WIPRO NGA Program – CSI-DC Batch-6

Capstone Project Presentation – 05 May 2024

Project Title Here - Cloud Computing

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Introduction

What is Cloud Computing?

Cloud computing is the delivery of computing services—including servers, storage, databases, networking, software, analytics, and intelligence—over the Internet

History of Cloud Computing

Early Concepts:

- Time-Sharing: A method from the 1960s allowing multiple users to share computing resources.
- Mainframes: Centralized, powerful computers used for large-scale tasks.

Evolution:

- Virtual Machines (VMs): Enabled multiple operating systems to run on a single physical server.
- The Cloud Era: Began with the mid-2000s launch of Amazon Web Services (AWS).

Milestones:

- 2006: AWS launches services like EC2 and S3.
- Late 2000s: Growth of SaaS applications like Salesforce.

Types of Cloud Computing

Public Cloud:

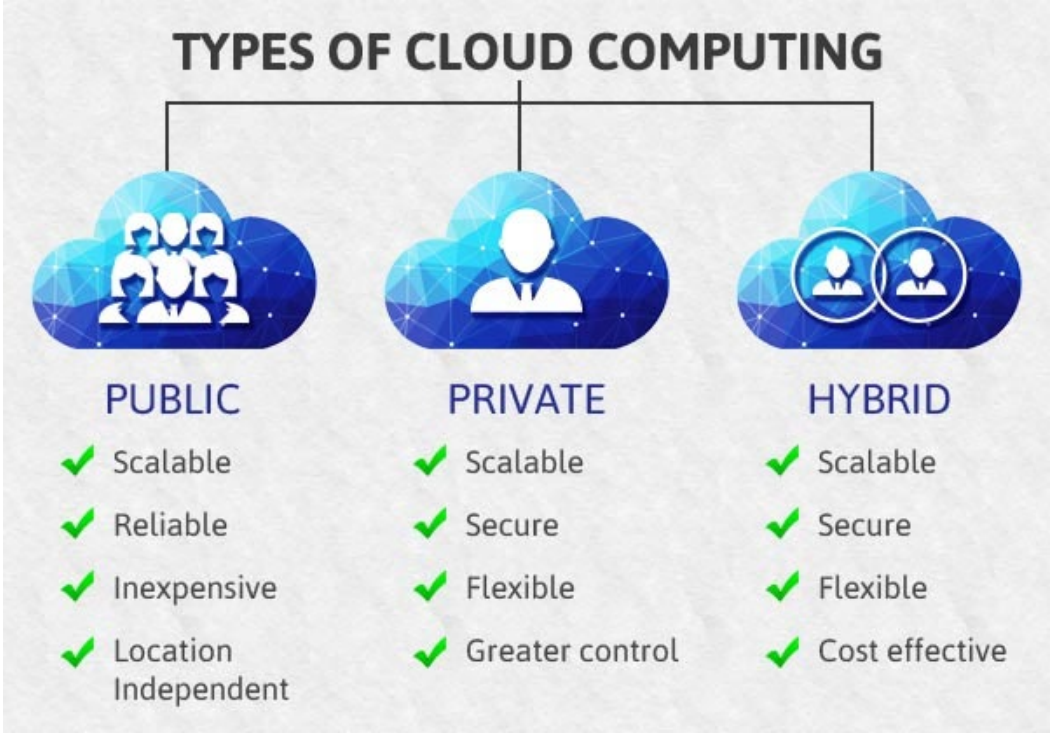
- Services offered over the public internet, accessible to anyone.
  Examples: AWS, Microsoft Azure

Private Cloud:

- Cloud infrastructure operated solely for a single organization, offering more control and privacy.

Hybrid Cloud:

- Combines public and private clouds, allowing data and applications to be shared between them.

