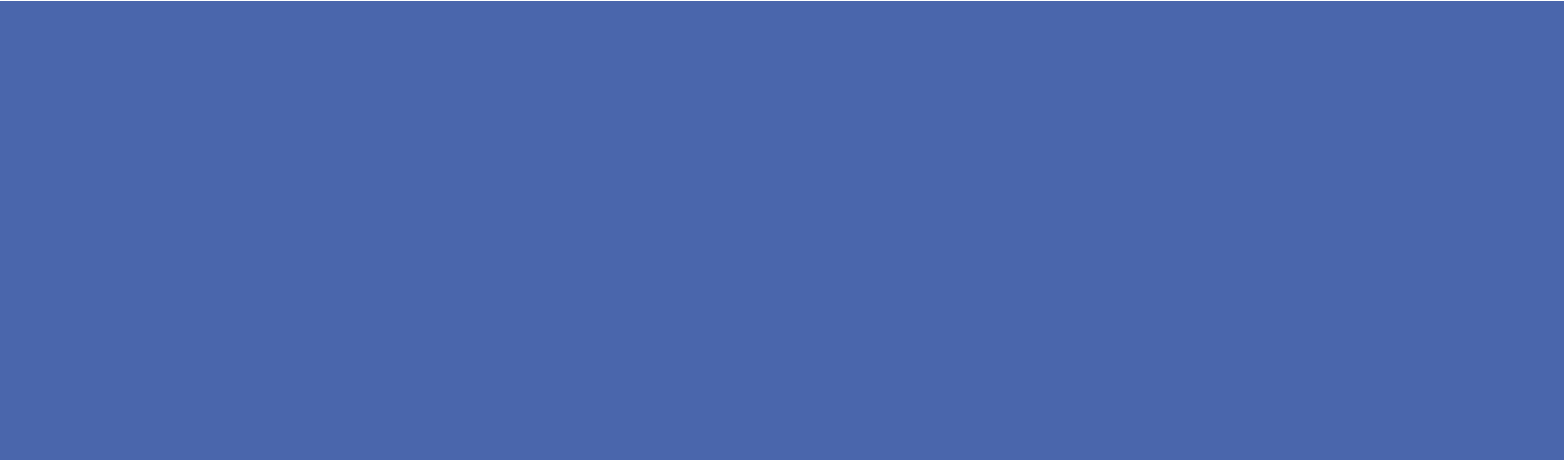# CLOUD COMPUTING

WEEK 12 – 11/11/2019

ANNOUNCEMENTS

Homework 3 is due on Friday, Nov 15 at 11:59 p.m.

Assignments being released this Friday:

- Project Milestone 5 – Due on Nov 22, 11:59 p.m.
- Homework 4 – Due on Dec 6, 11:59 p.m.
- Project Milestone 6 – Due on Dec 13, 11:59 p.m.
- Project Milestone 7 – Due on Dec 16, 11:59 p.m.

PROJECT PRESENTATIONS

- This qualifies as Milestone 6

- Presentation slots are up on Canvas

- We're looking for a bigger space to hold the presentations. We'll update the locations as soon as we have it.

- Each team will conduct a live presentation of their project in front of other students, TAs and the instructor.

- Your presentation requires all members to be present and standing up front. If an individual on the team is not present for the presentation, then he/she will get a zero for Milestone 6

- Each team member must present some aspect of the project during the presentation.

- Each team will target 10 minutes for their presentation (no more; no less please.)

- More details will be provided on the Milestone manual. Please read that carefully!

WHAT IS THE CLOUD?

THINGS TO THINK ABOUT

Scaling, Lead time	Floor space	Power management	Heating/Cooling	Redundancy – SPOF (Single Point of Failure)
Fire Suppression	Battery Backup -- UPS	Network Wiring	Data & Server Backups	Network Switching
	7X24 support	Alerts/Alarms		

A METAPHOR

- The electrical grid
  - You don't know where it comes from
  - It's there when you need it, just plug it in
  - Use what you want
  - Need more? Just take it.
  - Pay for what you use

DEFINITION

- "Computing Services and Solutions are delivered and consumed in real time over the internet."

