

SMi 4th Annual Military Flight Training Conference
London - 17 September 2015

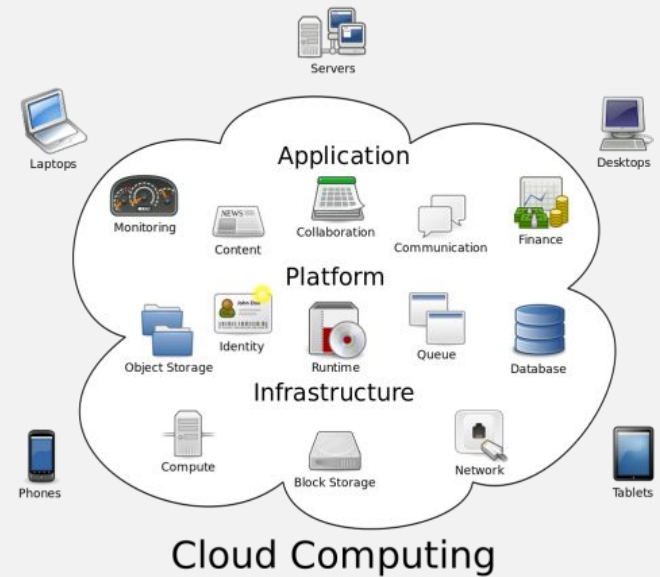
The Cloud and Training and Education

Andy
Fawkes

The Cloud is Creating and Transforming

What does the Cloud mean for Training and Education?

Cloud Computing Metaphor



For a user, the network elements representing the services are invisible, as if obscured by a cloud.

THINKE

Some Cloud Computing Attributes

Big Data Scalability Analytics

Machine Learning Distributed

Security Low Cost 24/7

Reliability

Predictive Analytics

Disruptive

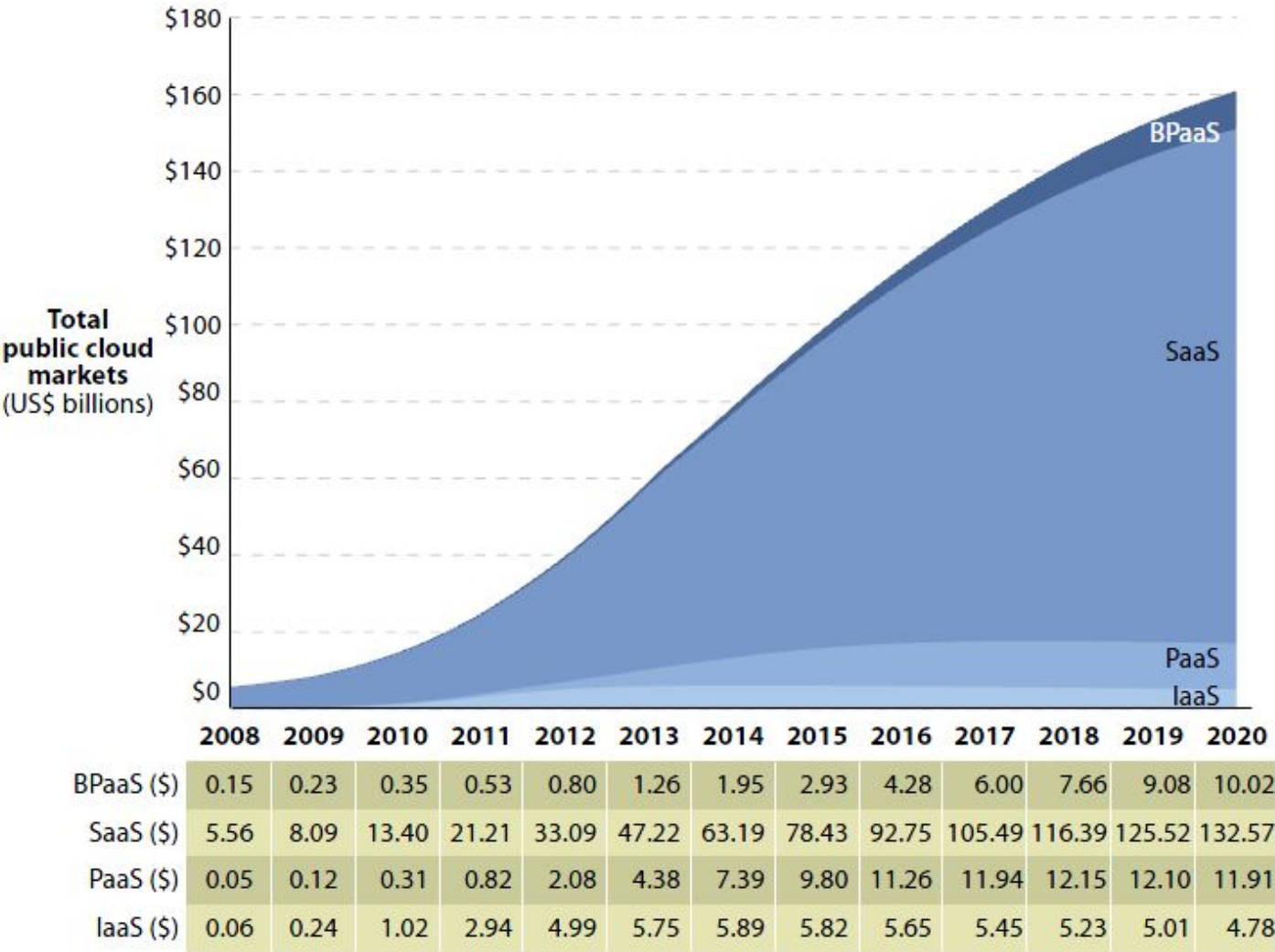
Focus on Service not
Technology

Figure 3 Forecast: Global Public Cloud Market Size, 2011 To 2020

 The spreadsheet detailing this forecast is available online.

Wikipedia

Global Cloud Market

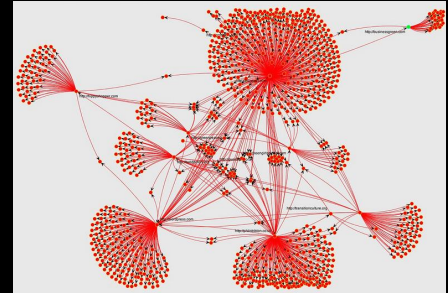


Why the Cloud and Training and Education?

- Delivery Platform



- Analytical Platform





Why the Cloud and Training and Education?

