CLOUD COMPUTING
Introduction & Cloud Definitions

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BRAC UNIVERSITY
Inspiring Excellence

Clouds Defined

Cirrus

Cirrocumulus

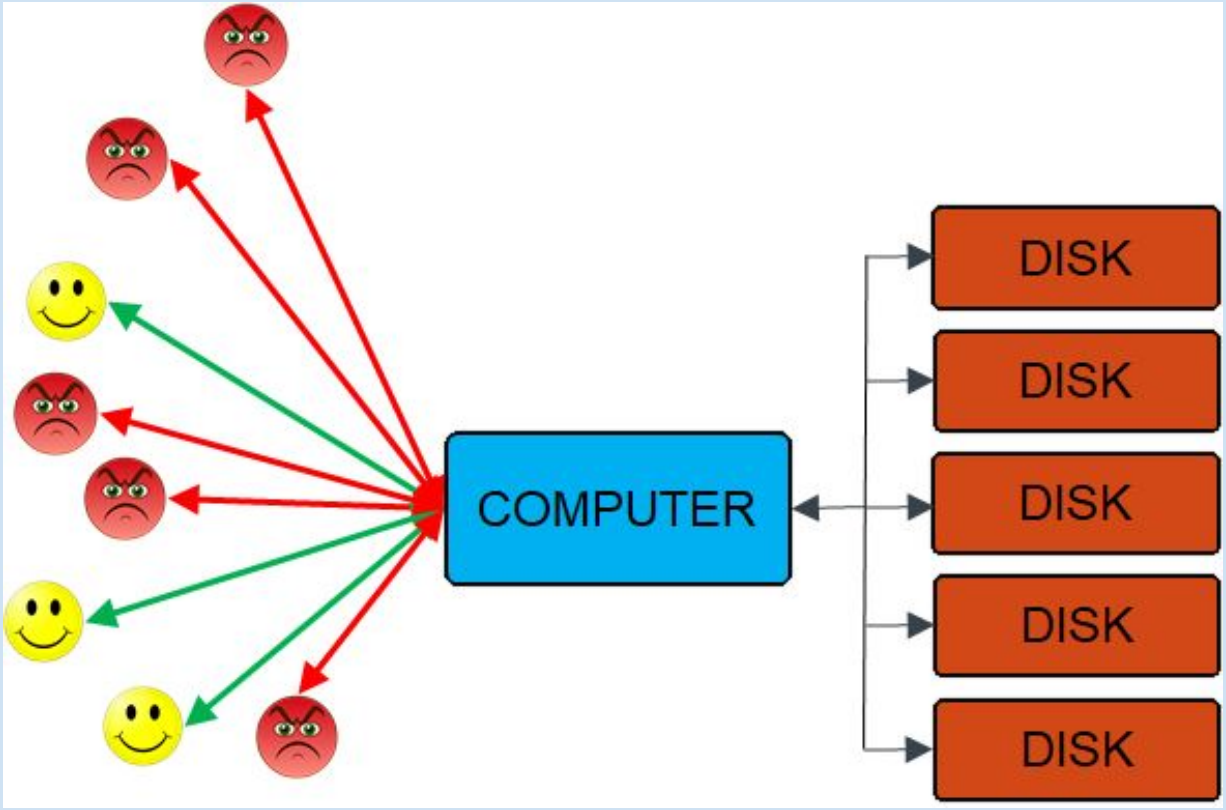
Cumulus

Lenticular

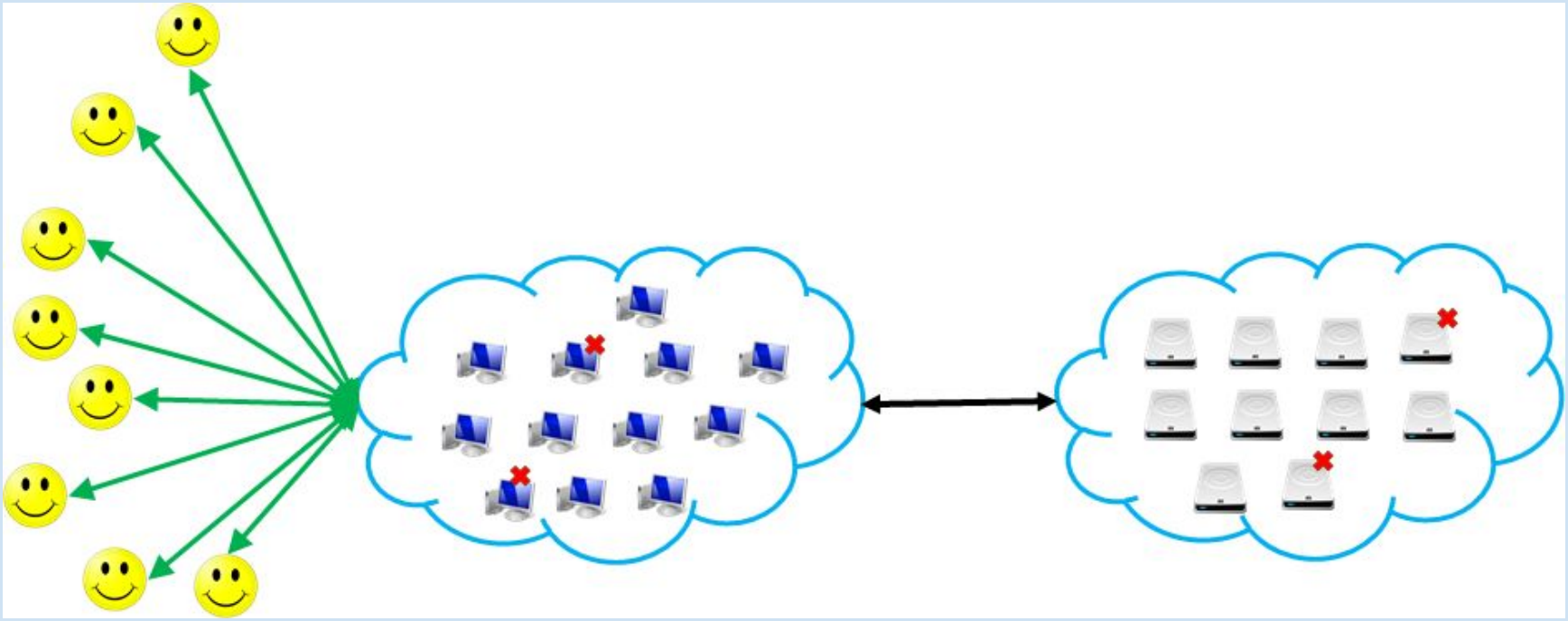
Altocumulus

Just like many real world, meteorological clouds; a group of defining characteristics make cloud computing systems "Cloud."

What if Only one Computer?



Computers on the internet can satisfy all clients!!



History

Grid Computing

- Solving large problems with Parallel computing
- Made mainstream By Global Alliance

Utility Computing

- Offering computing resources as a metered service
- Introduced in late 1990s

SaaS Computing

- Network-based subscriptions to applications
- Gained momentum in 2001

Cloud Computing

- Next-Generation Internet computing
- Next-Generation Data Centers

salesforce

amazon web services™

Windows Azure

Cloud Computing History

- *In 1999*, **Salesforce.com** *started delivering of applications to users using a simple website.*
  - The applications were delivered to enterprises over the Internet, and this way the dream of computing sold as utility were true.
- *In 2002*, **Amazon** *started Amazon Web Services*, providing services like storage, computation and even human intelligence.
  - Only starting with the launch of the Elastic Compute Cloud in 2006 a truly commercial service open to everybody existed.
- *In 2009*, **Google Apps** *also started to provide cloud computing enterprise applications.*
- *In 2009*, **Microsoft** *launched Windows Azure*, and companies like Oracle and HP have all joined the game.

