CAB432 Cloud Computing
Lecture 1 - Introduction

Faculty of Science

Some are just a little bit bigger than the rest…

THE MAJORS

Serious Players in Cloud

- **AWS**, **Microsoft** and **Google** really *are* different
- They already had global-scale distributed computing infrastructure
  - Amazon and the global bookstore
  - Google and search
  - Microsoft and software distribution (Live Update)
- They had enough cash to invest in new global scale businesses
- They have R & D capacity to develop new services – and they do this all the time

Perspective on the Hyperscalers

- Global data centres in almost identical locations.
- Laid their own high-capacity cables
- AWS began with IaaS, the others PaaS
- Now comparable service offerings
- Multiple cloud applications now common

Perspective on the Hyperscalers

Gartner Quadrant for Cloud Computing IaaS (2016)

You want to be in the top right hand corner, the sweet spot of the best vision and the ability to execute it.

Longer article in *The Register*:

http://bit.ly/2sNeoSU


AWS, Azure, GCP

Networks: Some Perspective

- The next slide shows global internet sea cables
- AWS, Google and Azure have their own cables
- All of them are better than the internet

- The Internet is no longer the core transit for business.
- It is the handoff point between the Hyperscalers

- Source – cablemap.info


Greenland
Iceland
Finland
Sweden
Norway
Russia
United Kingdom
Poland
Germany
Ukraine
Kazakhstan
Mongolia
Canada
France
Spain
Italy
Turkey
China
Japan
South Korea
North Pacific Ocean
United States
North Atlantic Ocean
Afghanistan
Iraq
Iran
Pakistan
Algeria
Libya
Egypt
Saudi Arabia
India
Thailand
Mexico
Mali
Niger
Sudan
Chad
Nigeria
Ethiopia
Venezuela
Colombia
DRC
Kenya
Tanzania
Indonesia
Papua New Guinea
Brazil
Peru
Angola
Bolivia
Namibia
Botswana
Madagascar
Indian Ocean
Australia
South Pacific Ocean
Chile
South Atlantic Ocean
South Africa
New Zealand
Argentina

