

ESTTA Tracking number: **ESTTA387093**

Filing date: **01/06/2011**

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

Notice of Opposition

Notice is hereby given that the following party opposes registration of the indicated application.

Opposer Information

Name	Nimbus Data Systems, Inc.
Granted to Date of previous extension	03/23/2011
Address	221 King St.Suite 200 San Francisco, CA 94107 UNITED STATES
Attorney information	Jennifer Lee Taylor Morrison & Foerster LLP 425 Market Steet San Francisco, CA 94105 UNITED STATES jtaylor@mofo.com, achristopher@mofo.com, lsimpson@mofo.com, mmcdaniel@mofo.com

Applicant Information

Application No	77740539	Publication date	11/23/2010
Opposition Filing Date	01/06/2011	Opposition Period Ends	03/23/2011
Applicant	Nimble Storage, Inc. 2645 Zanker Rd., Suite 100 San Jose, CA 95134 UNITED STATES		

Goods/Services Affected by Opposition

Class 009. All goods and services in the class are opposed, namely: Computer hardware and software for use in the storage, management, and acceleration of data over computer networks within the field of data storage, and instruction and user manuals provided in connection therewith

Grounds for Opposition

Priority and likelihood of confusion	Trademark Act section 2(d)
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Marks Cited by Opposer as Basis for Opposition

U.S. Application/Registration No.	NONE	Application Date	NONE
Registration Date	NONE		
Word Mark	NIMBUS		
Goods/Services	high-speed data storage systems that are used in the storage,		

	backup, and management of electronic data over computer networks		
U.S. Application/ Registration No.	NONE	Application Date	NONE
Registration Date	NONE		
Word Mark	NIMBUS DATA		
Goods/Services	high-speed data storage systems that are used in the storage, backup, and management of electronic data over computer networks		

Attachments	Notice of Opp - NIMBLE STORAGE.pdf (33 pages)(2148493 bytes)
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Certificate of Service

The undersigned hereby certifies that a copy of this paper has been served upon all parties, at their address record by First Class Mail on this date.

Signature	/Jennifer Lee Taylor/
Name	Jennifer Lee Taylor
Date	01/06/2011

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE TRADEMARK TRIAL AND APPEAL BOARD

NIMBUS DATA SYSTEMS, INC.,

Opposer,

vs.

NIMBLE STORAGE, INC.,

Applicant.

Opposition No.: TO BE ASSIGNED

Application No.: 77/740,539

Mark: NIMBLE STORAGE

Filed on May 19, 2009

Published for Opposition on November 23,
2010

NOTICE OF OPPOSITION

Box TTAB FEE
Commissioner for Trademarks
P.O. Box 1451
Arlington, VA 22313-1451

Nimbus Data Systems, Inc. (“Opposer”), a Delaware corporation having its principal place of business at 221 King Street, Suite 200, San Francisco, California 94107, believes that it will be damaged by registration of the mark shown in U.S. Application Serial No. 77/740,539, and hereby opposes the same.

As grounds for the opposition, it is alleged as follows:

1. Opposer develops and offers high-speed data storage systems that are used in the storage, backup, and management of electronic data over computer networks. Opposer has continuously used the NIMBUS and NIMBUS DATA marks (collectively “the NIMBUS Marks”) in connection with its development, promotion, and sale of its high-speed data storage systems since at least as early as 2003.
2. Nimble Storage, Inc. (“Applicant”), a Delaware corporation having its principal place of business at 2645 Zanker Road, Suite 100, San Jose, California 95134, filed U.S. Application

Serial No. 77/740,539 for NIMBLE STORAGE (the “NIMBLE Application”) on May 19, 2009, based upon an intent to use the mark in commerce.

3. The NIMBLE Application was published in the *Official Gazette* on November 23, 2010. Opposer obtained a ninety-day extension of time to oppose the NIMBLE Application until March 23, 2011.

4. By its NIMBLE Application herein opposed, Applicant seeks to register the mark NIMBLE STORAGE for “[c]omputer hardware and software for use in the storage, management, and acceleration of data over computer networks within the field of data storage” in International Class 9.

5. Since substantially prior to the filing date of the NIMBLE Application, and prior to any use by Applicant of the NIMBLE mark in connection with the goods and services recited in the NIMBLE Application, Opposer has continuously used the NIMBUS Marks in connection with the development, promotion, and sale of data storage systems that are used in the storage, backup, and management of electronic data over computer networks. Opposer first used the NIMBUS Marks in commerce in connection with such data storage systems at least as early as 2003. Opposer’s first use in commerce of the NIMBUS Marks predated the filing date of the NIMBLE Application by approximately six years.

6. Opposer has continuously offered and promoted data storage systems that are used in the storage, backup, and management of electronic data over computer networks under the NIMBUS Marks since at least as early as 2003 and therefore has prior common law rights in the NIMBUS Marks.

7. Applicant’s NIMBLE STORAGE mark is so similar in sight, sound, meaning, and commercial impression to Opposer’s NIMBUS Marks as to be likely to cause confusion, or to cause mistake, or to deceive. NIMBLE and NIMBUS are aurally and visually extremely similar. Both begin with the exact same letter combination and dominant sound. Both contain two syllables. The only distinguishing feature of the two marks, the STORAGE element of Applicant’s mark, is purely descriptive, has been disclaimed by Applicant, and will be ignored

by potential customers. Consumers will focus exclusively on the NIMBLE and NIMBUS elements of the marks and are likely to be confused by the striking aural and visual similarities. Moreover, the marks have very similar connotations in the context of the goods that Applicant and Opposer offer. NIMBUS is a type of cloud, *see* Entry from The Free Online Dictionary attached hereto as Exhibit A, and customers thus associate it with cloud computing, which is recognized for its agility and speed. *See* website printout attached as Exhibit B, http://en.wikipedia.org/wiki/Cloud_computing#Key_features. NIMBLE similarly means “[q]uick, light or agile in movement.” *See* Entry from The Free Online Dictionary attached hereto as Exhibit C.

8. Applicant has applied to register its NIMBLE STORAGE mark for “[c]omputer hardware and software for use in the storage, management, and acceleration of data over computer networks within the field of data storage, and instruction and user manuals provided in connection therewith” in Class 9. On information and belief, Applicant’s computer hardware and software for use in the storage, management, and acceleration of data over computer networks is directly competitive with Opposer’s goods, is offered through the same channels of trade, and targets the same or overlapping customer bases. On information and belief, both Applicant and Opposer’s goods are network-attached storage systems that utilize similar technology to store and manage data. On information and belief, both Applicant and Opposer’s goods are extremely visually similar, and Applicant offers its goods through the very same channels as Opposer. On information and belief, Applicant and Opposer offer their goods at the same or similar price points and target the same mid-market customers.

9. In view of the fact that Applicant’s NIMBLE STORAGE mark is very similar in sight, sound, meaning, and commercial impression to Opposer’s NIMBUS Marks; that Applicant’s goods and Opposer’s goods are directly competitive; and that the channels of trade and customer bases for Applicant’s and Opposer’s respective goods appear to be identical, Applicant’s NIMBLE STORAGE mark so resembles Opposer’s NIMBUS Marks as to be likely

to cause confusion, or to cause mistake, or to deceive. Opposer would thereby be injured by Applicant's registration of the NIMBLE STORAGE mark.

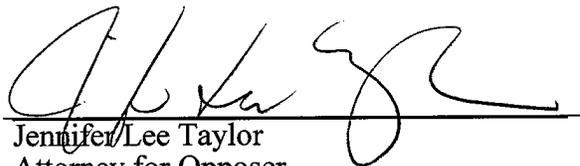
10. Filing Fee: The USPTO is authorized to charge \$300.00 for the Notice of Opposition to Morrison & Foerster LLP's Deposit Account 03-1952 (Reference No. 69033-6001501).

WHEREFORE, Opposer prays that U.S. Application Serial No. 77/740,539 be rejected, that no registration be issued thereon to Applicant, and that this opposition be sustained in favor of Opposer.

Respectfully submitted,

Dated: January 6, 2011

By:



Jennifer Lee Taylor
Attorney for Opposer
Nimbus Data Systems, Inc.

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EXHIBIT A

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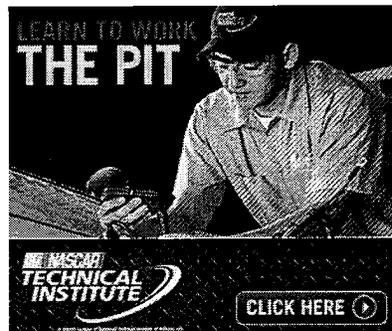
nim-bus (nīm'bus)

n. pl. nim-bi (-bi) or nim-bus-es

1. A cloudy radiance said to surround a classical deity when on earth.
2. A radiant light that appears usually in the form of a circle or halo about or over the head in the representation of a god, demigod, saint, or sacred person such as a king or an emperor.
3. A splendid atmosphere or aura, as of glamour, that surrounds a person or thing.
4. A rain cloud, especially a low dark layer of clouds such as a nimbostratus.

[Latin, *cloud*; see *neb-* in Indo-European roots.]

