

Secure Edge Computing in IoT Systems: Review and Case Studies

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OUTLINE

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- CHALLENGES
- CASE STUDIES
- CONCLUSION

INTRODUCTION

- Edge Computing is a distributed architecture, defined as the processing of data when it is collected.
- Data processing nodes in edge computing have less computation power compared to cloud servers.
- Employing of an edge computing technique is important .
- Review two case studies to illustrate the edge computing vision in real-world.

ARCHITECTURE

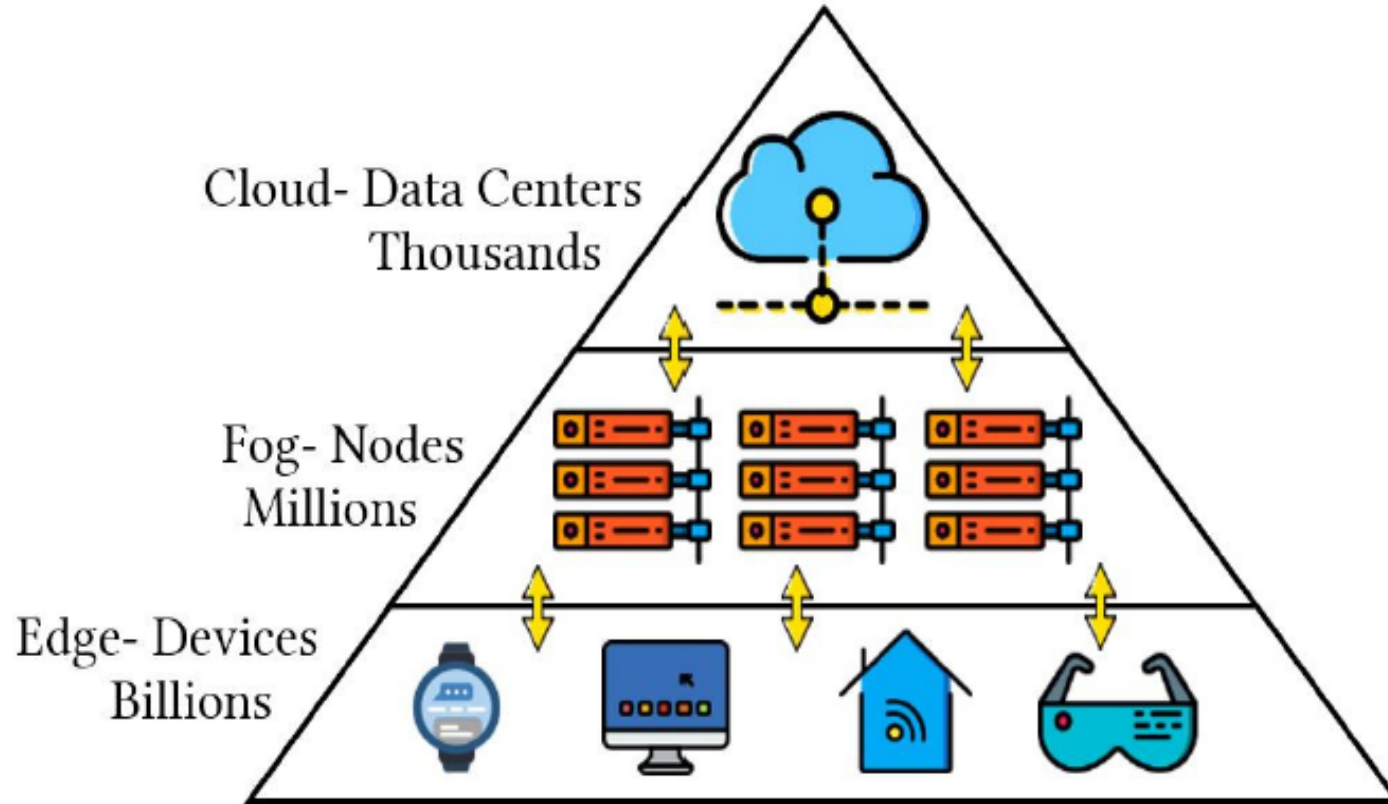


Fig. 1. Typical edge computing architecture.

CHALLENGES

- Public accessibility of edge nodes:
 - Risk associated by public /private organizations
 - The intended purpose of the device
 - Multi-tenancy on edge nodes
 - Minimum level of service
- Optimization Metrics.

