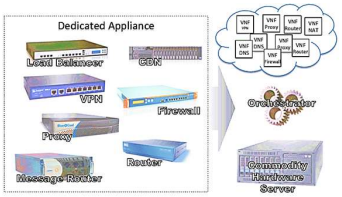
commodity server: an all-purpose and highly compatible piece of hardware that can have various kinds of software installed on it; a computer device or IT component that is relatively inexpensive



Session 3

main idea

Computing delivered as a utility can be defined as "on demand delivery of infrastructure, applications, and business processes in a security-rich, shared, scalable, and based computer environment over the Internet for a fee". The mainframe era collapsed with the advent of fast and inexpensive microprocessors and IT data centers moved to collections of commodity servers. Apart from its clear advantages, this new model inevitably led to isolation of workload into dedicated servers, mainly due to incompatibilities between software stacks and operating systems. In addition, the unavailability of efficient computer networks meant that IT infrastructure should be hosted in proximity to where it would be utilized. Altogether, these facts have prevented the utility computing reality of taking place on modern computer systems.

with a lot of security

easy to be made larger by adding extra hardware

?

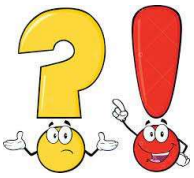
?

in addition to

certainly

?

near; close to



main idea

Similar to old electricity generation stations, which used to power individual factories, computing servers and desktop computers in a modern organization are often underutilized, since IT infrastructure is configured to handle theoretical demand peaks. In addition, in the early stages of electricity generation, electric current could not travel long distances without significant voltage losses. However, new paradigms emerged culminating on transmission systems able to make electricity available hundreds of kilometers far off from where it is generated. Likewise, the advent of

fail to use sth entirely

arrange

model

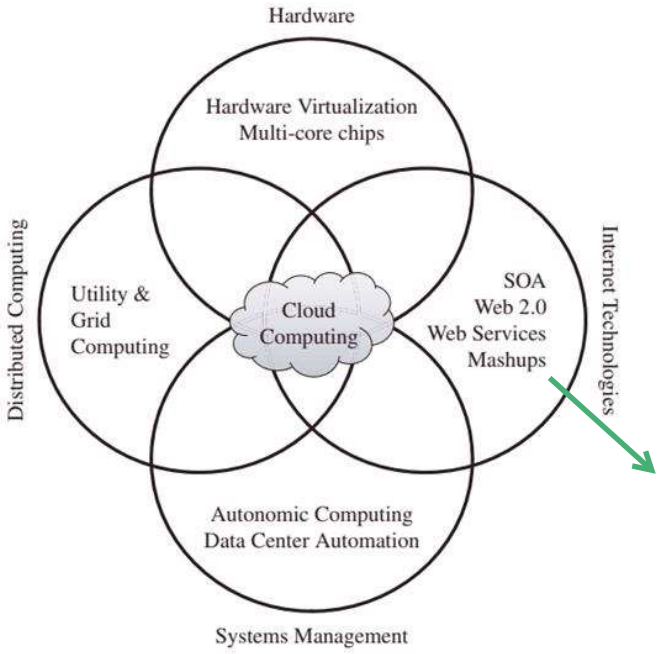
terminate

remote

increasingly fast fiber-optics networks has relit the fire, and new technologies
past and past participle of relight: light again; to cause sth to begin to burn again
for enabling sharing or computing power over great distances have appeared.


main idea

These facts reveal the potential of delivering computing services with the speed and reliability that businesses enjoy with their local machines. The benefits of economies of scale and high utilization allow providers to offer
cost reduction
computing services for a fraction of what it costs for a typical company that
a small amount of
generates its own computing power.



mashup: a web page or application created by combining data from different sources

Figure 1.1. Convergence of various advances leading to the advent of cloud computing
assembly; coming together

Web Services

computer hardware or software that does not belong to a particular company, but can be used by anyone

main idea

The emergence of Web services (WS) open standards has significantly contributed to advances in the domain of software integration. Web services can glue together applications running on different messaging product platforms, enabling information from one application to be made available to others, and enabling internal applications to be made available over the Internet.

main idea

In the Software as a Service (SaaS) domain, cloud applications can be built as compositions of other services from the same or different providers. (combination) Services such as user authentication (verifying identity), e-mail, payroll (list of salaries and employees) management, and calendars are examples of building blocks that can be reused and combined in a business solution in case a single, ready-made (available) system does not provide all those features. Many building blocks and solutions are now available in public marketplaces. For example, Salesforce.com offers App Exchange, which enables the sharing of solutions developed by third-party developers on top of Salesforce.com components.

Grid Computing

main idea

Grid computing enables aggregation of distributed resources and transparently (without the user being aware) access to them. Most production grids such as TeraGrid and EGEE seek to (look for) share compute (?) and storage (?) resources distributed across different administrative domains, with their main focus being speeding up a broad range of scientific applications, such as climate modeling, drug design,

and protein analysis.

a computer language allowing computers that are connected to each other to communicate

main idea

The development of standardized protocols for several grid computing activities has contributed - theoretically - to allow delivery of on-demand computing services over the Internet. However, ensuring quality of service (QoS) in grids has been perceived as a difficult endeavor.

effort

main idea

Lack of performance isolation has prevented grids adoption in a variety of scenarios, especially on environments where resources are oversubscribed or users are uncooperative. Activities associated with one user or virtual organization (VO) can influence, in an uncontrollable way, the performance perceived by other users using the same platform. Therefore, the impossibility of enforcing QoS and guaranteeing execution time became a problem, especially for time-critical applications.

selection and use

offer to buy more of sth that can be supplied

description of possible conditions

running

sth for which speed is important

main idea

Another issue that has led to frustration when using grids is the availability of resources with diverse software configurations, including disparate operating systems, libraries, compilers, runtime environments and so forth. At the same time, user applications would often run only on specially customized environments. Consequently, a portability barrier has often been present on most grid infrastructures, inhibiting users from adopting grids as utility computing environments.

different

a program that converts instructions into a machine code

personalized; to make according to individual needs

movement

prevent

Utility Computing