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nimbus ['nimbes]

n pl -bi [-bai], -buses

1. (Earth Sciences / Physical Geography)
 - a. a dark grey rain-bearing cloud
 - b. (in combination) *cumulonimbus* clouds
2. (Fine Arts & Visual Arts / Art Terms)
 - a. an emanation of light surrounding a saint or deity
 - b. a representation of this emanation
3. a surrounding aura or atmosphere

[from Latin: *cloud, radiance*]

nimbused *adj*

Collins English Dictionary – Complete and Unabridged © HarperCollins Publishers 1991, 1994, 1998, 2000, 2003

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nimbus (nīm'bus)

Plural *nimbi* (nīm'bi) or *nimbuses*
A rain cloud.

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Noun 1. nimbus - a dark grey cloud bearing rain

[nimbus cloud](#), [rain cloud](#)

[cloud](#) - a visible mass of water or ice particles suspended at a considerable altitude

[aureole](#), [corona](#) - the outermost region of the sun's atmosphere; visible as a white halo during a solar eclipse

2. nimbus - an indication of radiant light drawn around the head of a saint

[gloriole](#), [halo](#), [aura](#), [aureole](#), [glory](#)

[lightness](#), [light](#) - the visual effect of illumination on objects or scenes as created in pictures; "he could paint the lightest light and the darkest dark"



Charity

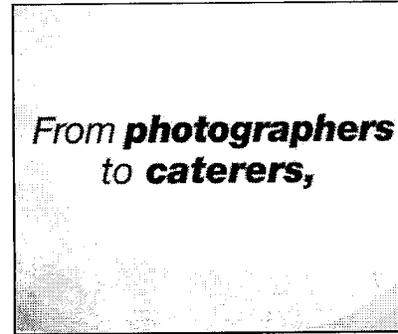
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nimbus

noun [halo](#), [atmosphere](#), [glow](#), [aura](#), [ambience](#), [corona](#), [irradiation](#), [aureole](#) Kevin was surrounded by a nimbus of sunlight.

Collins Thesaurus of the English Language - Complete and Unabridged 2nd Edition. 2002 © HarperCollins Publishers 1995, 2002



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[aureole](#) [rain cloud](#)
[Cumulo-cirro-stratus](#)

References in classic literature

of baleful lumination or **nimbus** – hag being the popular name of that
The Devil's Dictionary by [Bierce, Ambrose](#) [View in context](#)

"Don't ye be nervous, my dear good soul," expostulated, between his coughs, a young man with a wet face, and his straw hat so far back upon his head that the brim encircled it like the **nimbus** of a saint.

Tess of the d'Urbervilles - A Pure Woman by [Hardy, Thomas](#) [View in context](#)

The other part of the **nimbus** remained brilliant, and in the midst of this general brilliancy Tycho shone prominently like a sun.

Round The Moon by [Verne, Jules](#) [View in context](#)

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EXHIBIT B

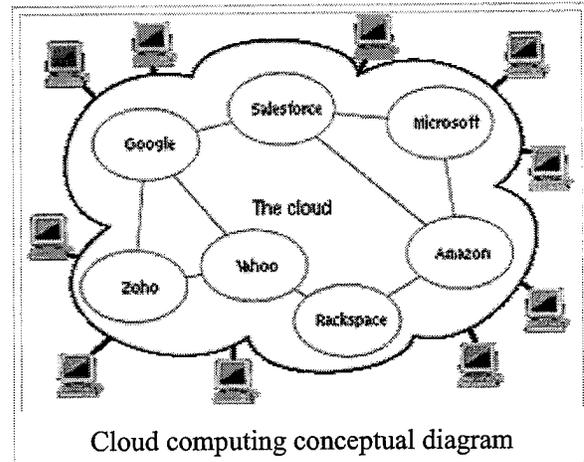
Cloud computing

From Wikipedia, the free encyclopedia

Cloud computing is Internet-based computing, whereby shared servers provide resources, software, and data to computers and other devices on demand, as with the electricity grid. Cloud computing is a natural evolution of the widespread adoption of virtualization, Service-oriented architecture and utility computing. Details are abstracted from consumers, who no longer have need for expertise in, or control over, the technology infrastructure "in the cloud" that supports them.^[1] Cloud computing describes a new supplement, consumption, and delivery model for IT services based on the Internet, and it typically involves over-the-Internet provision of dynamically scalable and often virtualized

resources.^{[2][3]} It is a byproduct and consequence of the ease-of-access to remote computing sites provided by the Internet.^[4] This frequently takes the form of web-based tools or applications that users can access and use through a web browser as if it were a program installed locally on their own computer.^[5] The National Institute of Standards and Technology (NIST) provides a somewhat more objective and specific definition here.^[6] The term "cloud" is used as a metaphor for the Internet, based on the cloud drawing used in the past to represent the telephone network,^[7] and later to depict the Internet in computer network diagrams as an abstraction of the underlying infrastructure it represents.^[8] Typical cloud computing providers deliver common business applications online that are accessed from another Web service or software like a Web browser, while the software and data are stored on servers.

Most cloud computing infrastructures consist of services delivered through common centers and built on servers. Clouds often appear as single points of access for consumers' computing needs. Commercial offerings are generally expected to meet quality of service (QoS) requirements of customers, and typically include service level agreements (SLAs).^[9] The major cloud service providers include Amazon, Rackspace Cloud, Salesforce, Microsoft and Google.^{[10][11]} Some of the larger IT firms that are actively involved in cloud computing are Fujitsu, Dell,^[12] Red Hat,^[13] Hewlett Packard,^[14] IBM,^[15] VMware and NetApp.



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Overview

Comparisons

Cloud computing derives characteristics from, but should not be confused with:

1. Autonomic computing — "computer systems capable of self-management"^[16]
2. Client–server model – *client–server computing* refers broadly to any distributed application that distinguishes between service providers (servers) and service requesters (clients)^[17]
3. Grid computing — "a form of distributed computing and parallel computing, whereby a 'super and virtual computer' is composed of a cluster of networked, loosely coupled computers acting in concert to perform very large tasks"
4. Mainframe computer — powerful computers used mainly by large organizations for critical applications, typically bulk data-processing such as census, industry and consumer statistics, enterprise resource planning, and financial transaction processing.^[18]
5. Utility computing — the "packaging of computing resources, such as computation and storage, as a metered service similar to a traditional public utility, such as electricity";^[19]
6. Peer-to-peer – distributed architecture without the need for central coordination, with participants being at the same time both suppliers and consumers of resources (in contrast to the traditional client–server model)
7. Service-oriented computing – Cloud computing provides services related to computing while, in a

reciprocal manner, service-oriented computing consists of the computing techniques that operate on software-as-a-service.^[20]

Characteristics

The fundamental concept of cloud computing is that the computing is "in the cloud" i.e. that the processing (and the related data) is not in a specified, known or the same place(s). This is in opposition to where the processing takes place in one or more specific servers that are known. All the other concepts mentioned are supplementary or complementary to this concept.

Generally, cloud computing customers do not own the physical infrastructure, instead avoiding capital expenditure by renting usage from a third-party provider. They consume resources as a service and pay only for resources that they use. Many cloud-computing offerings employ the utility computing model, which is analogous to how traditional utility services (such as electricity) are consumed, whereas others bill on a subscription basis. Sharing "perishable and intangible" computing power among multiple tenants can improve utilization rates, as servers are not unnecessarily left idle, which can reduce costs significantly while increasing the speed of application development. A side-effect of this approach is that overall computer usage rises dramatically, as customers do not have to engineer for peak load limits.^[21] In addition, "increased high-speed bandwidth" makes it possible to receive the same. The cloud is becoming increasingly associated with small and medium enterprises (SMEs) as in many cases they cannot justify or afford the large capital expenditure of traditional IT. SMEs also typically have less existing infrastructure, less bureaucracy, more flexibility, and smaller capital budgets for purchasing in-house technology. Similarly, SMEs in emerging markets are typically unburdened by established legacy infrastructures, thus reducing the complexity of deploying cloud solutions.^[citation needed]

Economics

Cloud computing users avoid capital expenditure (CapEx) on hardware, software, and services when they pay a provider only for what they use. Consumption is usually billed on a utility (resources consumed, like electricity) or subscription (time-based, like a newspaper) basis with little or no upfront cost. Other benefits of this approach are low barriers to entry, shared infrastructure and costs, low management overhead, and immediate access to a broad range of applications. In general, users can terminate the contract at any time (thereby avoiding return on investment risk and uncertainty), and the services are often covered by service level agreements (SLAs) with financial penalties.^{[22][23]}

According to Nicholas Carr, the strategic importance of information technology is diminishing as it becomes standardized and less expensive. He argues that the cloud computing paradigm shift is similar to the displacement of frozen water trade by electricity generators early in the 20th century.^[24]

Although companies might be able to save on upfront capital expenditures, they might not save much and might actually pay more for operating expenses. In situations where the capital expense would be relatively small, or where the organization has more flexibility in their capital budget than their operating budget, the cloud model might not make great fiscal sense. Other factors having an impact on the scale of potential cost savings include the efficiency of a company's data center as compared to the cloud vendor's, the company's existing operating costs, the level of adoption of cloud computing, and the type of functionality being hosted in the cloud.^{[25][26]}

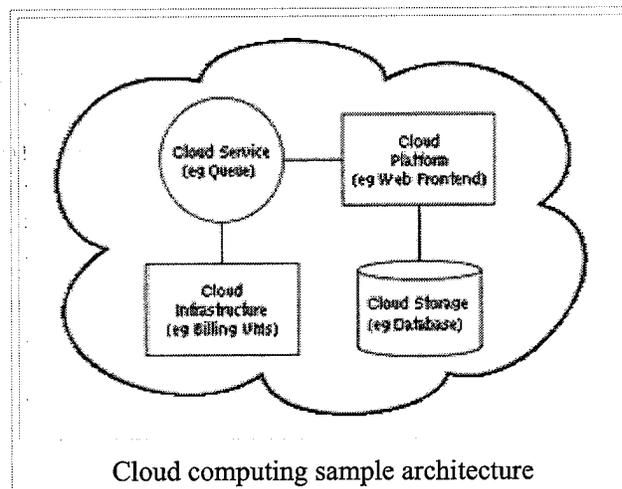
Among the items that some cloud hosts charge for are instances (often with extra charges for high-memory or high-CPU instances), data transfer in and out, storage (measured by the GB-month), I/O requests, PUT requests and GET requests, IP addresses, and load balancing. In some cases, users can bid

on instances, with pricing dependent on demand for available instances.^[*citation needed*]

Architecture

Cloud architecture,^[27] the systems architecture of the software systems involved in the delivery of cloud computing, typically involves multiple *cloud components* communicating with each other over application programming interfaces, usually web services. This resembles the Unix philosophy of having multiple programs each doing one thing well and working together over universal interfaces. Complexity is controlled and the resulting systems are more manageable than their monolithic counterparts.