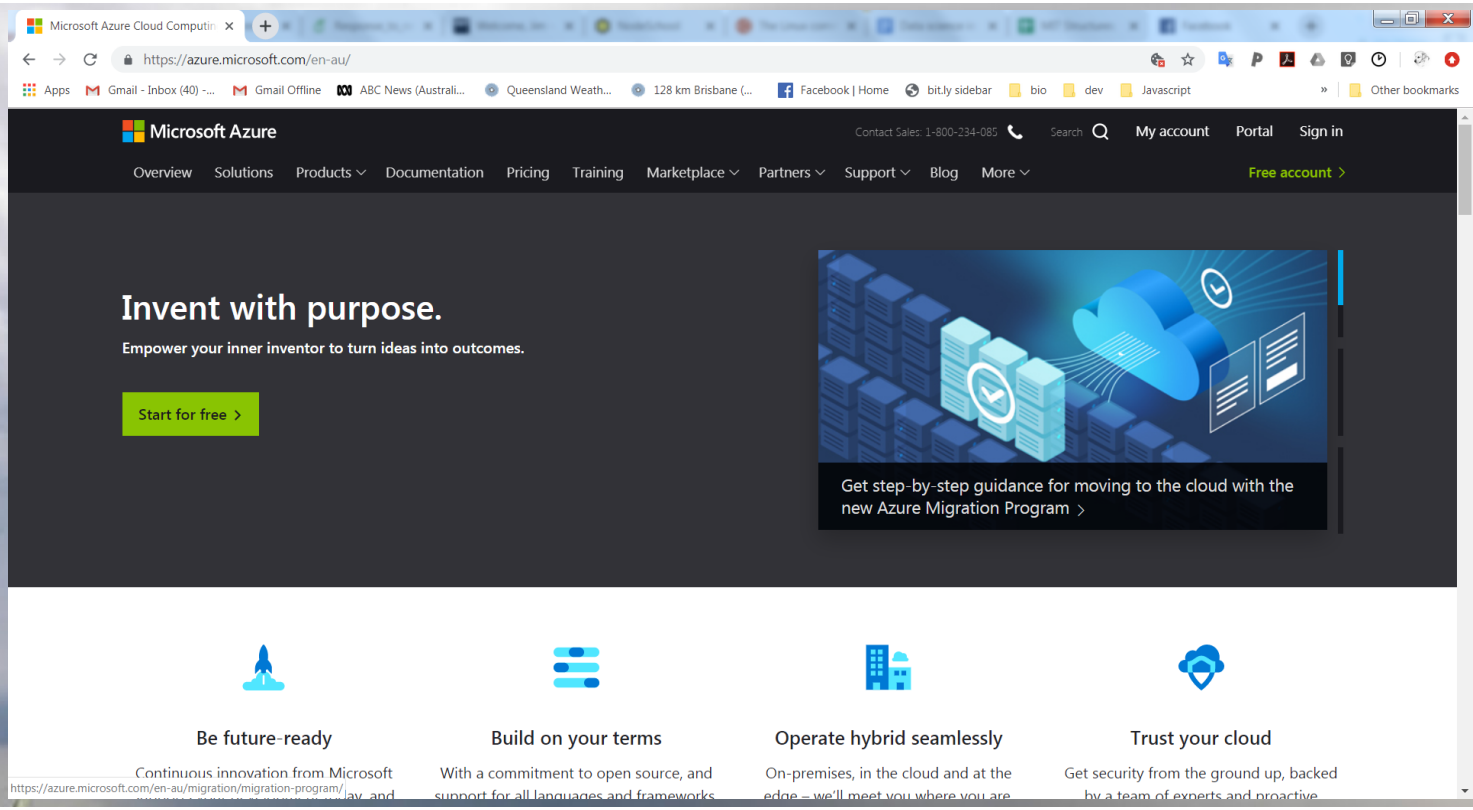
Azure, Google and AWS

AN OVERVIEW

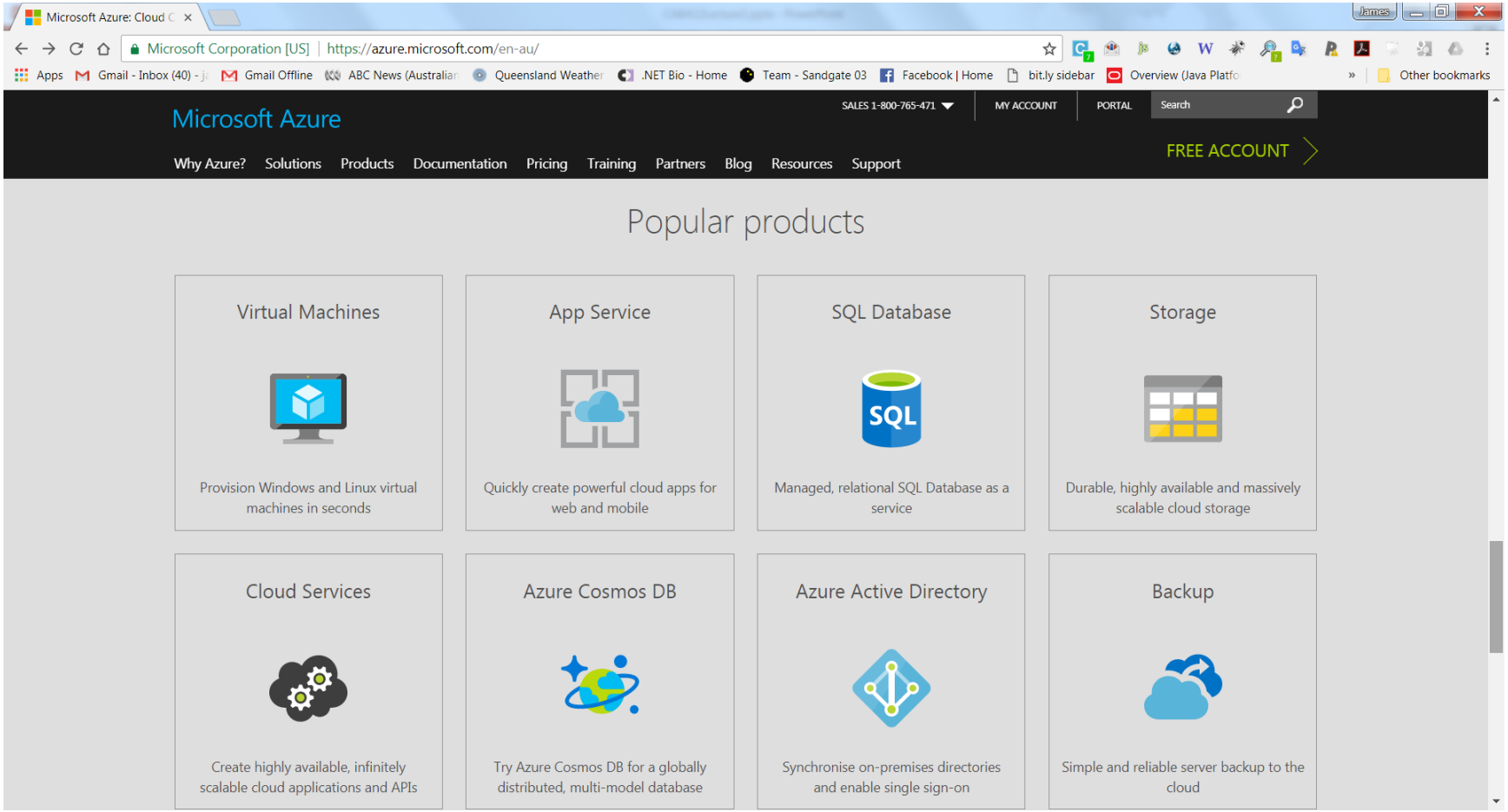
Microsoft Azure

- A mix of XaaS services, mainly IaaS and PaaS
- Windows Cloud Services support SaaS directly
  - Office365 et al see: http://bit.ly/VdFjPJ