PROS AND CONS

Advantages of Cloud Computing:

- Ubiquitous (available from anywhere)
- Automated change management
- Massively Scalable
- On-Demand Provisioning
- Rapid Deployment
- Lowers innovation barriers
- Leading edge architecture
- Lower Cost

Disadvantages of Cloud Computing:

- Surrender Control
- Less Robust Monitoring
- Less Secure – multi-tenancy, DDoS

TYPES OF CLOUD NETWORKS

Private – my private cloud in my own data center

Public – a shared environment hosted by a provider

CHARACTERISTICS OF PUBLIC CLOUD SERVICES

- Offsite hosting
- Pay per use (setup/initial, plus ongoing)
- Shared space
- Massively Scalable
- On-Demand Provisioning
- Rapid Deployment
- Lowers innovation barriers
- Leading edge architecture

CHARACTERISTICS OF PRIVATE CLOUD SERVICES
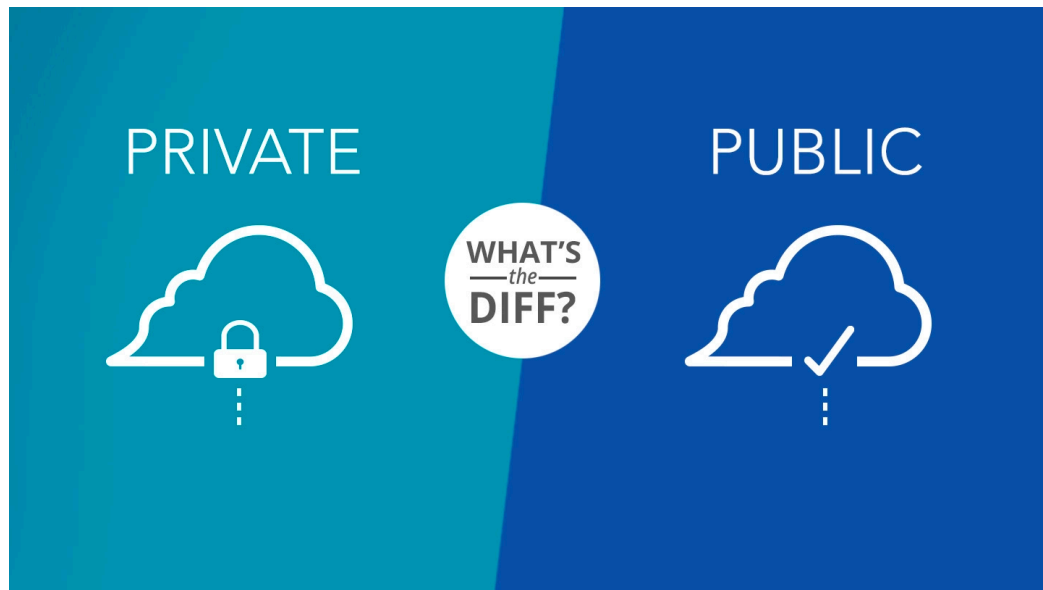
- Private: Leverage the advantages, with few disadvantages
  - Massively Scalable
  - On-Demand Provisioning
  - Rapid Deployment
  - More secure
  - Better Monitoring
  - BUT → Still requires significant internal infrastructure

Cloud Business Drives Amazon's Profits

Amazon's quarterly operating profit (in million U.S. dollars)

■ Amazon Web Services   ■ Total

In Q2 2018, AWS accounted for...

12% of Amazon's consolidated revenue

55% of consolidated operating income

2,983

1,642

$3,200m
$2,800m
$2,400m
$2,000m
$1,600m
$1,200m
$800m
$400m
0

Q1 '15   Q2 '15   Q3 '15   Q4 '15   Q1 '16   Q2 '16   Q3 '16   Q4 '16   Q1 '17   Q2 '17   Q3 '17   Q4 '17   Q1 '18   Q2 '18

