Distributed Cloud Computing

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Seminar Contents

- **Introduction** to Distributed Cloud Computing.
- **What** is Distributed Cloud Computing?
- **Key Characteristics and Features** of Distributed Computing.
- **How does** Distributed Computing **Work**?
- **Types** of Distributed Cloud Computing.
- **Examples** of Distributed Cloud Computing.
- **Advantages** & **Disadvantages**.
- **Conclusion**.

What is the
Distributed Cloud?

DISTRIBUTED CLOUD SERVICES = DISTRIBUTED TO DIFFERENT PHYSICAL LOCATIONS

Public Cloud + **Hybrid Cloud** + **Edge Computing** = **Distributed Cloud**
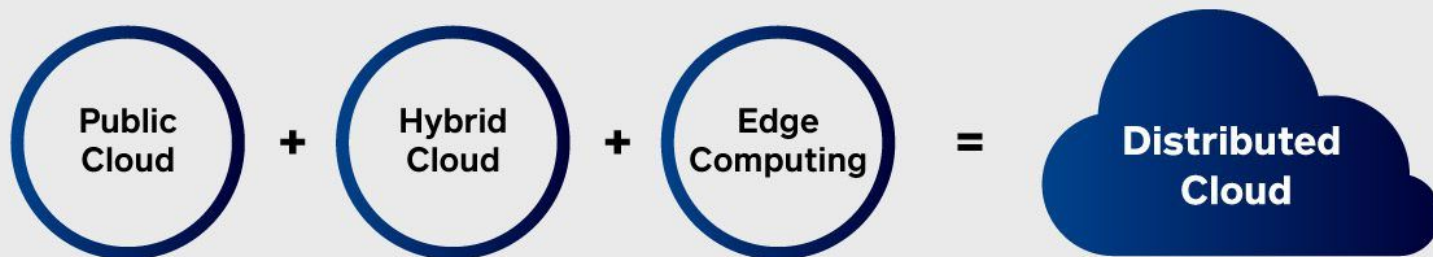
BENEFITS:

| Helps with low-latency scenarios | Reduces data costs | Satisfies laws that say data must remain in a specific geographical area |

Distributed cloud is a public cloud computing service that **lets you run public cloud infrastructure in multiple different locations** – not only on your cloud provider's infrastructure but on premises, in other cloud providers' data centers, or in third-party data centers or colocation centers – and **manage everything from a single control plane.**

Distributed Cloud Computing

VS

Cloud Computing

ALLOWS USERS TO SOLVE A PROBLEM OVER DISTRIBUTED AUTONOMOUS COMPUTERS THAT COMMUNICATE OVER A NETWORK

PROVIDES ON-DEMAND IT RESOURCES AND SERVICES

3 TYPES:

Distributed Computing Systems

Distributed Information Systems

**Distributed Pervasive Systems**

3 TYPES:

Private Clouds

Public Clouds

Hybrid Clouds

- **Cloud Computing** – cloud computing refers to **providing on-demand IT resources and services** like server, storage, database, networking, analytics, and software over the internet to users and customers. It is typically classified into three different types: p**rivate, public, and hybrid cloud**.

- **Distributed Cloud Computing** – distributed cloud computing allows users to solve a problem over distributed autonomous computers that communicate over a network. This technique is highly efficient as it **allows multiple computers to collaborate quickly and solve a single problem**. It is classified into three different types: **distributed computing systems, distributed information systems, and distributed pervasive systems**.

Key Characteristics and Features of Distributed Computing
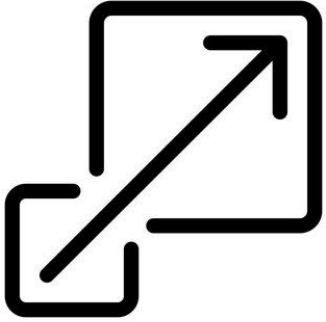
- **Scalability**: A distributed computing system **must expand** with the development and growth of the tasks. Moreover, it is an important feature that requires additional processing units or nodes in the network.

- **Concurrency**: Components in a distributed system **run concurrently**. They do not function on a "global clock", that is to say, they execute tasks that occur **out of sequence** and a various rates.

# Key Characteristics and Features of Distributed Computing

- **Availability**: In case there is a failure in one of the nodes, the **other nodes continue** to function. Hence, the execution takes place easily **without disrupting** the complete computation.

- **Transparency**: An external programmer or an end-user views the system as **one computational unit**. Therefore, it enables users to associate with a logical device and **avoid concerns regarding the system architecture**.

Key Characteristics and Features of Distributed Computing

- **Heterogeneity**: It is also important to know that the components in a distributed computing system are **non-contemporary**. As a result, this enables it to **expand and incorporate additional components**.