CHALLENGES

- Public accessibility of edge nodes:
 - Risk associated by public / private organizations
 - The intended purpose of the device
 - Multi-tenancy on edge nodes
 - Minimum level of service
- Optimization Metrics.
- Tasks offloading.
- User privacy.

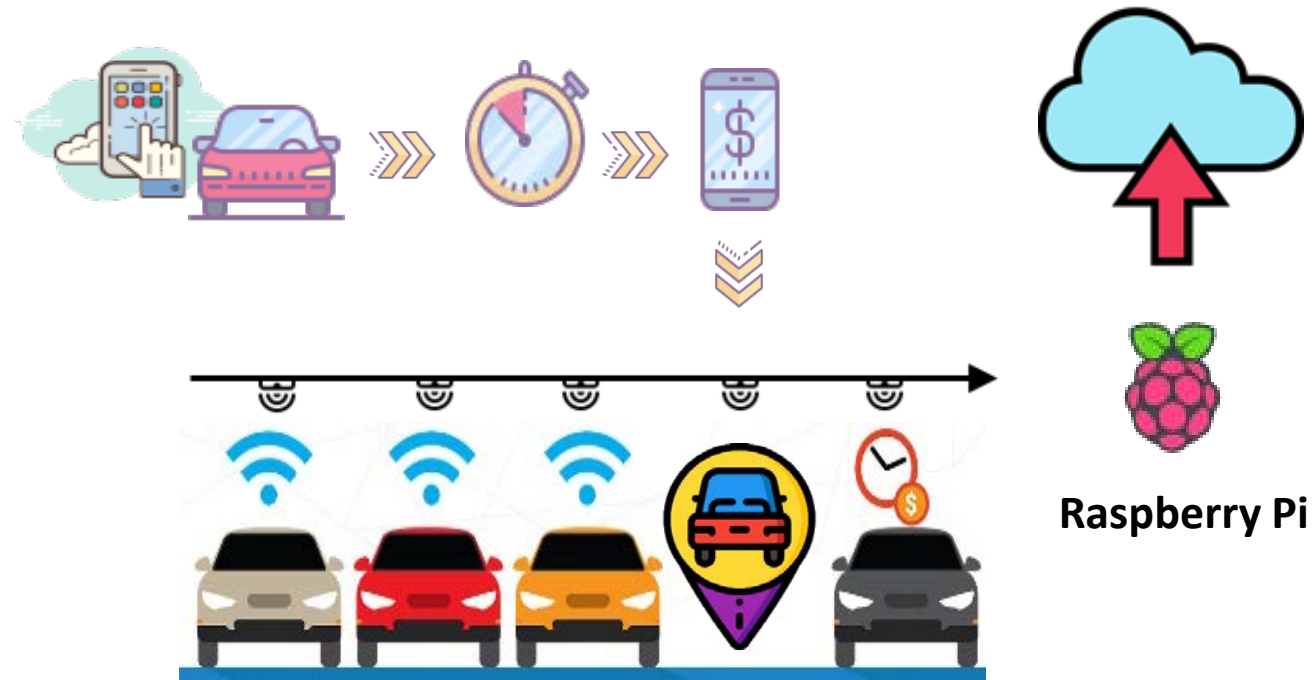
1. SMART PARKING SYSTEM

- A system that helps drivers to find a vacant spot using sensors in each parking space and smart phone.
- Smart Parking systems is usually powered via RFID, Ultrasonic detector, Infrared Sensors for item detection.

PROBLEM STATEMENT

- With increase in the population, number of vehicles increases and due to unmanaged parking it leads to many problems.
- In Downtowns, people face difficulties as an increasing number of vehicles creates congestion, waste of space and time..

EXAMPLE



ADVANTAGES

- Users can get learn about parking areas for particular locations.
- It saves user time in search of parking space available in such a large parking area.
- It excludes the need of human efforts for managing parking spaces.
- Users can pay online on the spot and confirm their space.
- Developing a smart parking solutions within a city solves the pollution problem

FUTURE SCOPE

- The system may be adjusted to integrate future self-driving automobiles.
- An efficient parking algorithms could be developed for the optimal consumption of resources.