@StatistaCharts   Source: Amazon
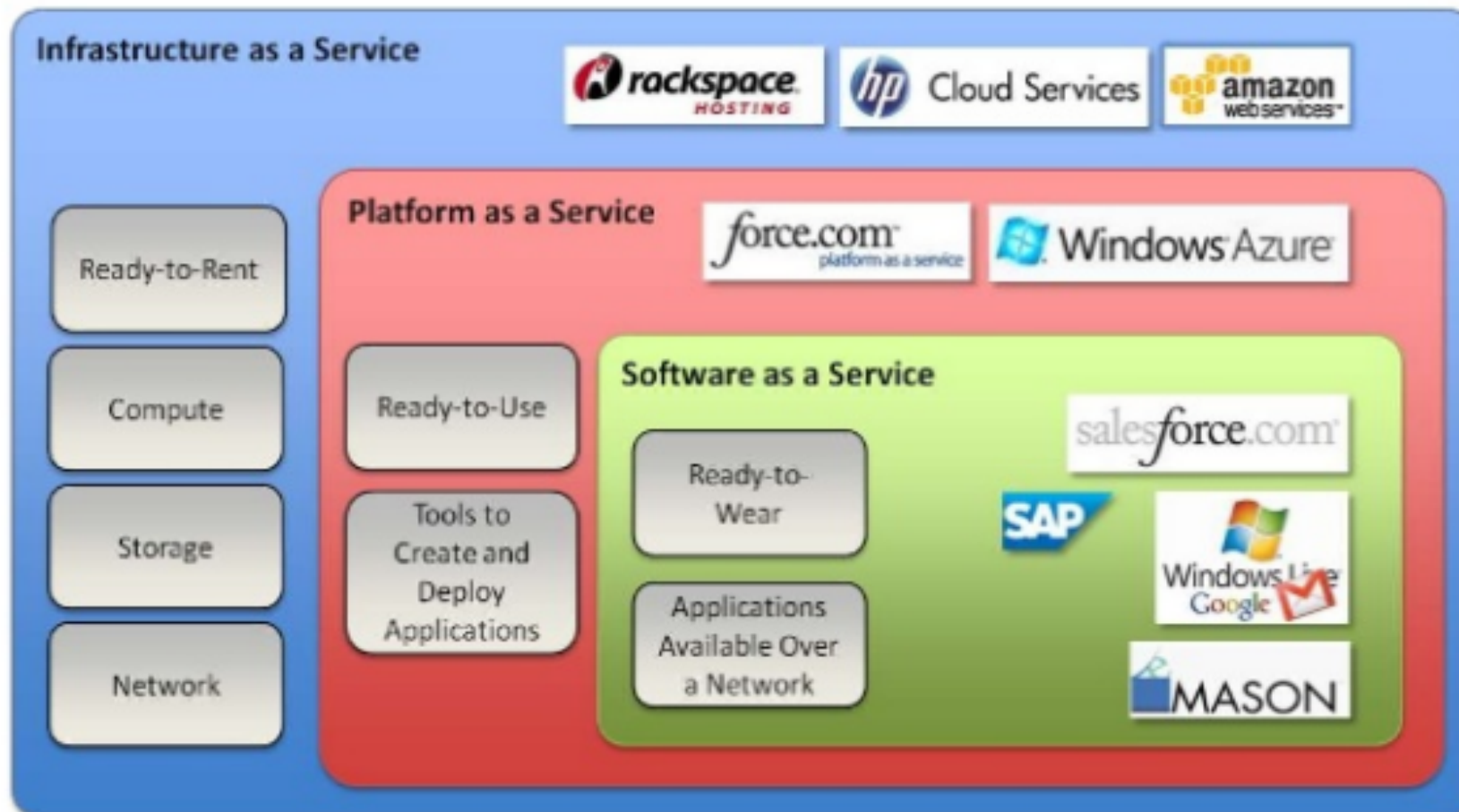
statista