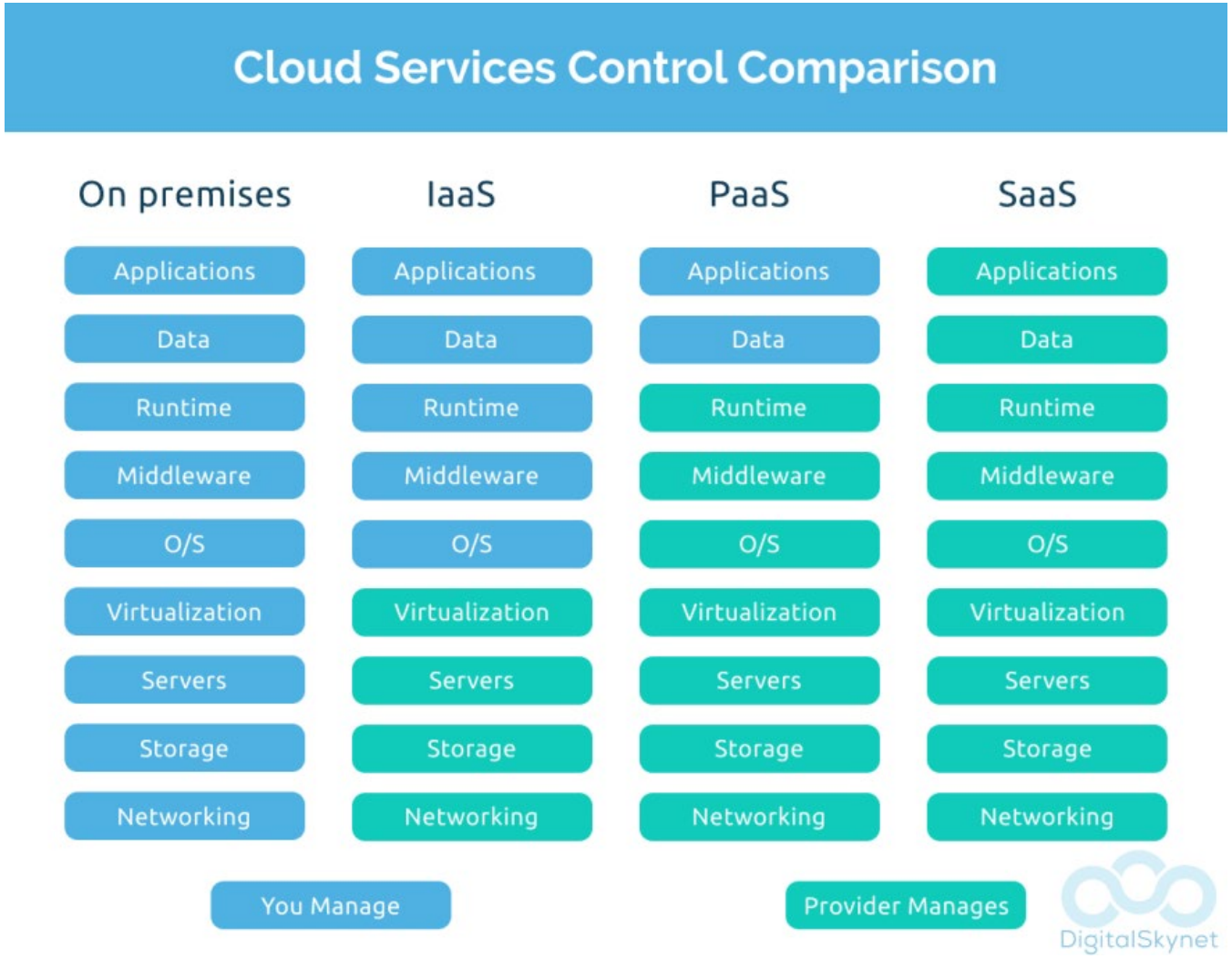


Cloud Service Models

Infrastructure as a Service (IaaS):
Provides virtualized computing resources over the internet.
Examples: AWS EC2, Google Compute Engine

Platform as a Service (PaaS):
A platform that allows customers to develop, run, and manage applications without dealing with infrastructure.
Examples: Google App Engine, Microsoft Azure

Software as a Service (SaaS):
Delivers software applications over the internet, usually on a subscription basis.
Examples: Google Workspace, Salesforce



Benefits of Cloud Computing

Scalability:
Easily scale computing resources up or down based on demand.

Cost Efficiency:
Eliminates the need for capital expenses on hardware and software; pay only for what you use.

Accessibility:
Access services and data from anywhere with an internet connection.

Security:
Robust security measures offered by cloud providers.

Disaster Recovery:
Reliable and faster cloud-based backup and recovery solutions compared to traditional methods.

Popular Cloud Providers

Amazon Web Services (AWS):
The most widely adopted cloud platform, offering a vast range of services.

