Exercise Sheet 3

Exercise 1 (Data Rate)

Imagine you have trained a pigeon to carry a USB flash drive with a storage capacity of 32 GB. The pigeon can fly with average speed of 72 km/h.

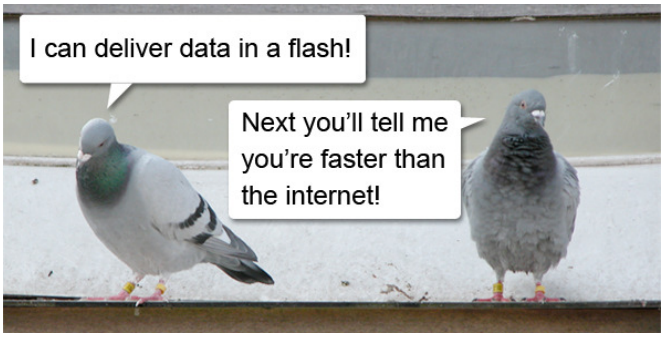


Image source: `http://www.usb-flashdrive.co.uk`

1. For what range of distances does the pigeon have a higher data rate than a computer network whose data rate (excluding overhead) is 100 Mbps?
2. How does your answer change, if the average speed of the pigeon is 108 km/h?
3. How does your answer change, if the capacity of the USB flash drive is doubled?
4. How does your answer change, if the computer network's data rate is doubled?

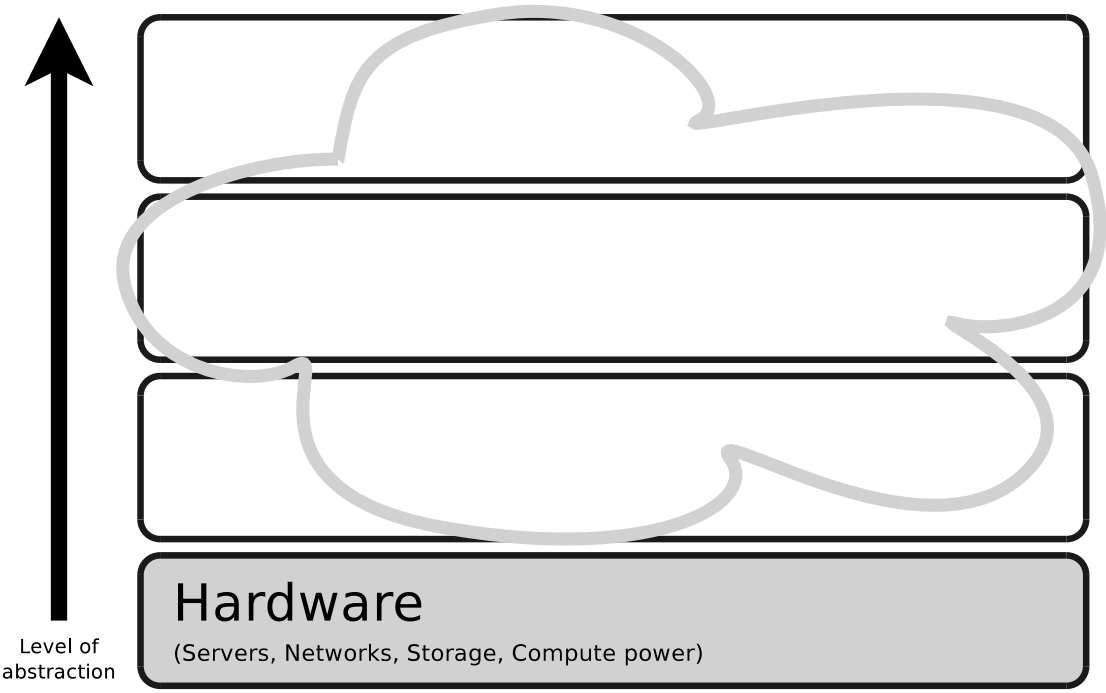
Exercise 2 (Laws and Limitations)

1. What is the central statement of Moore's law?
2. What is the Von Neumann Bottleneck?
3. What is the central statement of Amdahl's law?
4. What important factor is ignored by Amdahl's law?
5. What is the central statement of Gustafson's law (highlight the difference against Amdahl's law)

Exercise 3 (Cloud Services)

1. In which category of cloud services is human creativity offered for low cost or donated from volunteers?
2. Why is the term „Cloud Operating System“ misleading?
3. In which category of cloud services can customers run virtual server instances and even realize virtual data centers?
4. What is a PaaS, and what can customers do with it?
5. What do customers need to use software services?
6. What is the main difference between Public and Private Cloud services?
7. What is a Hybrid Cloud?

Exercise 4 (Service Categories and Offerings)



1. Assign these categories of cloud services to the layers in the figure

   - PaaS
   - Cloud Gaming
   - Cloud Printing
   - IaaS
   - HPCaaS
   - HuaaS
   - Cloud Operating System
   - SaaS

2. Assign these cloud service offerings to the layers in the figure

   - Google App Engine
   - Google Cloud Print
   - Amazon Elastic Compute Cloud
   - Amazon Mechanical Turk
   - eyeOS
   - EC2 Cluster Compute Instances
   - Google Apps
   - OnLive