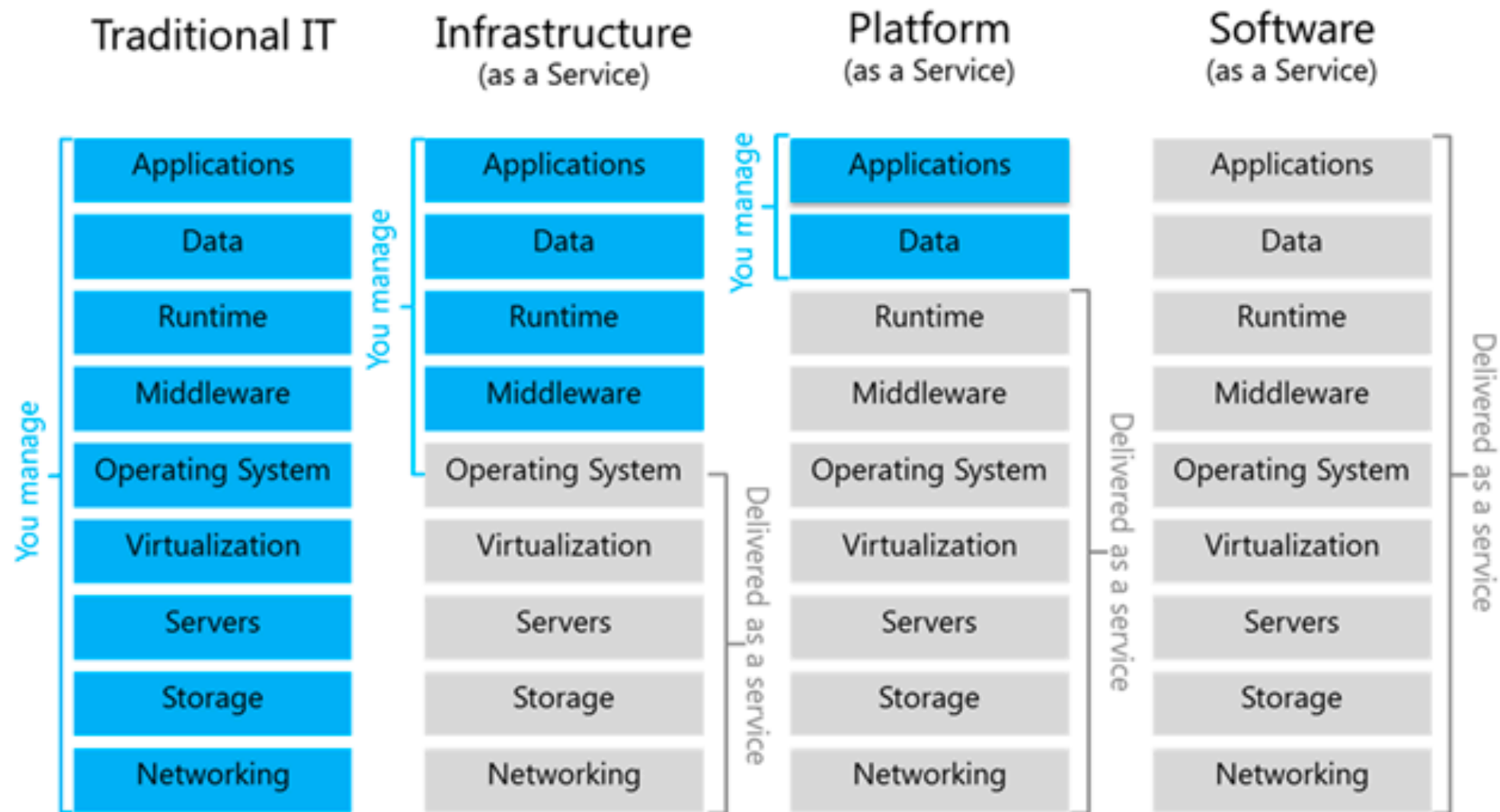SOURCE: CLOUD BUSINESS DRIVES AMAZON'S PROFITS, STATISTA, JULY 27, 2018

CLOUD SERVICE MODELS

- IaaS - Infrastructure-as-a-Service

  - A cloud service providing infrastructure - computers, networking resources, storage. Typically virtual, but could be could be physical.

- PaaS - Platform-as-a-Service

  - A cloud service that hides the infrastructure (users don't see the servers, storage, switches, etc.) Provides a software development platform. Users can develop and run an application on a PaaS: the system ensures the app has the necessary infrastructure to run and scale.