- Enterprise
 - Cost Effective Shared Infrastructure, Learns from Data
- Instructor
 - Empowered, Creates and Shares
- Trainee
 - Tailored Training & Education through Career

Presentation Outline

- Cloud Essentials
- Implications for Training and Education
 - Cloud Delivery
 - Cloud Analytics
- A Cloud Strategy?

Acknowledgements

- Amazon
- Bohemia Interactive Simulations
- Citrix
- Dstl
- Fujitsu
- Novatech
- Nvidia
- Prolinx
- Staffordshire University
- VMware



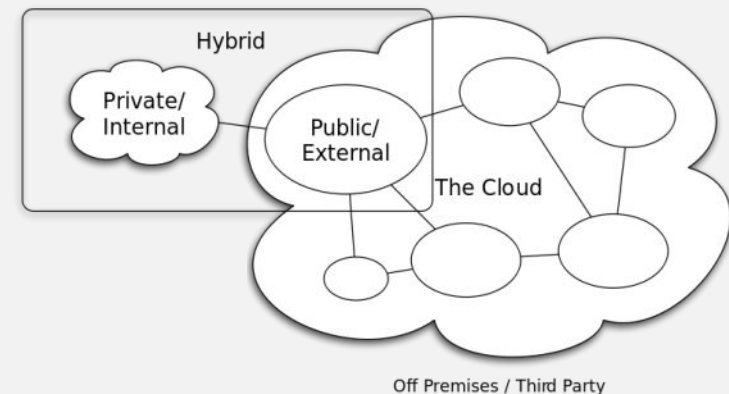


Some Cloud Essentials

Cloud Computing

Wikipedia

- Cloud computing enables computer resources to be consumed as a utility
- Cloud computing categories:
 - Infrastructure-as-a-Service (IaaS)
 - Virtual Hardware
 - Platform-as-a-Service (PaaS)
 - Development Tools, eg. Microsoft Azure
 - Software-as-a-Service (SaaS)
 - Web Services, eg. Google Mail
- Cloud computing services:
 - Private
 - Public
 - Hybrid



TECHNOLOGY

The Unbelievable Power of Amazon's Cloud

The company's Web Services—which undergird Netflix, Healthcare.gov, and Spotify—might be the single most important piece of technology to the modern tech boom.



Jeff Bezos speaks at a press conference in New York in 2011. (Shannon Stapleton / Reuters)



ROBINSON MEYER | APR 23, 2015

Cloud Computing - Home



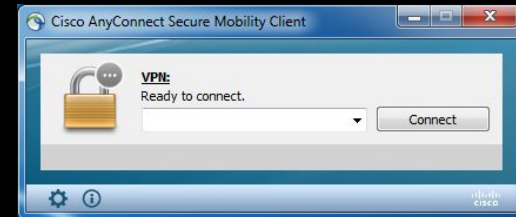
THE
HUFFINGTON
POST

coursera



Pinterest

Cloud Computing – for Business



Amazon looks for UK's next \$1BN business with London startup programme

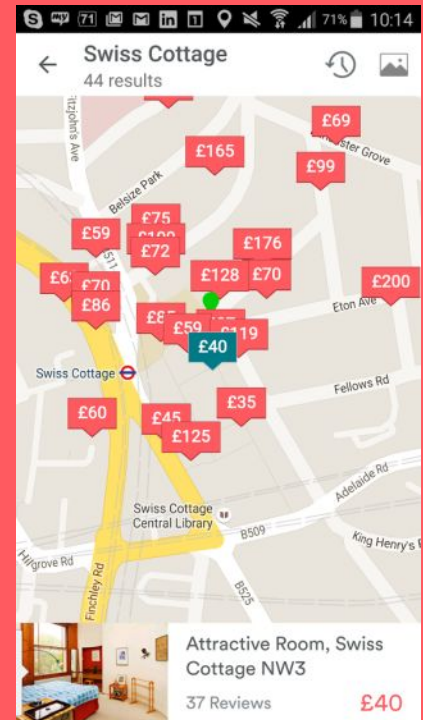
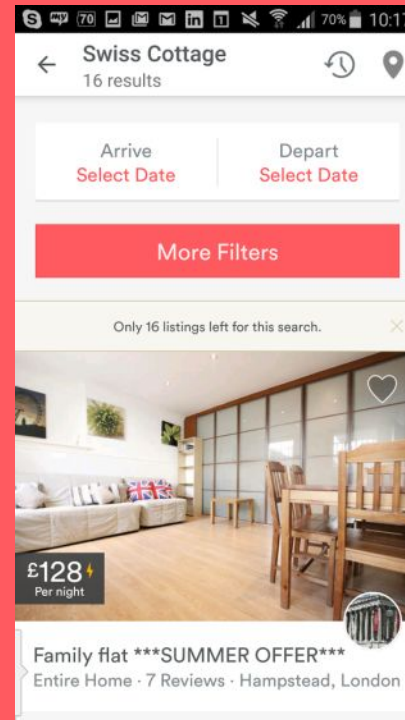
Amazon's cloud platform AWS, which is used by two thirds of UK startups, launches London programme to help build the next \$1 billion company.



The Cloud as a Catalyst for Business

Ben Rossi

Date: 21 August 2015



500,000

Cloud Computing - Government

The Register
Biting the hand that feeds IT

DATA CENTRE SOFTWARE NETWORKS SECURITY BUSINESS HARDWARE SCIENCE BOOTNOTES VIDEO FORUMS WEEKEND EDITION

HMRC ditches Microsoft for Google, sends data offshore

Tax doesn't have to be taxing for US firm with inside track



5 Jun 2015 at 07:56, Kat Hall

Her Majesty's Revenue and Customs (HMRC) is the first major department to move to Google Apps, part of an apparent loosening of Microsoft's stranglehold on the government's software services.

The department will join the Cabinet Office and Department for Culture, Media and Sport (DCMS) in deploying the fluffy white stuff.

HMRC has 70,000 staff, and as such will be Whitehall's first mass deployment of Google's cloud services.

The Cabinet Office currently has 2,500 users on Gmail. The government said in [March](#) the Google Apps suit best met the user needs for the Cabinet Office and DCMS.

