Database Systems:

Module 14, Lecture 1 – Cloud Computing

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Cloud Computing

LESSON OBJECTIVES

- Gain exposure to the principles of Cloud Computing
- Differentiate between Private and Public Cloud
- Observe market trends for cloud computing

Cloud Computing

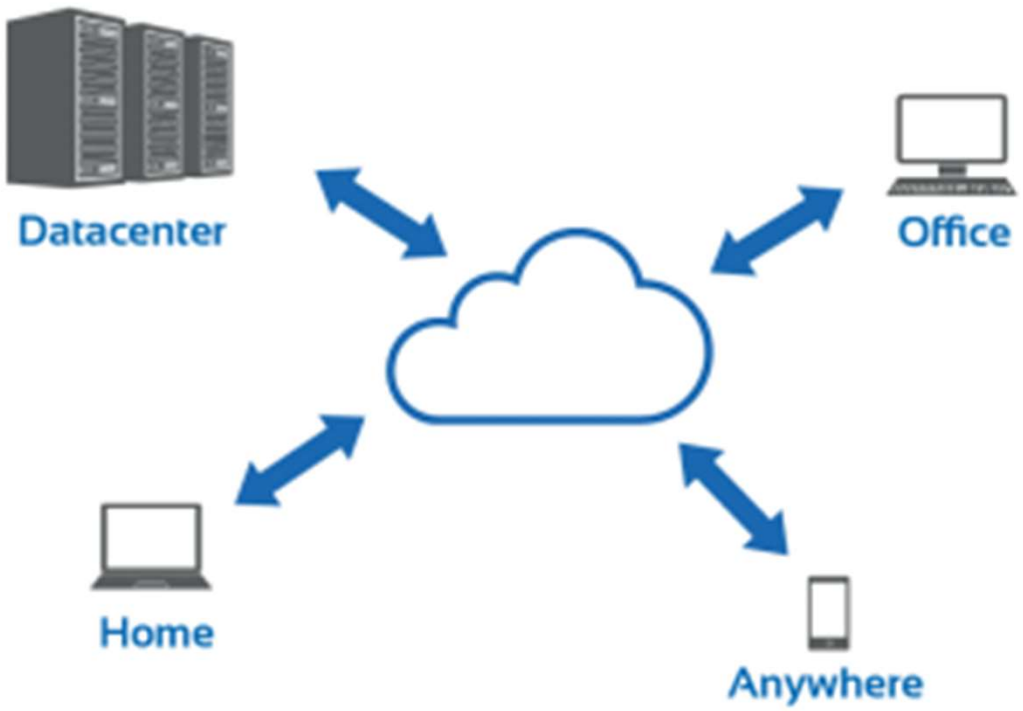
A little history . . .
Life in the Corporate
“Data Center”

Cloud Computing

A little history . . .

- Things to think about:
  - Scaling, Lead time
  - Floor space
  - Power management
  - Heating/Cooling
  - Redundancy -- SPOF
  - Fire Suppression
  - Battery Backup -- UPS
  - Network Wiring
  - Data & Server Backups
  - Network Switching
  - 7X24 support
  - Alerts/Alarms

Cloud Computing



Cloud Computing

Welcome, “Cloud Computing”

- Private – my private cloud in my own data center
- Public – a shared environment hosted by a provider

Cloud Computing

A metaphor

The electrical grid

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

Cloud Computing

Definition . . .

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

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

Cloud Computing

Advantages of Cloud Computing

- Ubiquitous (available from anywhere with an internet connection)
- 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
- Requires Large Network Pipe/Capacity
- Less Secure – multi-tenancy, DDOS