- SaaS - Software-as-a-Service

  - A cloud service providing users access to software in a self-service, on-demand fashion. This could be a single application or an entire suite.
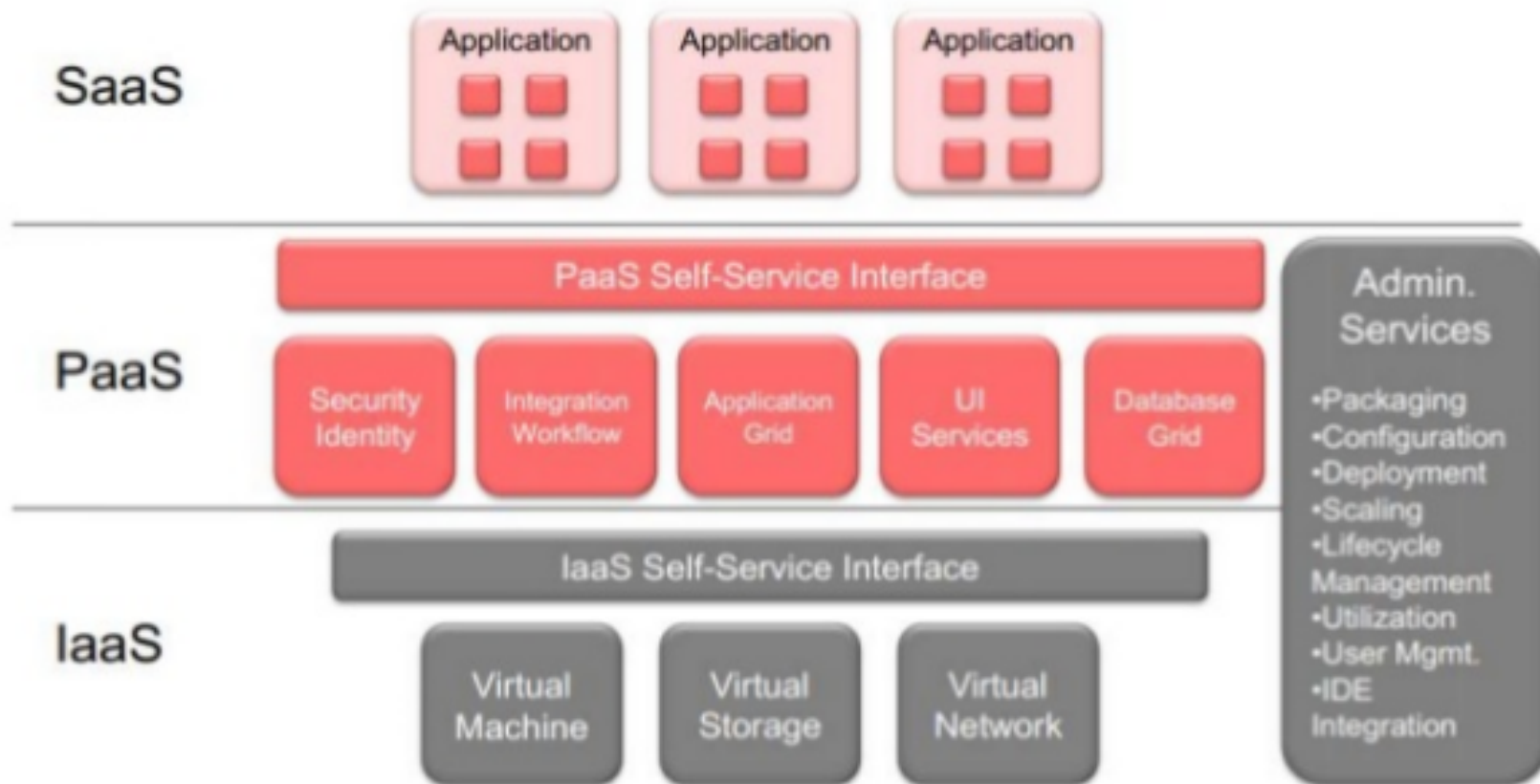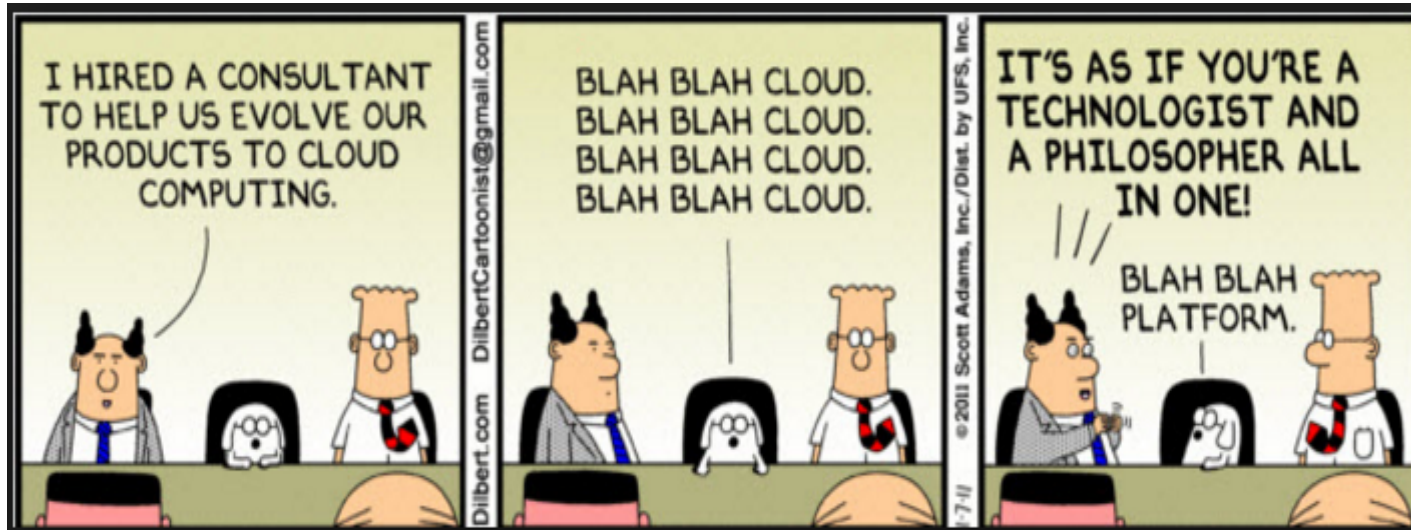
HEROKU

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