Cloud & Virtualization Technologies

December 2018

John Blackwood, CIS Faculty

Where to begin?

- Technology at the heart of every company
- Most companies will need some type of cloud-based solution
- The Cloud presents an opportunity & a threat
- Still a nascent technology
- Most people use the Cloud without knowing it
  - Gmail, iCloud, Google Drive, etc.

What is the “Cloud”?

- Access to hardware, platforms, software without purchasing or configuring them locally
  - Contractually available as needed
  - Can cancel at any time, no penalty
  - No continued cost
- All items available via Internet connection
- Platform independent
  - PC, laptop, Chromebook, phone, tablet

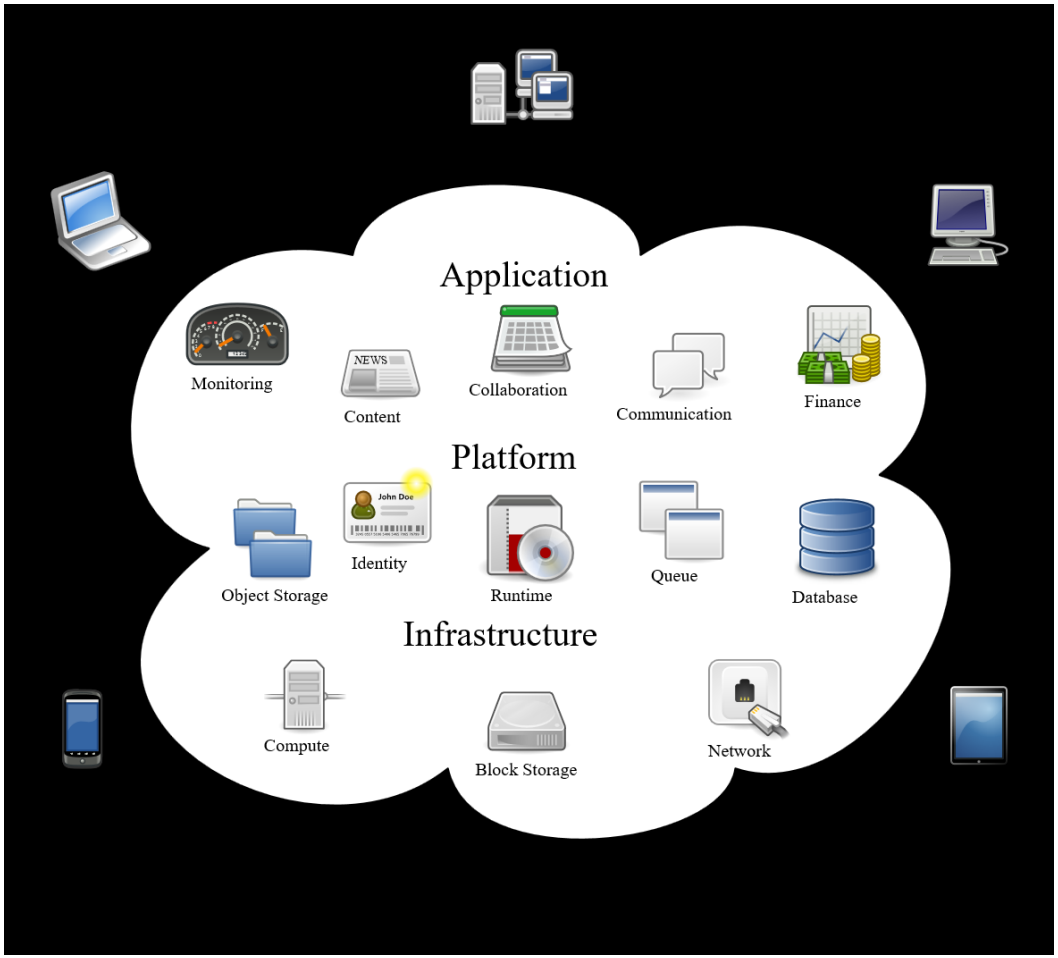
Cloud types

- Public
  - So-called ‘multi-tenant’ architecture
  - All cloud customers in one large bucket
- Private
  - Costs more than public cloud
  - Some isolation from other cloud customers
- Hybrid
  - Use of physical infrastructure, public, & private cloud technologies

