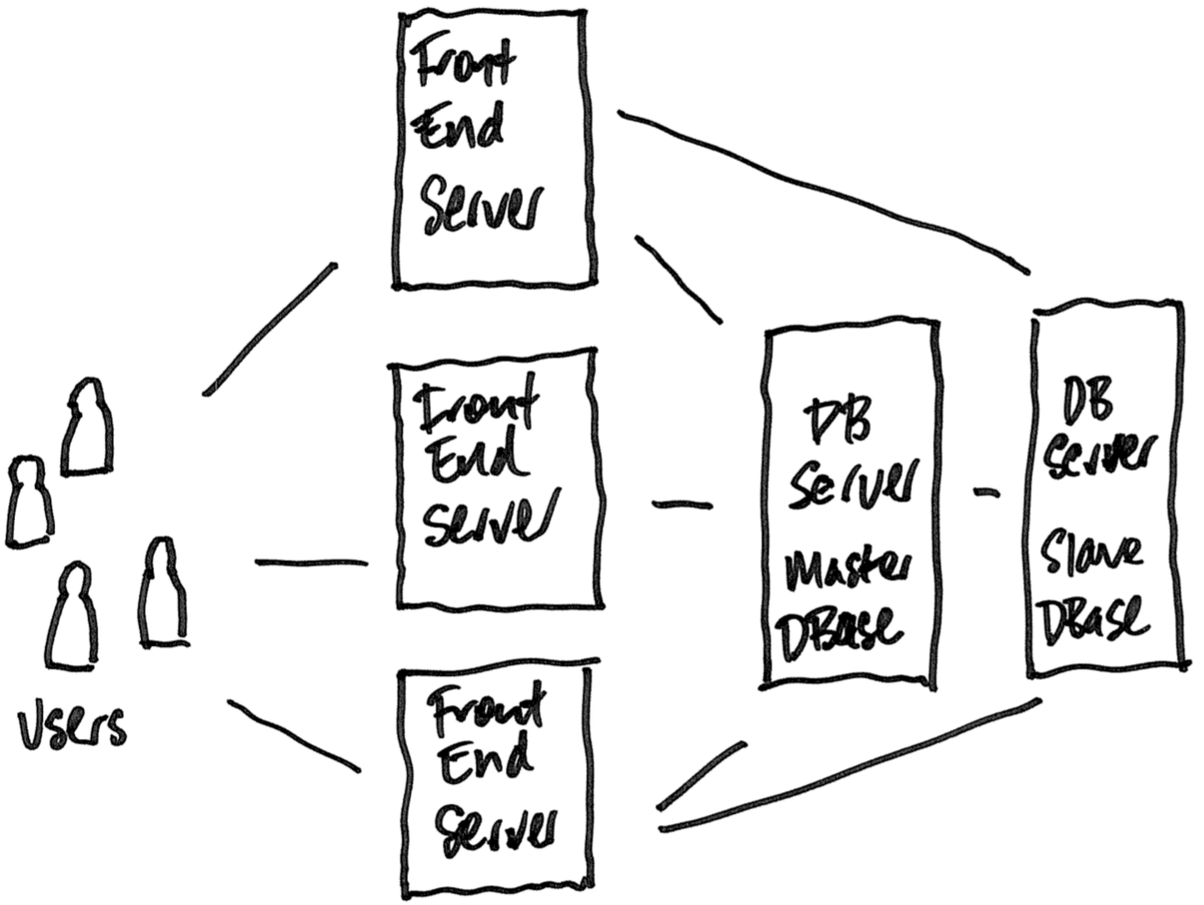
The Traditional Server



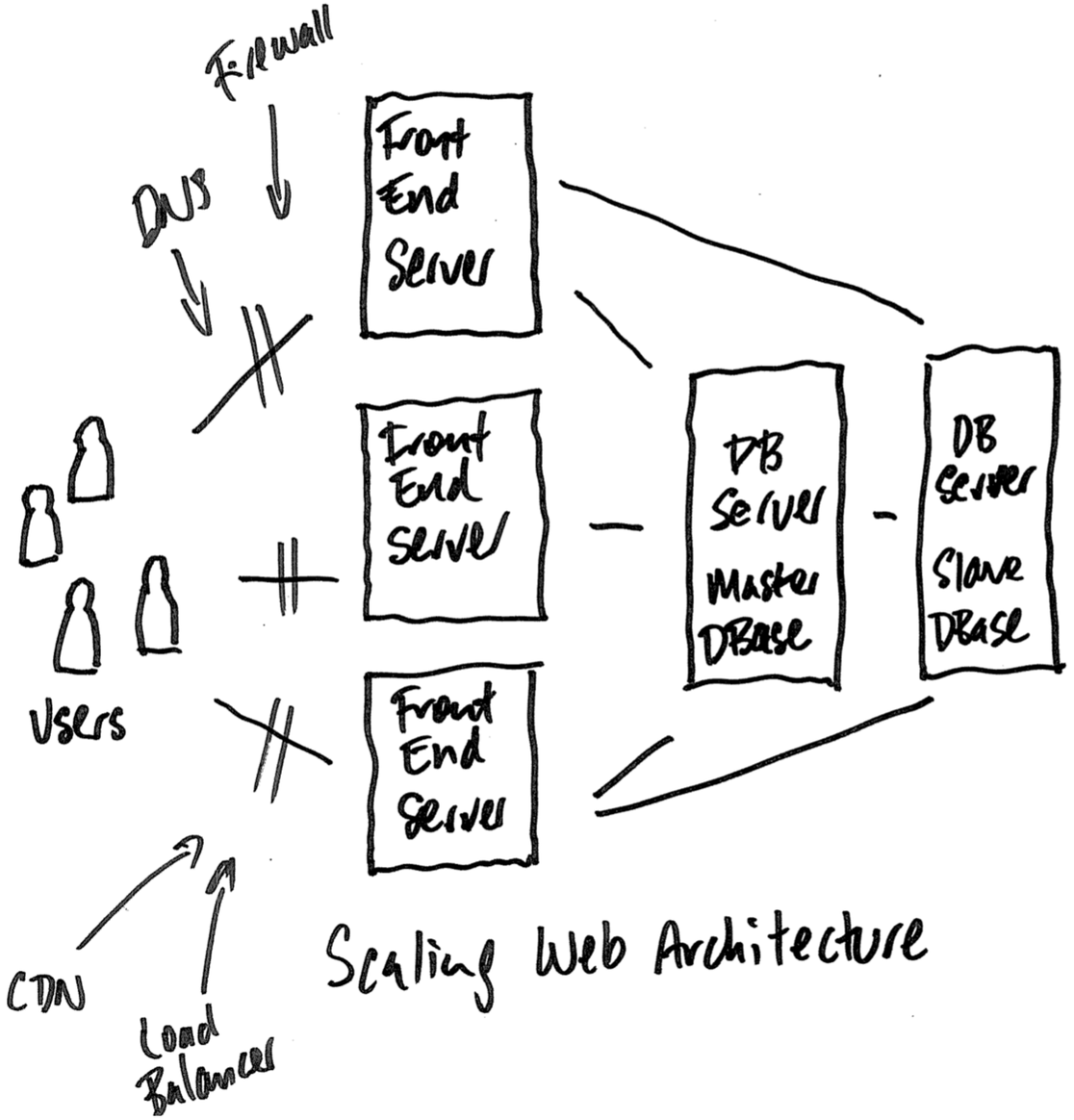
The Traditional Server + SAN



Web Architecture



Scaling Web Architecture

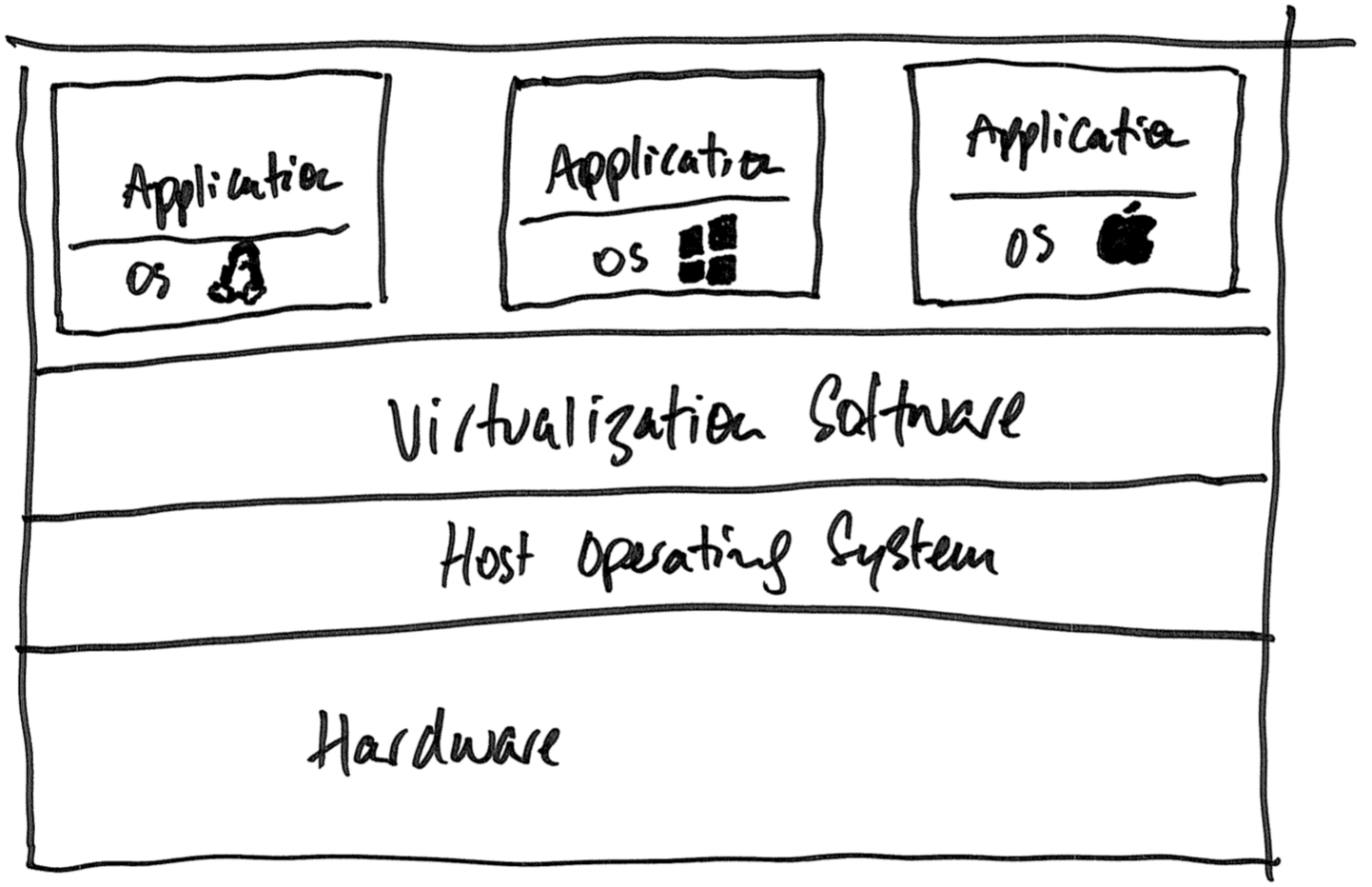

Firewall