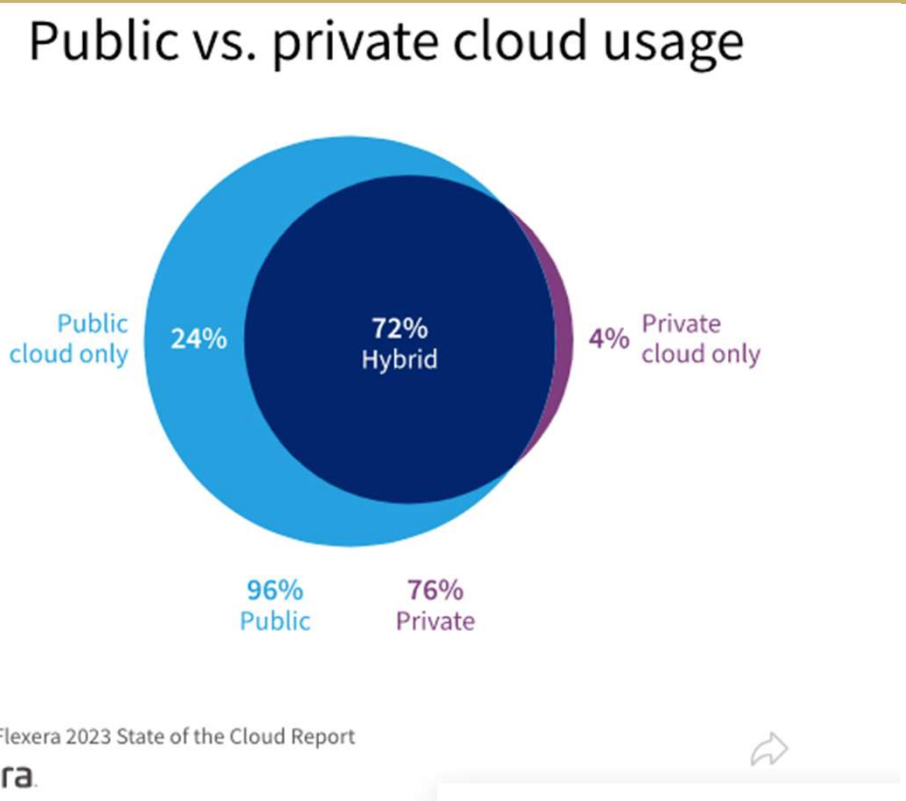
Cloud Computing

Private versus Public Cloud

Private: Leverage the advantages, with few disadvantages

- Massively Scalable
- On-Demand Provisioning
- Rapid Deployment
- More secure
- Better Monitoring
- BUT → Still requires significant internal infrastructure in your own corporate data center

Cloud Computing



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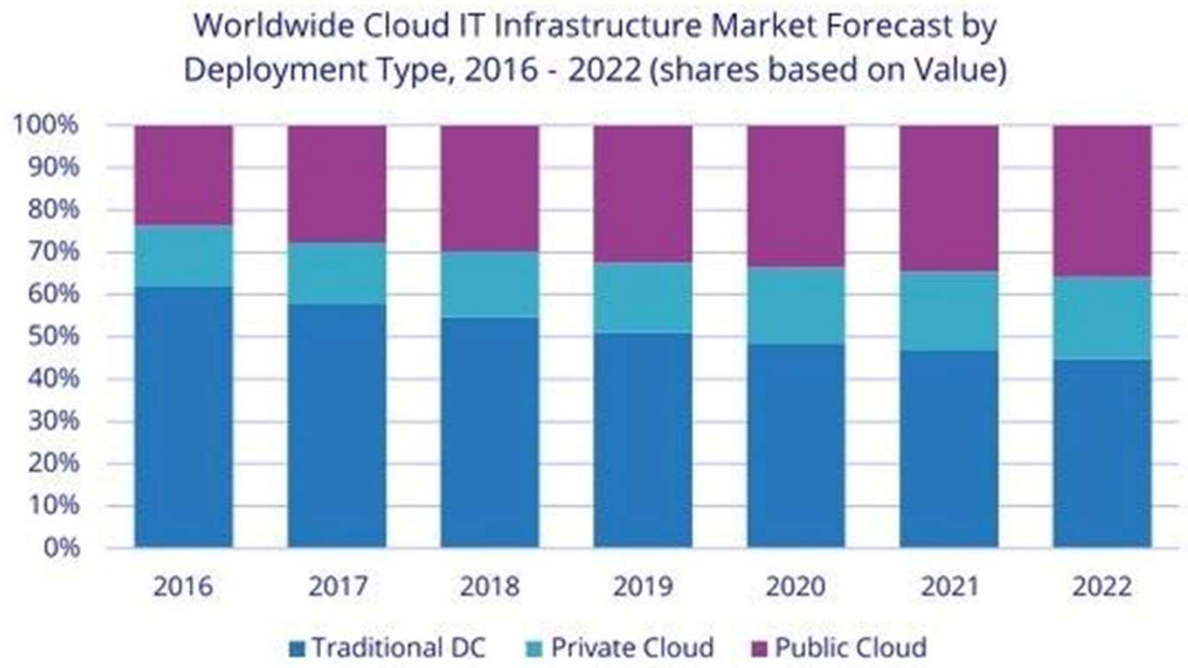