The two most significant components of cloud computing architecture are known as the front end and the back end. The front end is the part seen by the client, i.e. the computer user. This includes the client's network (or computer) and the applications used to access the cloud via a user interface such as a web browser. The back end of the cloud computing architecture is the 'cloud' itself, comprising various computers, servers and data storage devices.



History

The underlying concept of cloud computing dates back to the 1960s, when John McCarthy opined that "computation may someday be organized as a public utility." Almost all the modern-day characteristics of cloud computing (elastic provision, provided as a utility, online, illusion of infinite supply), the comparison to the electricity industry and the use of public, private, government and community forms was thoroughly explored in Douglas Parkhill's 1966 book, *The Challenge of the Computer Utility*.

The actual term "cloud" borrows from telephony in that telecommunications companies, who until the 1990s primarily offered dedicated point-to-point data circuits, began offering Virtual Private Network (VPN) services with comparable quality of service but at a much lower cost. By switching traffic to balance utilization as they saw fit, they were able to utilize their overall network bandwidth more effectively. The cloud symbol was used to denote the demarcation point between that which was the responsibility of the provider from that of the user. Cloud computing extends this boundary to cover servers as well as the network infrastructure.^[28] The first scholarly use of the term "cloud computing" was in a 1997 lecture by Ramnath Chellappa.

Amazon played a key role in the development of cloud computing by modernizing their data centers after the dot-com bubble, which, like most computer networks, were using as little as 10% of their capacity at any one time, just to leave room for occasional spikes. Having found that the new cloud architecture resulted in significant internal efficiency improvements whereby small, fast-moving "two-pizza teams" could add new features faster and more easily, Amazon initiated a new product development effort to provide cloud computing to external customers, and launched Amazon Web Service (AWS) on a utility computing basis in 2006.^{[29][30]}

In 2007, Google, IBM and a number of universities embarked on a large scale cloud computing research

project.^[31] In early 2008, Eucalyptus became the first open source AWS API compatible platform for deploying private clouds. By mid-2008, Gartner saw an opportunity for cloud computing "to shape the relationship among consumers of IT services, those who use IT services and those who sell them"^[32] and observed that "[o]rganisations are switching from company-owned hardware and software assets to per-use service-based models" so that the "projected shift to cloud computing ... will result in dramatic growth in IT products in some areas and significant reductions in other areas."^[33]

Key features

- **Agility** improves with users' ability to rapidly and inexpensively re-provision technological infrastructure resources.^[34]
- **Application Programming Interface (API)** accessibility to software that enables machines to interact with cloud software in the same way the user interface facilitates interaction between humans and computers. Cloud Computing systems typically use REST based APIs.
- **Cost** is claimed to be greatly reduced and capital expenditure is converted to operational expenditure.^[35] This ostensibly lowers barriers to entry, as infrastructure is typically provided by a third-party and does not need to be purchased for one-time or infrequent intensive computing tasks. Pricing on a utility computing basis is fine-grained with usage-based options and fewer IT skills are required for implementation (in-house).^[36]
- **Device and location independence**^[37] enable users to access systems using a web browser regardless of their location or what device they are using (e.g., PC, mobile). As infrastructure is off-site (typically provided by a third-party) and accessed via the Internet, users can connect from anywhere.^[36]
- **Multi-tenancy** enables sharing of resources and costs across a large pool of users thus allowing for:
 - **Centralization** of infrastructure in locations with lower costs (such as real estate, electricity, etc.)
 - **Peak-load capacity** increases (users need not engineer for highest possible load-levels)
 - **Utilization and efficiency** improvements for systems that are often only 10–20% utilized.^[29]
- **Reliability** is improved if multiple redundant sites are used, which makes well designed cloud computing suitable for business continuity and disaster recovery.^[38] Nonetheless, many major cloud computing services have suffered outages, and IT and business managers can at times do little when they are affected.^{[39][40]}
- **Scalability** via dynamic ("on-demand") provisioning of resources on a fine-grained, self-service basis near real-time, without users having to engineer for peak loads. Performance is monitored, and consistent and loosely coupled architectures are constructed using web services as the system interface.^[36] One of the most important new methods for overcoming performance bottlenecks for a large class of applications is data parallel programming on a distributed data grid.^[41]
- **Security** could improve due to centralization of data,^[42] increased security-focused resources, etc., but concerns can persist about loss of control over certain sensitive data, and the lack of security for stored kernels.^[43] Security is often as good as or better than under traditional systems, in part because providers are able to devote resources to solving security issues that many customers cannot afford.^[44] Providers typically log accesses, but accessing the audit logs themselves can be difficult or impossible. Furthermore, the complexity of security is greatly increased when data is distributed over a wider area and / or number of devices.

- **Maintenance** of cloud computing applications is easier, since they don't have to be installed on each user's computer. They are easier to support and to improve since the changes reach the clients instantly.
- **Metering** means that cloud computing resources usage should be measurable and should be metered per client and application on a daily, weekly, monthly, and yearly basis.

Layers

The Internet functions through a series of network protocols that form a stack of layers, as shown in the figure (or as described in more detail in the OSI model). Once an Internet connection is established among several computers, it is possible to share services within any one of the following layers.

Client

See also: Category:Cloud clients

A *cloud client* consists of computer hardware and/or computer software that relies on cloud computing for application delivery, or that is specifically designed for delivery of cloud services and that, in either case, is essentially useless without it. Examples include some computers, phones and other devices, operating systems and browsers.^{[45][46][47][48][49]}

Application

See also: Category:Cloud applications

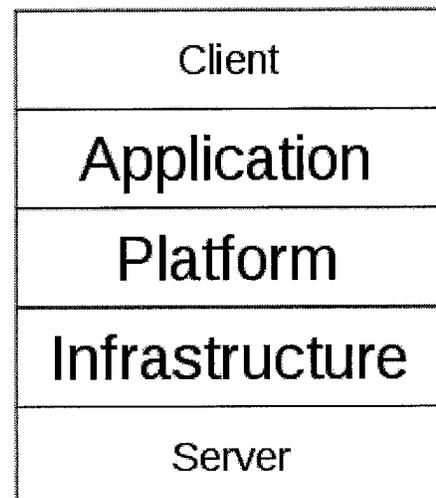
Cloud application services or "*Software as a Service (SaaS)*" deliver software as a service over the Internet, eliminating the need to install and run the application on the customer's own computers and simplifying maintenance and support. People tend to use the terms 'SaaS' and 'cloud' interchangeably, when in fact they are two different things.^[citation needed] Key characteristics include:^[50]

- Network-based access to, and management of, commercially available (i.e., not custom) software
- Activities that are managed from central locations rather than at each customer's site, enabling customers to access applications remotely via the Web
- Application delivery that typically is closer to a one-to-many model (single instance, multi-tenant architecture) than to a one-to-one model, including architecture, pricing, partnering, and management characteristics
- Centralized feature updating, which obviates the need for downloadable patches and upgrades.