DNS
Front End Server
Front End Server
Front End Server
DB Server Master DBase
DB Server Slave DBase
Users
CDN
Load Balancer
Scaling Web Architecture

The virtual machine

To vastly over-simplify, a virtual machine is software emulating a physical machine

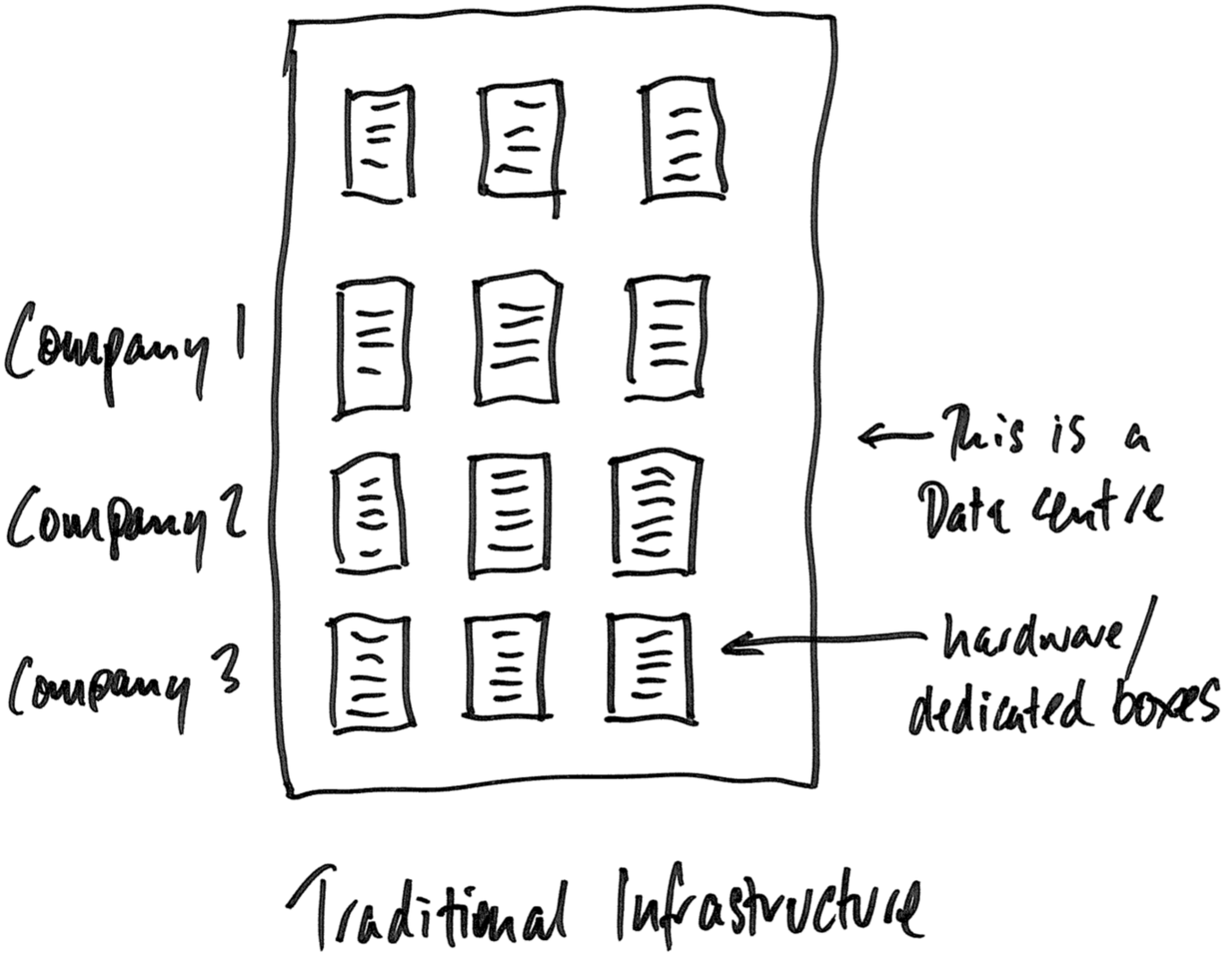
Using a virtual machine, a single server can run multiple virtual machines, allocating the memory, processor and disk of the physical machine to multiple different VMs

