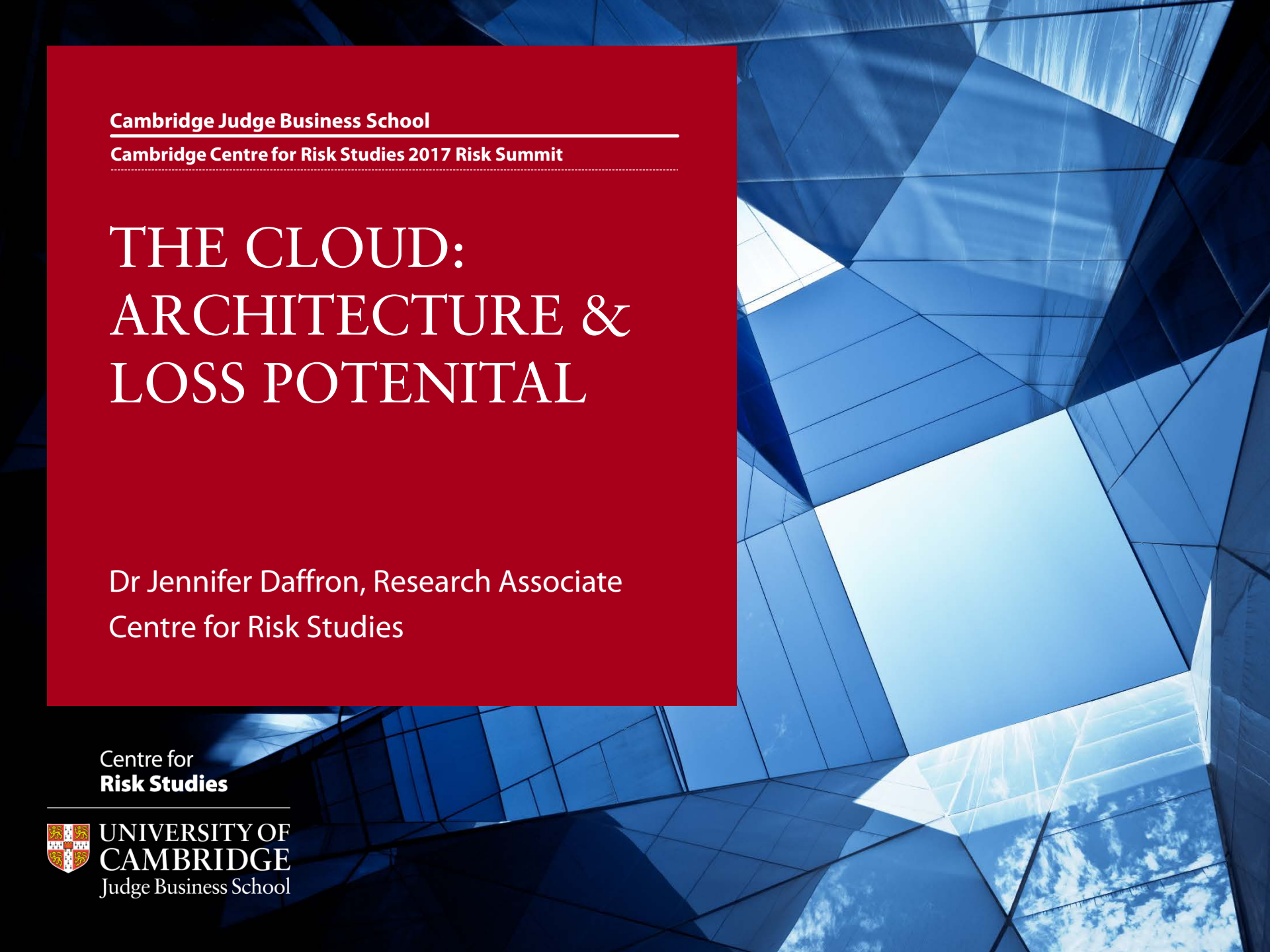

Cambridge Judge Business School

Cambridge Centre for Risk Studies 2017 Risk Summit

THE CLOUD: ARCHITECTURE & LOSS POTENITAL

Dr Jennifer Daffron, Research Associate
Centre for Risk Studies

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Overview

The Risks of Cloud Computing

What is Cloud Computing?

Cloud Architecture

+ Strengths

- Vulnerabilities

Modelling Potential Risks Case Study

Take Home Messages

The Risks of Cloud Computing

How protected is your business from catastrophic failures in the cloud?