Platform

See also: Category:Cloud platforms

Cloud platform services or "*Platform as a Service (PaaS)*" deliver a computing platform and/or solution stack as a service, often consuming *cloud infrastructure* and sustaining *cloud applications*.^[51] It facilitates deployment of applications without the cost and complexity of buying and managing the



underlying hardware and software layers.^{[52][53]}

Infrastructure

See also: Category:Cloud infrastructure

Cloud infrastructure services, also known as "*Infrastructure as a Service (IaaS)*", delivers computer infrastructure - typically a platform virtualization environment - as a service. Rather than purchasing servers, software, data-center space or network equipment, clients instead buy those resources as a fully outsourced service. Suppliers typically bill such services on a utility computing basis and amount of resources consumed (and therefore the cost) will typically reflect the level of activity. IaaS evolved from virtual private server offerings.^[54]

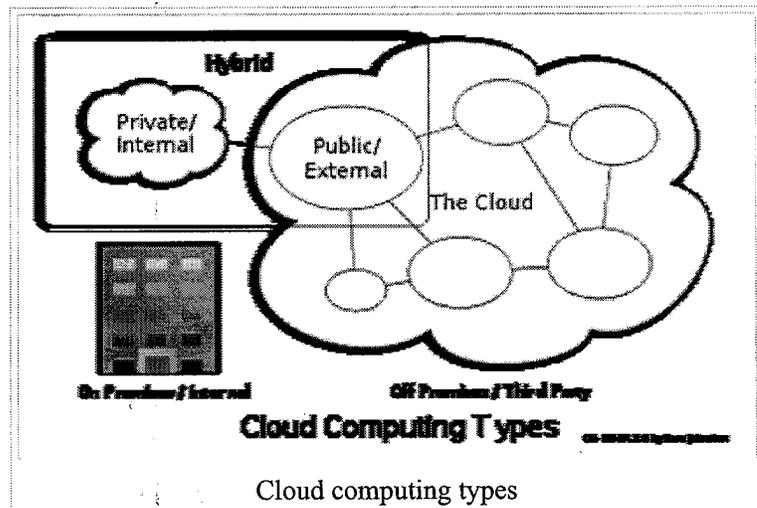
Server

The *servers* layer consists of computer hardware and/or computer software products that are specifically designed for the delivery of cloud services, including multi-core processors, cloud-specific operating systems and combined offerings.^{[45][55][56][57]}

Deployment models

Public cloud

Public cloud or *external cloud* describes cloud computing in the traditional main stream sense, whereby resources are dynamically provisioned on a fine-grained, self-service basis over the Internet, via web applications/web services, from an off-site third-party provider who bills on a fine-grained utility computing basis.^[36]



Community cloud

A *community cloud* may be established where several organizations have similar requirements and seek to share infrastructure so as to realize some of the benefits of cloud computing. With the costs spread over fewer users than a *public cloud* (but more than a single tenant) this option is more expensive but may offer a higher level of privacy, security and/or policy compliance. Examples of *community cloud* include Google's "Gov Cloud".^[58]

Hybrid cloud

See also: Cloud storage gateway

There is some confusion over the term "Hybrid" when applied to the cloud - a standard definition of the

term "Hybrid Cloud" has not yet emerged. The term "Hybrid Cloud" has been used to mean either two separate clouds joined together (public, private, internal or external), or a combination of virtualized cloud server instances used together with real physical hardware. The most correct definition of the term "Hybrid Cloud" is probably the use of physical hardware and virtualized cloud server instances together to provide a single common service.^[59] Two clouds that have been joined together are more correctly called a "combined cloud".

A *combined cloud* environment consisting of multiple internal and/or external providers^[60] "will be typical for most enterprises".^[61] By integrating multiple cloud services users may be able to ease the transition to *public cloud* services while avoiding issues such as PCI compliance.^[62]

Another perspective on deploying a web application in the cloud is using Hybrid Web Hosting, where the hosting infrastructure is a mix between Cloud Hosting and Managed dedicated servers - this is most commonly achieved as part of a web cluster in which some of the nodes are running on real physical hardware and some are running on cloud server instances.

A hybrid storage cloud uses a combination of public and private storage clouds. Hybrid storage clouds are often useful for archiving and backup functions, allowing local data to be replicated to a public cloud.^[63]

Private cloud

Douglas Parkhill first described the concept of a "Private Computer Utility" in his 1966 book *The Challenge of the Computer Utility*. The idea was based upon direct comparison with other industries (e.g. the electricity industry) and the extensive use of hybrid supply models to balance and mitigate risks.

Private cloud and *internal cloud* have been described as neologisms, however the concepts themselves pre-date the term *cloud* by 40 years. Even within modern utility industries, hybrid models still exist despite the formation of reasonably well-functioning markets and the ability to combine multiple providers.

Some vendors have used the terms to describe offerings that emulate cloud computing on private networks. These (typically virtualization automation) products offer the ability to host applications or virtual machines in a company's own set of hosts. These provide the benefits of utility computing - shared hardware costs, the ability to recover from failure, and the ability to scale up or down depending upon demand.

Private clouds have attracted criticism because users "still have to buy, build, and manage them" and thus do not benefit from lower up-front capital costs and less hands-on management,^[61] essentially "[lacking] the economic model that makes cloud computing such an intriguing concept".^{[64][65]}

Cloud Engineering

Main article: Cloud Engineering

Cloud Engineering is the application of a systematic, disciplined, quantifiable, and interdisciplinary approach to the ideation, conceptualization, development, operation, and maintenance of Cloud Computing, as well as the study and applied research of the approach, i.e., the application of engineering

to Cloud. It is a maturing and evolving discipline to facilitate the adoption, strategization, operationalization, industrialization, standardization, productization, commoditization, and governance of Cloud solutions, leading towards a Cloud ecosystem. Cloud engineering is also known as Cloud service engineering.

Cloud storage

Main article: Cloud storage

Cloud Storage is a model of networked computer data storage where data is stored on multiple virtual servers, generally hosted by third parties, rather than being hosted on dedicated servers. Hosting companies operate large data centers; and people who require their data to be hosted buy or lease storage capacity from them and use it for their storage needs. The data center operators, in the background, virtualize the resources according to the requirements of the customer and expose them as virtual servers, which the customers can themselves manage. Physically, the resource may span across multiple servers.

The Intercloud

Main article: Intercloud

The Intercloud^[66] is an interconnected global "cloud of clouds"^{[67][68]} and an extension of the Internet "network of networks" on which it is based.^[69] The term was first used in the context of cloud computing in 2007 when Kevin Kelly stated that "eventually we'll have the intercloud, the cloud of clouds. This Intercloud will have the dimensions of one machine comprising all servers and attendant cloudbooks on the planet."^[67] It became popular in 2009^[70] and has also been used to describe the datacenter of the future.^[71]

The Intercloud scenario is based on the key concept that each single cloud does not have infinite physical resources. If a cloud saturates the computational and storage resources of its virtualization infrastructure, it could not be able to satisfy further requests for service allocations sent from its clients. The Intercloud scenario aims to address such situation, and in theory, each cloud can use the computational and storage resources of the virtualization infrastructures of other clouds. Such form of pay-for-use may introduce new business opportunities among cloud providers if they manage to go beyond theoretical framework. Nevertheless, the Intercloud raises many more challenges than solutions concerning cloud federation, security, interoperability, QoS, vendor's lock-ins, trust, legal issues, monitoring and billing.^[citation needed]

The concept of a competitive utility computing market which combined many computer utilities together was originally described by Douglas Parkhill in his 1966 book, the "Challenge of the Computer Utility". This concept has been subsequently used many times over the last 40 years and is identical to the Intercloud.

Issues

Privacy

The Cloud model has been criticized by privacy advocates for the greater ease in which the companies

hosting the Cloud services control, and thus, can monitor at will, lawfully or unlawfully, the communication and data stored between the user and the host company. Instances such as the secret NSA program, working with AT&T, and Verizon, which recorded over 10 million phone calls between American citizens, causes uncertainty among privacy advocates, and the greater powers it gives to telecommunication companies to monitor user activity.^[72] While there have been efforts (such as US-EU Safe Harbor) to "harmonize" the legal environment, providers such as Amazon still cater to major markets (typically the United States and the European Union) by deploying local infrastructure and allowing customers to select "availability zones."^[73]

Compliance

In order to obtain compliance with regulations including FISMA, HIPAA and SOX in the United States, the Data Protection Directive in the EU and the credit card industry's PCI DSS, users may have to adopt *community* or *hybrid* deployment modes which are typically more expensive and may offer restricted benefits. This is how Google is able to "manage and meet additional government policy requirements beyond FISMA"^{[74][75]} and Rackspace Cloud are able to claim PCI compliance.^[76] Customers in the EU contracting with Cloud Providers established outside the EU/EEA have to adhere to the EU regulations on export of personal data.^[77]

Many providers also obtain SAS 70 Type II certification (e.g. Amazon,^[78] Salesforce.com,^[79] Google^[80] and Microsoft^[81]), but this has been criticised on the grounds that the hand-picked set of goals and standards determined by the auditor and the auditee are often not disclosed and can vary widely.^[82] Providers typically make this information available on request, under non-disclosure agreement.^[83]

Legal

In March 2007, Dell applied to trademark the term "cloud computing" (U.S. Trademark 77,139,082) in the United States. The "Notice of Allowance" the company received in July 2008 was canceled in August, resulting in a formal rejection of the trademark application less than a week later. Since 2007, the number of trademark filings covering cloud computing brands, goods and services has increased at an almost exponential rate. As companies sought to better position themselves for cloud computing branding and marketing efforts, cloud computing trademark filings increased by 483% between 2008 and 2009. In 2009, 116 cloud computing trademarks were filed, and trademark analysts predict that over 500 such marks could be filed during 2010.^[84]

Other legal cases may shape the use of cloud computing by the public sector. On October 29, 2010, Google filed a lawsuit against the U.S. Department of Interior, which opened up a bid for software that required that bidders use Microsoft's Business Productivity Online Suite. Google sued, calling the requirement "unduly restrictive of competition."^[85] Scholars have pointed out that, beginning in 2005, the prevalence of open standards and open source may have an impact on the way that public entities choose to select vendors.^[86]

Open source

Open source software has provided the foundation for many cloud computing implementations.^[87] In November 2007, the Free Software Foundation released the Affero General Public License, a version of GPLv3 intended to close a perceived legal loophole associated with free software designed to be run over a network.^[88]

Open standards

See also: Category:Cloud standards

Most cloud providers expose APIs which are typically well-documented (often under a Creative Commons license^[89]) but also unique to their implementation and thus not interoperable. Some vendors have adopted others' APIs^[90] and there are a number of open standards under development, including the OGF's Open Cloud Computing Interface. The Open Cloud Consortium (OCC)^[91] is working to develop consensus on early cloud computing standards and practices.

