

# Cloud Computing: New Paradigms and Challenges

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**Abstract** Cloud computing is an Internet-based distributed system architecture to provide the customers with services and resources in a scalable and self-manageable fashion. Whatever the user needs and wherever he demands it—Cloud can deliver the regarding software services, platform or infrastructural resources. Services are furnished by software whereas resources are a complex of virtualized computing facilities, storages, and networking hardware provided by the Cloud for end users and enterprises. Therefore, the Cloud computing principle leads to a new paradigm in computer architecture. We can divide the whole system into two parts:

- the front-end which consists of different kind of mobile devices like tablets, smart phones, PCs, or simply embedded systems, and regarding software as well as
- the back-end, which is the Cloud infrastructure consisting of resources and services (as public, private, hybrid, or federated Cloud) with a centralized view for users.

The front-end and back-end are connected to each other through a broadband network, usually the Internet. The front-end is what the computer user, or customer, sees. The back-end works in the background to satisfy user demand. In this presentation, in a short introduction the principle of cloud computing, its philosophy, and methods will be discussed. As main topics of the talk we will discuss some paradigms and challenging topics of cloud computing like the new architectural view, its benefits, advantages and disadvantages. Introduction of virtualization conceptions for an energy efficient cloud as well as the specification of security and security problems are further subjects of the talk. In this part we will introduce also a new security algorithm to store the big data in a cloud. It will then also illustrate how the solution can be leveraged in context of different applications to identity business, strategic, technical, and implementation challenges and find solutions for different kind of cloud back-end structures (like private, public, and hybrid cloud).

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