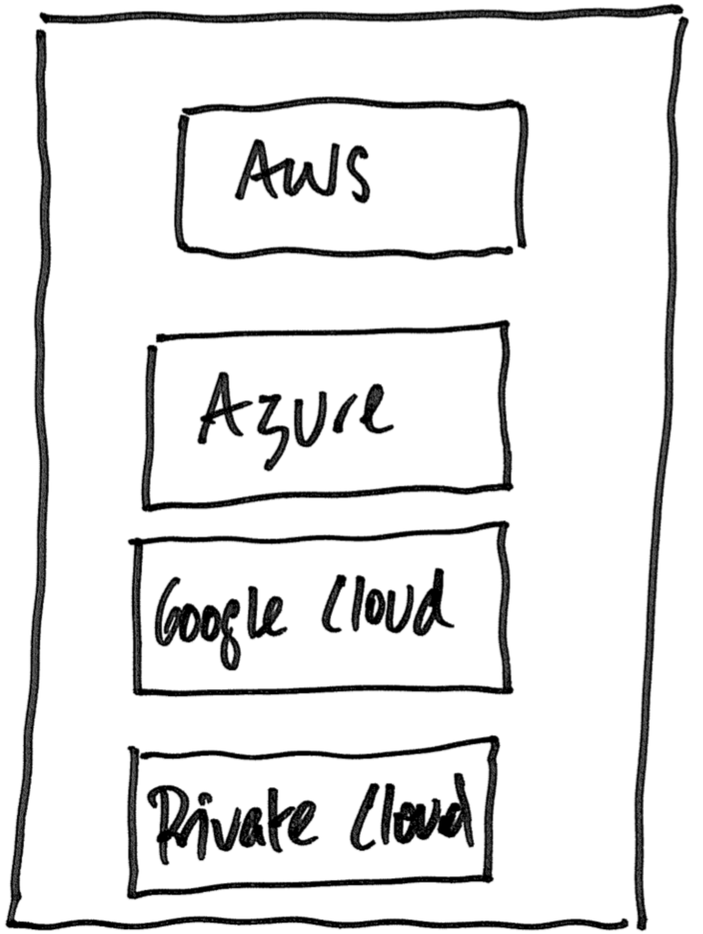
Each VM seems, to the end-user, to be the same as a single physical machine