Cloud models per type

- Infrastructure as a service (IaaS)
  - Hardware
- Platform as a service (PaaS)
  - Operating systems (OS) to run on hardware
- Software as a service (SaaS)
  - Software that runs in the OS
- Anything as a service (XaaS)
  - Literally anything and everything

Graphical Cloud example…



A simple Cloud example…

- Gmail
  - Previously required email client on device to send/receive email
  - Now able to log in via portal, access all email & functions
- Google Drive
  - Previously required to store files on a local device
  - Now able to store data on Internet server
  - Simplifies storage and backup of data

Why move to the Cloud?

- Always on, everywhere in the world
- Decreased cost
  - Less hardware
  - Pay for what you use
- Products faster to market
  - Create virtual infrastructure in a few minutes
  - Virtualized hardware, OS, and software
- Increased security (with caveat!)
- Disaster recovery

Why NOT move to the Cloud?

- Up front cost
- Regulatory requirements (HIPPA, SOX, etc.)
- Data isolation (security)
  - My data usually stored with competitor's data
- Use same XaaS as competitors, which may decrease competitive edge
- Might not work for my company
  - May require 'always on' hardware
  - This cost model may not 'pencil out'

What is virtualization?

- Example
  - Need 3-Windows servers
  - Need 10-Windows 10 desktops
  - Need productivity software & calendar
- Old solution
  - Purchase 3 physical servers & OS licenses
  - Purchase 10 desktops & OS licenses
  - Purchase MS Office for each user

What is virtualization (cont'd)?

- Major Cloud providers offer virtualization
- Today's solution
  - Perhaps purchase 1-Windows server to house virtual machines (VMs)
  - Create 2-cloud (virtual) Windows servers
    - Virtualized using VMware or other software
  - Contract for MS Office 365 in Cloud
- Much less costly
- More flexibility to cancel Cloud contract

What is happening?