- Focus areas include big data and Machine Learning
- Azure SQL, SQL Server in instances
- Cognitive Services and Azure ML are key offerings

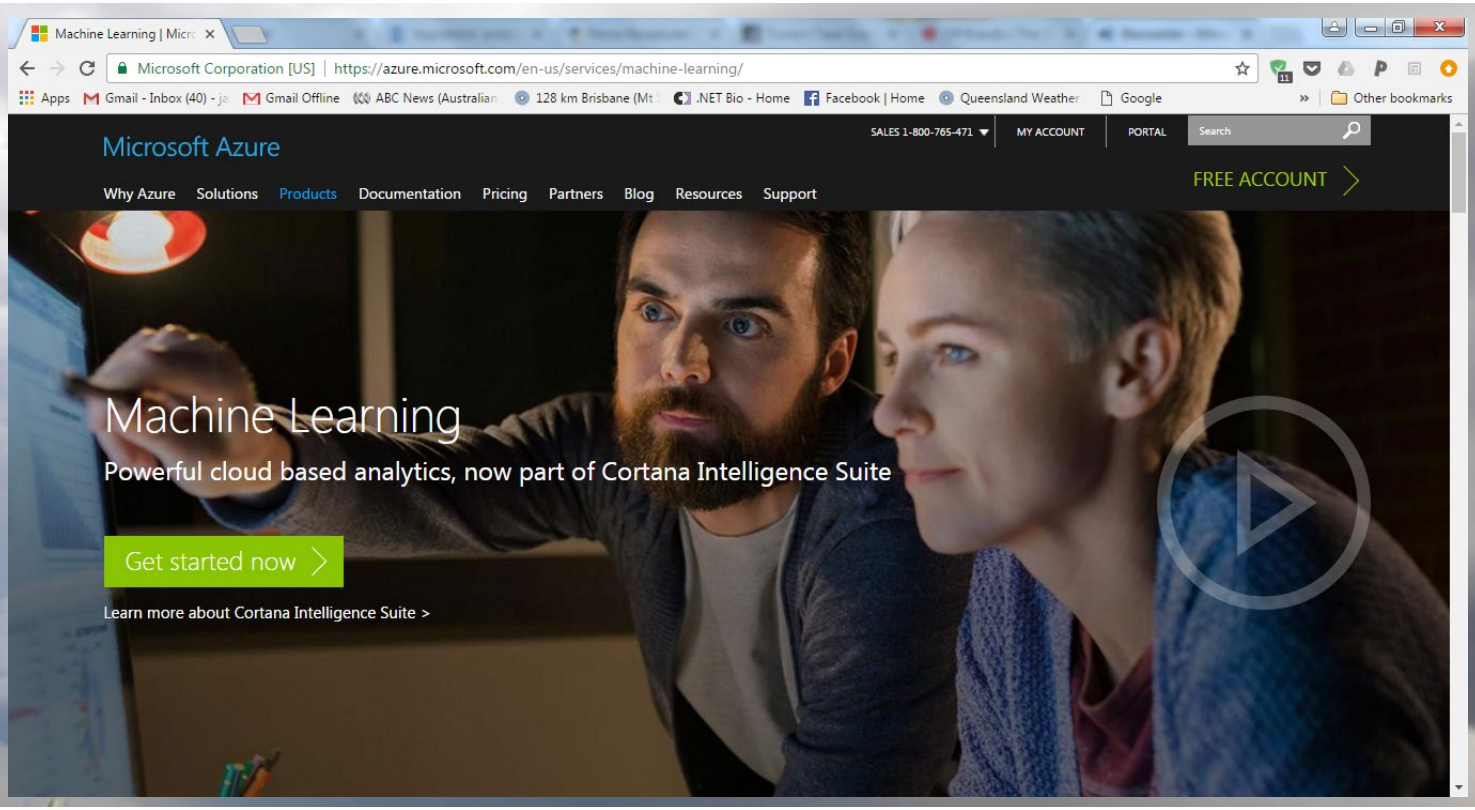
Microsoft Azure https://azure.microsoft.com/en-au/