Data Centre / Cloud

Related topics
Google, Microsoft, Cloud, Tax

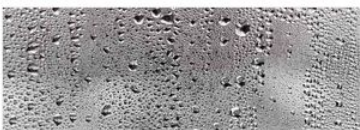
Most read

- Your servers are underwater? Chill OUT, baby – liquid's cool
- LG G4: Be careful while fingering this leather-clad smartie pants
- [HMRC ditches Microsoft for Google, sends data offshore](#)
- We stand on the brink of global cyber war, warns encryption guru
- Don't believe the hype: When that DATA seems just *too* good

Spotlight



Private cloud is NOT dead – and for one good reason: Control of data



Hybrid cloud: Define what it is, then decide what you want

UK G-Cloud



Digital Marketplace

Supplier login

BETA

This is a [beta service](#) – please send your feedback to enquiries@digitalmarketplace.service.gov.uk

Digital Marketplace

Find technology or people for digital projects in the public sector

[Find cloud technology and support](#)

eg web hosting or IT health checks

Procurement framework: [G-Cloud](#)

[Buy physical datacentre space for legacy systems](#)

Procurement framework: [Crown Hosting Data Centres](#)

[Find specialists to work on digital projects](#)

eg technical architects and user researchers

Procurement framework: [Digital Services](#)

G-Cloud 7 is open for applications

Deadline for submissions

3pm BST, 6 October 2015

Register your interest in becoming a G-Cloud 7 supplier.

[Log in to existing supplier account](#)

[Create new supplier account](#)

The Cloud in Your Hand



Wearables and the Cloud



And the technology possibilities are still growing...



Got network.

Knows location.

Connects to cloud.

Doesn't need a phone.

Microsoft Machine Learning

Business ▶ Government

Security fears arise over body-worn plodcam footage

'But is it secure?' experts ask, as forces prepare to sign contracts worth millions



21 Aug 2015 at 13:55, Kat Hall



48



5



13

Fears have been raised over the security of information from the new police bodycam recordings held in the public cloud by US company Taser.

Cloud Security Concerns

Google Security





Implications for Training and Education - Delivery

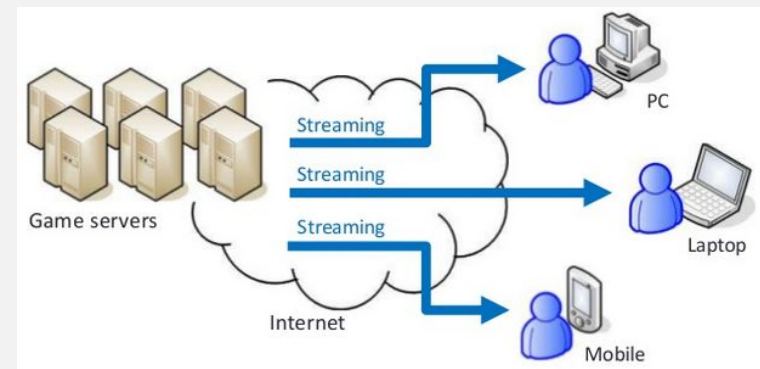
Cloud Gaming

- an umbrella term used to describe a form of online game distribution
- the most common methods of cloud gaming currently are:
 - video (or pixel) streaming
 - file streaming



Cloud Gaming - Incentives

- Games have more hardware platforms, PC, mobile, etc
- Computer games hardware needs constant upgrading
- **Benefits to Gamers:**
 - Less hardware upgrading
 - Reduces set up and compatibility issues
 - Play anywhere anytime
- **Benefits to Game Producers**
 - Supports more Platforms
 - Reduce production cost
 - Reduces piracy





Game Streaming Subscription

All You Can Play. 100+ PS3 Games.

Seize Your Moment™



1 Month \$19.99 / 3 Months \$44.99

Cloud Gaming



PlayStation™ LIBRARY OF GAMES



PlayStation®4



PlayStation®Vita



PlayStation®3



Televisions



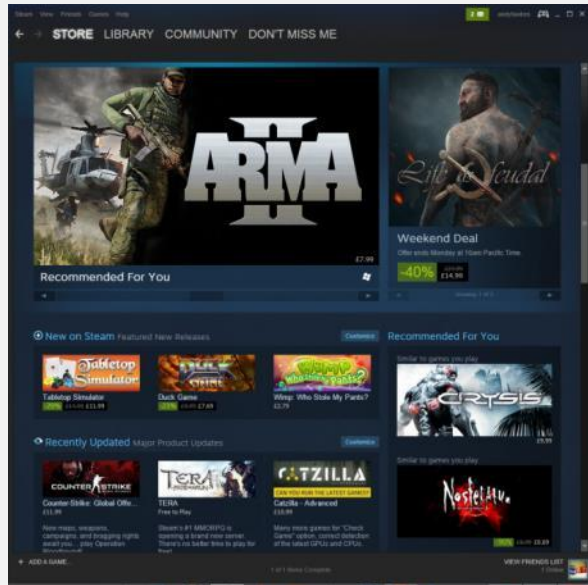
Tablets



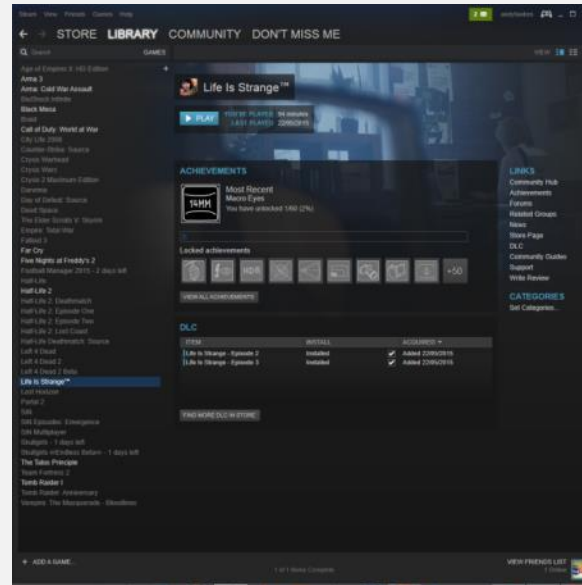
Smartphones

THINKE

Cloud Gaming



new
games



my
games



my
profile

THINKE

Cloud Gaming - Persistency



World of Warcraft

Persistent World
(MMOG)