BY DAAN PEPIJN

Business.com / Storage / Last Modified: June 9, 2017

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Photo credit: Rawpixel.com/Shutterstock

The cloud is increasingly a part of business, and any failure in distributed infrastructures could result in a potentially costly downtime.

The cloud is increasingly a part of business, and any failure in distributed infrastructures could result in a potentially costly downtime.

Cloud computing is a reality that most businesses today are facing. While there are still holdouts — especially businesses that have security and data sovereignty issues — the cloud will be prevalent to practically all businesses in the mid-term. In fact, if the early nineties and aughties were all about having an online presence as the minimum requirement for brands, then the next five years are all about businesses completing their cloud migration.

RACONTEUR

CLOUD FOR BUSINESS

ompanies
vay for techies

much to offer businesses of
s accelerating with companies
a variety of providers

The most important thing is for businesses to define their aims for cloud computing before they take a decision about which service to use

THE SUNDAY TIMES

CLOUD EXPO EUROPE

Can we trust cloud providers to keep our data safe?

By Matthew Wall
Technology of Business editor

29 April 2016 | Business

Share

Former NSA tech chief: I don't trust the cloud

RSA Conference hears warnings about trusting cloud services

By Tim Greene
Executive Editor, Network World | MAR 4, 2010 12:00 AM PT

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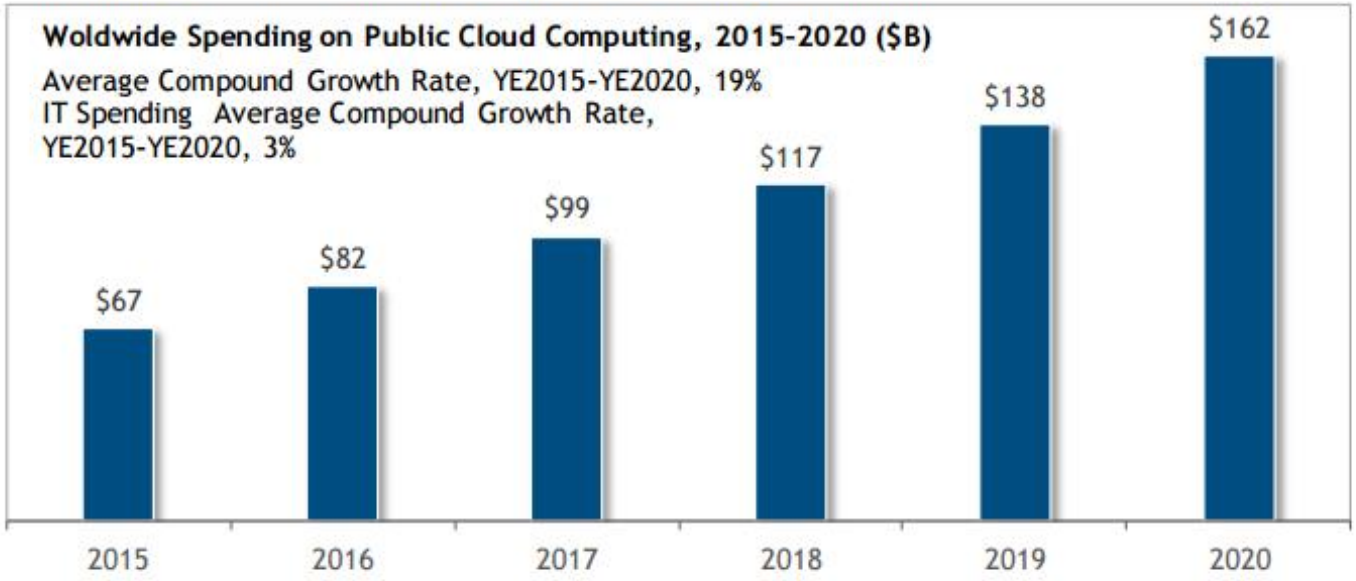
The Risks of Cloud Computing