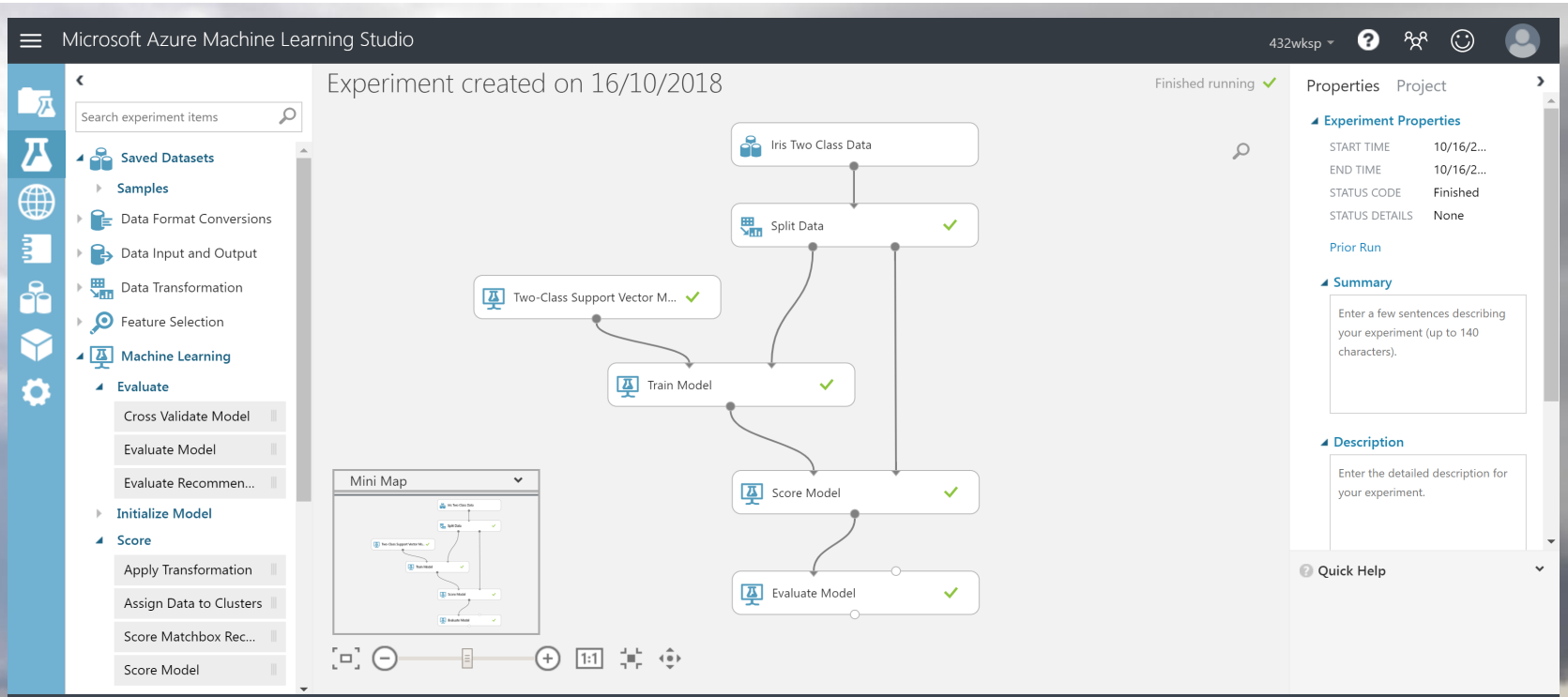
Microsoft Azure



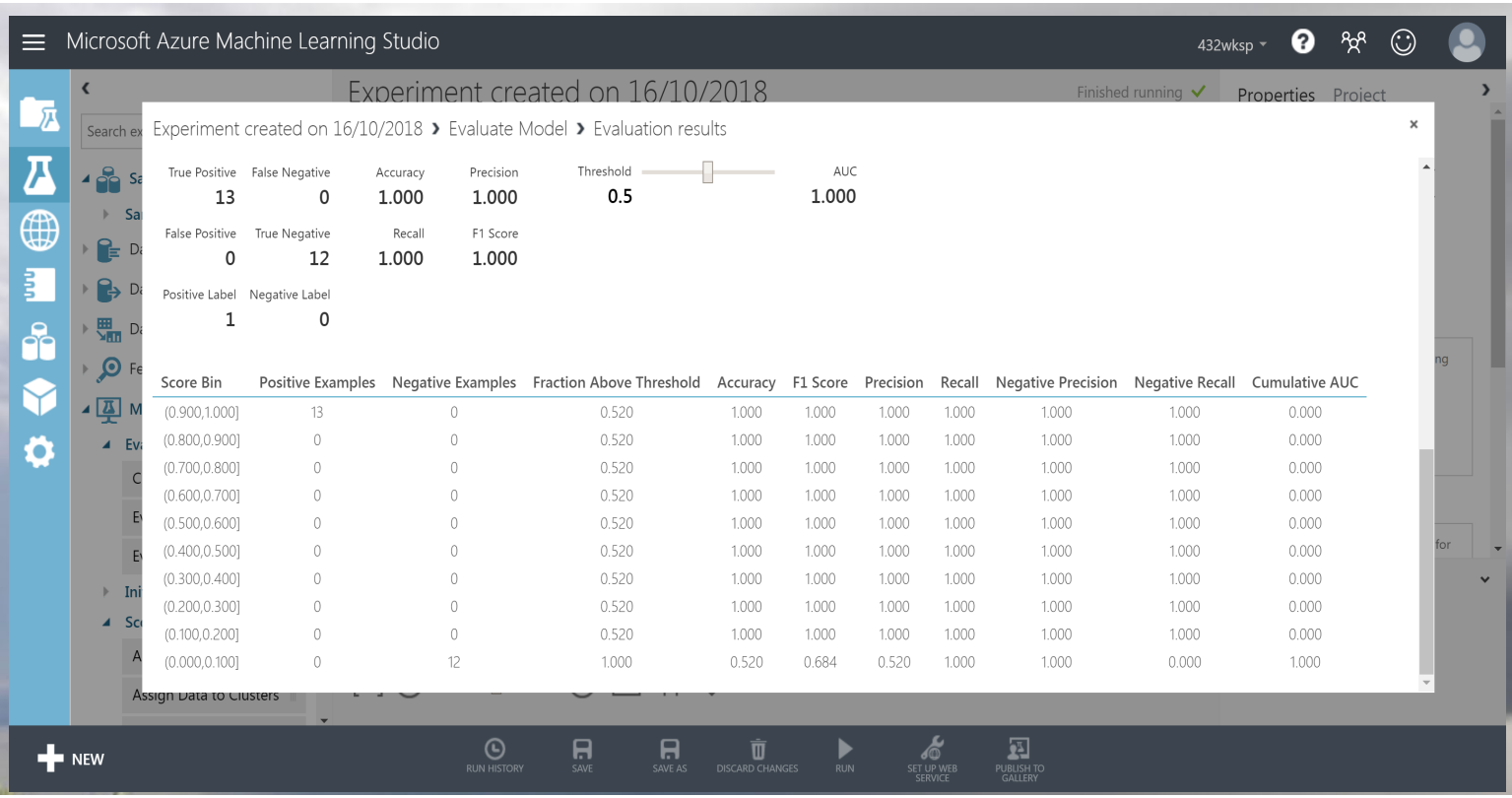
Azure ML – Machine Learning Service



Azure ML – example Machine Learning Service



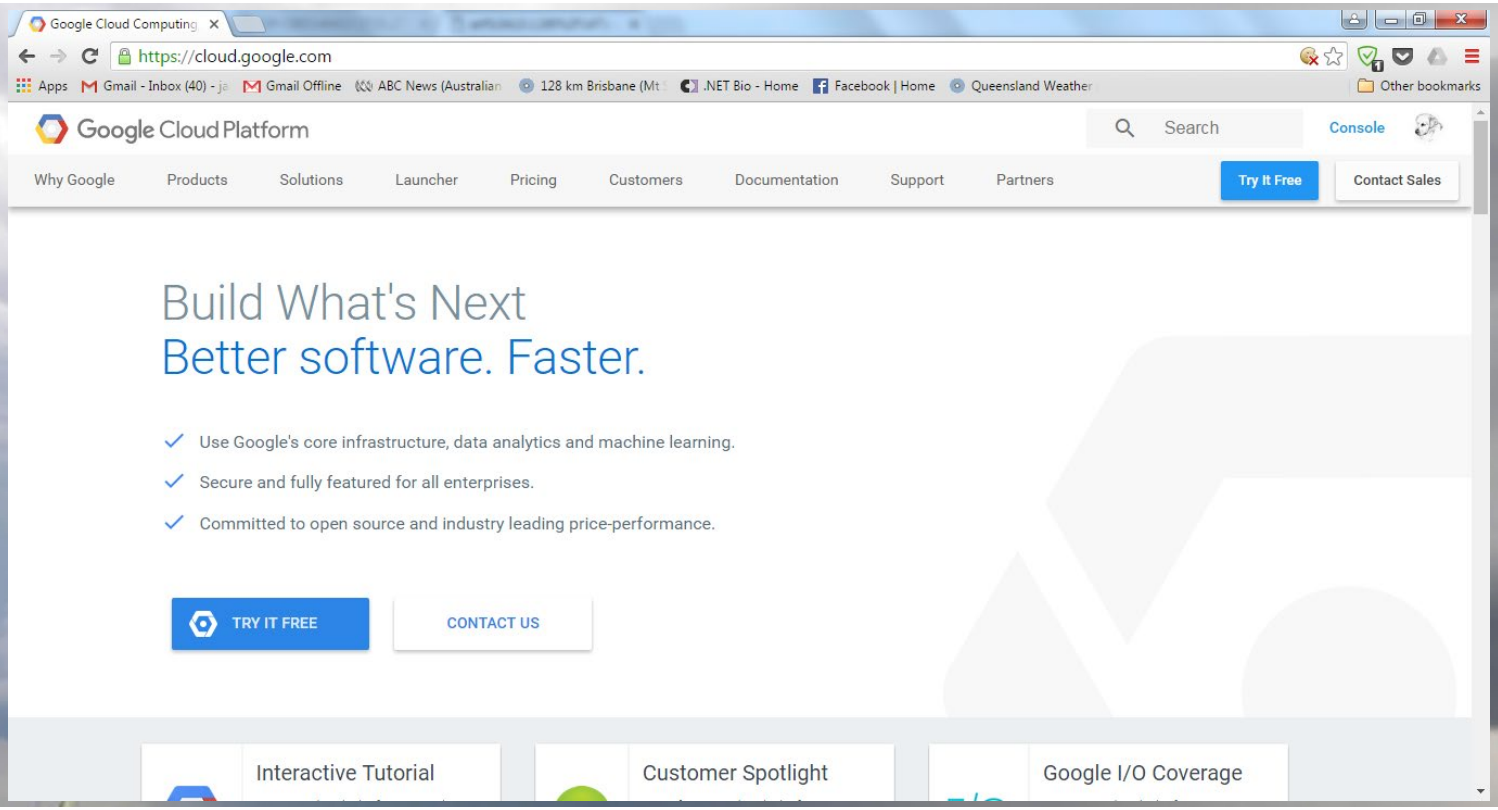
Azure ML – example Machine Learning Service