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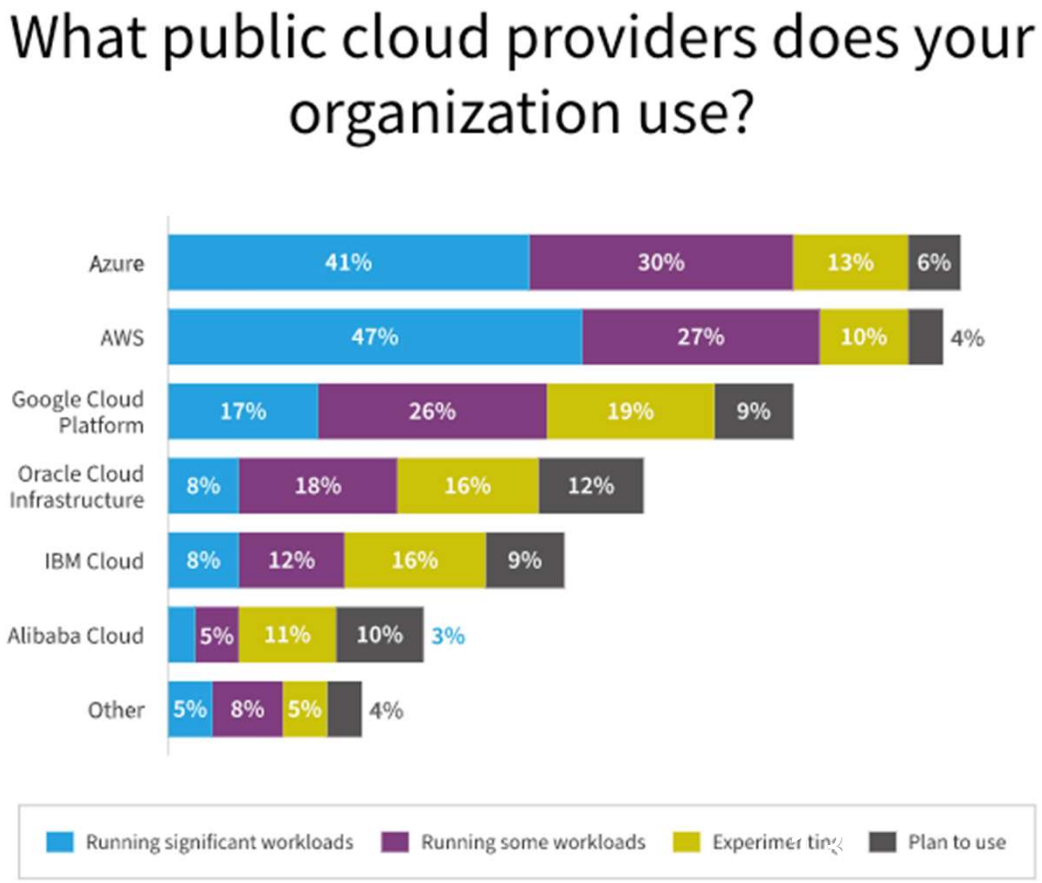

Cloud Computing

Trends in Cloud Computing for 2024

1. AI as a Service

2. Hybrid and Multi-Cloud Strategies.

Cloud Computing

IaaS - Infrastructure-as-a-Service

A cloud service providing infrastructure - computers, networking resources, storage.

I can pay for cloud-based servers and storage, and spin up database servers according to my own architecture/design, using my chosen DBMS software. For example, Oracle's "BYOL" offering.

Cloud Computing

SaaS - Software-as-a-Service

- A cloud service providing users access to software in a self-service, on-demand fashion.

Top cloud providers offer MANY, MANY database alternatives. Their equipment: their servers, their storage, their software licenses.

- I pay for storage by the byte.
- I pay for data movement into and out of my databases by the byte.
- I pay for network bandwidth consumption by the byte.
- I pay for CPU cycles as I burn them.

Next Topic: Cloud Databases – The Big Three