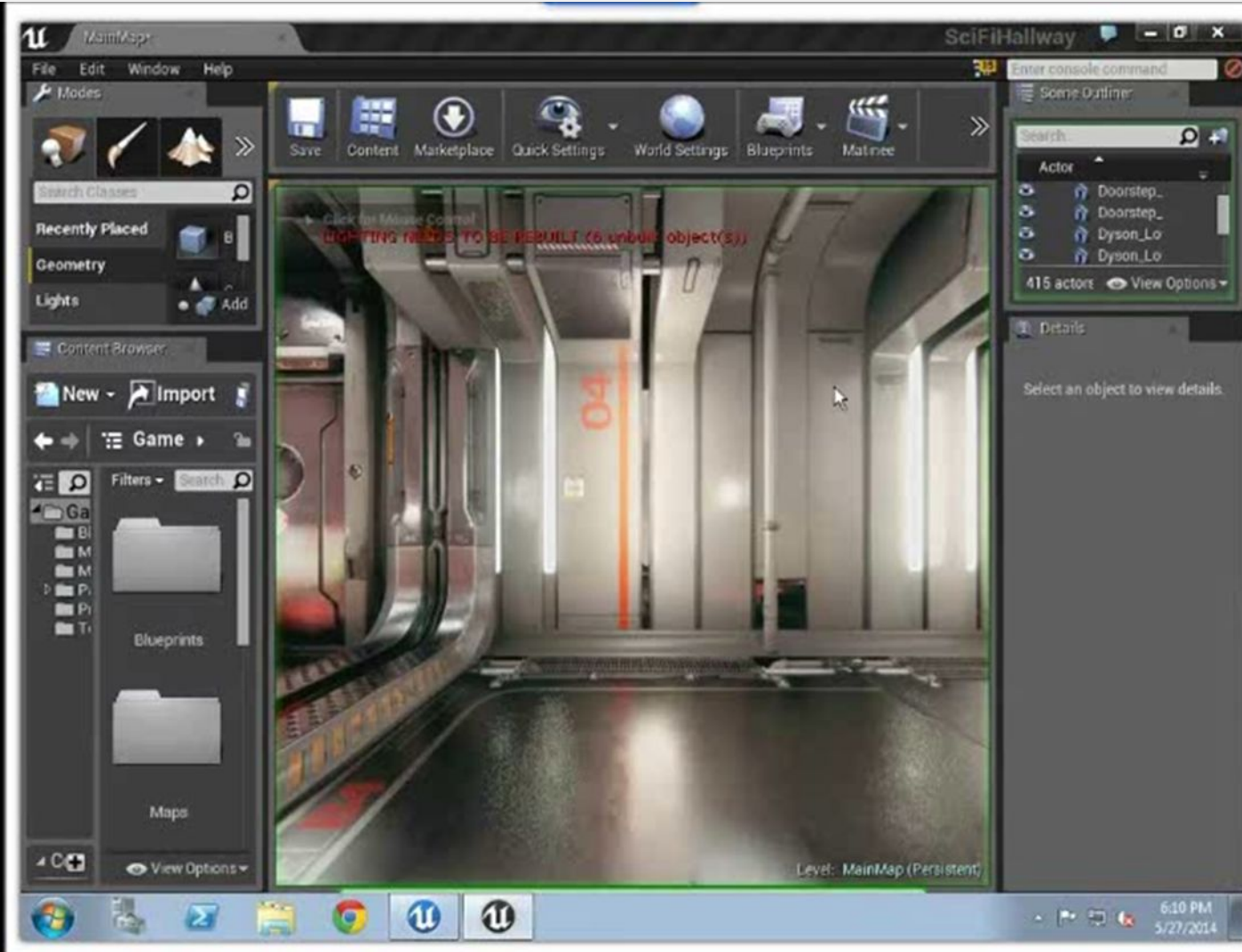
Minecraft

Persistent and
Non-Persistent



Unreal 4 on Amazon Cloud PC

Wikimedia



Battlefield 4 on Virtual Desktop Orlando - Oslo

Wikipedia



Run your own high-end cloud gaming service on EC2

Apr 12, 2015

How to use EC2 GPU machines + Steam In-Home Streaming + a VPN to play AAA titles on a shitty laptop



(DIY) Cloud Gaming

Cost

Playing games this way is actually quite economical – especially when comparing to purchasing a full-on gaming rig. Here are the costs you'll need to consider:

- GPU Instance runs about \$0.11/hr (on a Spot instance, regularly around \$0.70/hr)
- Data transfer will be around \$0.09/GB, and at a sustained ~10mbit, it'll cost you \$0.41/hr (4.5GB/hr)
- **Updated Apr 25:** Hard drive (EBS General Purpose SSD) storage of 100GB is \$12.00/mo, or a bit under \$0.02/hr

This comes out to around \$0.54/hr (**Updated Apr 25**), not bad, for the cost of a \$1000 gaming pc, you get ~1900 hours on much higher-end hardware!

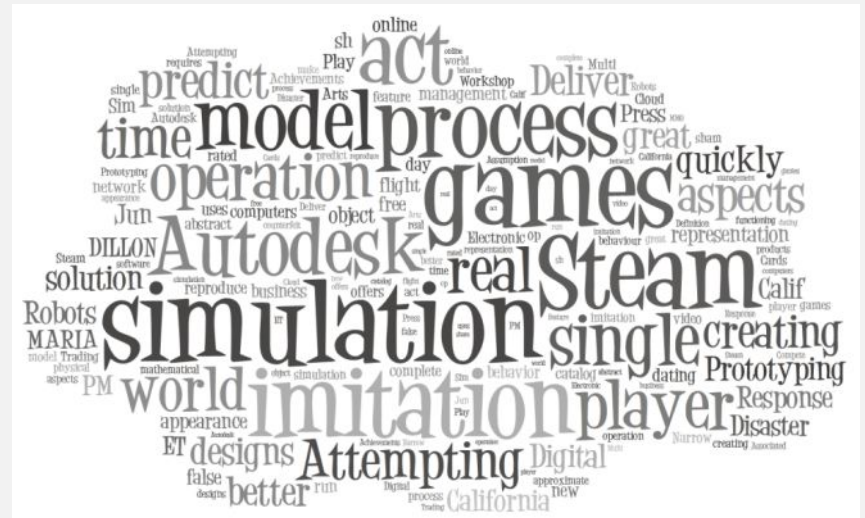
The catch?