Microsoft Azure:
Integrates with Microsoft products and offers a wide range of PaaS and IaaS services.

Google Cloud Platform (GCP):
Known for powerful data analytics and machine learning services.

Other Providers:
IBM Cloud, Oracle Cloud, Alibaba Cloud.

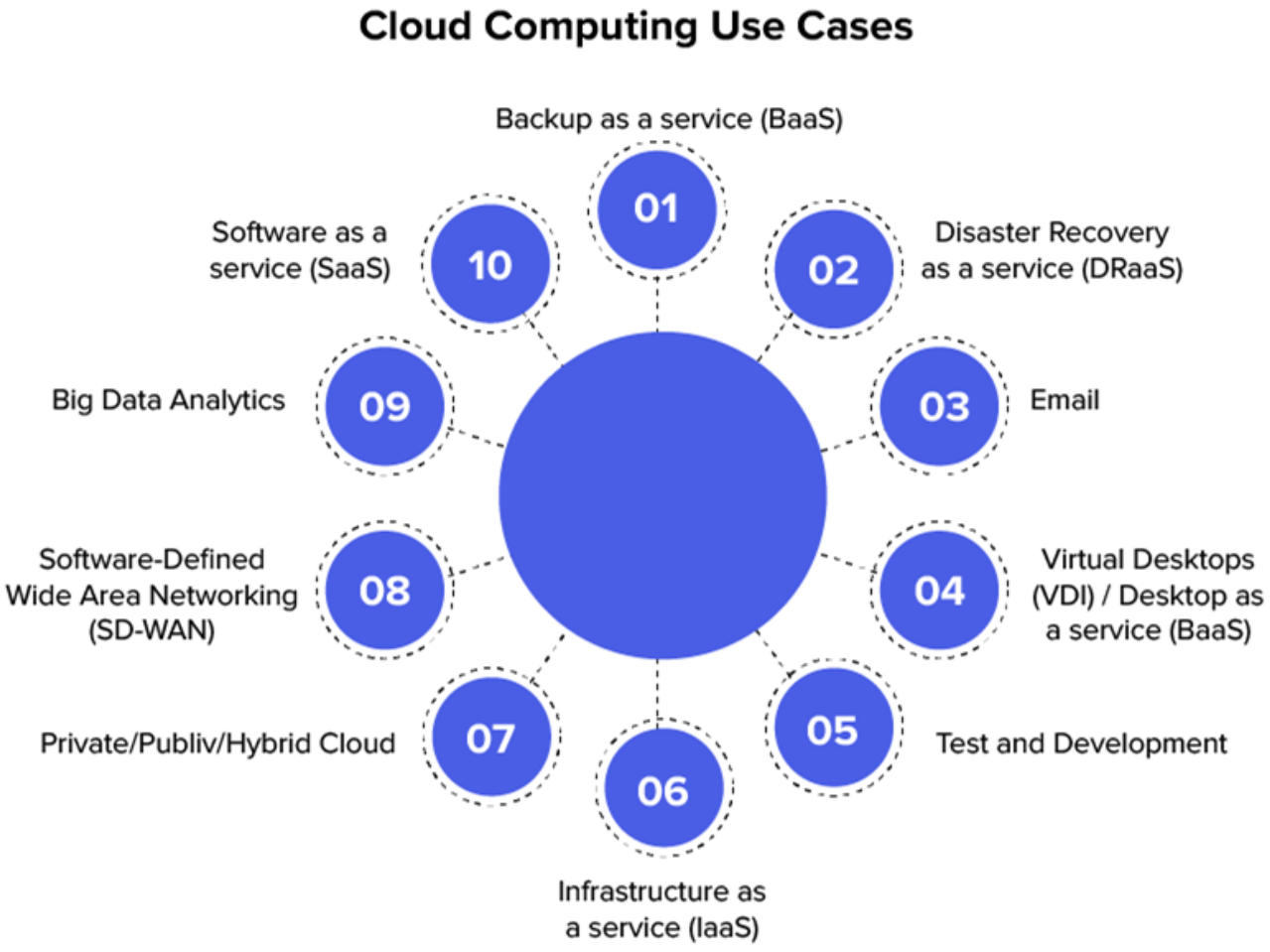
Use Cases of Cloud Computing

Business Applications:
Running enterprise applications like CRM, ERP, and collaboration tools on the cloud.

