



Enhancing Operational Capacities and Capabilities through Cloud Technologies

How freight forwarders and other logistics stakeholders can benefit from cloud-based solutions



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Agenda

- **Introduction to cloud technologies**
 - What is cloud computing?
 - How does it work?
 - How can it be used?
- **Application of cloud technologies in the logistics industry** (in particular for freight forwarders)
 - What types of solutions are available?
 - What are the benefits?
 - Examples of use/case studies.
- **Challenges and main concerns of applying cloud technologies**
- **Lessons learned for maximized benefit**
- **Possible future developments for cloud technology**
- **Q & A**



Introduction to Cloud Technologies

A primer to cloud technologies: what are they,
how they work and types of solutions

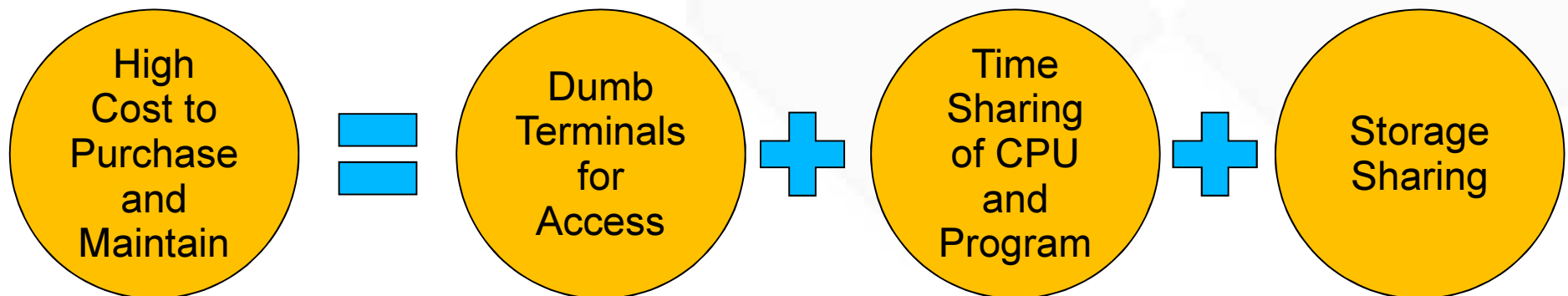


History of Cloud Computing

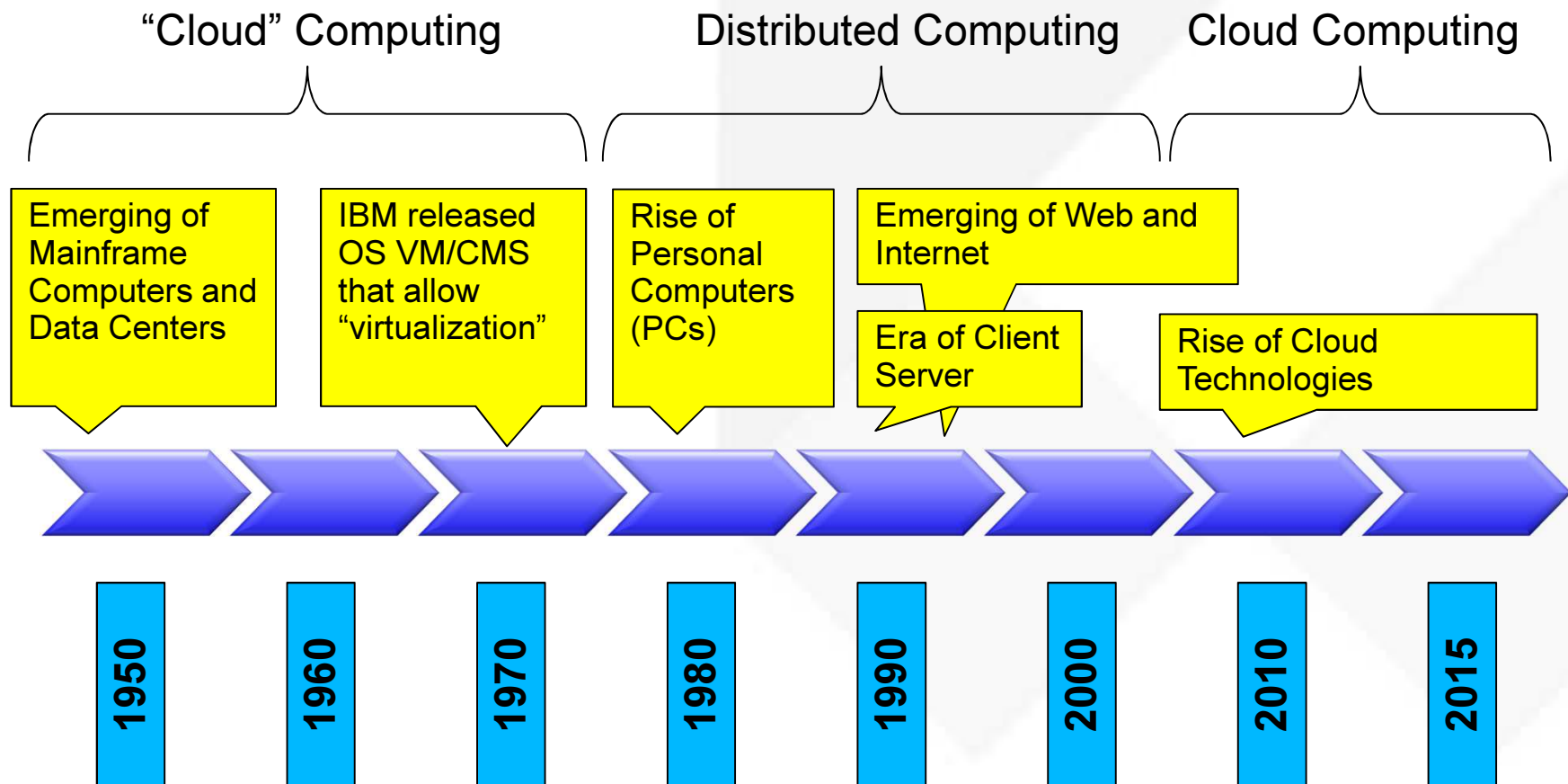


Picture courtesy from IBM archives

Cloud computing concepts dates back to the 1950s where main frame computers were used by large corporations and universities.



Timeline on Evolution of Computing



What Is Cloud Computing?

Definition in
Publication
800-145 by

NIST

**National Institute of
Standards and Technology**
U.S. Department of Commerce

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction.

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

Five Essential Characteristics (by NIST)

On-demand self-service.	A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service provider.
Broad network access.	Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g., mobile phones, tablets, laptops, and workstations).
Resource pooling.	The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g., country, state, or datacenter). Examples of resources include storage, processing, memory, and network bandwidth.
Rapid elasticity.	Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time.
Measured service.	Cloud systems automatically control and optimize resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g., storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported, providing transparency for both the provider and consumer of the utilized service.

https://www.yunbaogao.cn/report/index/report?reportId=5_5404

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Models (by NIST)

aaS
(Software as a Service)

Provision of the provider's business and user applications running on a cloud infrastructure

PaaS
(Platform as a Service)

Programming platform to deploy onto the cloud infrastructure consumer applications created using programming languages, libraries, services, and tools supported by the provider

IaaS
(Infrastructure as a Service)

Provision processing, storage, networks, and other fundamental computing resources