Security

Main article: Cloud computing security

The relative security of cloud computing services is a contentious issue which may be delaying its adoption.^[92] Issues barring the adoption of cloud computing is due in large part to the private and public sectors unease surrounding the external management of security based services. It is the very nature of cloud computing based services, private or public, that promote external management of provided services. This delivers great incentive amongst cloud computing service providers in producing a priority in building and maintaining strong management of secure services.^[93]

Organizations have been formed in order to provide standards for a better future in cloud computing services. One organization in particular, the Cloud Security Alliance is a non-profit organization formed to promote the use of best practices for providing security assurance within Cloud Computing.^[94]

Availability and performance

In addition to concerns about security, businesses are also worried about acceptable levels of availability and performance of applications hosted in the cloud.^[95]

There are also concerns about a cloud provider shutting down for financial or legal reasons, which has happened in a number of cases.^[96]

Sustainability and siting

Although cloud computing is often assumed to be a form of "green computing", there is as of yet no published study to substantiate this assumption.^[97] Siting the servers affects the environmental effects of cloud computing. In areas where climate favors natural cooling and renewable electricity is readily available, the environmental effects will be more moderate. Thus countries with favorable conditions, such as Finland,^[98] Sweden and Switzerland,^[99] are trying to attract cloud computing data centers.

SmartBay, marine research infrastructure of sensors and computational technology, is being developed using Cloud computing, an emerging approach to shared infrastructure in which large pools of systems are linked together to provide IT services.^[100]

Research

A number of universities, vendors and government organizations are investing in research around the

topic of cloud computing.^[101] Academic institutions include University of Melbourne (Australia), Georgia Tech, Yale, Wayne State, Virginia Tech, University of Wisconsin–Madison, Carnegie Mellon, MIT, Indiana University, University of Massachusetts, University of Maryland, North Carolina State University, Purdue University, University of California, University of Washington, University of Virginia, University of Utah, University of Minnesota, among others.^[102]

Joint government, academic and vendor collaborative research projects include the IBM/Google Academic Cloud Computing Initiative (ACCI). In October 2007 IBM and Google announced the multi-university project designed to enhance students' technical knowledge to address the challenges of cloud computing.^[103] In April 2009, the National Science Foundation joined the ACCI and awarded approximately \$5 million in grants to 14 academic institutions.^[104]

In July 2008, HP, Intel Corporation and Yahoo! announced the creation of a global, multi-data center, open source test bed, called Open Cirrus,^[105] designed to encourage research into all aspects of cloud computing, service and data center management.^[106] Open Cirrus partners include the NSF, the University of Illinois (UIUC), Karlsruhe Institute of Technology, the Infocomm Development Authority (IDA) of Singapore, the Electronics and Telecommunications Research Institute (ETRI) in Korea, the Malaysian Institute for Microelectronic Systems(MIMOS), and the Institute for System Programming at the Russian Academy of Sciences (ISPRAS).^[107] In Sept. 2010, more researchers joined the HP/Intel/Yahoo Open Cirrus project for cloud computing research. The new researchers are China Mobile Research Institute (CMRI), Spain's Supercomputing Center of Galicia (CESGA by its Spanish acronym), Georgia Tech's Center for Experimental Research in Computer Systems (CERCS) and China Telecom.^{[108][109]}

In July 2010, HP Labs India announced a new cloud-based technology designed to simplify taking content and making it mobile-enabled, even from low-end devices.^[110] Called SiteonMobile, the new technology is designed for emerging markets where people are more likely to access the internet via mobile phones rather than computers.^[111] In Nov. 2010, HP formally opened its Government Cloud Theatre, located at the HP Labs site in Bristol, England.^[112] The demonstration facility highlights high-security, highly flexible cloud computing based on intellectual property developed at HP Labs. The aim of the facility is to lessen fears about the security of the cloud. HP Labs Bristol is HP's second-largest central research location and currently is responsible for researching cloud computing and security.^[113]

The IEEE Technical Committee on Services Computing^[114] in IEEE Computer Society sponsors the IEEE International Conference on Cloud Computing (CLOUD).^[115] CLOUD 2010 was held on July 5–10, 2010 in Miami, Florida

Criticism of the term

During a video interview, Forrester Research VP Frank Gillett expresses criticism about the nature of and motivations behind the push for cloud computing. He describes what he calls "cloud washing" in the industry whereby companies relabel their products as cloud computing resulting in a lot of marketing innovation on top of real innovation. The result is a lot of overblown hype surrounding cloud computing. Gillett sees cloud computing as revolutionary in the long term but over-hyped and misunderstood in the short term, representing more of a gradual shift in our thinking about computer systems and not a sudden transformational change.^{[116][117]}

Larry Ellison, CEO of Oracle Corporation has stated that cloud computing has been defined as

"everything that we already do" and that it will have no effect except to "change the wording on some of our ads".^{[118][119]} Oracle Corporation has since launched a cloud computing center and worldwide tour. Forrester Research Principal Analyst John Rymer dismisses Ellison's remarks by stating that his "comments are complete nonsense and he knows it".^{[120][121][122]}

Richard Stallman said that cloud computing was simply a trap aimed at forcing more people to buy into locked, proprietary systems that would cost them more and more over time. "It's stupidity. It's worse than stupidity: it's a marketing hype campaign", he told The Guardian. "Somebody is saying this is inevitable – and whenever you hear somebody saying that, it's very likely to be a set of businesses campaigning to make it true."^[123]

External links

- Cloud Computing Dashboard and Resources on Academic Room
- The Microsoft "Cloud computing in government" guide

See also

- Cloud Engineering
- Cloud backup
- Cloud gaming
- Open Data Center Alliance
- Light Peak
- Optical interconnect
- Parallel optical interface
- Interconnect bottleneck
- Optical communication
- Optical cable
- Green computing
- InfiniBand
- Fibre channel
- HDMI
- PCI Express
- Small form-factor pluggable transceiver
- Terabit Ethernet
- 100 Gigabit Ethernet
- 10 Gigabit Ethernet
- Optoelectronics
- Data center
- High-performance computing
- Active Cables
- CXP (connector)
- C Form-factor Pluggable
- Fiber-optic communication
- Optical link
- List of device bandwidths

