Обща информация:

In basic terms, cloud computing is the phrase used to describe different scenarios in which computing resource is delivered as a service over a network connection (usually, this is the internet). Cloud computing is therefore a type of computing that relies on sharing a pool of physical and/or virtual resources, rather than deploying local or personal hardware and software. It is somewhat synonymous with the term ‘utility computing’ as users are able to tap into a supply of computing resource rather than manage the equipment needed to generate it themselves; much in the same way as a consumer tapping into the national electricity supply, instead of running their own generator.

One of the key characteristics of cloud computing is the flexibility that it offers and one of the ways that flexibility is offered is through scalability. This refers to the ability of a system to adapt and scale to changes in workload. Cloud technology allows for the automatic provision and deprovision of resource as and when it is necessary, thus ensuring that the level of resource available is as closely matched to current demand as possible. This is a defining characteristic that differentiates it from other computing models where resource is delivered in blocks (e.g., individual servers, downloaded software applications), usually with fixed capacities and upfront costs.

However, the advantages of cloud computing are not limited to flexibility. Enterprise can also benefit (in varying degrees) from the economies of scale created by setting up services en masse with the same computing environments, and the reliability of physically hosting services across multiple servers where individual system failures do not affect the continuity of the service.

Геша

## Characteristics

Cloud computing exhibits the following key characteristics:

* **Agility** improves with users' ability to re-provision technological infrastructure resources.
* **Cost** reductions claimed by cloud providers. A public-cloud delivery model converts capital expenditure to [operational expenditure](https://en.wikipedia.org/wiki/Operational_expenditure).[[42]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-42) This purportedly lowers [barriers to entry](https://en.wikipedia.org/wiki/Barriers_to_entry), as infrastructure is typically provided by a third party and need not 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).[[43]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-idc-43) The e-FISCAL project's state-of-the-art repository[[44]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-44)contains several articles looking into cost aspects in more detail, most of them concluding that costs savings depend on the type of activities supported and the type of infrastructure available in-house.
* [**Device and location independence**](https://en.wikipedia.org/wiki/Device_independence)[[45]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-yarmis-45) enable users to access systems using a web browser regardless of their location or what device they use (e.g., PC, mobile phone). As infrastructure is off-site (typically provided by a third-party) and accessed via the Internet, users can connect from anywhere.[[43]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-idc-43)
* [**Maintenance**](https://en.wikipedia.org/wiki/Software_maintenance) of cloud computing applications is easier, because they do not need to be installed on each user's computer and can be accessed from different places.
* [**Multitenancy**](https://en.wikipedia.org/wiki/Multitenancy) 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)
  + **utilisation and efficiency** improvements for systems that are often only 10–20% utilised.[[46]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-amazon-46)[[47]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-47)
* [**Performance**](https://en.wikipedia.org/wiki/Computer_performance) is monitored, and consistent and loosely coupled architectures are constructed using [web services](https://en.wikipedia.org/wiki/Web_services) as the system interface.[[43]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-idc-43)[[48]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-48)[[49]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-Elsevier.com-49)
* [**Productivity**](https://en.wikipedia.org/wiki/Productivity) may be increased when multiple users can work on the same data simultaneously, rather than waiting for it to be saved and emailed. Time may be saved as information does not need to be re-entered when fields are matched, nor do users need to install application software upgrades to their computer.[[50]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-Smith2013-50)
* **Reliability** improves with the use of multiple redundant sites, which makes well-designed cloud computing suitable for [business continuity](https://en.wikipedia.org/wiki/Business_continuity) and [disaster recovery](https://en.wikipedia.org/wiki/Disaster_recovery).[[51]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-51)
* **Scalability and**[**elasticity**](https://en.wikipedia.org/wiki/Elasticity_(cloud_computing)) via dynamic ("on-demand") [provisioning](https://en.wikipedia.org/wiki/Provisioning) of resources on a fine-grained, self-service basis in near real-time[[52]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-vmstartuptime2012-52)[[53]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-53) (Note, the VM startup time varies by VM type, location, OS and cloud providers[[52]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-vmstartuptime2012-52)), without users having to engineer for peak loads.[[54]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-54)[[55]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-55)[[56]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-He_15.E2.80.9322-56) This gives the ability to scale up when the usage need increases or down if resources are not being used.[[57]](https://en.wikipedia.org/wiki/Cloud_computing#cite_note-57)

Модели на доставка

Cloud е изграден на принципа всичко е “service”. Чрез този принцип архитектурата на Cloud може да се разгледа базирана на 3 основни “services”. Всички services в Cloud комуникират помежду си, чрез специален протокол за комуникация по мрежата. Това предоставя удобен и лесен начин за менажиране на отделните компоненти и дава възможност на отделните services да работят независимо един от друг(т.е. ако единия падне другите могат да продължат работата си). Въпреки това, че “services” работя независимо един от друг, те заедно комбинирани образуват “Cloud” структурата.

**ИААС - 7**

Virtual machines - <https://en.wikipedia.org/wiki/Virtual_machine>

https://bg.wikipedia.org/wiki/%D0%92%D0%B8%D1%80%D1%82%D1%83%D0%B0%D0%BB%D0%BD%D0%B0\_%D0%BC%D0%B0%D1%88%D0%B8%D0%BD%D0%B0

Servers - <https://en.wikipedia.org/wiki/Server_(computing)>

Storage - <https://en.wikipedia.org/wiki/Database>

Load Balancers - https://en.wikipedia.org/wiki/Load\_balancing\_(computing)

* Scalability; resource is available as and when the client needs it and, therefore, there are no delays in expanding capacity or the wastage of unused capacity
* No investment in hardware; the underlying physical hardware that supports an IaaS service is set up and maintained by the cloud provider, saving the time and cost of doing so on the client side
* Utility style costing; the service can be accessed on demand and the client only pays for the resource that they actually use
* Location independence; the service can usually be accessed from any location as long as there is an internet connection and the security protocol of the cloud allows it
* Physical security of data centre locations; services available through a public cloud, or private clouds hosted externally with the cloud provider, benefit from the physical security afforded to the servers which are hosted within a data centre
* No single point of failure; if one server or network switch, for example, were to fail, the broader service would be unaffected due to the remaining multitude of hardware resources and redundancy configurations.  For many services if one entire data center were to go offline, nevermind one server, the IaaS service could still run successfully.

**ПААС - 11**

* **They don’t have to invest in physical infrastructure;** being able to ‘rent’ virtual infrastructure has both cost benefits and practical benefits. They don’t need to purchase hardware themselves or employ the expertise to manage it. This leaves them free to focus on the development of applications. What’s more, clients will only need to rent the resources they need rather than invest in fixed, unused and therefore wasted capacity.
* **Makes development possible for ‘non-experts’;** with some PaaS offerings anyone can develop an application. They can simply do this through their web browser utilising one-click functionality. Salient examples of this are one-click blog software installs such as WordPress.
* **Flexibility;** customers can have control over the tools that are installed within their platforms and can create a platform that suits their specific requirements. They can ‘pick and choose’ the features they feel are necessary.
* **Adaptability;** Features can be changed if circumstances dictate that they should.
* **Teams in various locations can work together;** as an internet connection and web browser are all that is required, developers spread across several locations can work together on the same application build.
* **Security;** security is provided, including data security and backup and recovery.