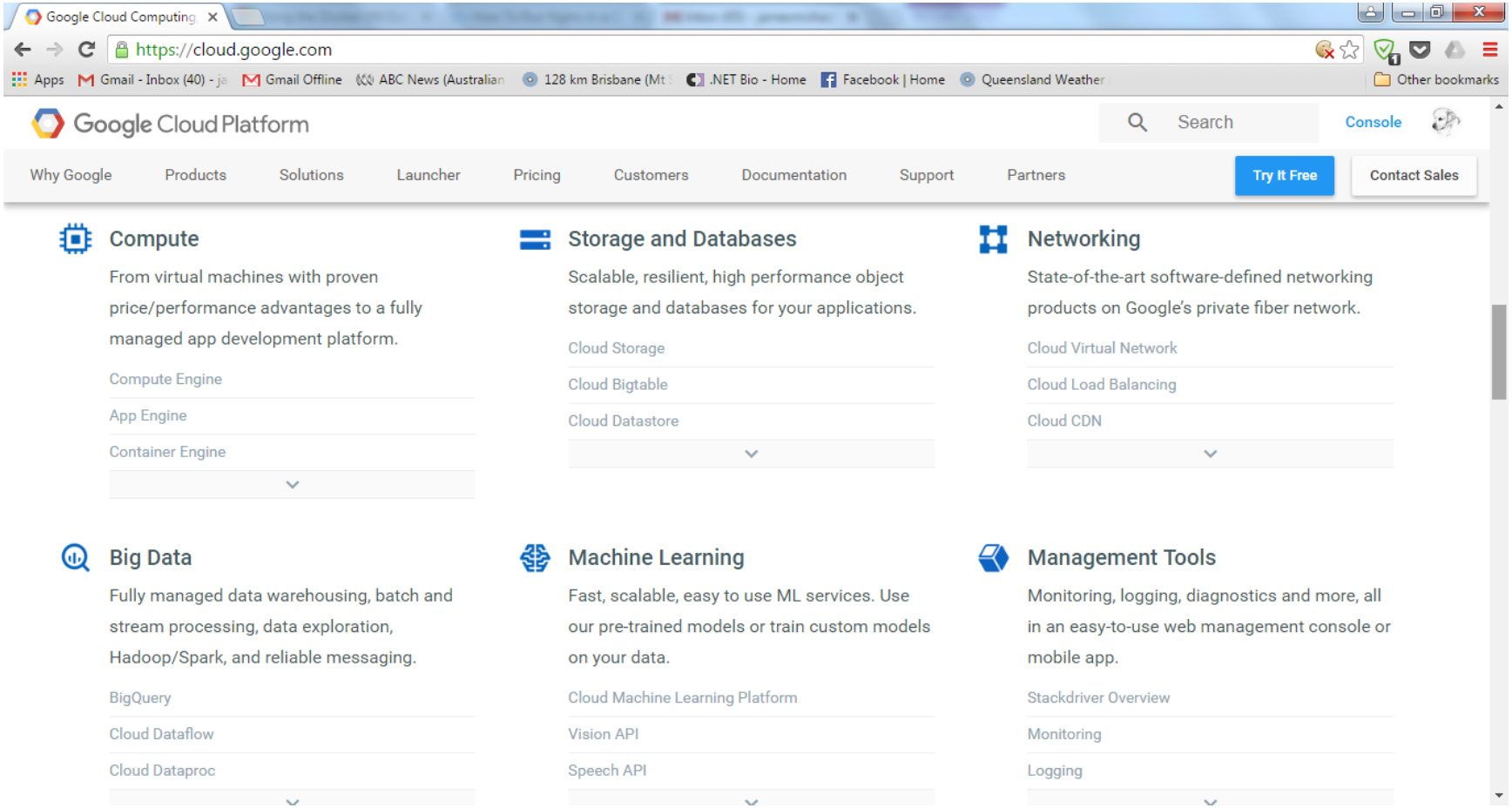
Google Cloud Platform

- Mix of IaaS and PaaS services
- Focus on IaaS at very large scale
- PaaS remains through Servlet based AppEngine
- Application areas in search, data and machine learning

Google Cloud https://cloud.google.com/



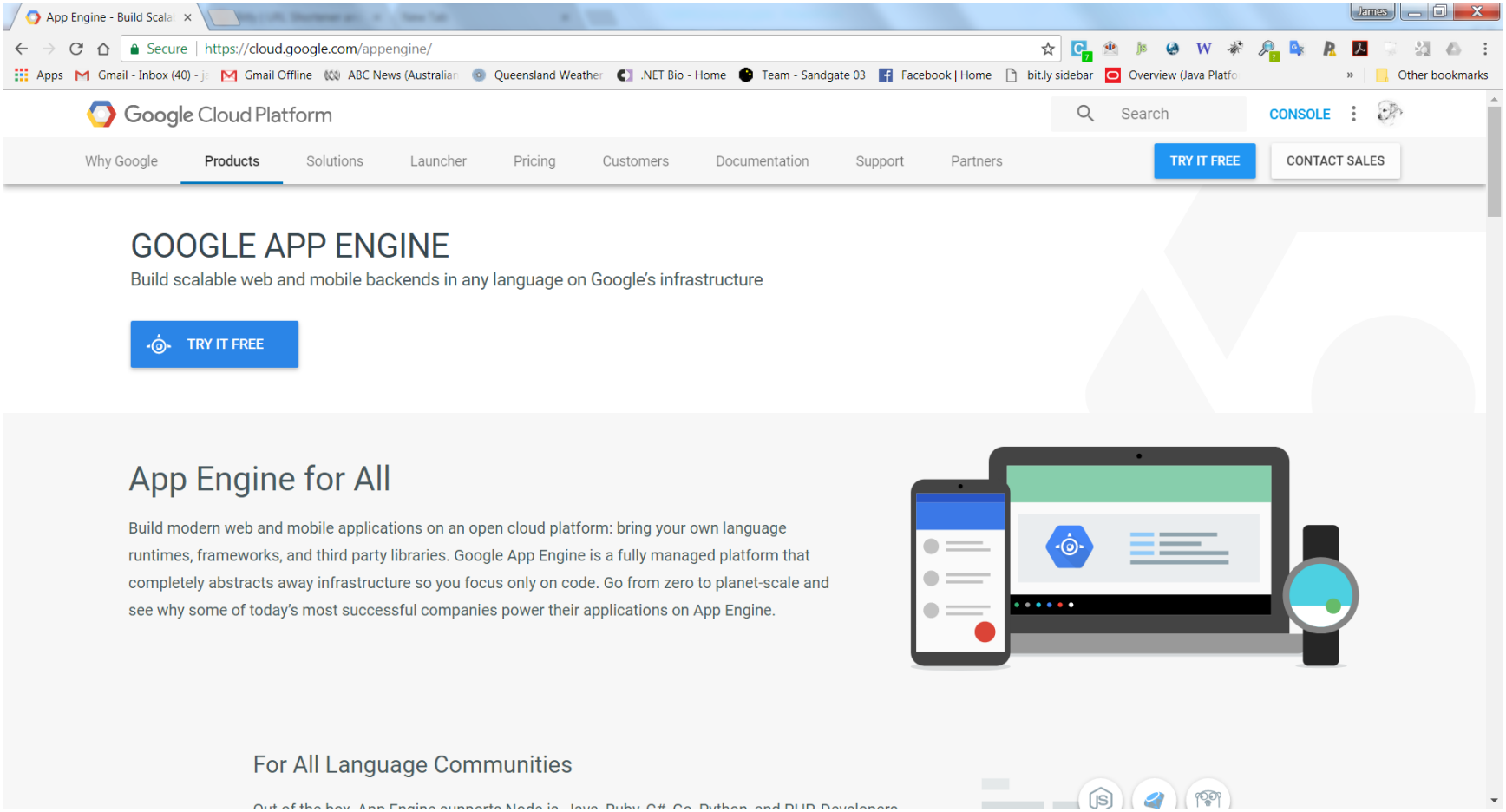
Google Cloud



AppEngine

- AppEngine is designed for web applications
- In the Java EE API, we assume URLs map to servlets
- The programming model is thus familiar
- The difference lies in the infrastructure and services
- Scalable compute and very large data store
- In memory caching of local results
- Access to numerous google services
- Exploitation of the Java libraries to access web services
- Google Web Toolkit
- Now generalised to allow other run times