The Rapid Growth of Cloud Computing, 2015-2020



Source: IDC, 2016

The Risks of Cloud Computing

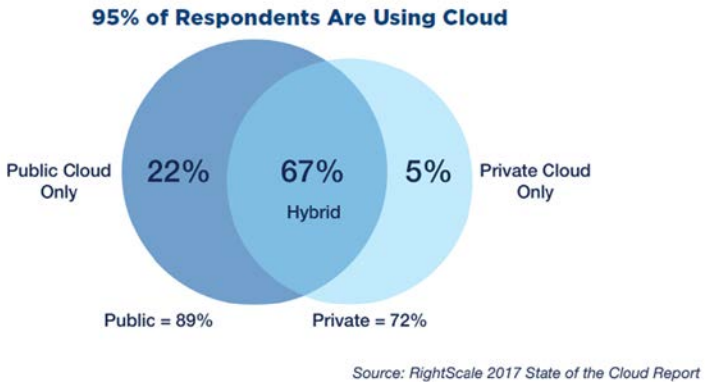
- Availability rating:
  - Amazon Elastic Cloud Compute: 99.9974%
    - Total down time: 2.41 hours
  - Google Compute Engine: 99.9815%
    - Total down time: 4.46 hours.

- What does ‘down time’ mean for cloud clients?
  - Loss estimates for **1 Day** based on Annual Revenue from advertising:

Google	$100 Million
amazon	$82 Million
ebay	$28 Million
YAHOO!	$12 Million
	$12 Million

The Risks of Cloud Computing

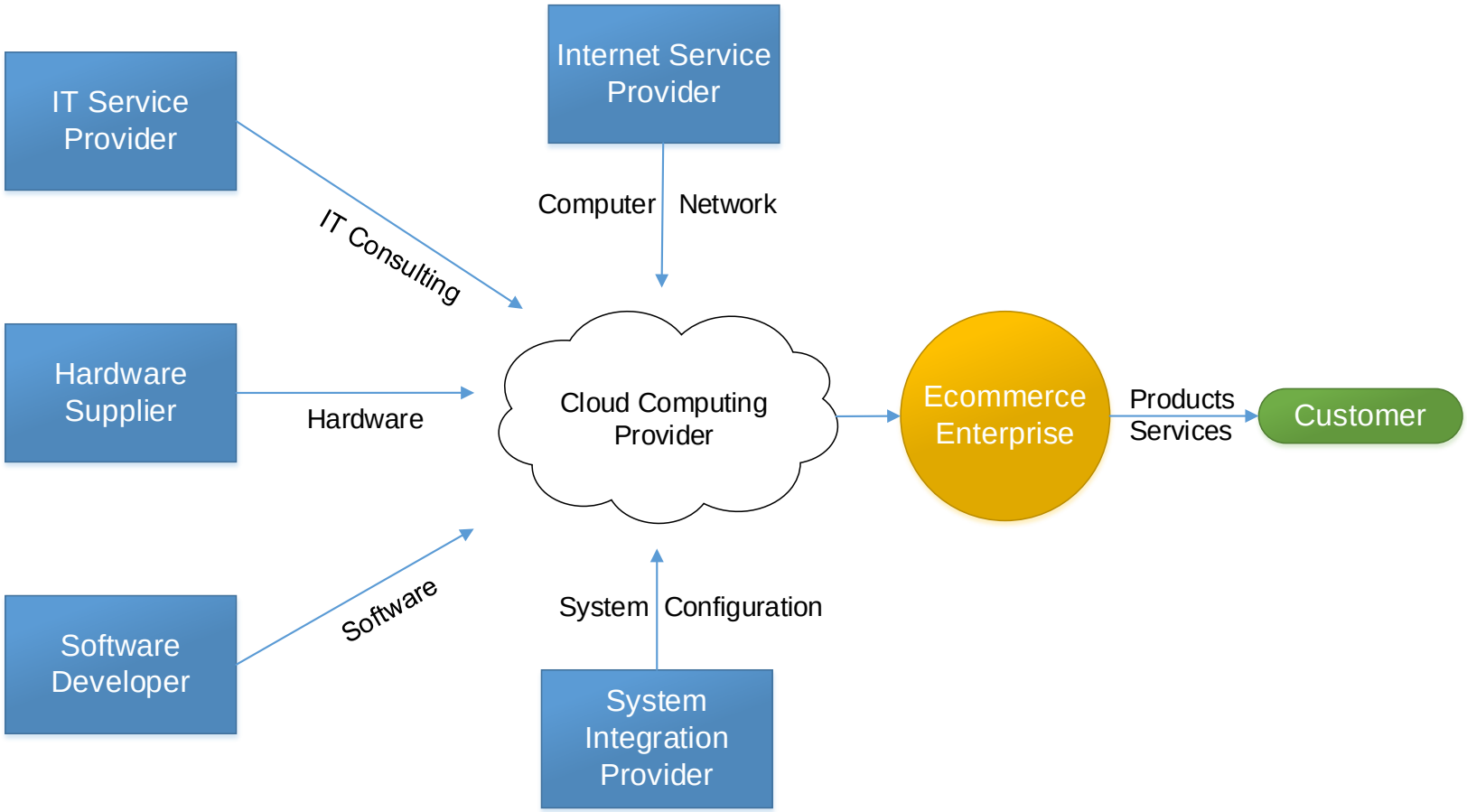
- Causes of Cloud Outages
  - Cybercrime
    - Fastest growing cause of cloud outages.
      - 22% of outages in 2015.
  - Faulty Software
    - Poor optimization = Down time
      - Lengthy reboots, defective load balancers, etc.
  - Failing Hardware
    - ‘The Cloud’ is a physical place
      - Age of infrastructure