- **Replication**: Most importantly, distributed systems also **allow users to share and transfer information and messaging**. Therefore, this **ensures consistency** within resources like software and hardware components.
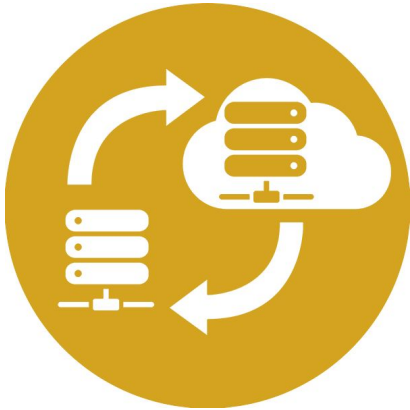
How does Distributed Computing Work?
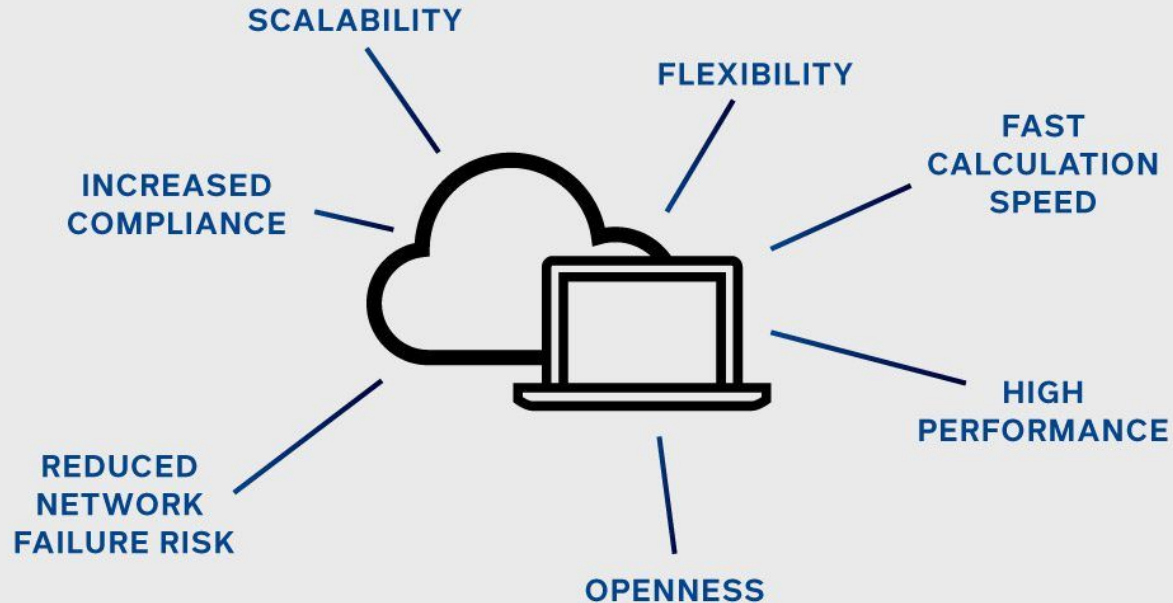
Types of Distributed Cloud Computing

- **Information Systems** : It refers to the objective of distributing information throughout the systems in various servers through different communication models.
- **Pervasive Systems** : It refers to the distributed system that incorporates embedded computing devices. Moreover, pervasive systems are more unstable in comparison to"traditional" distributed systems.
- **Computing Systems** : This type of system implies the use of computers that connect to a single network to transfer messages and information to monitor activities.

Examples of Distributed Cloud Computing

- **Edge Computing.**
- **Automotive Industry.**
- **Healthcare.**
- **Content Delivery Networks.**

Advantages of
Distributed Cloud Computing

SCALABILITY

FLEXIBILITY

FAST
CALCULATION
SPEED

INCREASED
COMPLIANCE

HIGH
PERFORMANCE

REDUCED
NETWORK
FAILURE RISK

OPENNESS

- **Increased compliance:** thanks to the distributed cloud's location-specific model, it ensures that distributed clouds follow regulatory requirements that data must be in a specific customer location.
- **Reduced network failure risk:** cloud services can reside in local or semi-local subnets, allowing them to operate intermittently untethered. Therefore, a system crash on one server does not affect other servers.
- **Scalability:** In distributed computing systems, more machines can be added as needed, which naturally increases the number and availability of locations where cloud services can be hosted or from where they can be consumed (compute zones)
- **Flexibility:** It is much easier to install, implement, and debug new services.
- **Fast calculation speed:** A distributed computer system is faster than other systems because it can leverage the computing power of multiple computers. Further, the distributed cloud enables more responsive communications for specific regions.
- **Openness:** the distributed cloud can be accessed both locally and remotely.
- **High performance:** Unlike centralized computer network clusters, the distributed cloud can provide higher performance and better cost performance.

Disadvantages of Distributed Computing

- **Difficult troubleshooting**: Troubleshooting and diagnostics are more difficult due to distribution across multiple servers.
- **Less software support:** Less software support is a major drawback of distributed computer systems.
- **High network infrastructure costs**: Network basic setup issues, including transmission, high load, and loss of information.
- **Security issues**: The characteristics of open systems make data security and sharing risks in distributed computer systems.

Conclus'i'on

- Distributed cloud computing expands the traditional, large data center-based cloud model to a set of distributed cloud infrastructure components that are geographically dispersed.

- Distributed cloud computing continues to offer on-demand scaling of computing and storage while moving it closer to where these are needed for improved performance.

- Edge computing is a complementary aspect of distributed cloud computing, and represents the farthest end of a distributed cloud architecture.

Thanks

From the clouds