Workshop on Dependability in Cloud Computing

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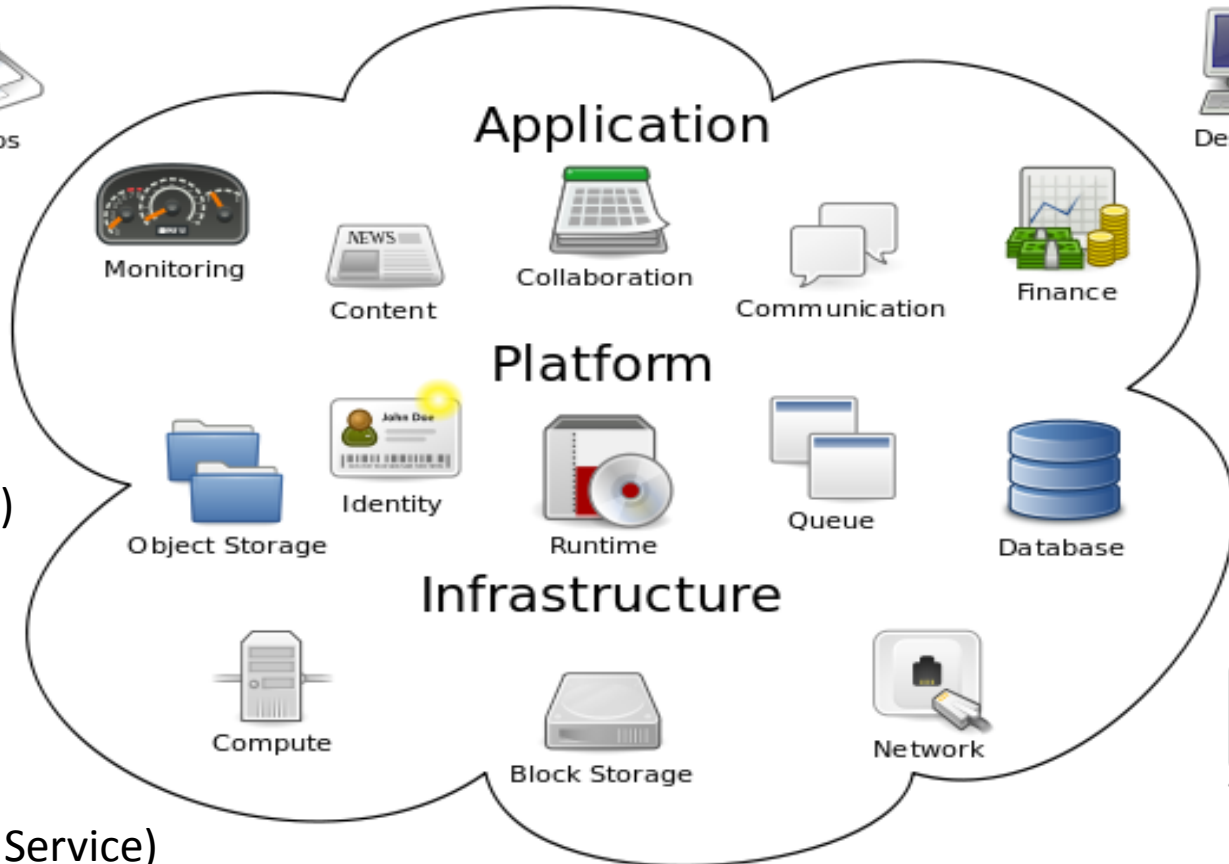# What is Cloud Computing?

- **"**the practice of storing regularly used computer data on multiple servers that can be accessed through the Internet". (Merriam-Webster)

- **"**the use of computing resources (hardware and software) that are delivered as a service over a network." (Wikipedia)

- "Internet-based computing in which large groups of remote servers are networked so as to allow sharing of data-processing tasks, centralized data storage, and online access to computer services or resources." (Dictionary.com)

- "a model of computer use in which services stored on the internet are provided to users on a temporary basis." (Collins English Dictionary)

- "a model for enabling ubiquitous, 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." (NIST)

- **"**a way to describe how organizations can take some or all of their existing IT infrastructure and operations and hand it over to someone else to build or manage, so the internal core team can focus on new ways to help the business at hand, rather than becoming experts in building servers, managing storage, or protecting data. " (Christopher Poelker*)*

IaaS (Infrastructure as a Service)

PaaS (Platform as a Service)

SaaS (Software as a Service)

SECaaS (Security as a Service)

Servers

Application

Laptops

Desktops

Monitoring

Content

Collaboration

Communication

Finance

Platform

DaaS (Data as a Service)