This is all fun and games, but you need to make sure of two things:

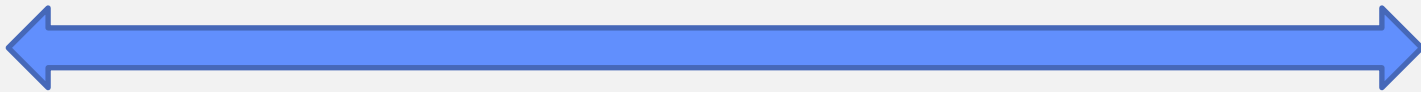
1. You are within 40ms to the closest AWS datacenter ([test here](#)) and has GPU instances (**Updated Apr 25** brought this up from 20ms, many people reporting it's just fine at slightly higher latencies)
2. You have at least a 10mbit connection and it's unmetered

Cloud Simulation

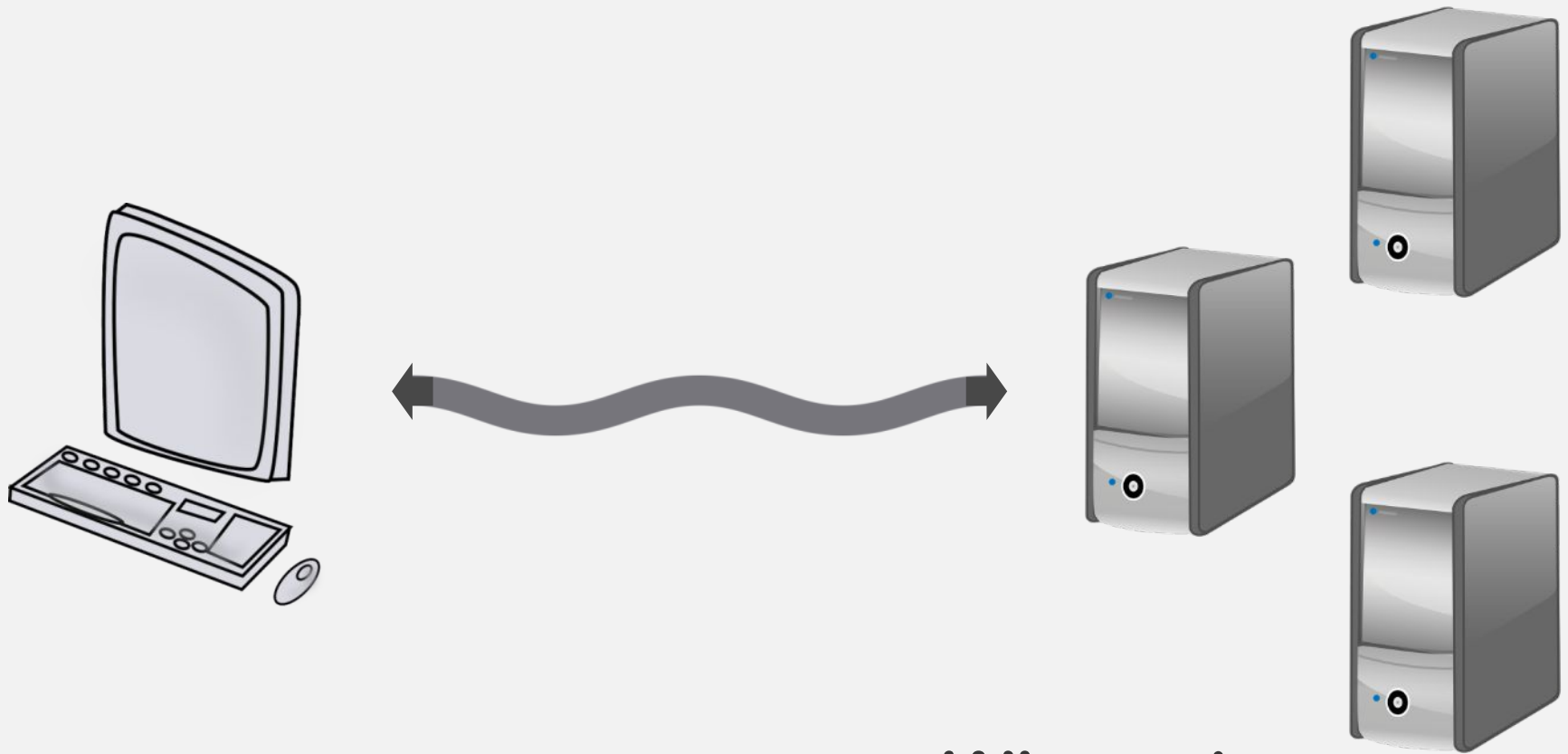
- **Key Features**
 - Centralisation of Computing and/or Data
 - Transparent to User(s)
- **Human in the Loop and/or Analytical**



Over Multiple Training Devices



Zero/Thin/Thick Clients



Where is the
Computing?

&

Where is
the
Data?

Simulation Network/Computing Demands

easier $\longleftrightarrow$ harder



Fujitsu/VBS3 DSEi Sep 15



Zero Client
Shared 20MB + WiFi
55 miles



Simulation & Training as a Remote Service



The Challenge

As the move to cloud based computing continues to gather pace, problems exist for those who demand security and high-performance at the desktop. Often, in a conventional 'thin-client' based architecture, performance and security are compromised to such an extent that a cloud based solution is simply impractical. While issues of data security can be addressed in a number of ways, the only way that a 'thin-client' can be made to handle the graphics throughput required in some applications is to add additional processing power and upgraded graphics capability. By the time all of this has been done, the client can no longer be regarded as being 'thin' and the argument for retaining a standard desktop computer becomes hard to resist.

In partnership with



Secure, Simplify, Collaborate

The Solution

Working in partnership with Prolinx, Bohemia and Pitch, Amulet Hotkey offers a combination of desktop and server-side technologies that deliver an HLA compliant, cloud based model without compromising security or graphics performance. In fact, the PCoIP* technology used in these solutions works to enhance security and can drive multiple, high-definition monitors at 60 frames per second using only a single IP connection. Datacentres can be situated in geographically remote locations, hundreds of kilometres from the desktop and still provide a low latency, 'pixel perfect' computing experience for the user.