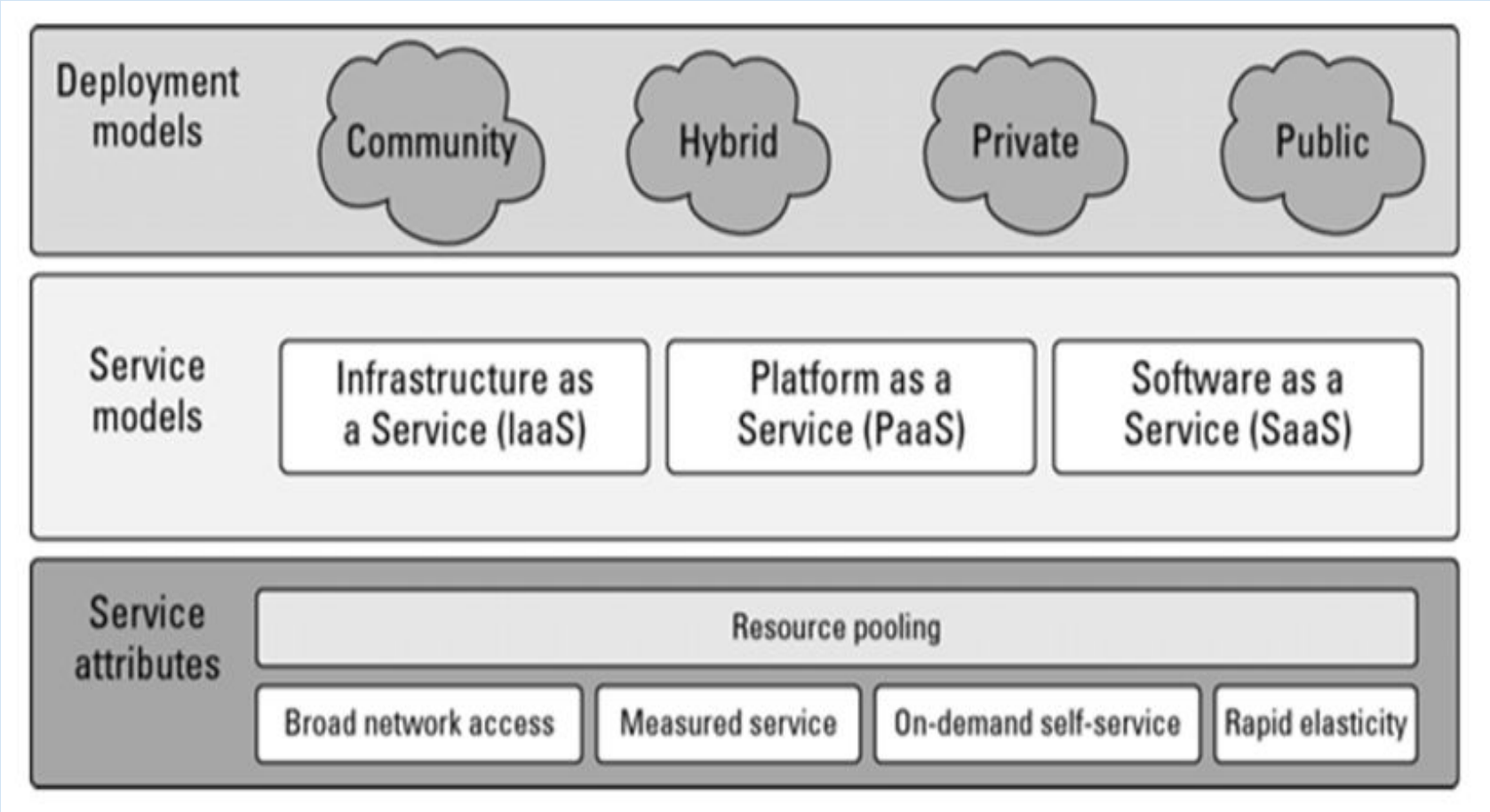
Cloud Computing :