Google App Engine

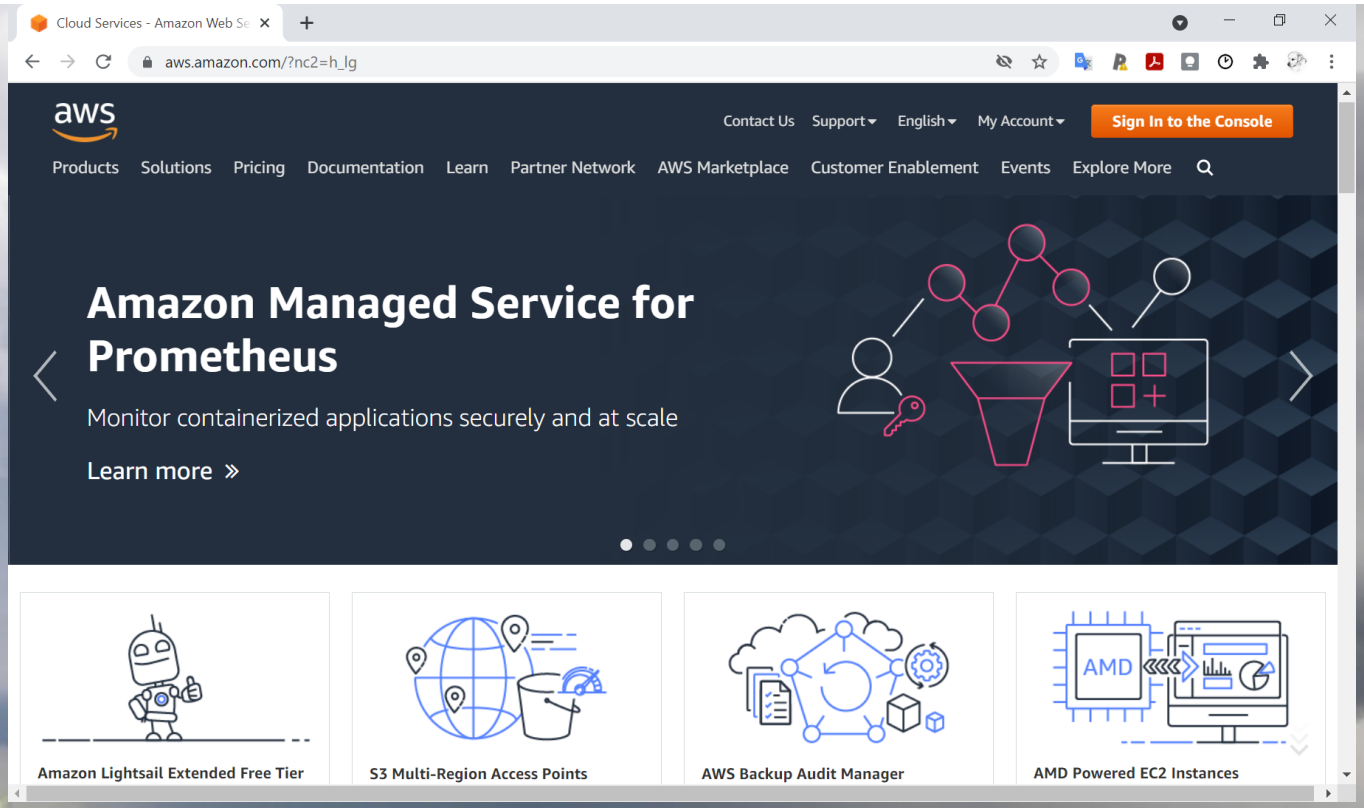


https://cloud.google.com/appengine/

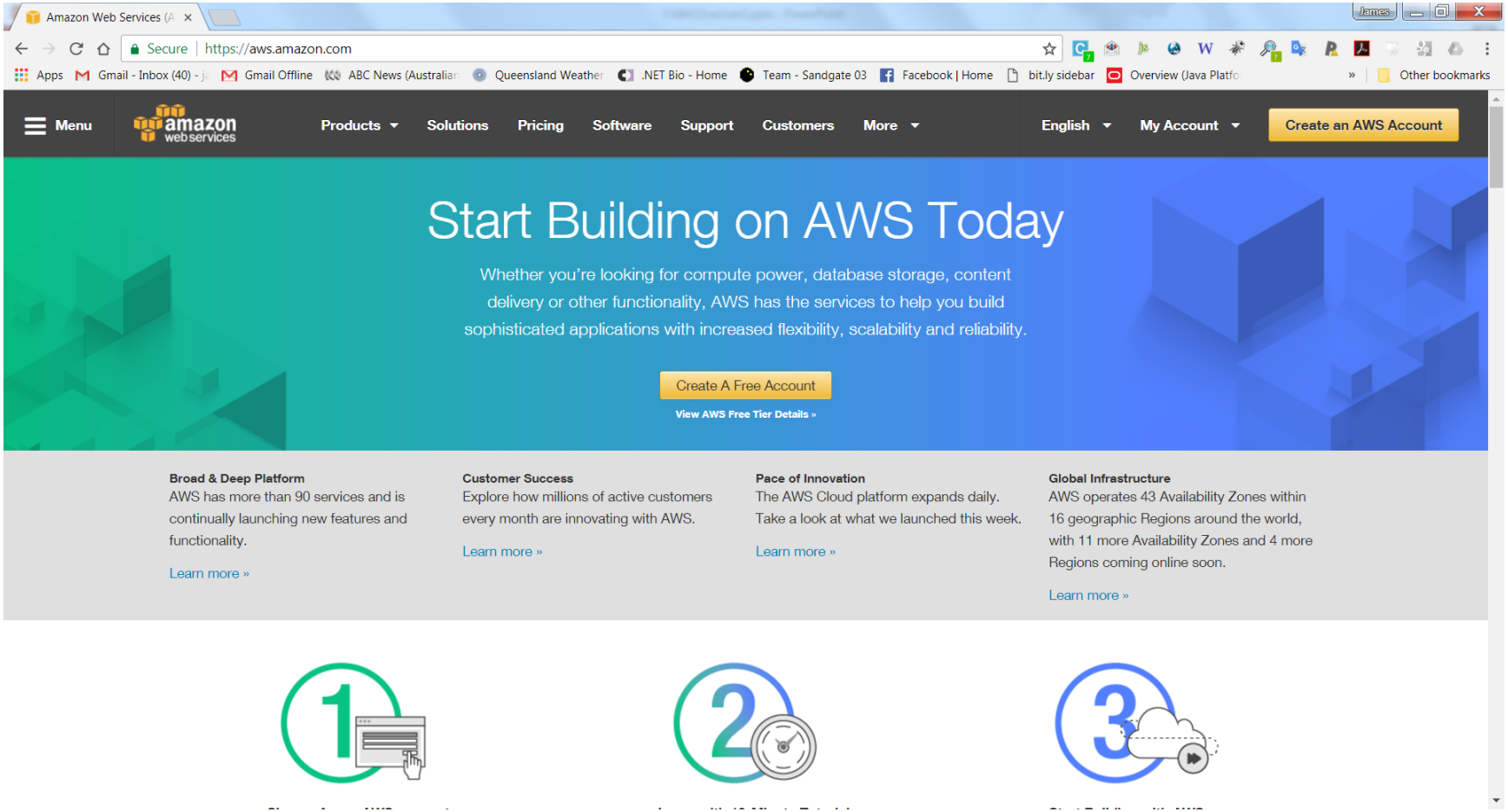
Amazon Web Services

- Mix of XaaS services ranging from EC2 and S3 through to marketplace.
- Massive range of elastic application services
