

Edge Computing in Cloud Computing

Galiléa LE MOULLEC (Mun ID: 202415993), Syed Aaqil Abbas (Mun ID: 202388362), and Félicien MOQUET (Mun ID: 202415994)

Memorial University of Newfoundland, St. John's, Canada
glemoullec@mun.ca, saabbas@mun.ca, fmoquet@mun.ca

This document presents a preliminary and non-definitive outline of the topics we plan to address in our upcoming survey on Edge Computing. It serves as a roadmap, highlighting the key concepts, advantages, challenges, and future trends that will be explored in more depth in the final report.

1 Introduction

Edge Computing is gaining prominence in the field of cloud computing due to its ability to process data closer to the end-users, reducing the dependency on centralized cloud resources and optimizing bandwidth usage. This section introduces the topic, its relevance, and the objectives of the study.

1.1 Definition

Definition and key characteristics of Edge Computing.

1.2 Importance for Cloud Computing

Why Edge Computing is essential in modern cloud infrastructures.

1.3 Objectives of the Study

Scope and goals of studying Edge Computing.

2 Key Concepts of Edge Computing

2.1 Fundamental Principles

Core principles and operational model.

2.2 Difference with Centralized Cloud Computing

Comparing traditional cloud computing and Edge Computing.

2.3 Architecture and Key Components

Overview of the architecture, including edge nodes and devices.

3 Advantages and Challenges

3.1 Advantages

1. [Latency Reduction](#): Faster data processing and response times.
2. [Bandwidth Optimization](#): Efficient bandwidth usage by processing data locally.
3. [Enhanced Security and Privacy](#): Enhancing security and privacy by reducing data transfers.
4. [Decentralized Data Processing](#): Distributed computing model reducing cloud dependency.

3.2 Challenges

1. [Managing Distributed Resources](#): Handling computing resources across different edge nodes.
2. [Security and Regulatory Compliance](#): Addressing regulatory and security challenges.
3. [Interoperability with Cloud Computing](#): Ensuring seamless integration with existing cloud infrastructure.
4. [Cost and Maintenance of Edge Infrastructures](#): Evaluating the financial and operational implications.

4 Applications and Use Cases

4.1 Internet of Things (IoT)

[Role of Edge Computing in IoT networks.](#)

4.2 Autonomous Vehicles

Application of Edge Computing in self-driving vehicles.

4.3 Smart Cities and Intelligent Infrastructure

Enhancing urban management with edge-based technologies.

4.4 Industry and Manufacturing

[Industrial automation and real-time analytics.](#)

4.5 Healthcare and Telemedicine

Role of Edge Computing in healthcare and remote diagnostics.

5 Trends and Future Perspectives

5.1 Technological Evolution and Innovation

[Advancements and innovations in Edge Computing.](#)

5.2 Integration with Artificial Intelligence and 5G

How AI and 5G enhance Edge Computing.

5.3 Research Challenges and Future Developments

[Current challenges and future directions in research.](#)

6 Conclusion

6.1 Importance of Edge Computing in the Evolution of Cloud Computing

Summary of the role of Edge Computing in modern infrastructures.

6.2 Growth and Research Perspectives

Future research opportunities and expected advancements.