Solution Benefits

- HLA compliant environment.
- Uncompromised graphics performance at 60 frames per second (fps) across multiple monitors.
- Uncompromised data security using AES 256 and third party encryption.
- Fibre and copper IP connections fully supported.
- A state-of-the-art range of server-side hardware options to suit specific requirements.
- The entire system managed and delivered by Prolinx - recognised experts in the field.
- Standard zero client desktop deployments mean simplified spares holdings, ease of maintenance and complete hardware lock-down.
- Perfect for high-end simulation.
- COTS solution - tried and tested.

www.prolinx.co.uk

Secure Thin Client

THINKE

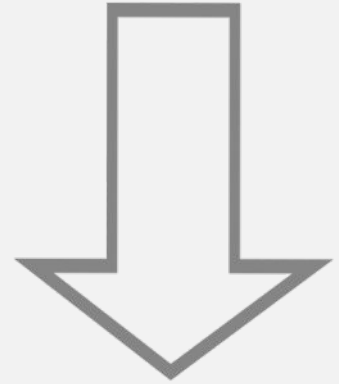
Cloud Simulation Benefits

- **Simulation as a Service**
- **Centralised Software and Data**
- **Secure Login**
- **Player Data**
- **Big Training Data**
- **Multiple Hardware Platforms**
- **Centralised Management**
- **Efficient Allocation of Computing Power**



Cloud Simulation Challenges

- Network Capacity
- Do Training Enterprises Scale?
- Compatibility with Other Simulation?
- Transition Challenges



Cloud (Asynchronous) Tutoring



Definition

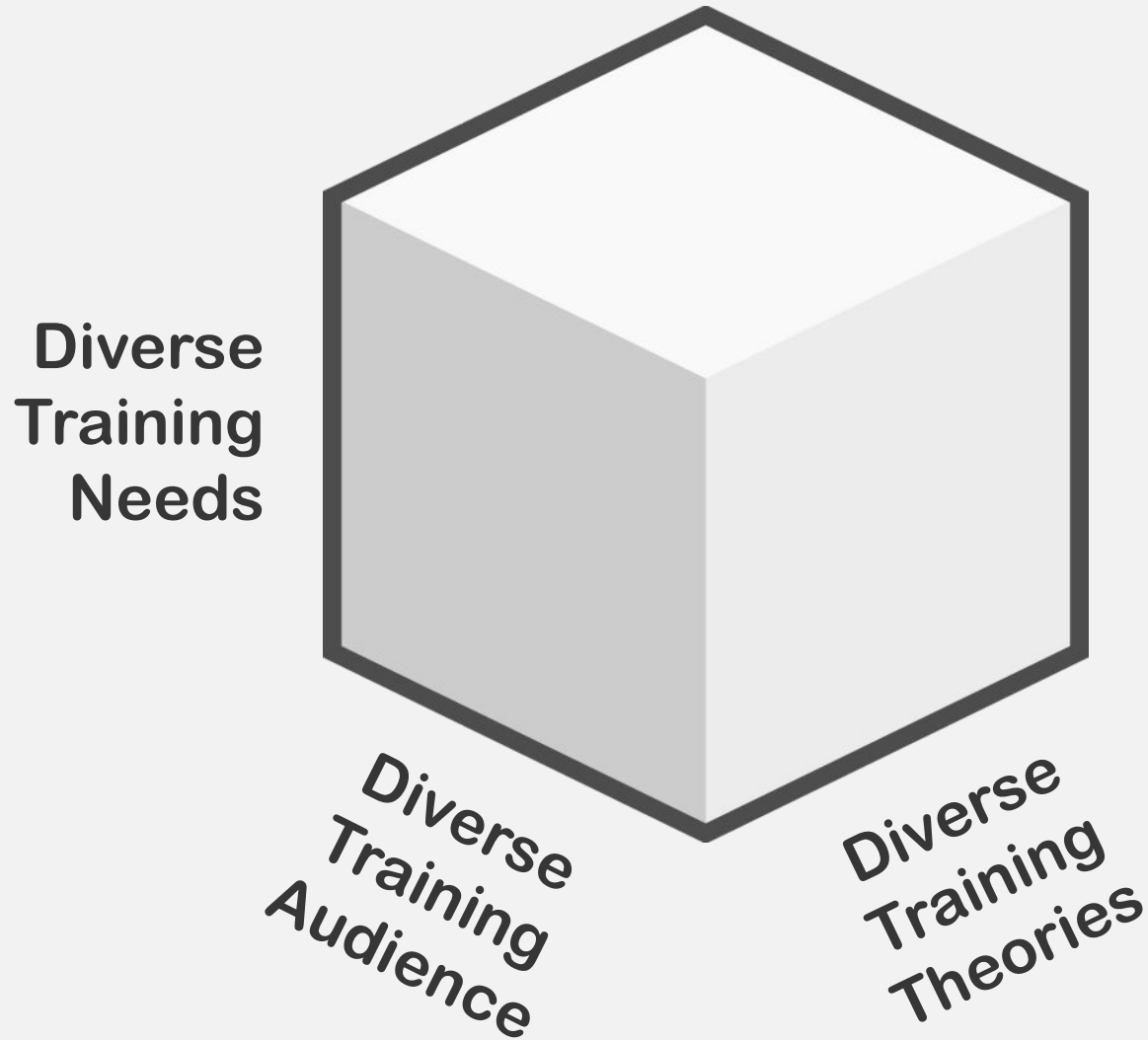
Cloud Tutoring is an online education model in which all student-teacher interaction takes place virtually on
“The Cloud”



