

A Primer on Cloud Computing

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- Background
- Cloud Computing Defined
- Taxonomy
- Value Proposition
- Cloud Providers
- Who uses it
- Opportunities for Improvement



The Challenges

- Make all New York Times archived articles from 1851 to 1922 available free of charge over the internet
- 11 Million articles as images to be scanned and converted to PDF format in an inflexible project deadline

Solution

- Use Amazon Web Services infrastructure for reading and converting the article images to PDF

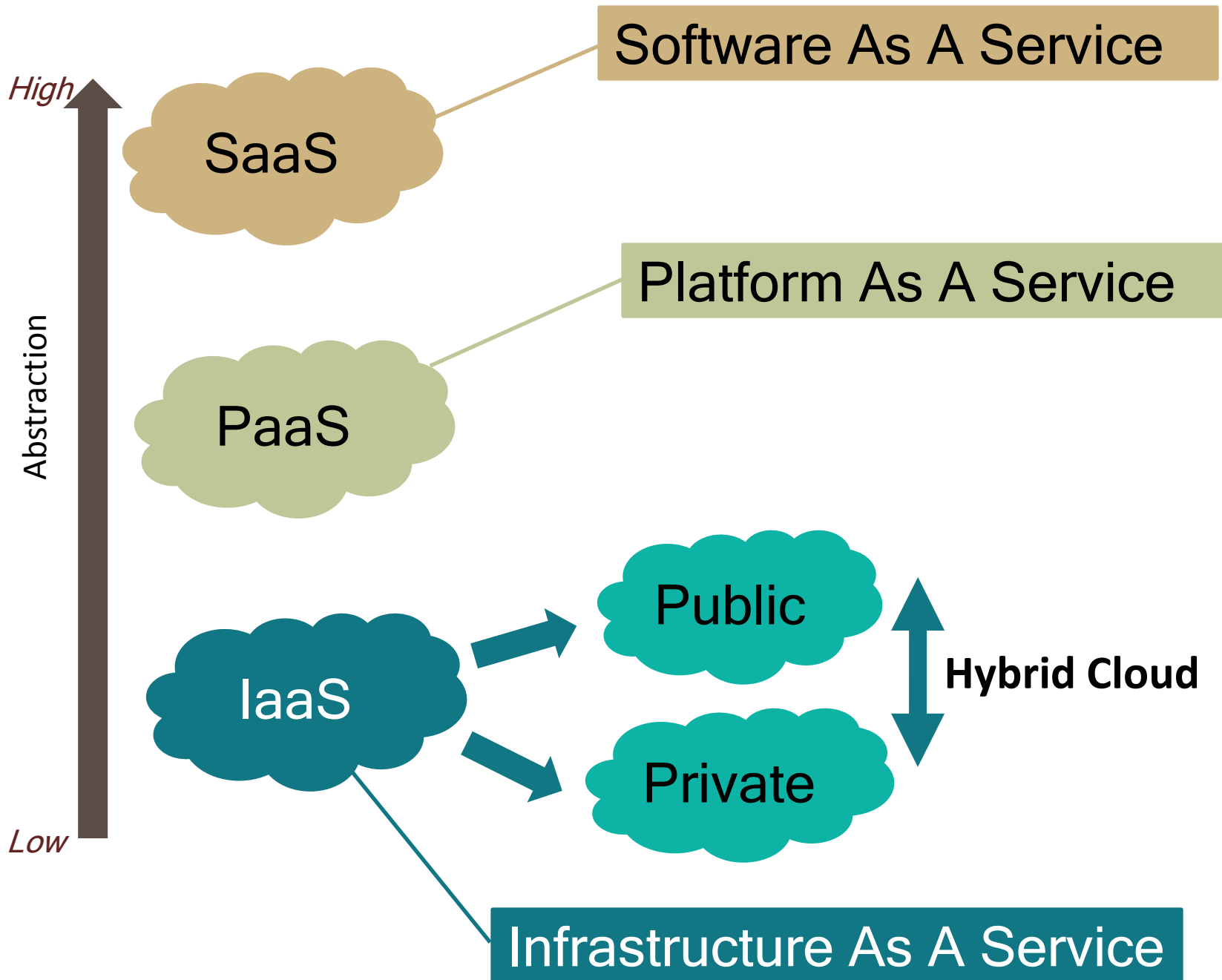
Results

- All 11 million articles processed in < 24 hours
- Using 100 Amazon EC2 instances
- The total cost ~\$240

Cloud Computing refers to both the applications delivered as services over the Internet and the hardware and systems software in the datacenters that provide those services. The datacenter hardware and software is what we will call a Cloud. .. Cloud Computing has the following characteristics:

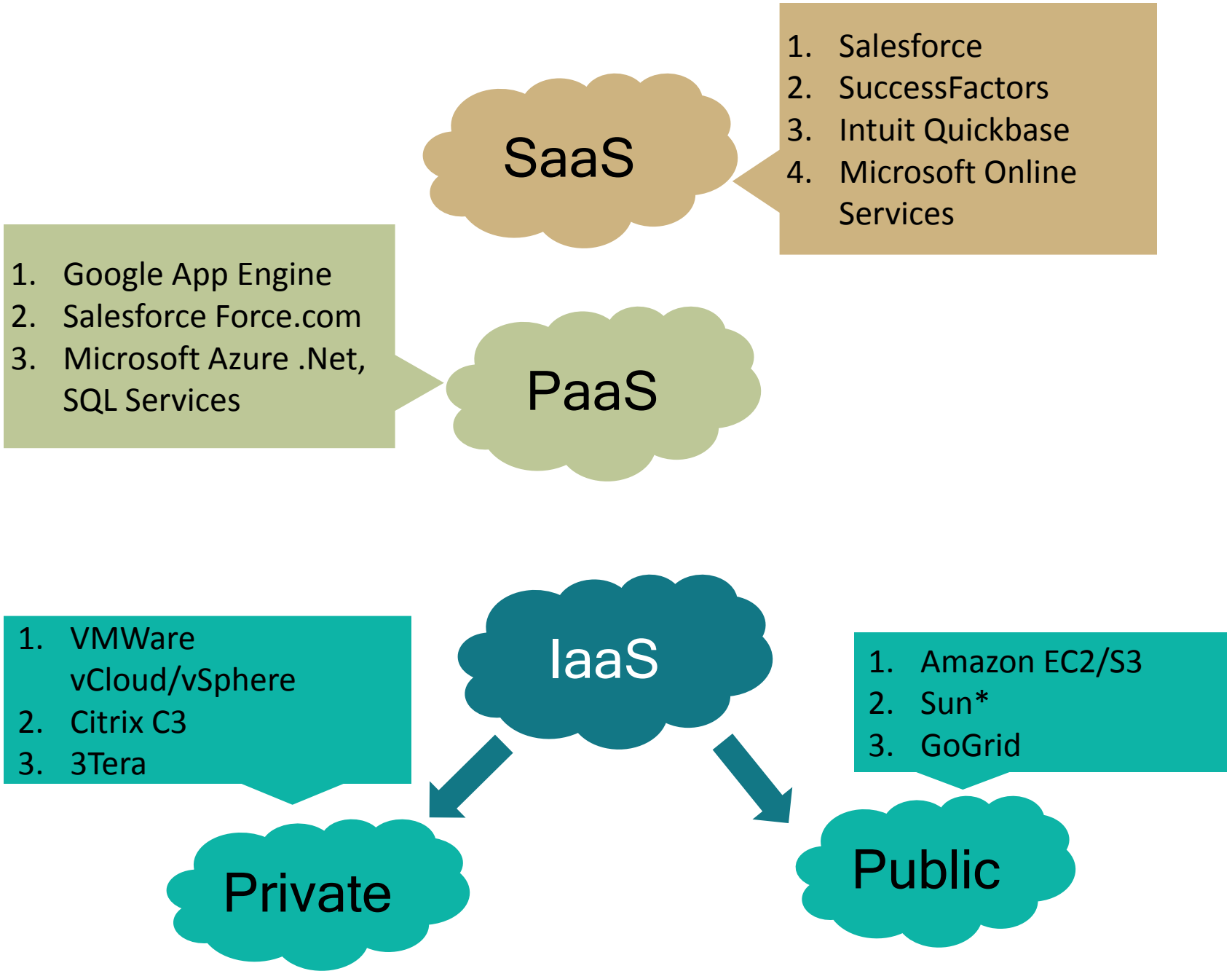
1. The illusion of **infinite computing resources**...
2. The **elimination of an up-front commitment**..
3. The ability to **pay for use** of computing resources..

- UC Berkeley RAD Lab



1. **No infrastructure investment costs**
2. **Only operational costs based on usage**
3. Multi-tenant architecture leads to **massive economy of scale**
4. **Flexibility** leads to increases in **operational efficiency**
5. **No commitment**

Cloud Providers (Examples)



Salesforce and Force.com	Offers on demand Customer Relationship Management (CRM) solutions. Force.com is a platform to build and host web applications on Salesforce 's infrastructure
SuccessFactors	On demand performance and talent management solutions for workforce management
Intuit Quickbase	Ready made applications such as Project Management, Sales Management among others offered online
Google App Engine	A platform to build and host web applications on Google's infrastructure. Web applications can be developed using Java and Python programming languages.
Microsoft Azure Services Platform & Online Services	A platform to build, host web applications leveraging .NET framework. Also offers services such as Office Online, Data Mining and Sharepoint among others online.
VMWare vCloud, vSphere	A platform comprising of services for process automation & orchestration, metering, chargeback model and application delivery
Citrix Cloud Center (C3)	Cloud enabling product offering features such as process automation & orchestration, metering, chargeback model and application delivery
Amazon EC2, SQS and S3	A set of web services that allows customers to rent computers and storage among other app. services to run applications and pay only for usage

- 1. Bank Of America (ISD) uses Intuit Quickbase
- 2. Oakley uses SuccessFactors

SaaS

PaaS

- 1. StarbucksIdea built on Force.com
- 2. Haagen-Dazs built on Force.com

IaaS

Chase (formerly WAMU) uses VMWare

- 1. New York Times uses AWS
- 2. Animoto uses AWS

Private

Public

BofA uses Quickbase	Central source for sharing information for the entire sales team
Oakley uses SuccessFactors	For improvements in collaboration, accountability and productivity among employees
MyStarbucksIdea.com built on Force.com	An application that allows customers to share, discuss and vote their suggestions.
Haagen Dazs Shoppe on Force.com	Uses Salesforce as its CRM and Force.com for integration with calendaring and contact management among others
NYT Times Select using Amazon EC2 and S3	Makes all articles from 1851 to 1922 available for free to its internet audience
Animoto powered by Amazon Cloud	Generates a music video from photos
Chase (formerly WAMU) uses VMWare	Enterprise compute cloud improving operational efficiency, flexibility and lower costs.

- **Portability:** Of data against cloud provider competitors
- **Security:** Risk of insider threats (within cloud provider)
- **Customer Service:** Focus on customer service when building XaaS
- **Visibility:** Data retention and destruction
- **Compliance:** Geographical locations of Data Centers for assessment of legal compliance
- **Encryption:** Of data for incident response and remediation

Thank You

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