Source: RightScale 2017 State of the Cloud Report

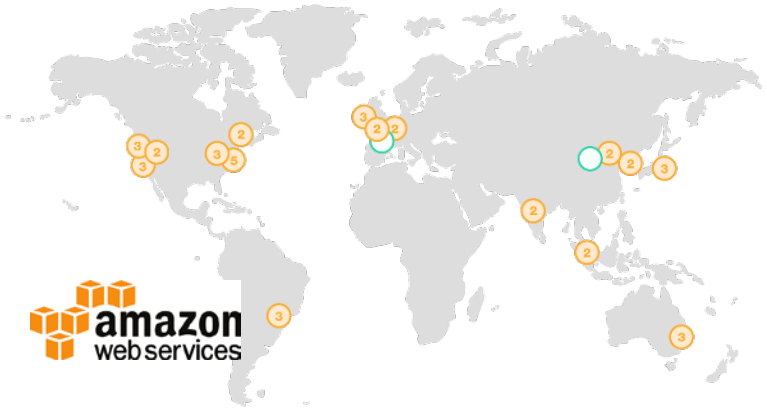
Increasing dependence on ‘The Cloud’ makes it essential to understand the risks associated with cloud computing

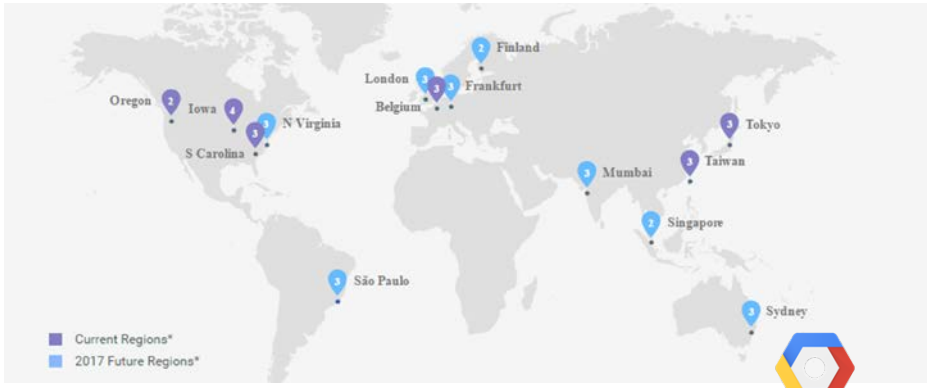
What is Cloud Computing?