Implications for Training and Education - Analysis

Military Training & Education Challenge

Wikipedia

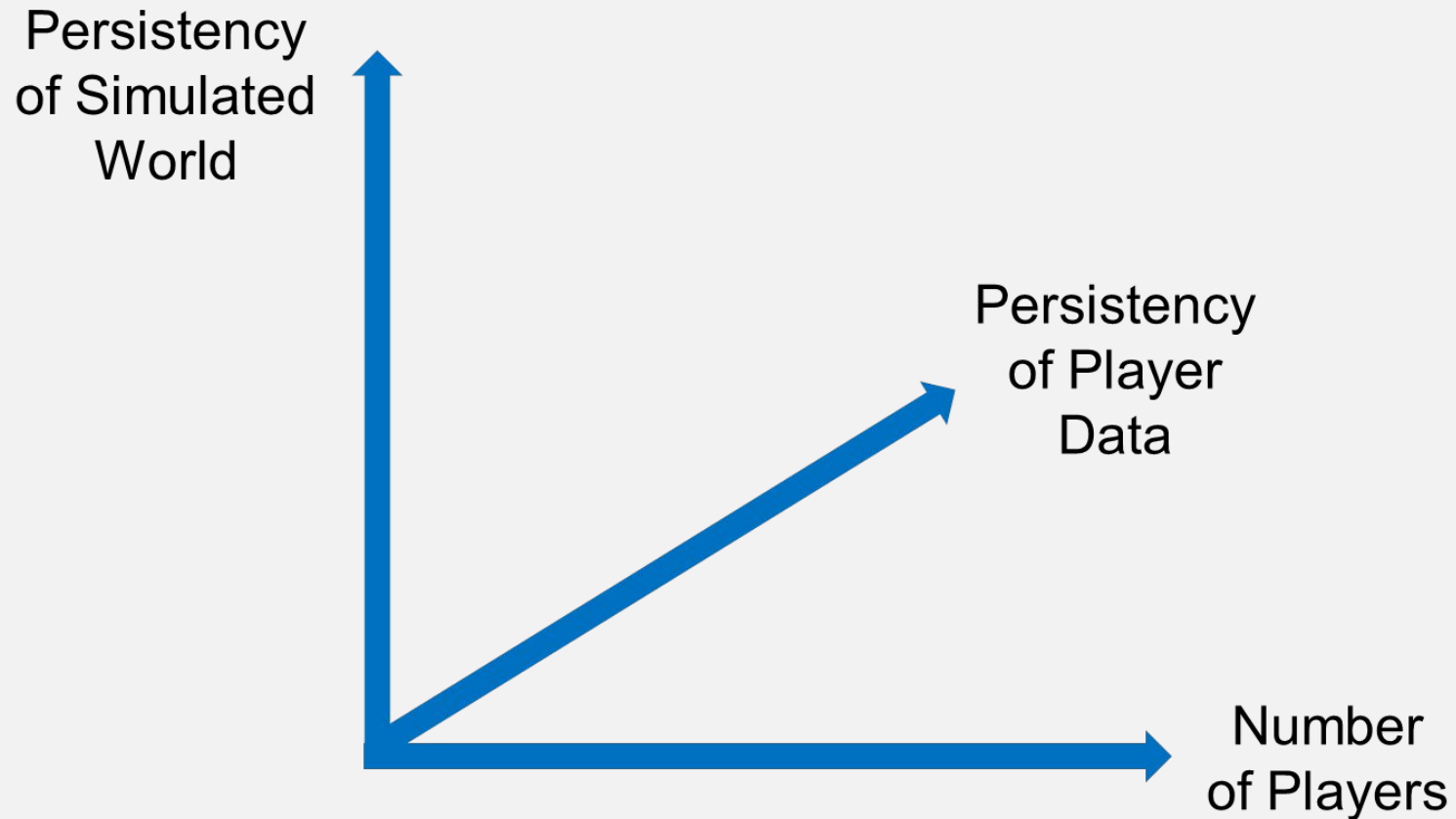


Can We Learn from Massively Multiplayer Online Games? (MMOGs)



MMOG - Massively Multiplayer Online Game

- An online video game which can be played by a very large number of people simultaneously



Typical MMOG Characteristics

- Persistent interactive world that can be accessed 24/7
- Millions of Concurrent Users
- Player data that tracks and rewards performance
- In game communication and interaction with other players
- Online Communities and Support
- Supports thin client approach
- Secure login
- Ranked/Unranked Worlds

MMOG = Database + Services

Training Data

Cloud

Learning
Management
System

Learning
Record Store



example
trg. sys.



IBM – Personalised Education



Machine Learning in Education

**Pinpoint**

[Home](#) [Solution providers](#) [Applications](#) [Services](#) [Marketplaces](#) [Partner Center](#) [Sign in](#)



PNP Solutions
ST LEONARDS, New South Wales AUS (HQ)

[Overview](#) [Applications](#) [Services](#) [Reviews](#) [Locations](#)

[All Applications](#)

[EduRe CRM Suite's Student Retention Management Module](#)

[EduRe CRM Suite's Delivery Management Module](#)

[EduRe CRM Suite](#)

[EduRe CRM Suite's Business Opportunity Management Module](#)

[EduRe CRM Suite's Marketing Management Module](#)

[EduRe CRM Suite's Alumni Management Module](#)

[EduRe CRM Suite's Tender Management Module](#)

[EduRe CRM Suite's Enquiry Management Module](#)

[EduRe CRM Suite](#)

EduRe CRM Suite's Student Retention Management Module

★★★★★ (0)

Every year the education sector globally and in Australia, spends billions of dollars attracting and recruiting new students, but with very little focus on the issue of student retention. Student Attrition costs tertiary education institutions millions of dollars every year. Did you know that every year a typical Australian University converts 1 in 6 applicants to an enrolment and an average of 20% of recruits leave the University? At a lifetime value of 50K for each student that equates to hundreds-of-million of dollars of lost revenue (per annum).

Challenge
How do to determine which students to retain, how to identify those at risk of leaving, how to communicate with these students and how to retain them for the lifetime of the course and beyond?

Our Solution
EduRe's Student Retention Management module includes three key components: Strategy, Identify, "Contact and Retain".

Strategy: We will work with you to determine your Student Retention Strategy. Elements such as; Which Student Cohorts, Key Identification Metrics, Who Owns the Issues, Setting Targets, Assigning Resources and Staff Skills will be reviewed, agreed and planned.

[Buy from this solution provider](#)

Version:
0.0.0.0

Release date:
0001-01-01

Pricing:
For Purchase

Application type:
Add-in/Add-on, Applications

Business needs:
Business Process Management, Customer

Microsoft Azure Machine Learning

Azure ML Experiment	How could that be used in education?
Social media sentiment analysis	What are people saying about my university/school?
Movie recommendation	What supplementary course materials match this lecture recording?
Flight delay prediction	What is the likely lecture room capacity needed to optimise campus use?
Predictive maintenance	What does the facilities team focus on to minimise campus disruption?
Fraud detection	Which students are getting somebody else to submit their assignments?
Student problem solving	Will a student eventually be able to solve the problem, based on their first attempt?
Customer Segmentation	How do we divide our 100,000 prospective student into groups for marketing purposes?
Buyer propensity model	How many of our student applicants are likely to start the course?

A Cloud Strategy?