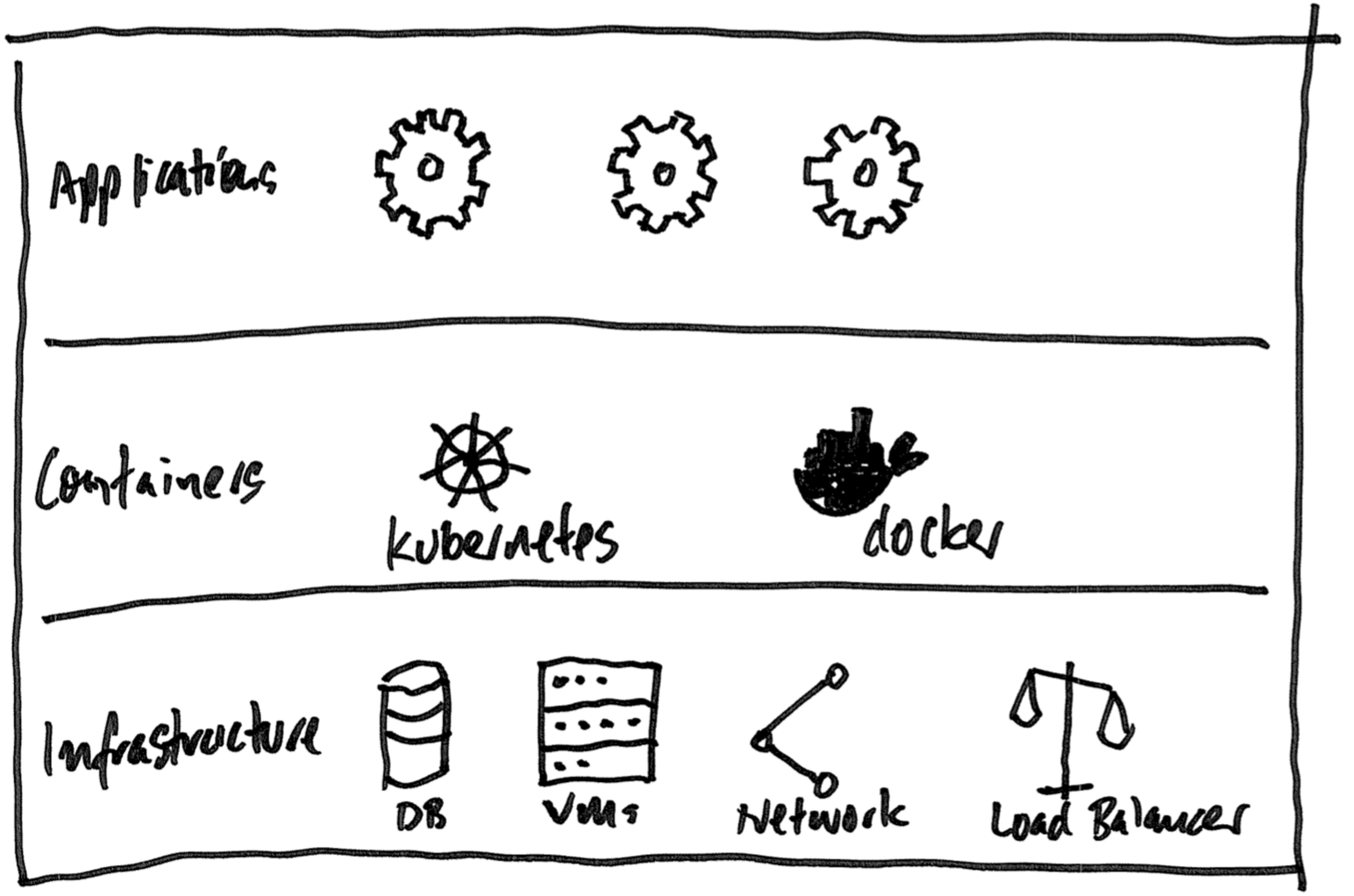
Virtual Machines

Most computer servers these days run Virtual Machines

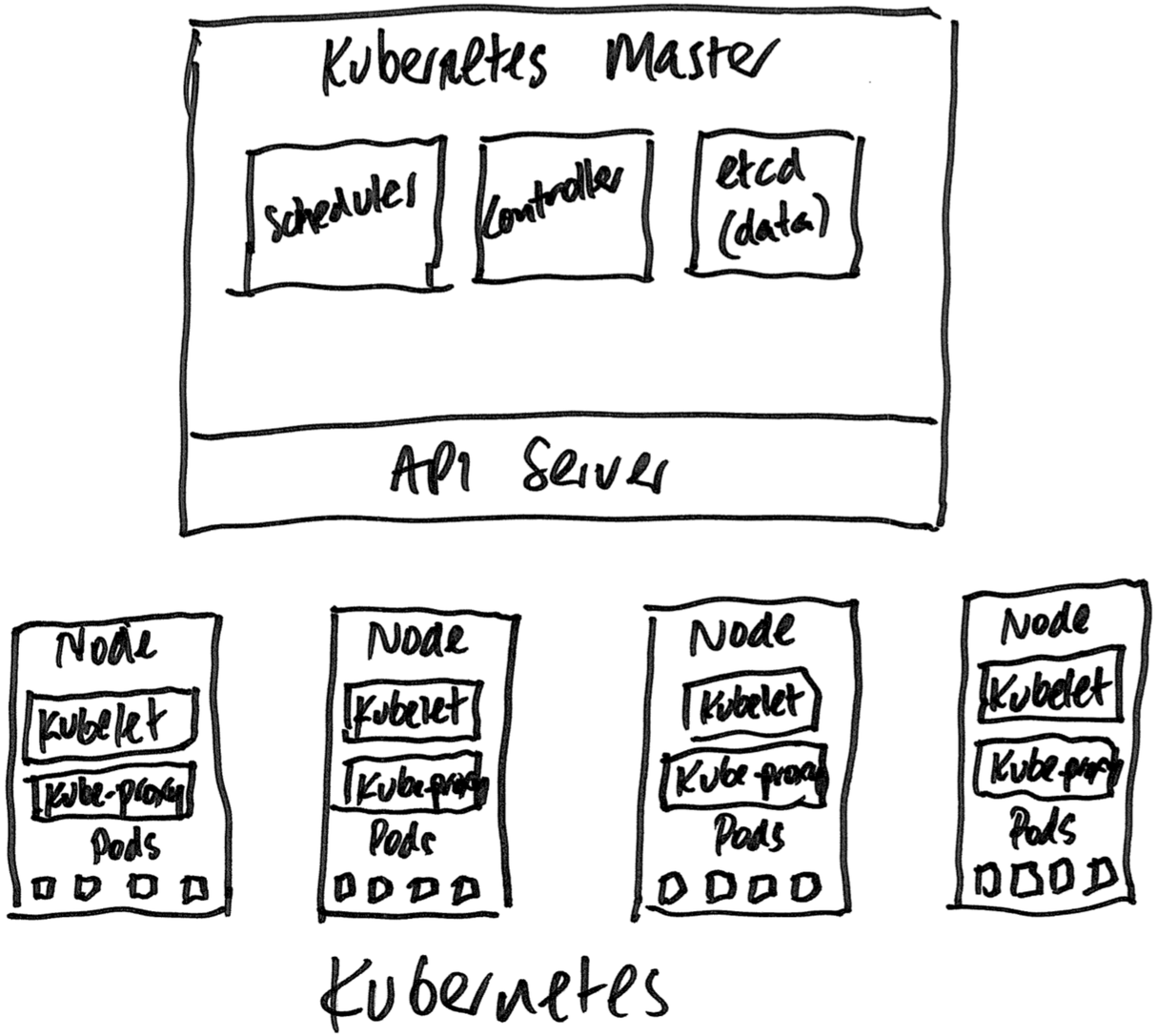

Company 1
Company 2
Company 3
← This is a Data Centre
← hardware/ dedicated boxes
Traditional Infrastructure