References

1. ^ Danielson, Krissi (2008-03-26). "Distinguishing Cloud Computing from Utility Computing". Ebizq.net. http://www.ebizq.net/blogs/saasweek/2008/03/distinguishing_cloud_computing/. Retrieved 2010-08-22.
2. ^ "Gartner Says Cloud Computing Will Be As Influential As E-business". Gartner.com. <http://www.gartner.com/it/page.jsp?id=707508>. Retrieved 2010-08-22.
3. ^ Gruman, Galen (2008-04-07). "What cloud computing really means". *InfoWorld*. <http://www.infoworld.com/d/cloud-computing/what-cloud-computing-really-means-031>. Retrieved 2009-06-02.
4. ^ "Cloud Computing: Clash of the clouds". *The Economist*. 2009-10-15. http://www.economist.com/displaystory.cfm?story_id=14637206. Retrieved 2009-11-03.
5. ^ Cloud Computing Defined 17 July 2010. Retrieved 26 July 2010.
6. ^ "NIST.gov - Computer Security Division - Computer Security Resource Center". Csrc.nist.gov. <http://csrc.nist.gov/groups/SNS/cloud-computing/>. Retrieved 2010-08-22.
7. ^ "Writing & Speaking". Sellsbrothers.com. <http://www.sellsbrothers.com/writing/intro2tapi/default.aspx?content=pstn.htm>. Retrieved 2010-08-22.
8. ^ "The Internet Cloud". *Thestandard.com*. <http://www.thestandard.com/article/0,1902,5466,00.html>. Retrieved 2010-08-22.
9. ^ Buyya, Rajkumar; Chee Shin Yeo, Srikumar Venugopal (PDF). *Market-Oriented Cloud Computing: Vision, Hype, and Reality for Delivering IT Services as Computing Utilities*. Department of Computer Science and Software Engineering, University of Melbourne, Australia. pp. 9. http://www.gridBus.org/~raj/papers/hpcc2008_keynote_cloudcomputing.pdf. Retrieved 2008-07-31.
10. ^ ""The Rise of Cloud Computing." Michael Otey. April 2010". windowsITpro.com. 2010-04-26. <http://www.windowsitpro.com/article/cloud-computing2/The-Rise-of-Cloud-Computing/2.aspx>. Retrieved 2010-08-22.
11. ^ Lai, Eric (2009-08-27). "Google, Amazon, Microsoft beef up cloud services". Infoworld.com. <http://www.infoworld.com/d/cloud-computing/woo-partners-cloud-computing-vendors-show-them-money-426>. Retrieved 2010-08-22.
12. ^ "Dell Cloud Computing Solutions". dell.com. <http://www.dell.com/cloud>. Retrieved 2010-11-03.
13. ^ "Red Hat acquires cloud software vendor Makara". infoworld.com. <http://www.infoworld.com/d/the-industry-standard/red-hat-acquires-cloud-software-vendor-makara-238>. Retrieved 2010-12-07.
14. ^ Poeter, Damon (2010-07-12). "Channel Web: "HP, Microsoft Promise Windows Azure Cloud Platform By Year's End." July 2010. Poeter". Crn.com. <http://www.crn.com/225702946>. Retrieved 2010-08-22.
15. ^ Goldman, Alex (2010-09-01). "Channel Web: "IBM Outlines an Aggressive Cloud Computing Strategy" September 2010. Goldman". internet.com. <http://itmanagement.earthweb.com/features/article.php/3901656/IBM-Outlines-an-Aggressive-Cloud-Computing-Strategy.htm>. Retrieved 2010-09-22.
16. ^ "What's In A Name? Utility vs. Cloud vs Grid". Datacenterknowledge.com. http://www.datacenterknowledge.com/archives/2008/Mar/25/whats_in_a_name_utility_vs_cloud_vs_grid.html. Retrieved 2010-08-22.
17. ^ "Distributed Application Architecture". Sun Microsystems. <http://java.sun.com/developer/Books/jdbc/ch07.pdf>. Retrieved 2009-06-16.
18. ^ "Sun CTO: Cloud computing is like the mainframe". Itknowledgeexchange.techtarget.com. 2009-03-11. <http://itknowledgeexchange.techtarget.com/mainframe-blog/sun-cto-cloud-computing-is-like-the-mainframe/>. Retrieved 2010-08-22.
19. ^ "It's probable that you've misunderstood 'Cloud Computing' until now". TechPluto. <http://portal.acm.org/citation.cfm?id=1496091.1496100&coll=&dl=ACM&CFID=21518680&CFTOKEN=18800807>. Retrieved 2010-09-14.
20. ^ "Service-Oriented Computing and Cloud Computing: Challenges and Opportunities". IEEE Internet Computing. <http://www.computer.org/portal/web/csdl/doi/10.1109/MIC.2010.147>. Retrieved 2010-12-4.
21. ^ "Cloud Computing: The Evolution of Software-as-a-Service". Knowledge.wpcarey.asu.edu. <http://knowledge.wpcarey.asu.edu/article.cfm?articleid=1614>. Retrieved 2010-08-22.
22. ^ <http://www.eweek.com/c/a/Enterprise-Applications/Forresters-Advice-to-CFOs-Embrace-Cloud-Computing-to-Cut-Costs/>
23. ^ "Five cloud computing questions". Networkworld.com. <http://www.networkworld.com/columnists/2008/080508-dzubeck.html>. Retrieved 2010-08-22.
24. ^ "Nicholas Carr on 'The Big Switch' to cloud computing". Computerworlduk.com. <http://www.computerworlduk.com/technology/internet/applications/instant-expert/index.cfm?articleid=1610>. Retrieved 2010-08-22.

25. ^ Paul, Fredric. "1 Midsize Organization Busts 5 Cloud Computing Myths". Bmighty.com. <http://www.bmighty.com/services/showArticle.jhtml?articleID=211600030>. Retrieved 2010-08-22.
26. ^ "Cloud Computing Savings – Real or Imaginary?". Appirio.com. 2009-04-16. <http://www.appirio.com/blog/2009/04/cloud-computing-savings-real-or.php>. Retrieved 2010-08-22.
27. ^ "Building GrepTheWeb in the Cloud, Part 1: Cloud Architectures". Developer.amazonwebservices.com. <http://developer.amazonwebservices.com/connect/entry.jspa?externalID=1632&categoryID=100>. Retrieved 2010-08-22.
28. ^ "July, 1993 meeting report from the IP over ATM working group of the IETF". <http://mirror.switch.ch/ftp/doc/ietf/ipatm/atm-minutes-93jul.txt>. Retrieved 2010-08-22.
29. ^ *a b* Jeff Bezos' Risky Bet.
30. ^ [1].
31. ^ Google and I.B.M. Join in 'Cloud Computing' Research
32. ^ Keep an eye on cloud computing, Amy Schurr, Network World, 2008-07-08, citing the Gartner report, "Cloud Computing Confusion Leads to Opportunity". Retrieved 2009-09-11.
33. ^ Gartner Says Worldwide IT Spending On Pace to Surpass \$3.4 Trillion in 2008, Gartner, 2008-08-18. Retrieved 2009-09-11.
34. ^ "Infrastructure Agility: Cloud Computing as a Best Practice". Edgewater.tech.wordpress.com. 2010-01-15. <http://edgewater.tech.wordpress.com/2009/04/24/best-practice-cloud-computing/>. Retrieved 2010-08-22.
35. ^ "Recession Is Good For Cloud Computing – Microsoft Agrees". Cloudave.com. <http://www.cloudave.com/link/recession-is-good-for-cloud-computing-microsoft-agrees>. Retrieved 2010-08-22.
36. ^ *a b c d* "Defining "Cloud Services" and "Cloud Computing"". Blogs.idc.com. 2008-09-23. <http://blogs.idc.com/ie/?p=190>. Retrieved 2010-08-22.
37. ^ Farber, Dan (2008-06-25). "The new geek chic: Data centers". News.cnet.com. http://news.cnet.com/8301-13953_3-9977049-80.html. Retrieved 2010-08-22.
38. ^ King, Rachael (2008-08-04). "Cloud Computing: Small Companies Take Flight". Businessweek.com. http://www.businessweek.com/technology/content/aug2008/tc2008083_619516.htm. Retrieved 2010-08-22.
39. ^ "Google Apps Admins Jittery About Gmail, Hopeful About Future". Pworld.com. 2008-08-15. http://www.pworld.com/businesscenter/article/149892/google_apps_admins_jittery_about_gmail_hopeful_about_future.html. Retrieved 2010-08-22.
40. ^ "New Resource, Born of a Cloud Feud". Datacenterknowledge.com. 2009-06-03. <http://www.datacenterknowledge.com/archives/2008/09/22/a-new-resource-born-of-a-cloud-feud/A>. Retrieved 2010-08-22.
41. ^ "Scaling Storage and Analysis of Data Using Distributed Data Grids". Nubifer.wordpress.com. 2010-02-16. <http://nubifer.wordpress.com/2010/02/16/scaling-storage-and-analysis-of-data-using-distributed-data-grids/>. Retrieved 2010-08-22.
42. ^ "Exari: Death By Laptop". Exari.blogspot.com. 2006-05-08. <http://exari.blogspot.com/2006/05/death-by-laptop.html>. Retrieved 2010-08-22.
43. ^ "Encrypted Storage and Key Management for the cloud". Cryptoclarity.com. 2009-07-30. http://www.cryptoclarity.com/CryptoClarityLLC/Welcome/Entries/2009/7/23_Encrypted_Storage_and_Key_Management_for_the_cloud.html. Retrieved 2010-08-22.
44. ^ Mills, Elinor (2009-01-27). "Cloud computing security forecast: Clear skies". News.cnet.com. http://news.cnet.com/8301-1009_3-10150569-83.html. Retrieved 2010-08-22.
45. ^ *a b* Nimbus Cloud Guide
46. ^ "Microsoft's cloud operating system, Windows Azure, to go live in January". Geek.com. 2009-11-18. <http://www.geek.com/articles/news/microsofts-cloud-operating-system-windows-azure-to-go-live-in-january-20091118/>. Retrieved 2010-08-22.
47. ^ Claburn, Thomas. "Google Reveals Nexus One 'Super Phone'". Informationweek.com. http://www.informationweek.com/news/software/web_services/showArticle.jhtml?articleID=222200331. Retrieved 2010-08-22.
48. ^ "What Makes a Cloud Computer?". Gigaom.com. 2008-06-22. <http://gigaom.com/2008/06/22/what-makes-a-good-cloud-computer/>. Retrieved 2010-08-22.
49. ^ by Brian BraikerSeptember 02, 2008 (2008-09-02). "The Cloud's Chrome Lining". Newsweek.com. <http://www.newsweek.com/id/156911>. Retrieved 2010-08-22.
50. ^ 2005 Software as a Service Taxonomy and Research Guide
51. ^ "An example of a 'Cloud Platform' for building applications". Eccentex.com.