Definition

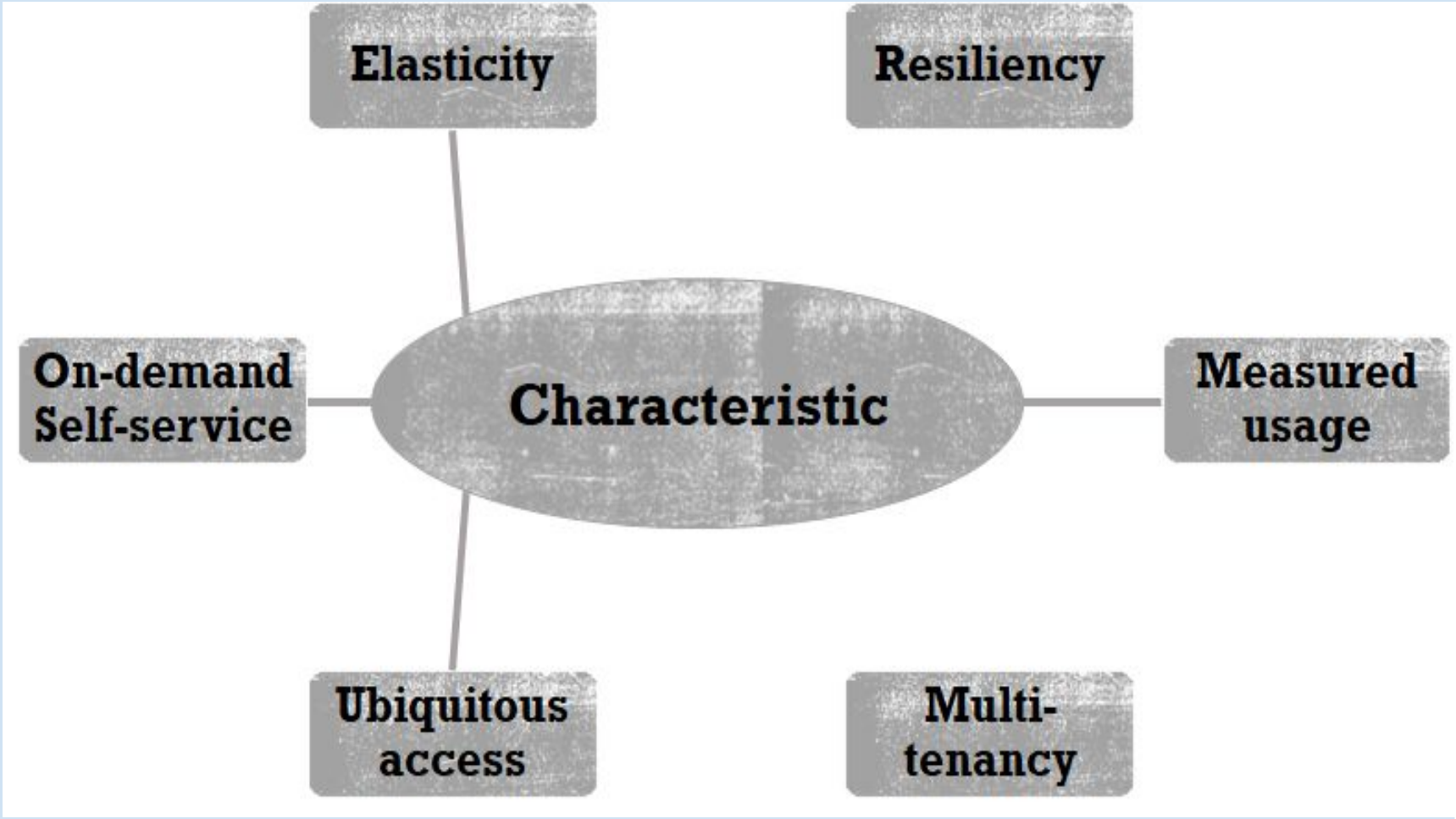
According to the NIST Laboratory,

"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."