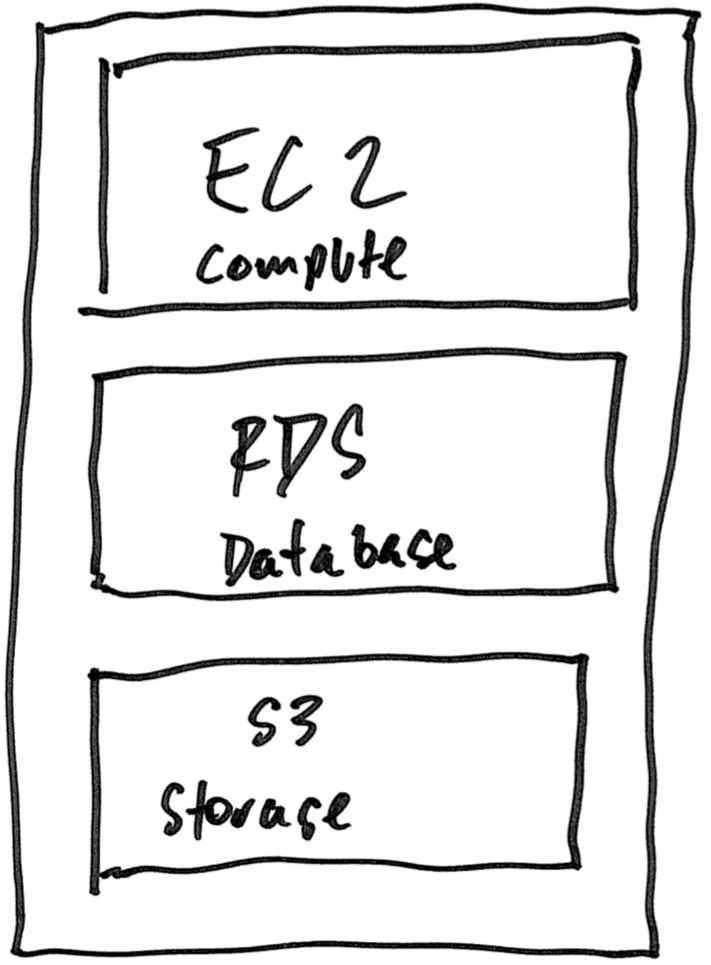


Infrastructure-as-a-Service

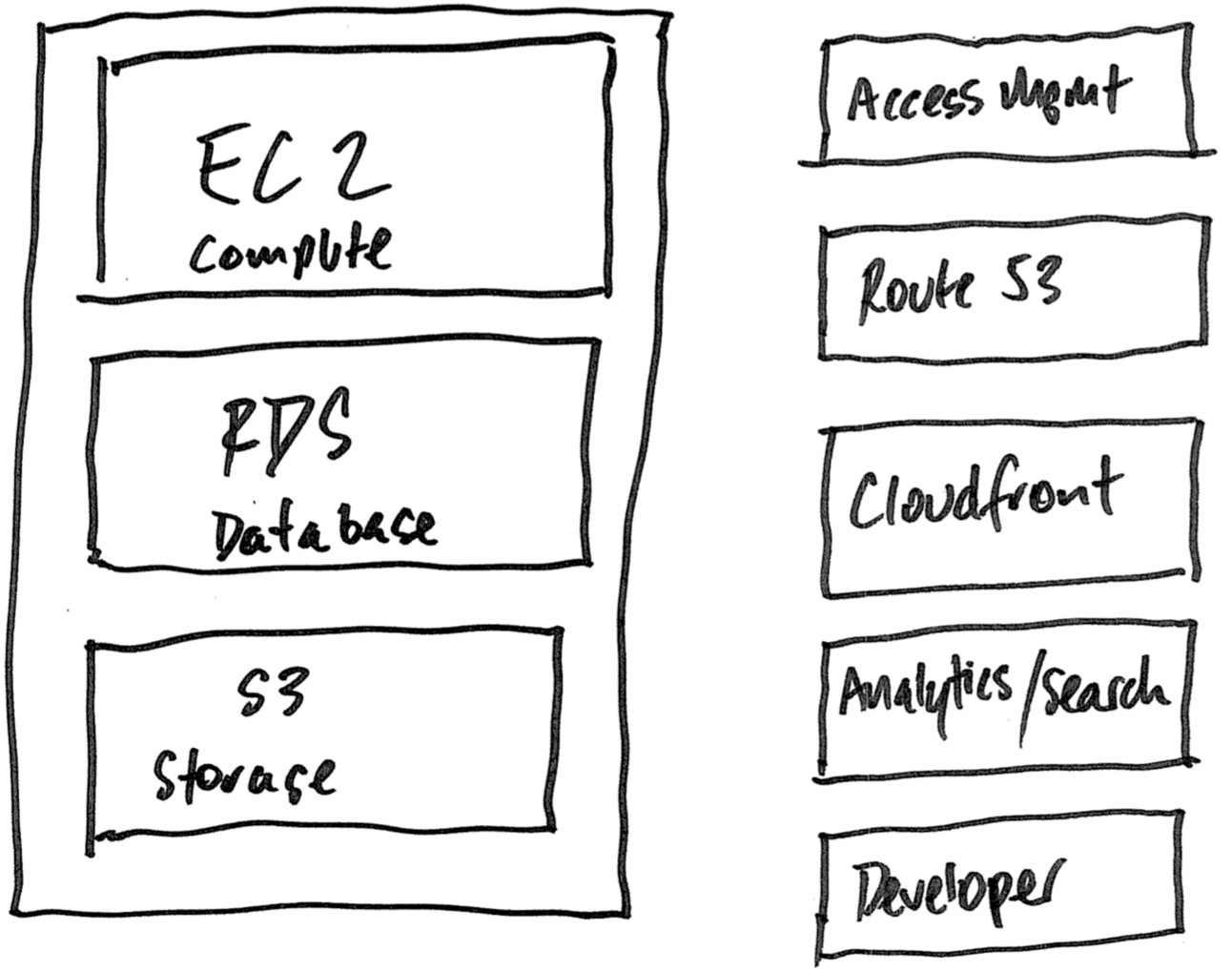

Applications
Containers
kubernetes
docker
Infrastructure
DB
VMs
Network
Load Balancers