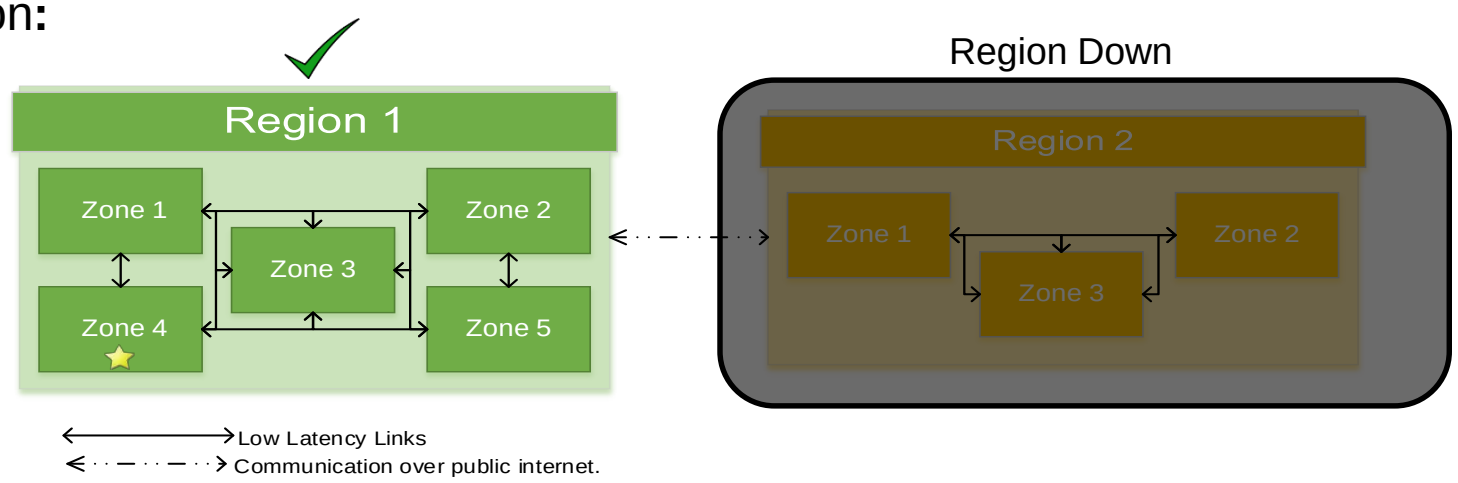
Cloud Architecture: Strengths

Redundancy:





Isolation:



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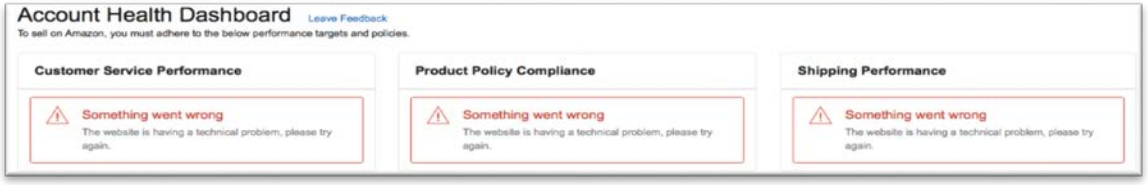
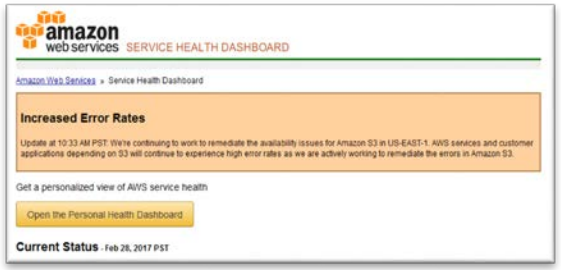
Cloud Architecture: Weaknesses

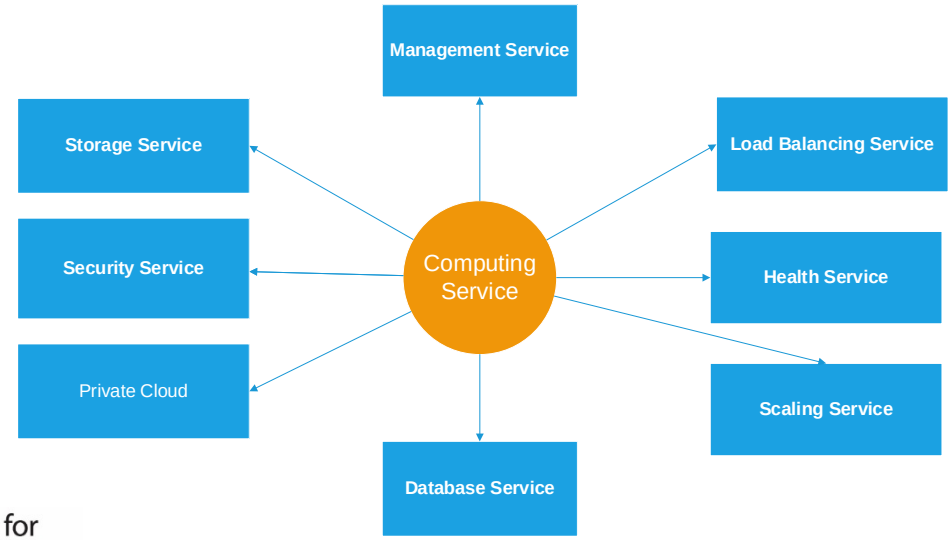
Single Endpoints**:**

- If there is only a single endpoint for a service, regardless of where the service is available, the service will be lost if the endpoint is lost.