Data Storage & Backup:
Securely storing large amounts of data, accessible from anywhere.

Big Data & Analytics:
Processing large datasets using cloud-based tools and deriving insights through analytics.

Development & Testing:
Rapid development and testing of applications with scalable resources.



Cloud Security

Importance of Cloud Security:
Protecting data, applications, and services from potential threats and breaches.

Common Threats:
Data breaches, insecure APIs, account hijacking, insider threats.

Security Best Practices:
Encryption, regular security audits, multi-factor authentication, and compliance with standards like GDPR, HIPAA.

Challenges in Cloud Computing

Data Privacy & Compliance:
Ensuring data storage and processing align with regional laws and regulations.

Downtime & Reliability:
Risk of service outages and ensuring business continuity.

Cost Management:
Controlling cloud costs and avoiding overspending on services.

Vendor Lock-In:
Difficulty in migrating services or data from one cloud provider to another due to proprietary technologies.

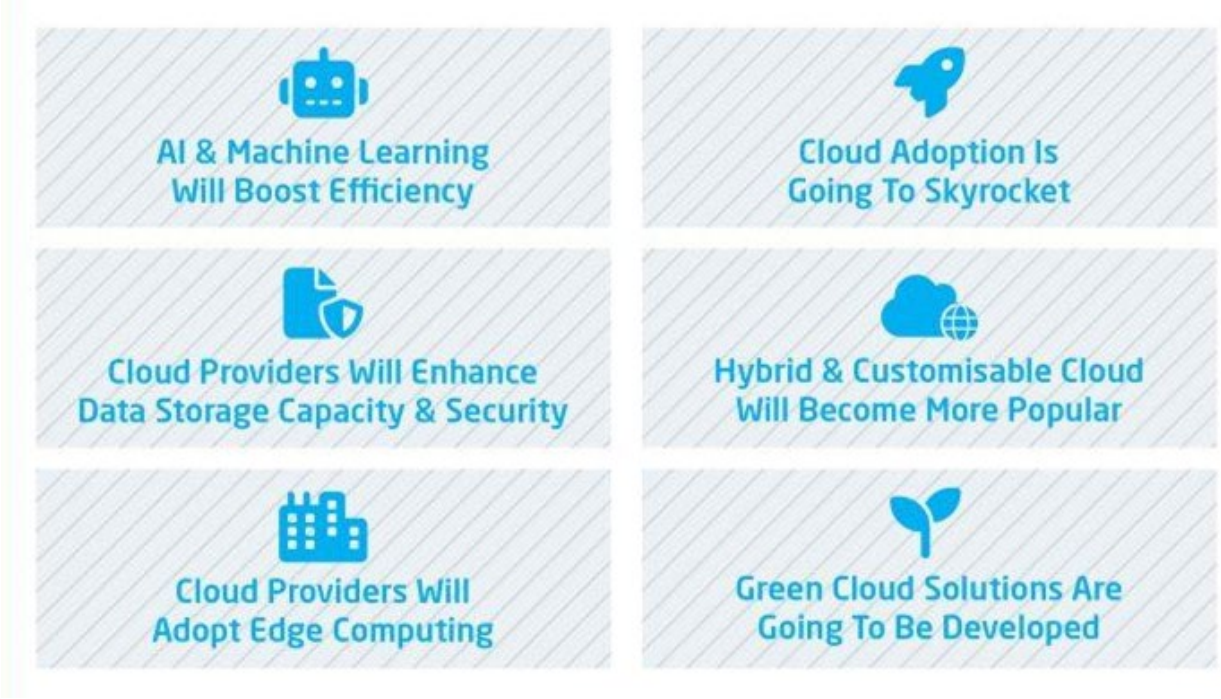
Future of Cloud Computing

Edge Computing:
Processing data closer to where it’s generated to reduce latency and bandwidth use.

AI & Machine Learning Integration:
Leveraging cloud resources for AI/ML model training, deployment, and scaling.

Serverless Computing:
Running functions and microservices without managing underlying infrastructure.

Quantum Computing Potential:
Future integration of quantum computing with cloud services to solve complex problems.



Case Studies

Netflix & AWS:

Netflix uses AWS to stream movies and shows, manage data, and scale resources based on demand.