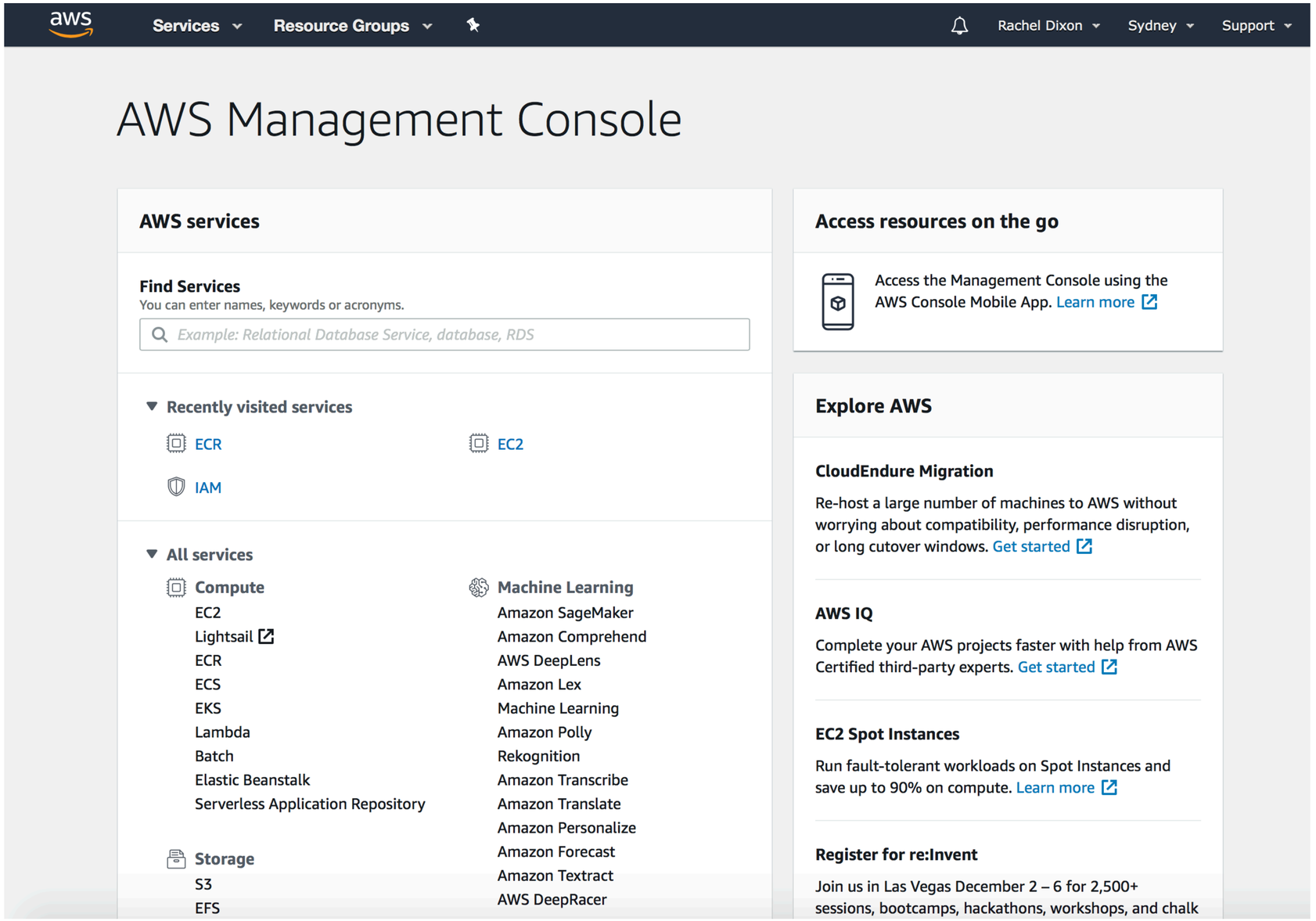
Containers


Kubernetes Master
scheduler
controller
etcd (data)
API Server
Node
Kubelet
Kube-proxy
Pods
Node
Kubelet
Kube-proxy
Pods
Node
Kubelet
Kube-proxy
Pods
Node
Kubelet
Kube-proxy
Pods
Kubernetes



Amazon Web Services


EC2
Compute
RDS
Database
S3
Storage
Access Mgmt
Route 53
Cloudfront
Analytics/Search
Developer
Amazon Web Services


aws
Services
Resource Groups
Rachel Dixon
Sydney
Support
AWS Management Console
AWS services
Find Services
You can enter names, keywords or acronyms.
Example: Relational Database Service, database, RDS
Recently visited services
ECR
EC2
IAM
All services
Compute
EC2
Lightsail
ECR
ECS
EKS
Lambda
Batch
Elastic Beanstalk
Serverless Application Repository
Storage
S3
EFS
Machine Learning
Amazon SageMaker
Amazon Comprehend
AWS DeepLens
Amazon Lex
Machine Learning
Amazon Polly
Rekognition
Amazon Transcribe
Amazon Translate
Amazon Personalize
Amazon Forecast
Amazon Textract
AWS DeepRacer
Access resources on the go
Access the Management Console using the AWS Console Mobile App. Learn more
Explore AWS
CloudEndure Migration
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AWS IQ
Complete your AWS projects faster with help from AWS Certified third-party experts. Get started
EC2 Spot Instances
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WEBINAR
Birthday Week 2019 Recap
Join us for a recap of this year's

UPDATED
An Improved Cloudflare Workers Developer Experience
We've updated the CLI, docs, and more

WEBINAR
Get rid of your network perimeter hardware
Introducing Magic Transit. Extend the

Cloud is only cheaper if you design for it

For some applications that need to scale up or down, it’s much cheaper.
But if you take an existing application and put it in the cloud
it may cost much more to run

Amazon Rekognition Video

PAGE CONTENT

What is Amazon Rekognition Video?