Interdependent Services:



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Modelling Potential Cloud Risk

Company Information Needed:

- Name: **CRS Travel Booker**
  - *Revenue, employees, etc.*
- Cloud Provider
  - *Services & regions*
- Industry
  - *Services*
- Locations: Headquarters, Offices, Clients
  - *Regions*
- Cloud initiation
  - *Regions*

CRS Travel Booker

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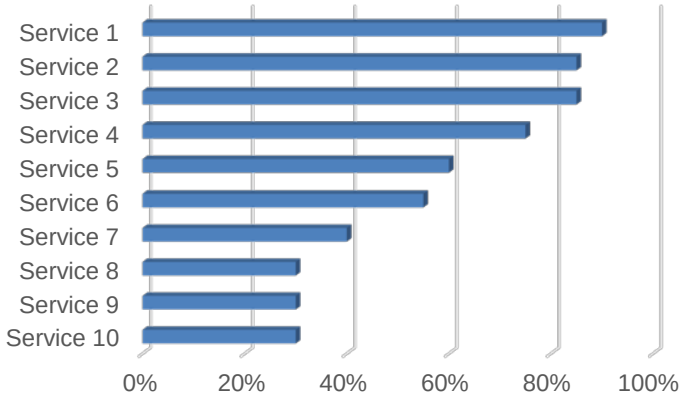
Modelling Potential Cloud Risk

Company Cloud Risk Profile:

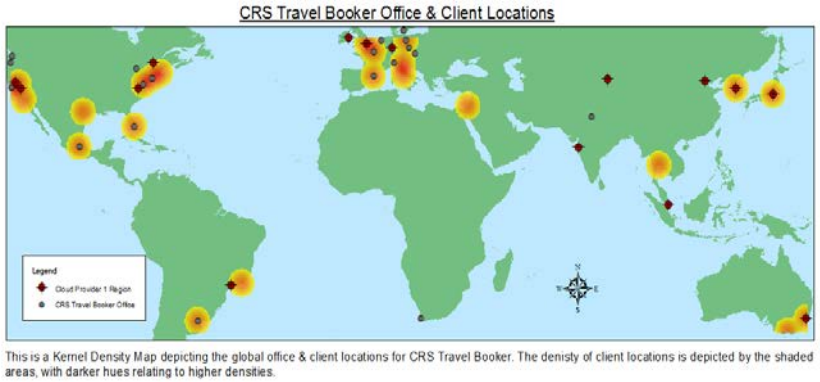
CRS Travel Booker

- Name: *CRS Travel booker*
  - *Total Revenue: $260,7000,000 USD*
- Cloud Provider: *Cloud Provider 1*
  - *14 Regions, 100 Services*
- Industry: *IT-Software*



- Cloud Initiation: *2012*

- Office & Client Locations:



  - *Regions 1, 2, 3, & 4*

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Modelling a Cloud Outage

Scenario

- 'Cloud Provider 1' experiences down time in its 3 oldest regions: **Region 1, Region 2, & Region 3** due to a slow re-boot of system. The Regions are down for 6 – 12 hours.

Impact on CRS Travel Booker

- 3 out of 4 of CRS Travel Booker's regions are offline
- Losses: Total revenue from 3 down regions
  - CRS' 4th Region is still up and running, but CRS Travel Booker's Cloud Design focused on isolation and forgot about redundancy.

Potential Loss Estimates for CRS Travel Booker

Region 1 is responsible for 29% of total revenue: $8,600

Region 2 is responsible for 24% of total revenue: $7,000

Region 3 is Responsible for 26% of total revenue: $8,000

- % revenue is based on customers served in that region

Region	1 Hour	6 Hours	12 Hours
Region 1	$8,600	$52,000	$103,000
Region 2	$7,000	$43,000	$85,600
Region 3	$8,000	$47,000	$94,000
Total	$25,000	$142,000	$282,600

Take Home Messages

- The services and cost effectiveness provided by Cloud Providers has caused tremendous growth in Cloud Industries in the past decade.
- With increases in dependency on the Cloud comes increases in Risk
- The best Cloud strategies focus on isolation and redundancy.
- We can use what we know about dependency, loss potential, and cloud architecture to model potential risks.

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