



# ***Impact of Emerging Technologies to ICANN***

---

Nashrah Fatima

# About me:

- 2nd year student at the University of Toronto
- Studying Communication Information Technology
- Interests in technology field and a associate in university club DEMA (Digital Enterprise Management Association), the largest academic association at the university. DEMA has won countless accolades year after year such as "Campus Club of the Year" and "Club Excellence Award and represents the ICCIT Department .
- Enjoys researching articles/blogs on topics surrounding the advancement of technology and AI and influence in technological age.

Contact:

[Nashrahfatima8@gmail.com](mailto:Nashrahfatima8@gmail.com)

Number: 6472319439



# Table of contents

01

1. Blockchain and  
Decentralized DNS

02

Internet of Things  
(IoT)

03

Artificial  
Intelligence (AI) and  
Machine Learning  
(ML)

04

5G Networks

05

Quantum Computing

06

Edge Computing



# Blockchain and Decentralized DNS



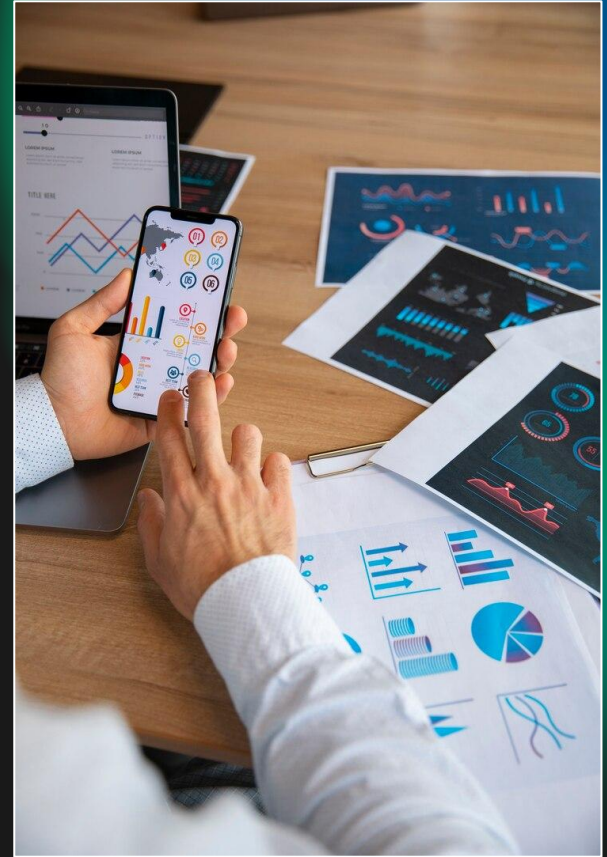
- The Domain Name System is often described as the phonebook of the internet, translating human-readable domain names into IP addresses.
- Blockchain technology has the potential to decentralize DNS records, mitigating risks associated with centralized control, such as single points of failure or censorship.

## *Advantages of Decentralized DNS*

- Enhanced Security
- Censorship Resistance

## *Real-world Example:*

Ethereum Name Service (ENS): ENS leverages the Ethereum blockchain to offer decentralized domain names, allowing users to register domain names that are fully controlled by the domain owner, not by a central registrar.



Internet users as a percentage of regional population:

| Region                     | 2018 | 2023 |
|----------------------------|------|------|
| Global                     | 51%  | 66%  |
| Asia Pacific               | 52%  | 72%  |
| Central and Eastern Europe | 65%  | 78%  |
| Latin America              | 60%  | 70%  |
| Middle East and Africa     | 24%  | 35%  |
| North America              | 90%  | 92%  |
| Western Europe             | 82%  | 87%  |

# Internet of Things (IoT)

## *The Impact of IoT on DNS*

Increased Volume of DNS Queries: IoT devices, rely on the internet for various services, including software updates, data synchronization, and remote control functionalities.

Need for Enhanced Scalability and Security: The increase in DNS queries necessitates improvements in DNS infrastructure to handle the higher load.

## *Security Challenges Posed by IoT Devices*

Vulnerability to Malware and Attacks: Many IoT devices are notorious for having inadequate security measures, due to their limited computing resources and the cost constraints in manufacturing.

DNS Rebinding Attacks: DNS rebinding is a technique that exploits the way web browsers trust DNS responses to allow malicious web content to interact with devices on a local network, potentially gaining unauthorized access.



# Artificial Intelligence (AI) and Machine Learning (ML)

The impact and application of Artificial Intelligence (AI) and Machine Learning (ML) in enhancing DNS security and optimizing its performance are significant developments in the field of cybersecurity and network management.

Their application within the domain of DNS security exemplifies how these technologies are revolutionizing our approach to cyber threats.

The application of AI and ML extends beyond threat detection to the optimization of DNS query routing.

AI systems can predict peak times and potential bottlenecks, dynamically adjusting the routing of DNS queries to mitigate these issues.



# 5G Networks

The rollout of 5G technology indeed brings transformative impacts on various aspects of telecommunications, including the Domain Name System (DNS).

## Impact

**Increased Speed and Volume of Data:** With 5G, the expected increase in data traffic speed and volume is significant. This is due to 5G's ability to support higher data rates, leading to more data-intensive applications and services being used.

**Low Latency Requirements:** One of the hallmark features of 5G technology is its promise of ultra-low latency, which is crucial for applications requiring real-time data exchange.

## Adaptation

**Enhanced DNS Resolution Strategies:** To cope with the demands brought about by 5G, DNS resolution strategies need significant enhancements



# Quantum Computing



Quantum computing promises to bring significant changes across various sectors due to its potential to solve complex problems much faster than classical computers. Regarding the DNS, quantum computing could impact both the security and efficiency of the DNS in several ways:

**Quantum Key Distribution (QKD) for DNS:** Quantum computing introduces the concept of QKD, which could provide a new level of security for DNS communications.

## **Security Enhancements and Challenges:**

Quantum computers could potentially break many of the cryptographic algorithms used to secure the internet, including those used within the DNS infrastructure for ensuring secure domain name lookups and preventing man-in-the-middle attacks



IBM's quantum center



# Edge Computing

The integration of edge computing into the DNS infrastructure represents a significant shift in how data is processed and managed across the internet.

## Improved Efficiency

Edge computing allows for more efficient handling of data by reducing the need for information to travel long distances to centralized data centers.

## Enhanced Security

Incorporating edge computing into DNS management can also bolster security measures.



## The Need for Continuous Evolution

As the internet continues to grow and evolve, the DNS infrastructure must also adapt. The integration of edge computing into DNS management is a testament to the ongoing evolution of internet technologies.



***Thank You For Listening***

---