Cloud Training and Education Benefits

- Streamlined Infrastructure
- Data-driven
- Platform for Innovation

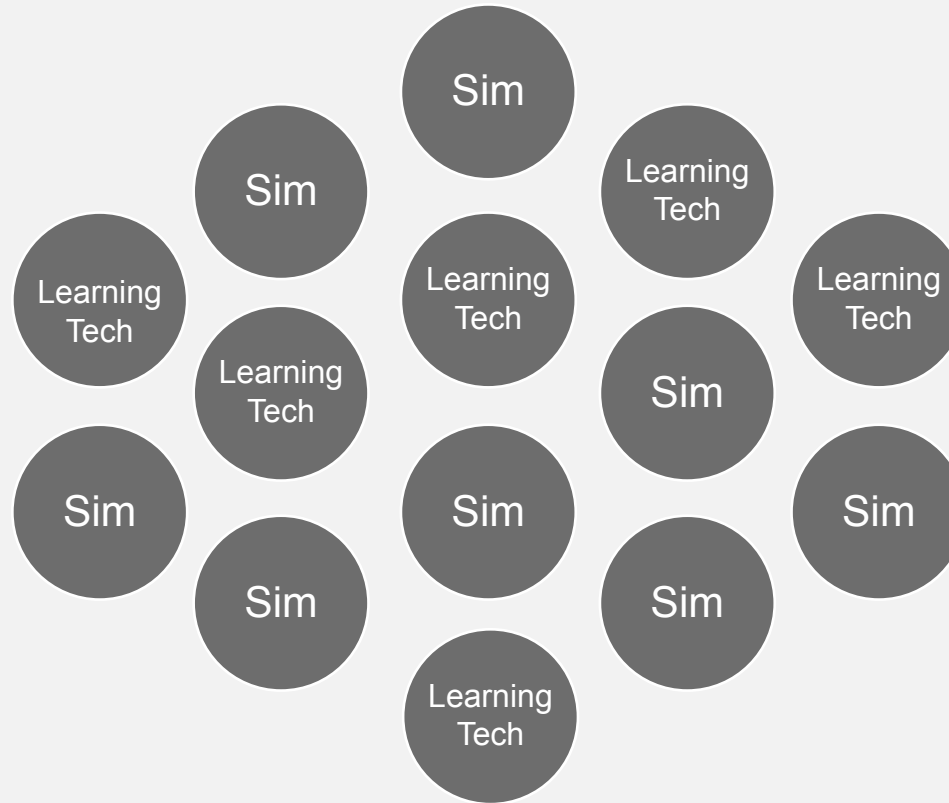
A Strategy

Where are we?

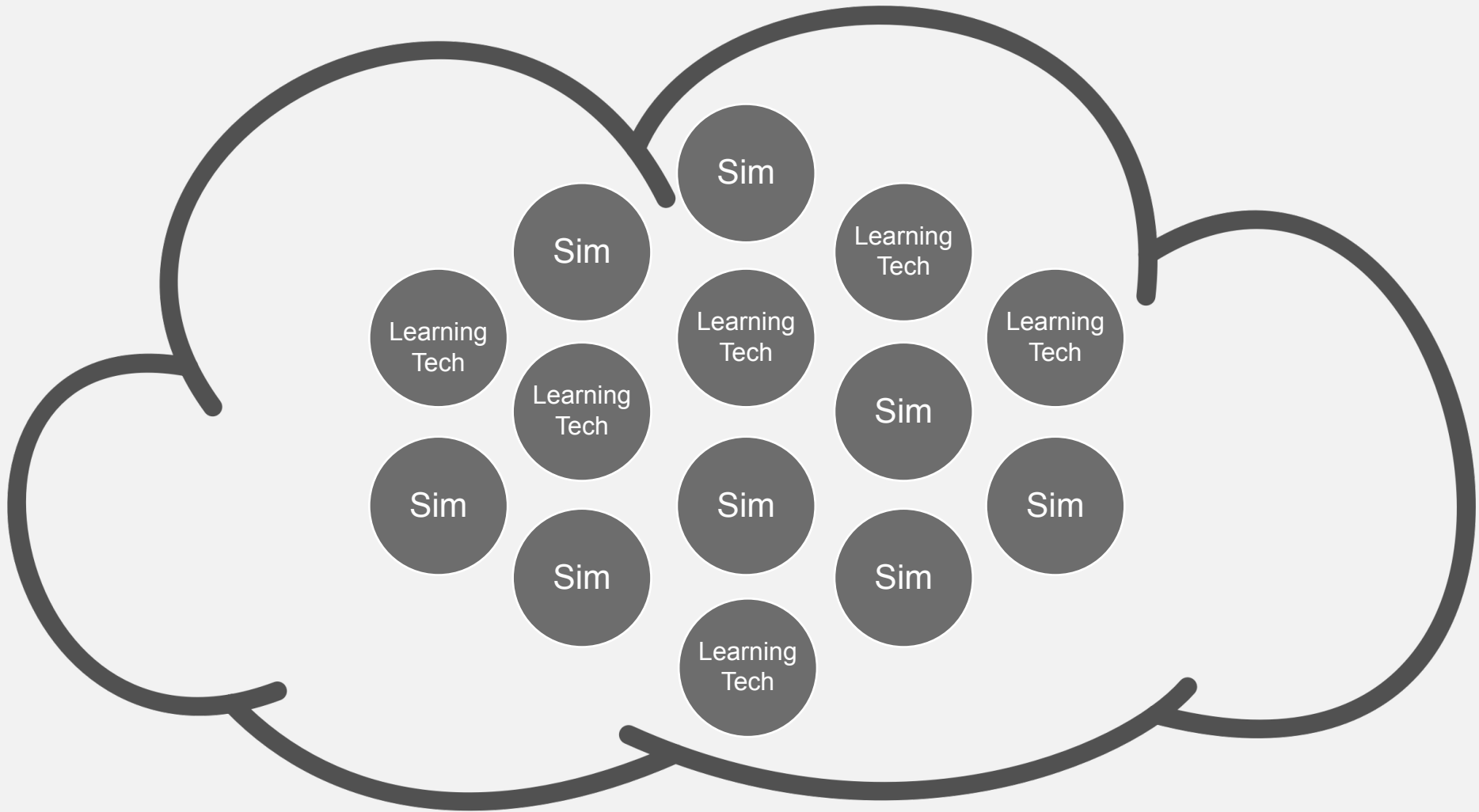
Where do we want to be?

How can we get there?

Islands of Training Capability and Data



Unifying Cloud





Have a Cloud Mindset

Cloud Stakeholder Benefits

Trainee	Trainer/Instructor
• Training environment that tracks and compares performance • Easy discovery of other players and training scenarios • Ranked/Unranked Worlds for Formal Training and Practice/Play	• Persistent interactive world that can be accessed 24/7 across the Enterprise • Training data that tracks and compares performance • Easy discovery of training scenarios • Ranked/Unranked Worlds for Formal Training and Practice/Play
Analysts	Enterprise
• Assess and compare Training Effectiveness through Big Data and machine learning	• Reduced Client Hardware requirements and upgrading • Secure login • Highly autonomous and centralised • Commonality of Systems

Cloud Training & Education Take Away



The Cloud should Inform & Shape your Training & Education Infrastructure Requirements



Data-Driven Training & Education

Questions?