

# Cloud definitions you've been pretending to understand

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You keep using that word  
“cloud”. I do not think it means  
what you think it means.

apologies to Inigo Montoya



**Obligatory picture of real clouds**





Jaws Body Wash  
150ml / 5.1 fl. oz.

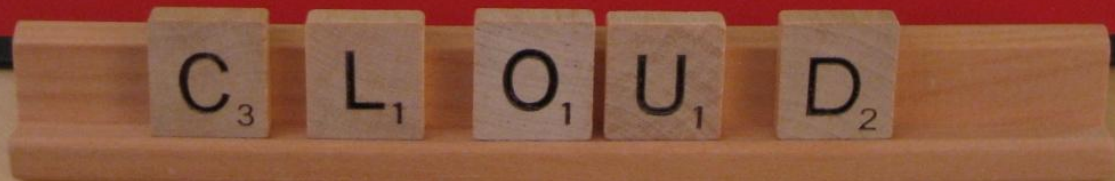
Jaws Body Wash  
150ml / 5.1 fl. oz.







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# What exactly is “cloud computing”?

The US NIST has a good two-page cloud computing definitions document available from [csrc.nist.gov/groups/SNS/cloud-computing/](https://csrc.nist.gov/groups/SNS/cloud-computing/) (quoted extensively in following slides).

It is a good starting point, even if you want to argue with it.

# Definition of cloud computing

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. This cloud model promotes availability and is composed of five essential *characteristics*, three *service models*, and four *deployment models*.

# Definition of cloud computing

Cloud computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources.



# Definition of cloud computing

...and is composed of:

- five essential *characteristics*
- three *service models*
- four *deployment models*.

# Five Essential Characteristics

- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

# Alternate definition of cloud computing

Anything on the Internet.



# Service Models

- Software as a Service (SaaS)
- Platform as a Service (PaaS)
- Infrastructure as a Service (IaaS)



# Software as a Service (SaaS)

The capability provided to the consumer is to use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a thin client interface such as a web browser (e.g., web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

# Software as a Service (SaaS)

The capability... to use the provider's applications  
running on a cloud infrastructure...

# Platform as a Service (PaaS)

The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.

# Platform as a Service (PaaS)

The capability... to deploy... consumer-created or acquired applications\*

\*created using programming languages and tools supported by the provider...

# Infrastructure as a Service (IaaS)

The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g., host firewalls).



# Infrastructure as a Service (IaaS)

The capability... to provision... resources where the consumer is able to deploy and run arbitrary software\*

\*which can include operating systems and applications...

# SaaS/PaaS/IaaS Matrix

LAYER	SaaS Source	PaaS Source	IaaS Source
User			
Data and content			
Client Software			
Software Layer			
Platform Layer			
Infrastructure layer			
Load balancers (maybe)			
Virtualization (maybe)			
Physical Servers			

# SaaS/PaaS/IaaS Matrix

LAYER	SaaS Source	PaaS Source	IaaS Source
User	Customer	Customer	Customer
Data and content	Customer	Customer	Customer
Client Software	Customer	Customer	Customer
Software Layer	<i>Vendor</i>	<i>Customer</i>	<i>Customer</i>
Platform Layer	<i>Vendor</i>	<i>Vendor</i>	<i>Customer</i>
Infrastructure layer	Vendor	Vendor	Vendor
Load balancers (maybe)	Vendor	Vendor	Vendor
Virtualization (maybe)	Vendor	Vendor	Vendor
Physical Servers	Vendor	Vendor	Vendor

# SaaS/PaaS/IaaS Matrix

LAYER	SaaS Source	PaaS Source	IaaS Source	Who owns risk/ responsibility?
User	Customer	Customer	Customer	
Data and content	Customer	Customer	Customer	
Client Software	Customer	Customer	Customer	
Software Layer	<b>Vendor</b>	<b>Customer</b>	<b>Customer</b>	
Platform Layer	<b>Vendor</b>	<b>Vendor</b>	<b>Customer</b>	
Infrastructure layer	Vendor	Vendor	Vendor	
Load balancers (maybe)	Vendor	Vendor	Vendor	
Virtualization (maybe)	Vendor	Vendor	Vendor	
Physical Servers	Vendor	Vendor	Vendor	





# Deployment Models

- Private cloud
- Community cloud
- Public cloud
- Hybrid cloud

# Private Cloud

- The cloud infrastructure is operated solely for an organization.
- It may be managed by the organization or a third party.
- It may exist on premise or off premise.
- Note: This model is great for starting arguments amongst the clouderati.

# Community Cloud

- The cloud infrastructure is shared by several organizations and supports a specific community that has shared concerns.
  - Mission, security requirements, policy, and compliance considerations, etc.
- It may be managed by the organizations or a third party.
- It may exist on premise or off premise.

# Public Cloud

The cloud infrastructure is made available to the general public or a large industry group and is owned by an organization selling cloud services.

# Hybrid Cloud

The cloud infrastructure is a composition of two or more clouds (private, community, or public) that remain unique entities but are bound together by standardized or proprietary technology that enables data and application portability (e.g., cloud bursting for load-balancing between clouds).

# Hybrid Cloud

The cloud infrastructure is a composition of two or more clouds (private, community, or public)



# Q & A

- Should “CyberCloud” be hyphenated?
  - No, but anyone using that term should be.
- Is cloud computing really that great for disaster recovery?
  - Absolutely, I always keep a copy of my resume on Google Docs.



# Thank you!

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