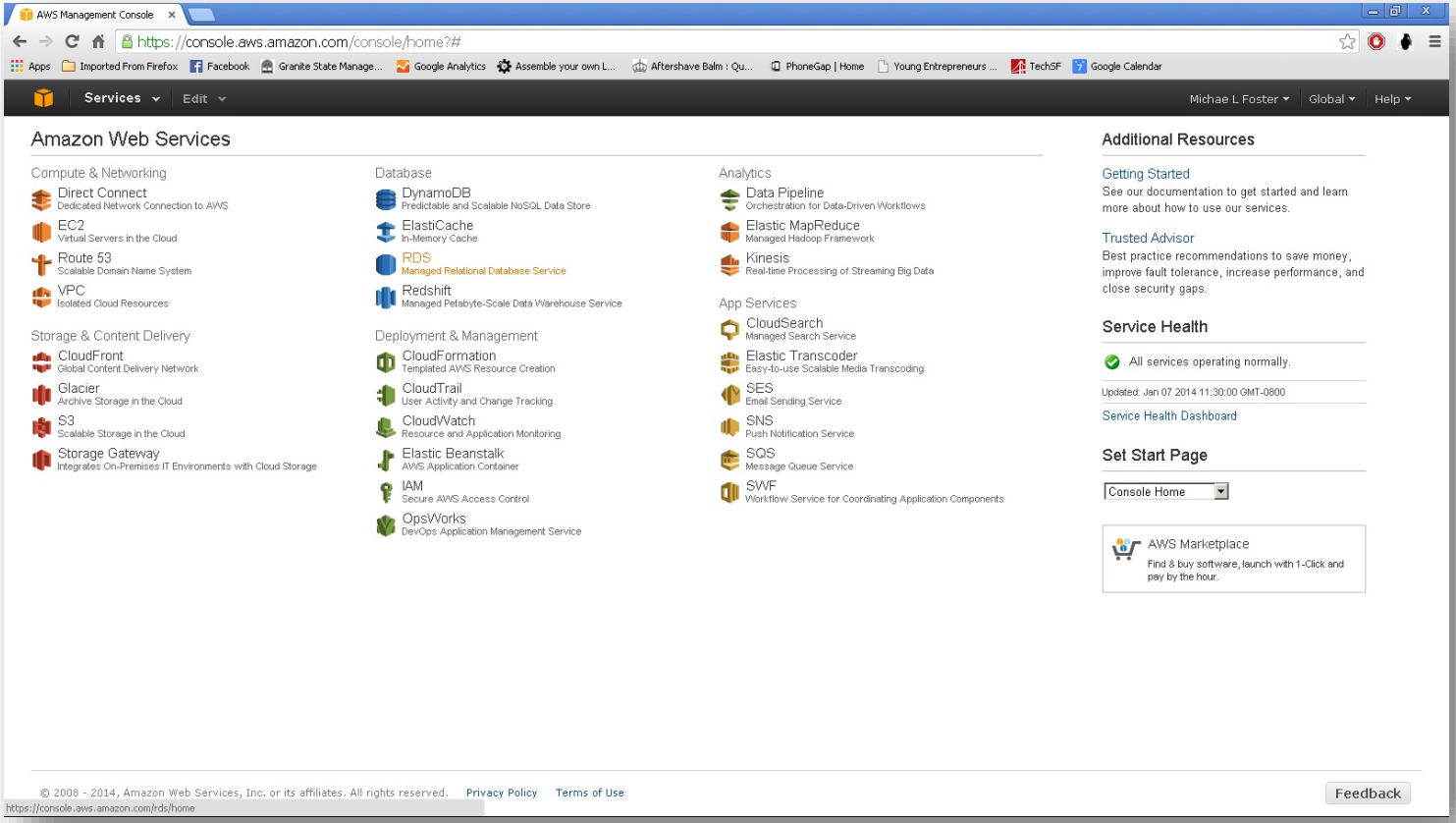
- Companies moving to cloud
- Three main players dominate
  - AWS, Google, Microsoft
- Others are niche market players (IBM)
- Unable to hire staff to manage cloud
- Cloud management harder than it looks
- Companies relying more on Cloud Access Security Brokers (CASBs)

Major Cloud players

- Amazon Web Services – AWS
- Google Cloud & G Suite
- Microsoft Azure
- Many, many others:
  - IBM
  - Alibaba, Cisco, Oracle, Salesforce, Rackspace, etc.