- Major improvement in machine learning services in recent years
- Developing focus on IoT and devices.

AWS http://aws.amazon.com/

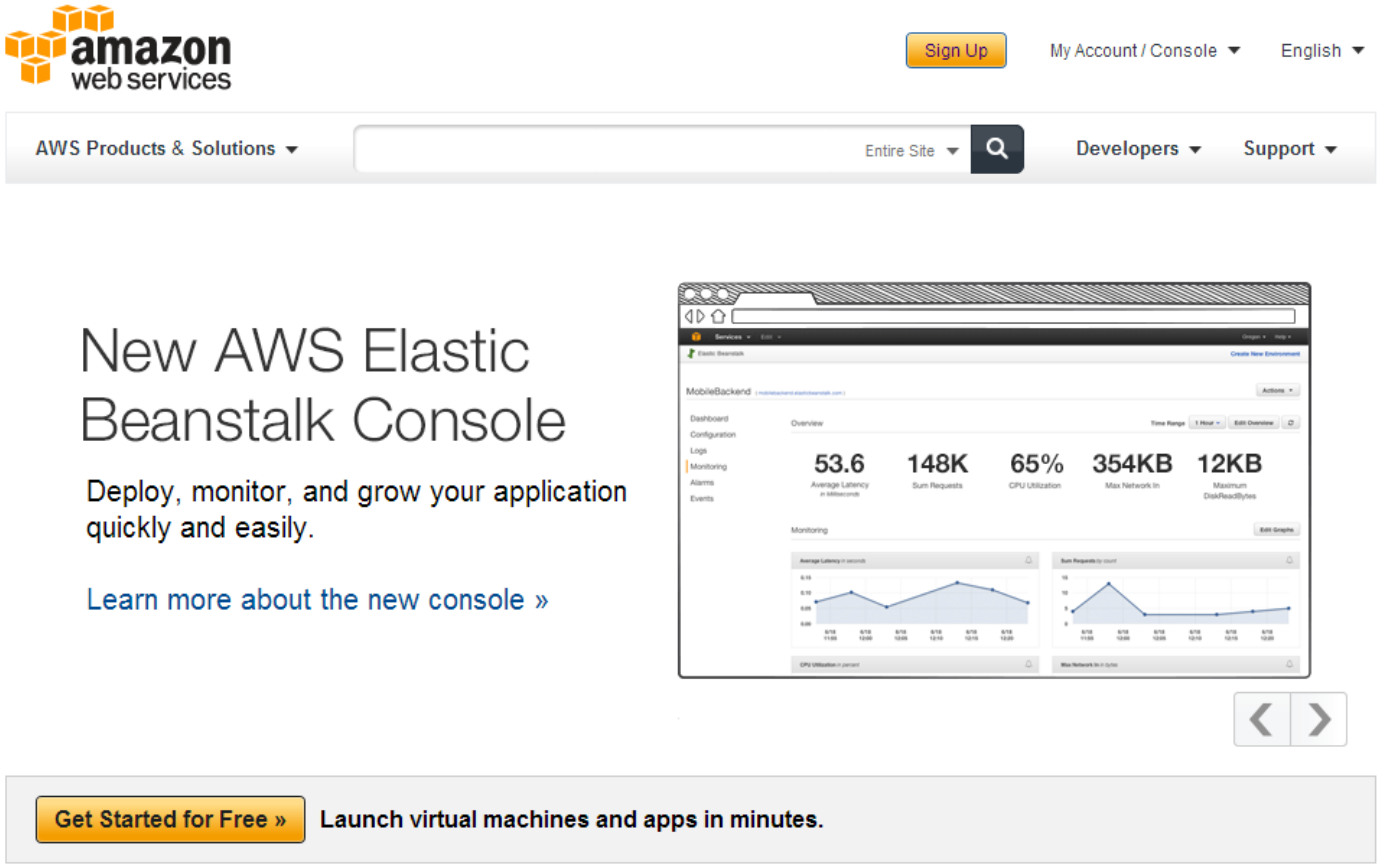


AWS – IaaS ++ (2018)



http://aws.amazon.com/

AWS Elastic Beanstalk – PaaS (2014)