- <http://www.eccentex.com/platform/workflow.html>. Retrieved 2010-08-22.
52. ^ Jack Schofield (2008-04-17). "Google angles for business users with 'platform as a service'". London: Guardian. <http://www.guardian.co.uk/technology/2008/apr/17/google.software>. Retrieved 2010-08-22.
 53. ^ "The Emerging Cloud Service Architecture". Aws.typepad.com. 2008-06-03. <http://aws.typepad.com/aws/2008/06/the-forthcoming.html>. Retrieved 2010-08-22.
 54. ^ "EMC buys Pi and forms a cloud computing group". Searchstorage.techtarget.com. 2008-02-21. http://searchstorage.techtarget.com/news/article/0,289142,sid5_gci1301852,00.html. Retrieved 2010-08-22.
 55. ^ Myslewski, Rik (2009-12-02). "Intel puts cloud on single megachip". Theregister.co.uk. http://www.theregister.co.uk/2009/12/02/intel_scc/. Retrieved 2010-08-22.
 56. ^ Duffy, Jim (2009-05-12). "Cisco unveils cloud computing platform for service providers". Infoworld.com. <http://www.infoworld.com/d/cloud-computing/cisco-unveils-cloud-computing-platform-service-providers-113>. Retrieved 2010-08-22.
 57. ^ Microsoft Plans 'Cloud' Operating System
 58. ^ Claburn, Thomas. "Google's "Gov Cloud" Wins \$7.2 Million Los Angeles Contract". Informationweek.com. <http://www.informationweek.com/news/services/saas/showArticle.jhtml?articleID=221100129>. Retrieved 2010-08-22.
 59. ^ <http://cloudscaling.com/blog/cloud-computing/hybrid-clouds-are-half-baked>
 60. ^ Eric Krangel (2009-02-10). "IBM Embraces Juniper For Its Smart 'Hybrid Cloud', Disses Cisco (IBM)". Businessinsider.com. <http://www.businessinsider.com/2009/2/ibm-embraces-juniper-for-its-smart-hybrid-cloud-disses-cisco-ibm>. Retrieved 2010-08-22.
 61. ^ ^a ^b Foley, John. "Private Clouds Take Shape". Informationweek.com. <http://www.informationweek.com/news/services/business/showArticle.jhtml?articleID=209904474>. Retrieved 2010-08-22.
 62. ^ "Forecast for 2010: The Rise of Hybrid Clouds". Gigaom.com. 2010-01-01. <http://gigaom.com/2010/01/01/on-the-rise-of-hybrid-clouds/>. Retrieved 2010-08-22.
 63. ^ Managing Private and Hybrid Clouds for Data Storage, SNIA, Jan 2010
 64. ^ Haff, Gordon (2009-01-27). "Just don't call them private clouds". News.cnet.com. http://news.cnet.com/8301-13556_3-10150841-61.html. Retrieved 2010-08-22.
 65. ^ "There's No Such Thing As A Private Cloud". Informationweek.com. 2010-06-30. http://www.informationweek.com/cloud-computing/blog/archives/2009/01/theres_no_such.html. Retrieved 2010-08-22.
 66. ^ Bernstein, David; Ludvigson, Erik; Sankar, Krishna; Diamond, Steve; Morrow, Monique (2009-05-24). *Blueprint for the Intercloud - Protocols and Formats for Cloud Computing Interoperability*. IEEE Computer Society. pp. 328–336. doi:10.1109/ICIW.2009.55. <http://www2.computer.org/portal/web/csdl/doi/10.1109/ICIW.2009.55>.
 67. ^ ^a ^b "Kevin Kelly: A Cloudbook for the Cloud". Kk.org. http://www.kk.org/thetechnium/archives/2007/11/a_cloudbook_for.php. Retrieved 2010-08-22.
 68. ^ "Intercloud is a global cloud of clouds". Samj.net. 2009-06-22. <http://samj.net/2009/06/intercloud-is-global-cloud-of-clouds.html>. Retrieved 2010-08-22.
 69. ^ "Vint Cerf: Despite Its Age, The Internet is Still Filled with Problems". Readwriteweb.com. http://www.readwriteweb.com/archives/vint_cerf_despite_its_age_the.php?mtcCampaign=2765. Retrieved 2010-08-22.
 70. ^ "SP360: Service Provider: From India to Intercloud". Blogs.cisco.com. http://blogs.cisco.com/sp/comments/from_india_to_intercloud/. Retrieved 2010-08-22.
 71. ^ Canada. "Head in the clouds? Welcome to the future". Theglobeandmail.com. <http://www.theglobeandmail.com/servlet/story/LAC.20071129.TWLINKS29/TPStory/Business>. Retrieved 2010-08-22.
 72. ^ Cauley, Leslie (2006-05-11). "NSA has massive database of Americans' phone calls". Usatoday.com. http://www.usatoday.com/news/washington/2006-05-10-nsa_x.htm. Retrieved 2010-08-22.
 73. ^ "Feature Guide: Amazon EC2 Availability Zones". Developer.amazonwebservices.com. <http://developer.amazonwebservices.com/connect/entry.jspa?externalID=1347&categoryID=112>. Retrieved 2010-08-22.
 74. ^ "FISMA compliance for federal cloud computing on the horizon in 2010". Searchcompliance.techtarget.com. http://searchcompliance.techtarget.com/news/article/0,289142,sid195_gci1377298,00.html. Retrieved 2010-08-22.

75. ^ "Google Apps and Government". Googleenterprise.blogspot.com. 2009-09-15. <http://googleenterprise.blogspot.com/2009/09/google-apps-and-government.html>. Retrieved 2010-08-22.
76. ^ "Cloud Hosting is Secure for Take-off: Mosso Enables The Spreadsheet Store, an Online Merchant, to become PCI Compliant". Rackspacecloud.com. 2009-03-14. <http://www.rackspacecloud.com/blog/2009/03/05/cloud-hosting-is-secure-for-take-off-mosso-enables-the-spreadsheet-store-an-online-merchant-to-become-pci-compliant/>. Retrieved 2010-08-22.
77. ^ "How the New EU Rules on Data Export Affect Companies in and Outside the EU | Dr. Thomas Helbing - Kanzlei für Datenschutz-, Online- und IT-Recht". Thomashelbing.com. <http://www.thomashelbing.com/en/how-new-eu-rules-data-export-affect-companies-and-outside-eu>. Retrieved 2010-08-22.
78. ^ "AWS Completes SAS70 Type II Audit". Aws.amazon.com. <http://aws.amazon.com/about-aws/whats-new/2009/11/11/aws-completes-sas70-type-ii-audit/>. Retrieved 2010-08-22.
79. ^ "Trust Salesforce.com". Trust Salesforce.com. <http://trust.salesforce.com/>. Retrieved 2010-08-22.
80. ^ Feigenbaum, Eran (2008-11-04). "SAS 70 Type II for Google Apps". Googleenterprise.blogspot.com. <http://googleenterprise.blogspot.com/2008/11/sas-70-type-ii-for-google-apps.html>. Retrieved 2010-08-22.
81. ^ "Securing Microsoft's Cloud Infrastructure". Blogs.technet.com. 2009-05-28. <http://blogs.technet.com/gfs/archive/2009/05/27/securing-microsoft-s-cloud-infrastructure.aspx>. Retrieved 2010-08-22.
82. ^ "Amazon gets SAS 70 Type II audit stamp, but analysts not satisfied". Searchcloudcomputing.techtarget.com. 2009-11-17. http://searchcloudcomputing.techtarget.com/news/article/0,289142,sid201_gci1374629,00.html. Retrieved 2010-08-22.
83. ^ "Assessing Cloud Computing Agreements and Controls". Wistechology.com. <http://wistechology.com/articles/6954/>. Retrieved 2010-08-22.
84. ^ "Inside Trademarks March 24, 2010". Insidetrademarks.com. 2010-03-24. <http://insidetrademarks.com/2010/03/24/cloud-computing-trademark-trends/>. Retrieved 2010-08-22.
85. ^ Google, Inc. vs. the United States
86. ^ Casson and Ryan, Open Standards, Open Source Adoption in the Public Sector, and Their Relationship to Microsoft's Market Dominance
87. ^ "Open source fuels growth of cloud computing, software-as-a-service". Networkworld.com. <http://www.networkworld.com/news/2008/072808-open-source-cloud-computing.html>. Retrieved 2010-08-22.
88. ^ "AGPL: Open Source Licensing in a Networked Age". Redmonk.com. 2009-04-15. <http://redmonk.com/sogrady/2009/04/15/open-source-licensing-in-a-networked-age/>. Retrieved 2010-08-22.
89. ^ GoGrid Moves API Specification to Creative Commons
90. ^ "Eucalyptus Completes Amazon Web Services Specs with Latest Release". Ostatic.com. <http://ostatic.com/blog/eucalyptus-completes-amazon-web-services-specs-with-latest-release>. Retrieved 2010-08-22.
91. ^ "Open Cloud Consortium.org". Open Cloud Consortium.org. 1999-02-22. <http://opencloudconsortium.org>. Retrieved 2010-08-22.
92. ^ "Are security issues delaying adoption of cloud computing?". Networkworld.com. <http://www.networkworld.com/news/2009/042709-burning-security-cloud-computing.html>. Retrieved 2010-08-22.
93. ^ "Security of virtualization, cloud computing divides IT and security pros". Networkworld.com. 2010-02-22. <http://www.networkworld.com/news/2010/022210-virtualization-cloud-security-debate.html>. Retrieved 2010-08-22.
94. ^ "Cloud Security Alliance Official web page". Cloudsecurityalliance.org. <http://www.cloudsecurityalliance.org/>. Retrieved 2010-08-22.
95. ^ Mullins, Robert (2010-06-16). "IDC Survey: Risk In The Cloud". Network Computing. <http://www.networkcomputing.com/cloud-computing/cloud-minuses-outweigh-pluses-for-businesses.php>. Retrieved 2010-08-22.
96. ^ Scheier, Robert L. (2009-04-20). "What to do if your cloud provider disappears | Cloud Computing". InfoWorld. <http://www.infoworld.com/d/cloud-computing/what-do-if-your-cloud-provider-disappears-508>. Retrieved 2010-08-22.
97. ^ James Urquhart (January 7, 2010). "Cloud computing's green paradox". CNET News. http://news.cnet.com/8301-19413_3-10428065-240.html. Retrieved March 12, 2010. "...there is some significant evidence that the cloud is encouraging more compute consumption"