Object Storage

Identity

Runtime

Queue

Database

Infrastructure

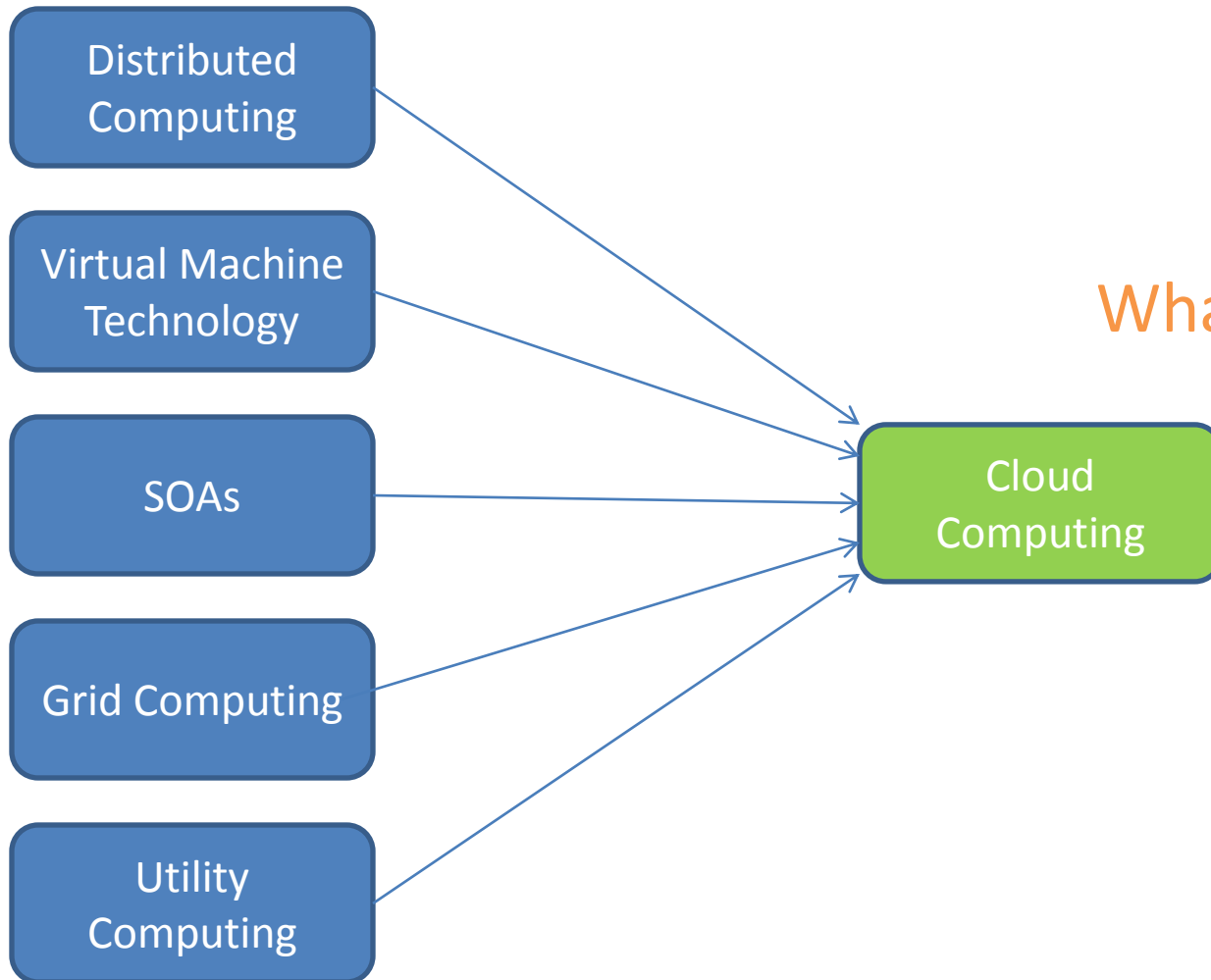Phones

Compute

Block Storage

Network

Tablets

DBaaS (Database as a Service)

Cloud Computing

TEaaS (Test Environment as a Service)

NaaS (Network as a Service)

Cloud computing in context

What is new?

- Scale?
- Geographic distribution (world wide)?
- Elasticity?
- (Relative) anonymity?
- Multi-tenancy/co-location with total strangers?
- Business model (over subscription, cheap hardware, etc)?
- New application types/ application requirements?
- New threats?

Things to think about

- New ideas, challenges, and opportunities for dependability community?

- Opportunities for old ideas in new context?

Program change

- Opening for short reaction talks, opinions, short research talks on dependable cloud computing Saturday 9:15-10:00.

- Please contact Antonio or me by the end of afternoon break.

Overview

The Workshop on Dependability in Cloud Computing addresses the novel dependability challenges and opportunities introduced by cloud computing. Cloud computing provides a pay-what-you-use model for computing and storage in a highly dynamic and scalable manner. For example, it is possible to buy, instantiate, and use 100s or even 1000s of virtual machines in few minutes and for as short periods as few hours. Cloud computing builds on prior work in distributed computing, virtual machine technology, grid/utility computing, SOAs, meta-computing, etc. Thus, an important topic of discussion at the workshop will be what is truly different about cloud computing and its dependability challenges. There are several factors of cloud computing that make the challenges difficult including massive scale and geographic distribution, over-subscription of resources, expectation of fast provisioning for any new customers (no background checks etc), multi-tenancy, cheap COTS hardware not designed using best dependability practices, etc. The challenges include both traditional failures in the hardware, network, OS, and application layers but also intentional attacks targeting either the availability or security of the cloud infrastructure and its users.