IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

STUDY OF ARCHITECTURE IN CLOUD COMPUTING

Lina Suresh Khaire Department of IT GMVCS Tala University Of Mumbai

Riya Sudhir Khaire Department of IT GMVCS Tala University Of Mumbai

Rutuja Santosh Amle Department of IT GMVCS Tala University Of Mumbai

Akib Anis Bade Department of IT GMVCS Tala University Of Mumbai

Mrs. M. M. Wadhawal
Assistant Professor GMVCS
University Of Mumbai

ABSTRACT :-

Cloud computing architecture is the backbone of modern digital infrastructure offering on demand access to computing resources via the internet. The architecture is designed to support scalability, flexibility, and high availability, enabling efficient deployment of services across different models such as infrastructure as a services (IaaS), platform as a services (PaaS), and software as a services (SaaS). This paper explores the components and layers of cloud computing architecture, discusses key technologies like virtualization and containerization, and identifies challenges including latency, data security, and interoperability. A structured approach is proposed for building resilient and secure cloud environments.

KEYWORDS :-

Cloud Computing, Architecture, Virtualization, IaaS, PaaS, SaaS, Scalability, Data Security, Distributed Systems

I. INTRODUCTION :-

Cloud computing has emerged as a fundamental paradigm in delivering computing services over the internet. Organizations today rely on cloud platforms to deploy applications, store data, and manage complex operations. The architecture of cloud computing plays a pivotal role in ensuring efficient resources allocation, data management, and services delivery. At its core, cloud computing architecture consist of frontend interfaces (user clients), backend infrastructure (servers, storage, databases), and a management layer that orchestrates these components.

What is Cloud Computing Architecture ?

Cloud computing architecture refers to the components and subcomponents required for cloud computing. These components typically consist of:

Fronted platform (client side)

Backend platform (servers, storage, etc.)

Cloud based delivery

Network (internet)

Components Of Cloud Computing Architecture :-

Fronted (client side) :- Includes user interfaces and applications used to access cloud services.

Examples: Web browsers, thin clients, mobile apps.

Backend (server side) :-

Application Servers :- Running cloud applications.

Storage Systems :- Databases, distributed file systems.

Resources Management :- Load balancing, resources allocation

Virtual Machines (VMs) :- Abstract hardware resources

Types Of Cloud Computing Architecture :-

1 - Public Cloud :-

Managed by : Third party providers (e.g., AWS, Azure, Google cloud)

Access : Shared infrastructure; used by multiple customers

Examples : Google Drive, Microsoft Azure, Dropbox

2 – Private Cloud :-

Managed by : The organization or a third party exclusively for one organization

Access : Restricted to the organization

Examples : On premise data centers using VMware or OpenStack

3 - Infrastructure as a Services (IaaS) :-

Provides : Virtualized computing resources over the internet

Examples : Virtual network services for managing network resources.

II. METHODOLOGY :-

1 – Requirements analysis :-

Identify business needs :- Understand the goals (e.g., scalability, cost reduction, flexibility)

Compliance and regulatory requirements :- E.g., GDPR, HIPAA, etc

2 – Security and compliance planning :-

Implement Identity and Access Control (e.g., RBAC, MFA)

Data encryption (at rest and in transit)

3 – Scalability and performance planning :-

Content Delivery Network (CDN) integration

Monitoring and performance tuning

III. CONCLUSION :-

Cloud computing architecture is the backbone of modern digital infrastructure. A deep understanding of its design, components, and evolving trends is critical for developing robust, scalable, and secure applications. As the industry evolves, new paradigms like edge computing and serverless architecture are shaping the future of cloud computing. Cloud Computing architecture is a critical enabler of modern digital transformation. A well structured cloud architecture ensures high availability fault tolerance, and elasticity.

REFERENCES :-

1 – Ghosh, R., & Shah, N. (2020). Secure and Scalable Cloud Architecture: Best Practices. IEEE Cloud Computing, 7(1), 40-49

2 – Armbrust et al. (2010). A view of Cloud Computing. Communication of the ACM.

3 – Mell, P., & Grance, T. (2011). The NIST Definition of Cloud Computing.