98. ^ Finland - First Choice for Siting Your Cloud Computing Data Center.. Retrieved 4 August 2010.
99. ^ Swiss Carbon-Neutral Servers Hit the Cloud.. Retrieved 4 August 2010.
100. ^ Katrice R. Jalbuena (March 19, 2009). "SmartBay pilot information system operational in Galway Bay". EcoSeed. <http://ecoseed.org/en/living-green-article-list/article/6-living-green/1067-smartbay-pilot-information-system-operational-in-galway-bay>. Retrieved November 10, 2010. "SmartBay is being developed using Cloud computing, an emerging approach to shared infrastructure in which large pools of systems are linked together to provide IT services."
101. ^ "Cloud Net Directory. Retrieved 2010-03-01". Cloudbook.net. <http://www.cloudbook.net/directories/research-clouds>. Retrieved 2010-08-22.
102. ^ nsf.gov - National Science Foundation (NSF) News - National Science Foundation Awards Millions to Fourteen Universities for Cloud Computing Research - US National Science Foun...
103. ^ ""IBM, Google Team on an Enterprise Cloud." May 2008. Rich Miller Retrieved 2010-04-01". DataCenterKnowledge.com. 2008-05-02. <http://www.datacenterknowledge.com/archives/2008/05/02/ibm-google-team-on-an-enterprise-cloud/>. Retrieved 2010-08-22.
104. ^ "National Science Foundation press release. September 2008. "National Science Foundation Awards Millions to Fourteen Universities for Cloud Computing Research." Retrieved 2010-03-01". Nsf.gov. http://www.nsf.gov/news/news_summ.jsp?cntn_id=114686. Retrieved 2010-08-22.
105. ^ "HP News Release. "HP, Intel and Yahoo! Create Global Cloud Computing Research Test Bed." July 2008". Hp.com. 2008-07-29. http://www.hp.com/hpinfo/newsroom/press_kits/2008/cloudresearch/index.html?jumpid=reg_R1002_USEN. Retrieved 2010-08-22.
106. ^ "HP News Release. "HP, Intel and Yahoo! Attract Leading Research Organizations to Collaborative Cloud Computing Test Bed. June 2009". Hp.com. http://www.hp.com/hpinfo/newsroom/press/2009/090608a.html?jumpid=reg_R1002_USEN. Retrieved 2010-08-22.
107. ^ "Open Cirrus: the Open Cloud Computing Research Testbed."
108. ^ IDG News Service. "More join HP, Intel and Yahoo on Open Cirrus cloud test bed." Perez. Sept. 2010
109. ^ Open Cirrus Video
110. ^ "Information Week: "HP Labs India offers SiteonMobile for emerging markets." Ribeiro, IDG News Service\Bangalore Bureau July 2010". Informationweek.in. 2010-07-09. http://www.informationweek.in/Mobile/10-07-09/HP_Labs_India_offers_SiteonMobile_for_emerging_markets.aspx. Retrieved 2010-08-22.
111. ^ "IDG: San Francisco Chronicle: "HP Labs uses cloud technology to simplify mobile web access." Ribeiro. July 2010". Sfgate.com. <http://www.sfgate.com/cgi-bin/article.cgi?f=/g/a/2010/07/08/urnidgns852573C4006938800025775A001A2D85.DTL#ixzz0tB7X8Iti>. Retrieved 2010-08-22.
112. ^ ZDNet UK. "HP Labs unveils G-Cloud demo facility."
113. ^ "HP Lifts Curtain on G-Cloud Theatre." HP News Release. Nov. 2010
114. ^ "IEEE Technical Committee on Services Computing". Tab.computer.org. <http://tab.computer.org/tcsc>. Retrieved 2010-08-22.
115. ^ "IEEE International Conference on Cloud Computing (CLOUD)". Thecloudcomputing.org. <http://www.thecloudcomputing.org>. Retrieved 2010-08-22.
116. ^ "" (2008-09-29). "Cloud Computing is Hyped and Overblown". Youtube.com. <http://www.youtube.com/watch?v=f7wv1i8ubng>. Retrieved 2010-08-22.
117. ^ "Cloud Computing is Hyped and Overblown, Forrester's Frank Gillett Big Tech Companies Have "Cloud Envy"". Beet.tv. <http://www.beet.tv/2008/09/cloud-computing.html>. Retrieved 2010-08-22.
118. ^ "" "Larry Ellison – What The Hell Is Cloud Computing?". Youtube.com. <http://www.youtube.com/watch?v=0FacYAI6DY0>. Retrieved 2010-08-22.
119. ^ Farber, Dan (2008-09-26). "Oracle's Ellison nails cloud computing". News.cnet.com. http://news.cnet.com/8301-13953_3-10052188-80.html. Retrieved 2010-08-22.
120. ^ "Oracle desperately seeking cloud cred". Searchcloudcomputing.techtarget.com. 2010-02-16. http://searchcloudcomputing.techtarget.com/news/article/0,289142,sid201_gci1384202,00.html. Retrieved 2010-08-22.
121. ^ "Oracle launches worldwide cloud-computing tour". Computerworld.com.au. 2010-02-10. http://www.computerworld.com.au/article/335674/oracle_launches_worldwide_cloud-computing_tour/. Retrieved 2010-08-22.
122. ^ By James Rogers (2009-12-18). "Oracle's Ellison Issues Cloud Challenge". Thestreet.com. <http://www.thestreet.com/story/10649557/1/oracles-ellison-issues-cloud-challenge.html>. Retrieved 2010-08-

22.

123. ^ Cloud computing is a trap, warns GNU founder Richard Stallman The Guardian, Monday 29 September 2008 14.11 BST

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nim·ble (nĭm'bl̩)

adj. **nim·bler**, **nim·blest**

- Quick, light, or agile in movement or action; deft: *nimble fingers*. See Synonyms at [dexterous](#).
- Quick, clever, and acute in devising or understanding: *nimble wits*.

[Middle English *neme1*, from Old English *næme1*, *quick to seize* and *numo1*, *quick at learning*; see *nem-* in Indo-European roots.]

nim'ble-ness *n.*

nim'bly *adv.*

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nimble ['nɪmbəl]

adj

- agile, quick, and neat in movement *nimble fingers*
- alert; acute *a nimble intellect*

[Old English *næmel* quick to grasp, and *numol* quick at seizing, both from *niman* to take]

nimbleness *n*

nimbly *adv*

Collins English Dictionary – Complete and Unabridged © HarperCollins Publishers 1991, 1994, 1998, 2000, 2003

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Adj. 1. **nimble** - moving quickly and lightly; "sleek and agile as a gymnast"; "as nimble as a deer"; "nimble fingers"; "quick of foot"; "the old dog was so spry it was halfway up the stairs before we could stop it"

[agile](#), [spry](#), [quick](#)

[active](#) - characterized by energetic activity; "an active toddler"; "active as a gazelle"; "an active man is a man of action"

2. **nimble** - mentally quick; "an agile mind"; "nimble wits"

[agile](#)

[intelligent](#) - having the capacity for thought and reason especially to a high degree; "is there intelligent life in the universe?"; "an intelligent question"

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nimble

adjective

- [agile](#), [active](#), [lively](#), [deft](#), [proficient](#), [sprightly](#), [nippy](#) (*Brit. informal*), [spry](#), [dexterous](#) *Lily, who was light and nimble on her feet, was learning to tap-dance.*
[agile](#) [heavy](#), [slow](#), [dull](#), [awkward](#), [clumsy](#), [inactive](#), [lethargic](#), [indolent](#)
- [alert](#), [ready](#), [bright](#) (*informal*), [sharp](#), [keen](#), [active](#), [smart](#), [quick-witted](#) *To keep your mind nimble, you must use it.*

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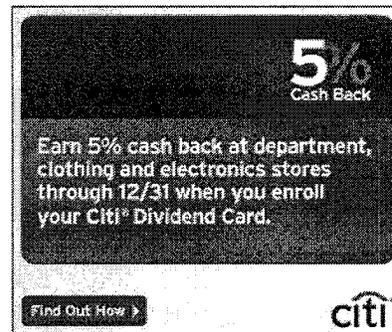
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nimble

adj **nimble** ['nimbl]

quick and light in movement *a nimble jump.*

adv **nimbly**

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|--------------------------------|------------------------------|
| agile | light-footed |
| dexterous | nimble Will |
| Dexterousness | spry |
| light-fingered | |

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Away bounded the Hart, and soon, by the aid of his **nimble** legs, was nearly out of sight of the Hunter; but not noticing where he was going, he passed under some trees with branches growing low down in which his antlers were caught, so that the Hunter had time to come up.
Fables by Aesop [View in context](#)

Northerton no sooner obtained a release from his captivity, as we have seen, than he hasted away to overtake Mrs Waters; which, as he was a very active **nimble** fellow, he did at the last-mentioned city, some few hours after Captain Waters had left her.
The History of Tom Jones, a Foundling by Fielding, Henry [View in context](#)

At that hour the clear-voiced nymphs are with him and move with **nimble** feet, singing by some spring of dark water, while Echo wails about the mountain-top, and the god on this side or on that of the choirs, or at times sidling into the midst, plies it **nimbly** with his feet.
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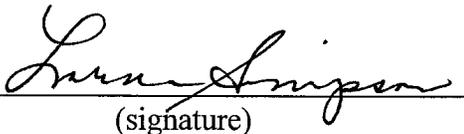
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