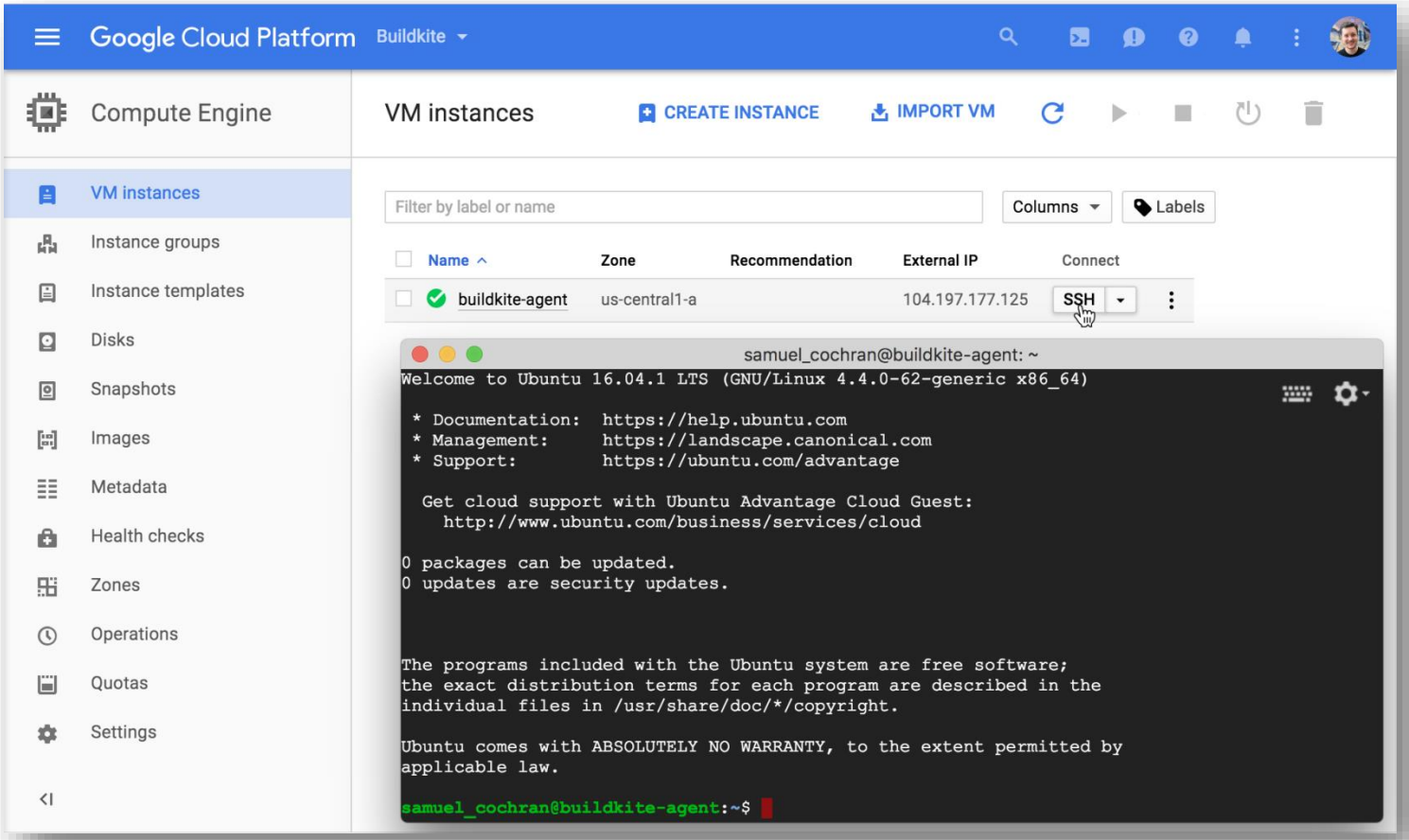
AWS

- Elephant in the room…



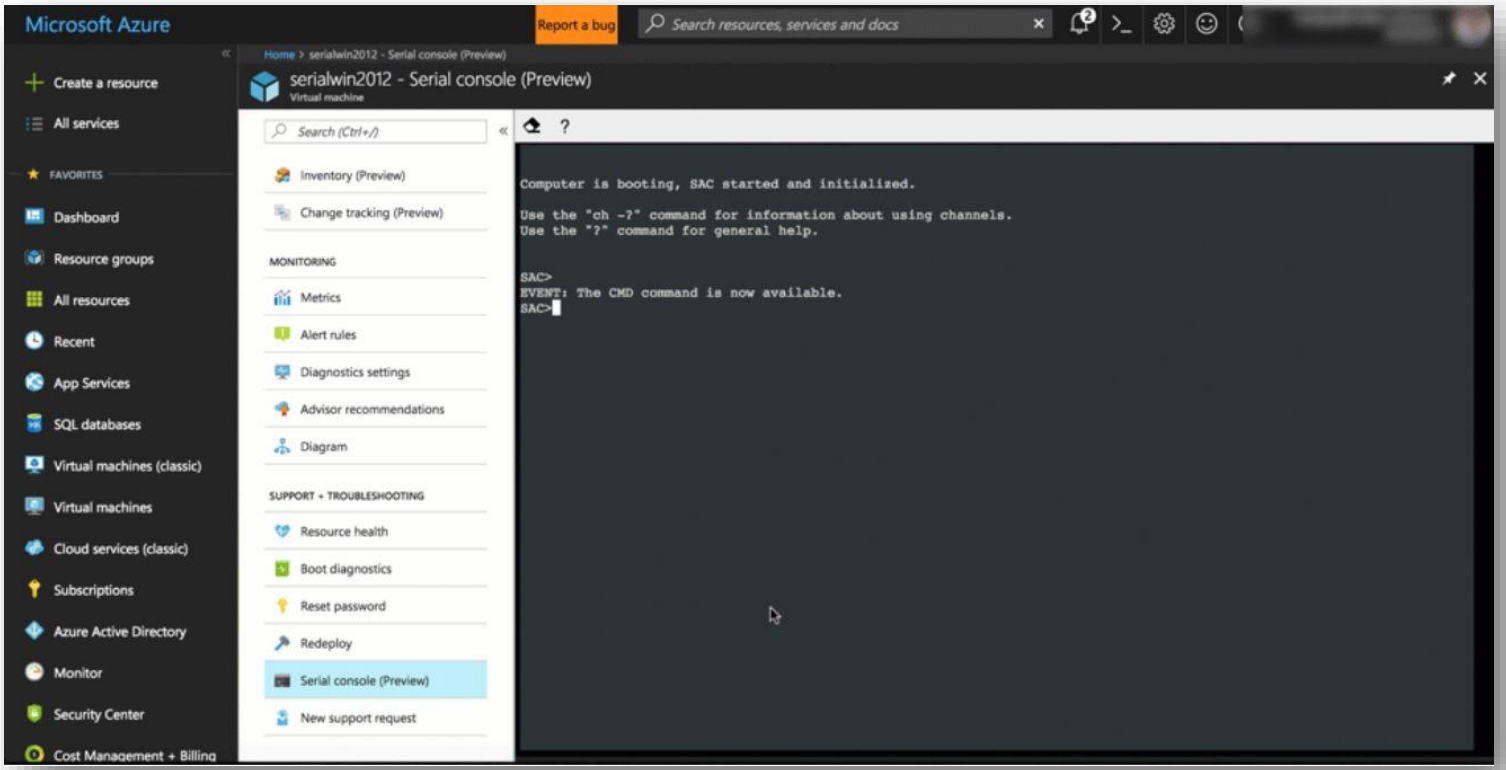
Google Cloud (GC)

- Expanding rapidly…



Microsoft Azure

- Currently between AWS & GC in market share



Company challenges

- Companies losing money due to slow cloud migration
- Clouds are rapidly changing
  - AWS adding 1K features/year
- Lack of skilled staff
  - This was the most mentioned challenge companies face

Impact on UCC CIS programs

- Must train all students in basic programming and Cloud/virtualization technologies
- CIS core degree offerings may be moved to Cloud
  - Reduced cost for students
  - Reduced cost for UCC
  - Will require planning & change management
  - Rapid cloud innovations make transition difficult

Impact on UCC CIS programs (cont'd)

- Courses to move to Cloud:
  - Server, SQL Server, & OS
  - Programming & Web design
  - MS Office
- May offer generic Cloud Technologies course for all students
- CIS Cybersecurity degree may embed Cloud & virtualization in coursework

Impact on UCC CIS programs (cont'd)

- May apply to writing, business, pieces/all of other programs
- Adoption of Cloud and virtualization technologies will require staff training
  - All UCC employees affected by transition

Questions?


Google
Engine
Cloud-provider
Cloud-broker
Amazon
Cloud-Oriented
Azure
Services
Internal
Hosted
HaaS
Architecture
Microsoft
Cloudware
Mashup
computing
technology
Cluster
IaaS
self-service
pricing
center
application
Elastic
Middleware
Subscription-based
Cloud-operating
migration
Cloud-portability
Service
SaaS
cloud
Vertical
data
Cloudsourcing
PaaS
Cloudstorming
Virtual
Windows
Advertising-based
Smart
On-demand
model
Disruptive
Business
private
Hybrid