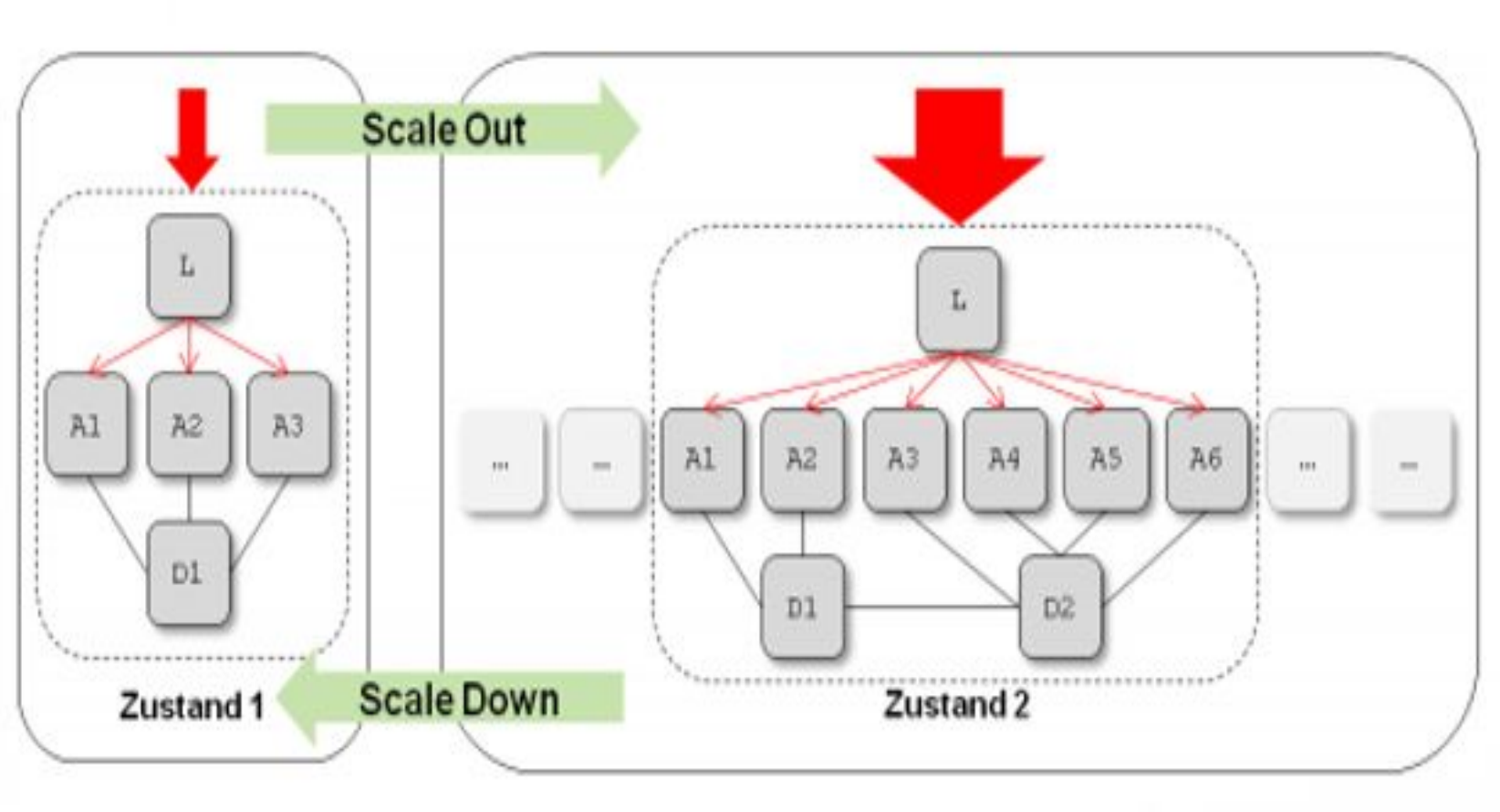
NIST Cloud Definition



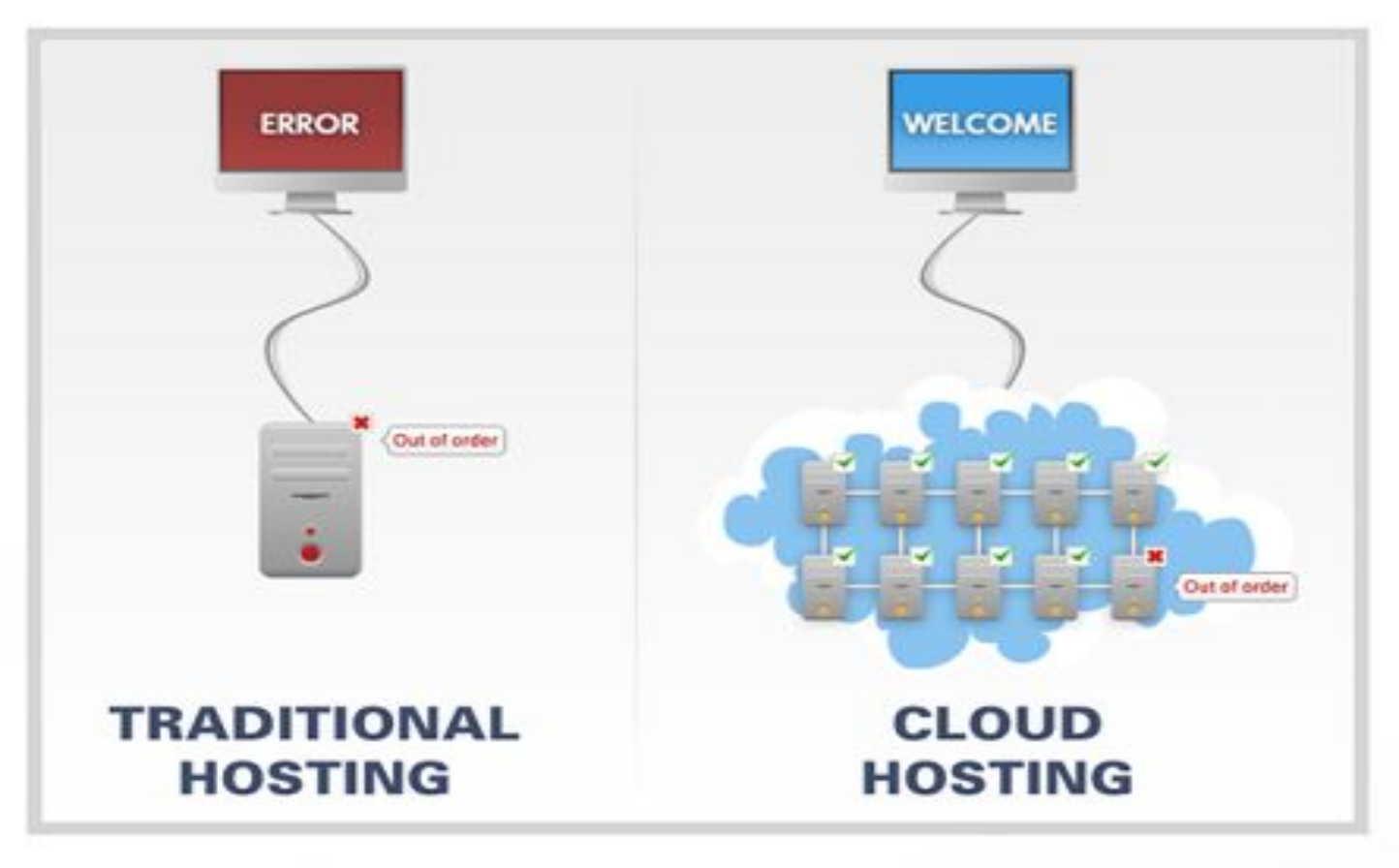
Characteristic



Elasticity

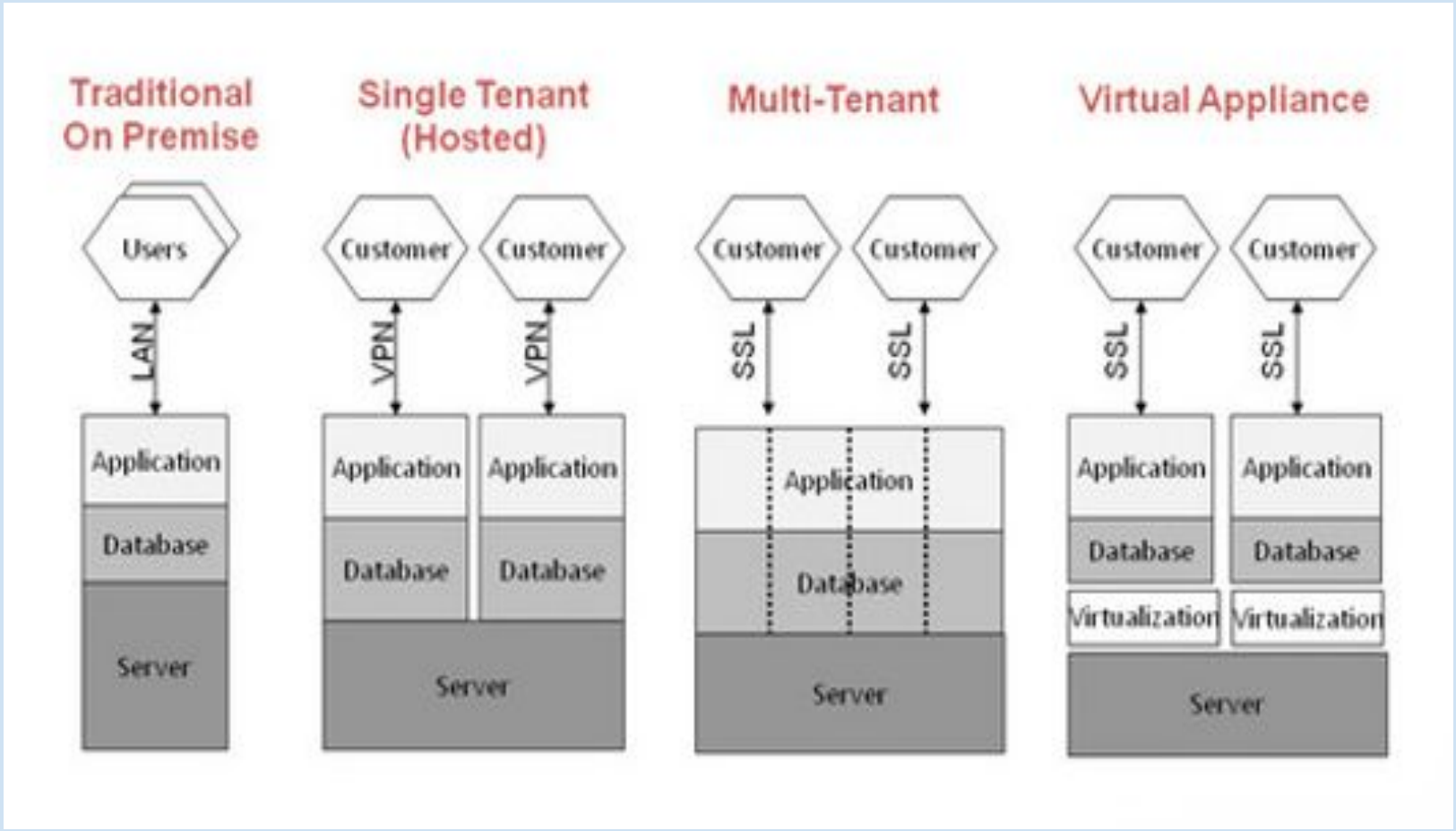


Resiliency



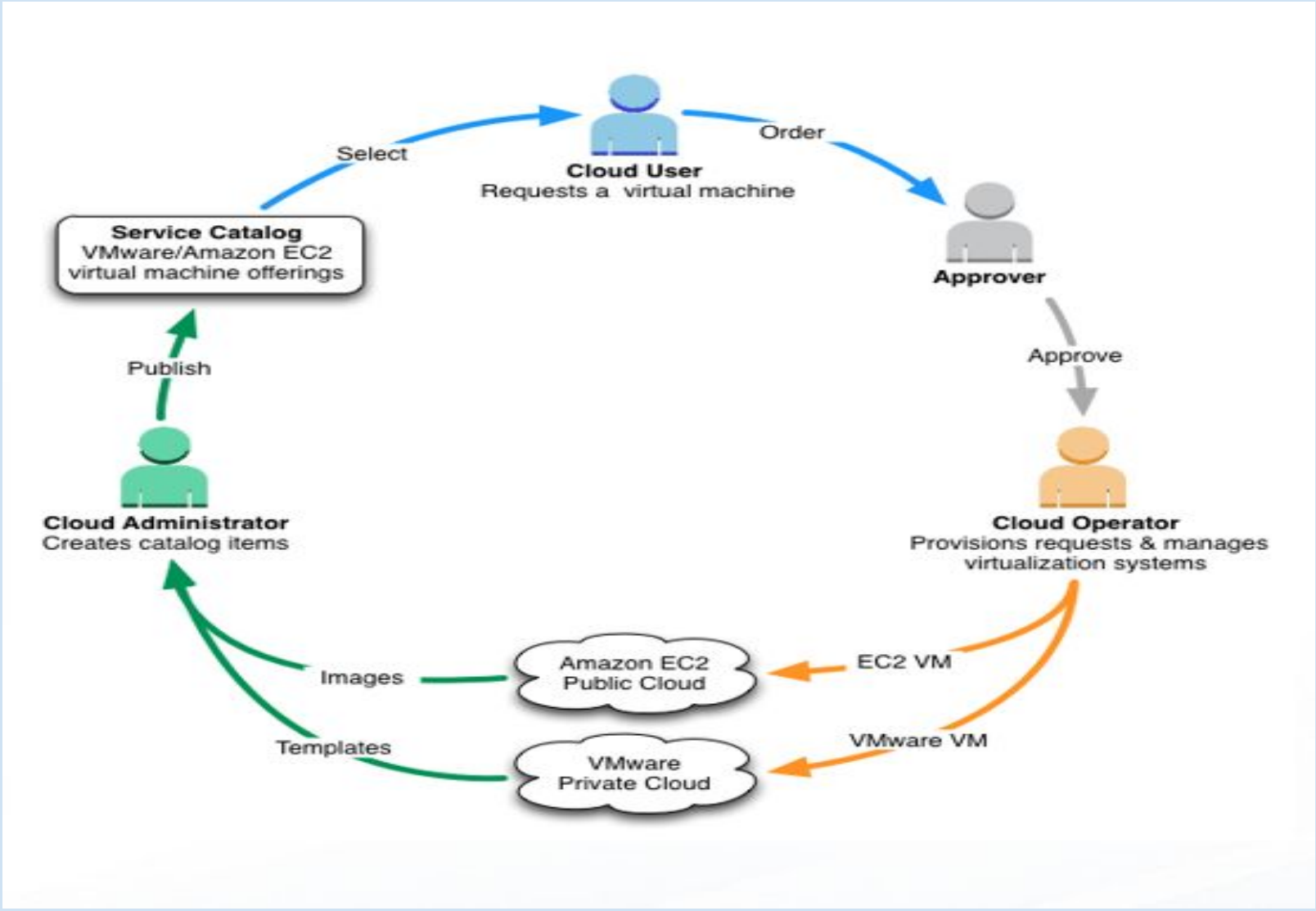
Measured Usage

Multitenancy



Ubiquitous access

On-demand Self-service



Cloud Computing :
Characteristic

- **On-demand usage :** Users are able to provision cloud computing resources without requiring human interaction.
- **Ubiquitous access :** Cloud computing resources are accessible over the network, supporting heterogeneous client platforms.
- **Multi-tenancy :** Service multiple customers from the same physical resources, by securely separating the resources on logical level.

Cloud Computing :
Characteristic (cont.)

- **Elasticity :** Resources are provisioned and released on-demand and/or automated based on triggers or parameters.
- **Measured usage :** Resource usage are monitored, measured, and reported (billed) transparently based on utilization.
- **Resiliency :** Automatically detect and recover from failure.

Cloud software takes full advantage of the cloud paradigm by being service oriented with a focus on statelessness, low coupling, modularity, and semantic interoperability.