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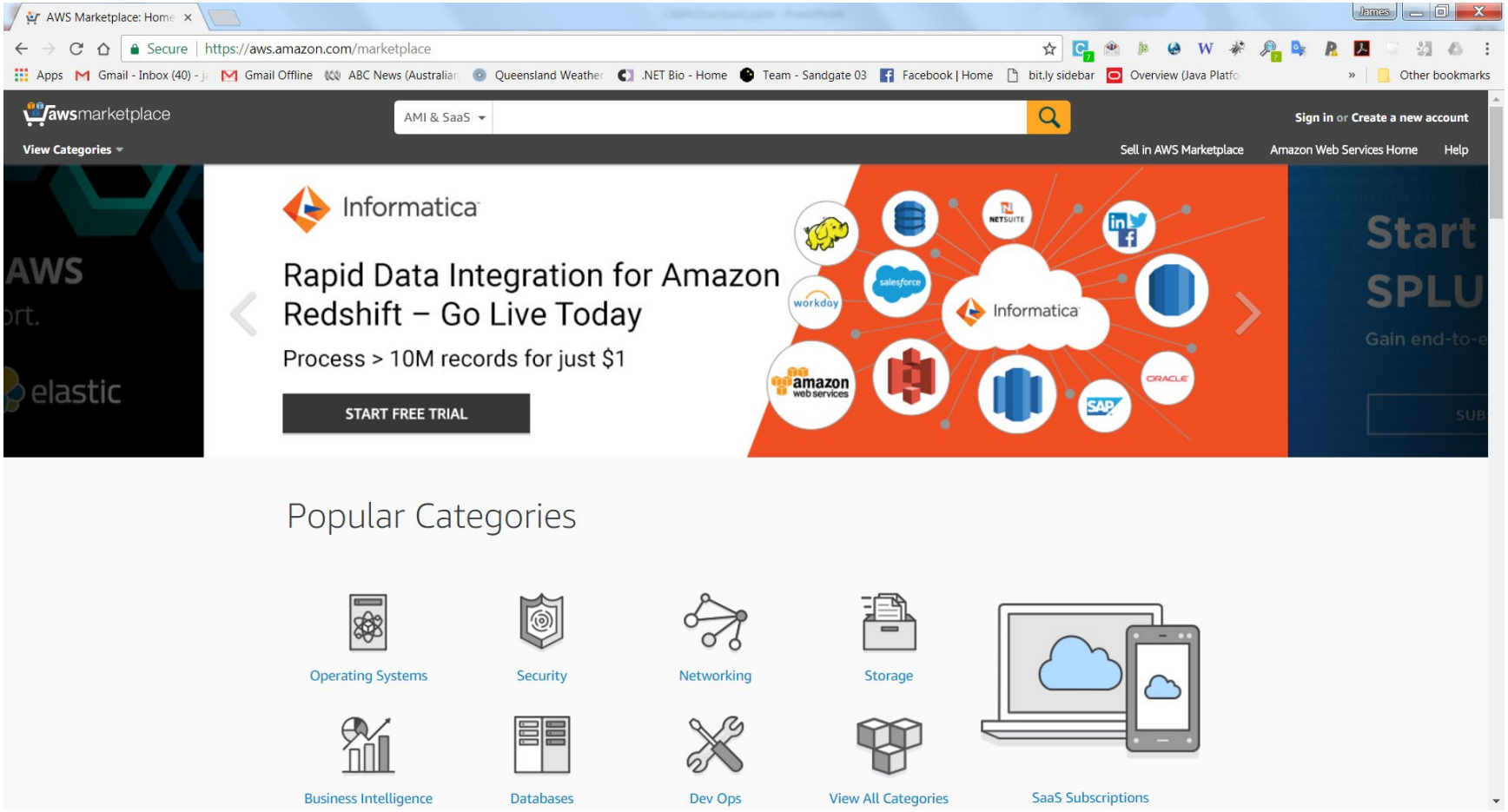
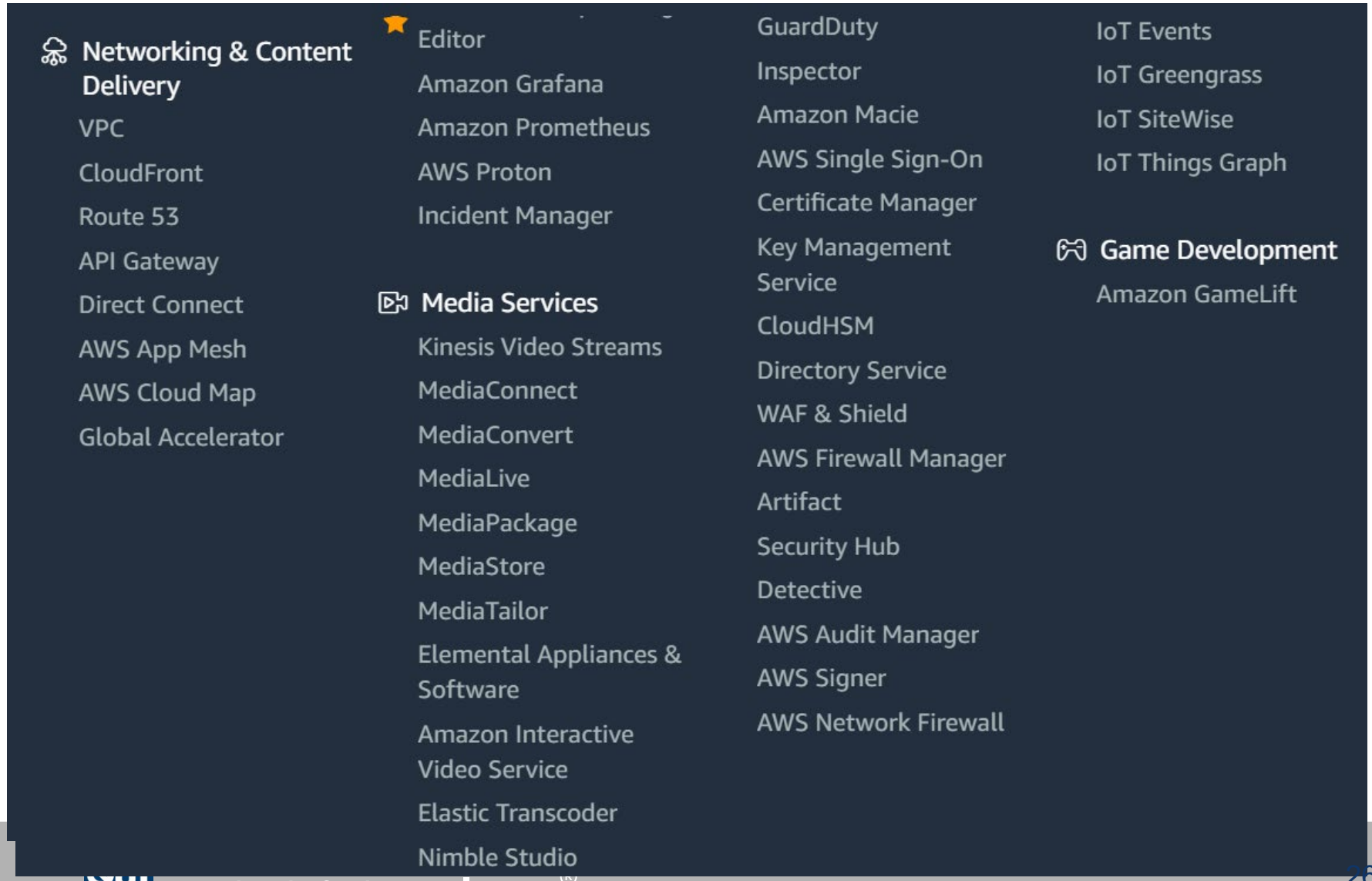
AWS MarketPlace - SaaS



https://aws.amazon.com/marketplace

Services: AWS 2021



Some Readings

- Become familiar with the ideas considered in the lecture
- Follow all the links given – and explore the APIs offered.
- Here are some less technical articles:
- http://www.economist.com/topics/cloud-computing