# Cloud Computing

Everything as a Service

# Cloud Computing

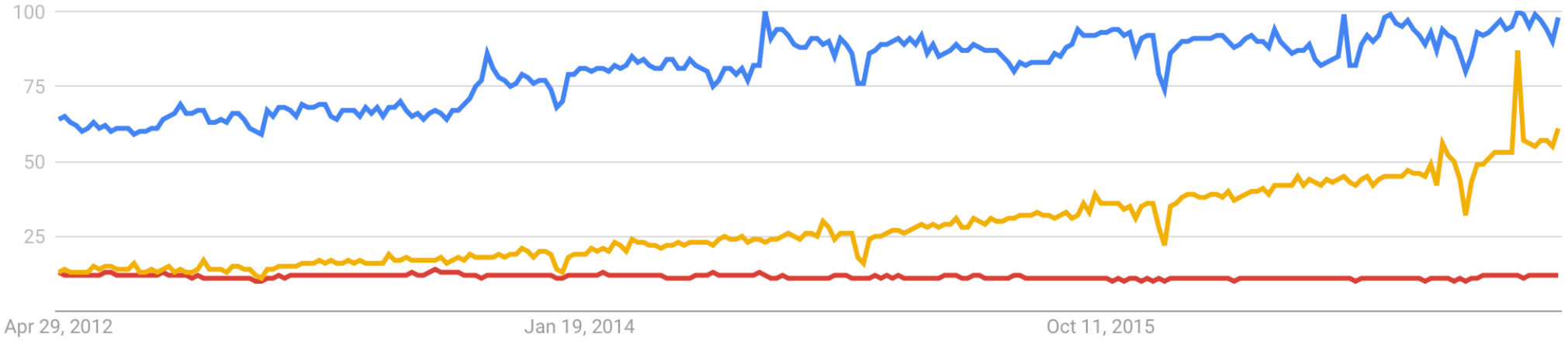
- Running a DataCenter is expensive.
  - Costs to much to built (CapEx)
  - Costs to much to run (OpEx)

***"Need milk? Don't buy the cow… buy the milk"***

- Rent what you need instead of buying and running everything!
- Cloud Computing advantages:
  - Pay per use!
  - Instant Scalability
  - Security
  - Reliability
  - APIs

# The hype

Cloud Computing AWS VPS




# Definition (NIST)

- “Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.“

## SaaS

- Salesforce, Google Apps, MS Office 360

## PaaS

- MS Azure, Google App Engine, Heroku

## IaaS

- Amazon, Google Cloud Platform, IBM Bluemix

# IaaS – Infrastructure as a Service

- Infrastructure as a Service : Grids of virtualized servers, storage & networks
  - E.g. Amazon (EC2, S3, EBS), IBM Bluemix, Google Cloud Platform
- Access to infrastructure stack:
  - Full OS access
  - Firewalls
  - Routers
  - Load balancing
- Advantages
  - Pay per use
  - Instant Scalability
  - Security
  - Reliability
  - APIs
- Examples


# PaaS – Platform as a Service

- The abstraction of applications from traditional limits of hardware allowing developers to focus on application development and not worry about operating systems, infrastructure scaling, load balancing and so on.
  - Examples include Google App Engine (Java, Python), MS Azure (.net), Heroku (RoR)
- Platform delivery model
  - Platforms are built upon Infrastructure, which is expensive
  - Estimating demand is not a science!
  - Platform management is not fun!
- Advantages
  - Pay per use
  - Instant Scalability
  - No sysadmin tasks
  - Better Security



# SaaS – Software as a Service

- Software-as-a-Service: Applications with a Web-based interface accessed via Web Services and Web 2.0.
  - E.g. Google Apps, SalesForce.com and social network applications such as FaceBook
- Software delivery model
  - Increasingly popular with SMEs
  - No hardware or software to manage
  - Service delivered through a browser
- Advantages
  - No Installation Required
  - Not platform specific
  - Automatic Upgrades
  - Access your data anywhere

# Cloud Computing

- Lower cost of ownership
- Reduce infrastructure management responsibility
- Allows for unexpected resource loads
- Faster application rollout
- How does cloud economy work ?
  - Multi-tenent
  - Virtualization lowers costs by increasing utilization
  - Economies of scale afforded by technology
  - Automated update policy
- Risks
  - Security
  - Downtime
  - Access
  - Dependency
  - Interoperability

# Cloud Business Models

| | Suitable Apps | Maintenance (HW, SW, Support) | Quick Starts | Efficiency | Cash Flow | Management and Compliance |
|---|---|---|---|---|---|---|
| Public | Limited | Excellent | Excellent | Excellent | Excellent | Newer Issues Up Front |
| Hybrid | Broad | Good+ | Good | Good+ | Good | Fewer Issues |
| Private | Almost All | Primarily HW Benefits | Reduces HW Setup | Good+ | Good | Few New Issues |

# Build a wordpress site on the cloud

- Use either:
  - AWS
  - IBM Bluemix
  - Google Cloud Platform
  - MS Azure
- Make use of their services (not just VM hosting)