Amazon Rekognition Video is a deep learning powered video analysis service that detects activities; understands the movement of people in frame; and recognizes people, objects, celebrities, and inappropriate content from your video stored in Amazon S3. Results are paired with time stamps so that you can easily create an index to facilitate highly detailed video search. For people and faces, Rekognition Video also returns the bounding box coordinates, which is the specific location of the person or face in the frame.

Amazon Rekognition Video can also monitor a live stream that you create from Amazon Kinesis Video Steams to detect and recognize faces from face data that you provide.

Key features

REAL-TIME ANALYSIS OF STREAMING VIDEO

Amazon Rekognition Video can analyze your live video streams in real time to detect and recognize faces. By providing a stream from Amazon Kinesis Video Streams as an input to Rekognition Video, you can perform facial recognition against collections of up to tens of millions of faces that you provide with very low latency. For batch processing use cases, Amazon Rekognition Video can also analyze previously recorded video data stored in Amazon S3.

PERSON IDENTIFICATION AND PATHING

With Amazon Rekognition Video, you can capture the position of each person in a video. The TrackPersons API detects people and how they move even when the camera is in motion. It can also attribute motion to the same person even when their face is blocked or they move in and out of the frame. The TrackPersons API returns time segments and confidence scores.

FACE RECOGNITION

Amazon Rekognition Video allows you to perform real time face searches against collections of tens of millions of faces that you provide. Using the CreateCollection API, you can easily create a face collection from your images with vectors representing facial features. Rekognition then searches the provided face collection for visually similar faces throughout your video. This can enable use cases such as access control or automatic identification of friends in photo sharing apps.

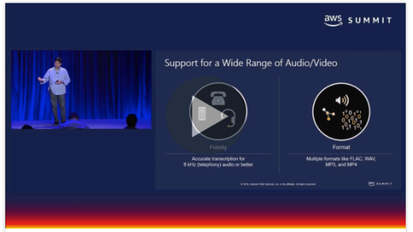
Amazon Transcribe

Automatic speech recognition

Get Started with Amazon Transcribe

Amazon Transcribe is an automatic speech recognition (ASR) service that makes it easy for developers to add speech-to-text capability to their applications. Using the Amazon Transcribe API, you can analyze audio files stored in Amazon S3 and have the service return a text file of the transcribed speech. You can also send a live audio stream to Amazon Transcribe and receive a stream of transcripts in real time.

Amazon Transcribe can be used for lots of common applications, including the transcription of customer service calls and generating subtitles on audio and video content. The service can transcribe audio files stored in common formats, like WAV and MP3, with time stamps for every word so that you can easily locate the audio in the original source by searching for the text. Amazon Transcribe is continually learning and improving to keep pace with the evolution of language.



AWS San Francisco Summit 2018 - Amazon Transcribe is Now Generally Available

Key Features

Easy-to-Read Transcriptions

Most speech recognition systems output a string of text without punctuation. Amazon Transcribe uses deep learning to add punctuation and formatting automatically, so that the output is more intelligible and can be used without any further editing.

Timestamp Generation

Amazon Transcribe returns a timestamp for each word, so that you can easily locate the audio in the original recording by searching for the text.

Support for a Wide Range of Use Cases

Amazon Transcribe is designed to provide accurate and automated transcripts for a wide range of audio quality. You can generate subtitles for any video or audio files, and even transcribe low quality telephony recordings such as customer service calls.

Cloud computing and the IPPs

Office of the Victorian Information Commissioner

Principle 4—Data Security

4.1. An organisation must take reasonable steps to protect the personal information it holds from misuse and loss and from unauthorised access, modification or disclosure.

4.2. An organisation must take reasonable steps to destroy or permanently de-identify personal information if it is no longer needed for any purpose.

Privacy and Data Protection Act 2014

Principle 9—Transborder Data Flows

9.1. An organisation may transfer personal information about an individual to someone (other than the organisation or the individual) who is outside Victoria only if—

(a) the organisation reasonably believes that the recipient of the information is subject to a law, binding scheme or contract which effectively upholds principles for fair handling of the information that are substantially similar to the Information Privacy Principles; or

(b) the individual consents to the transfer; or

(c) the transfer is necessary for the performance of a contract between the individual and the organisation, or for the implementation of precontractual measures taken in response to the individual's request; or

(d) the transfer is necessary for the conclusion or performance of a contract concluded in the interest of the individual between the organisation and a third party; or

(e) all of the following apply—

(i) the transfer is for the benefit of the individual;

(ii) it is impracticable to obtain the consent of the individual to that transfer;

(iii) if it were practicable to obtain that consent, the individual would be likely to give it; or

(f) the organisation has taken reasonable steps to ensure that the information which it has transferred will not be held, used or disclosed by the recipient of the information inconsistently with the Information Privacy Principles.

Privacy and Data Protection Act 2014

Cloud Vulnerabilities

- Legal/control risk
- Unsecured services (especially storage)
- Poorly designed software
- Poor development practices
- Poor user management
- Vendor lock-in potential