2. CDN (Content Delivery Network)

What is a CDN?

- CDN is a server setup which allows for faster, more efficient delivery of files on a Website.
 - Distributed system.
 - Transparent to end users.

How does a CDN work?

- It does this by maintaining copies of content at different points of presence (POPs) along a global network to ensure quick client access and the fastest delivery possible.

A CDN provides a mechanism for

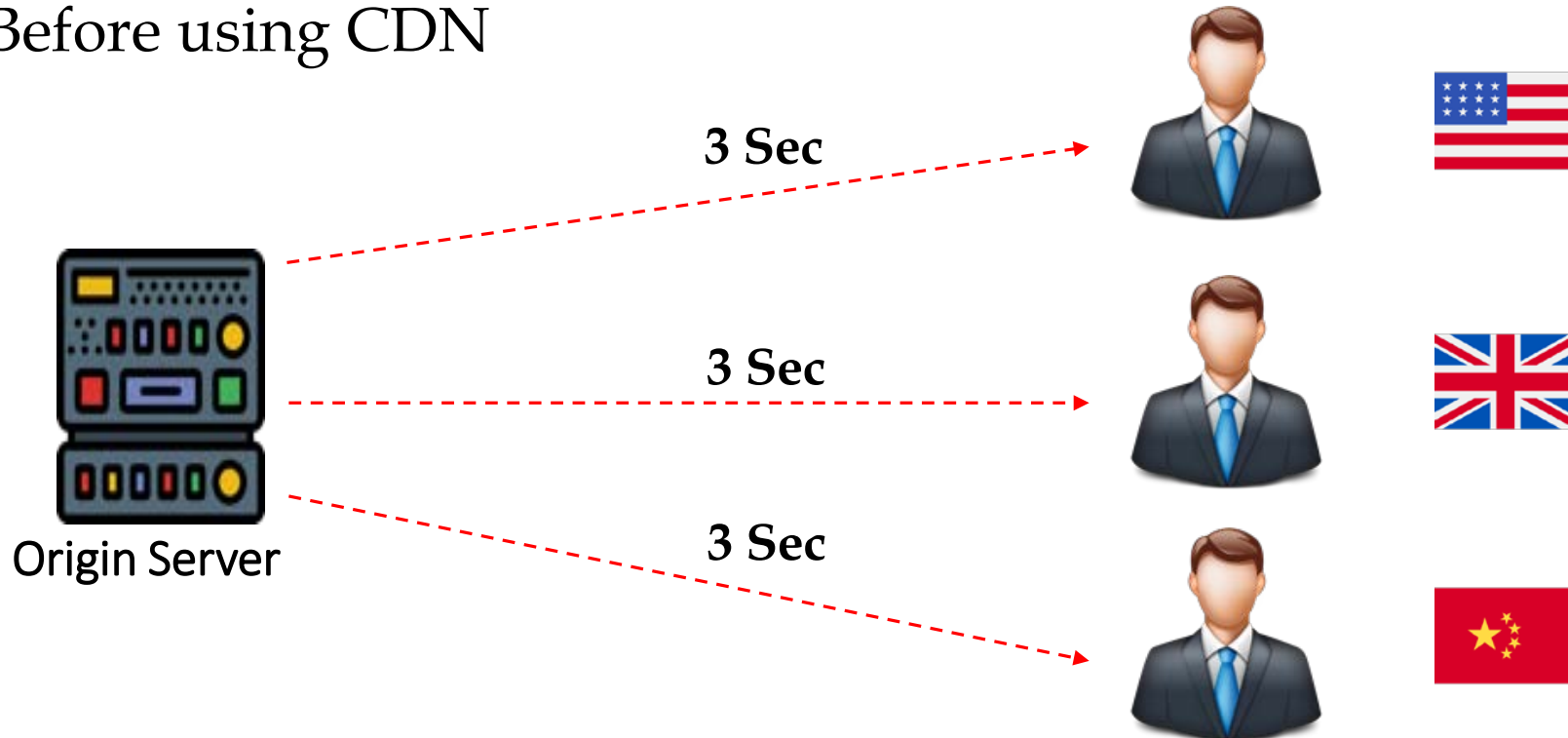
- Providing Users with a means to determine the servers that can deliver the content fastest.
- CDNs are operated by companies which charge content providers for the delivery services.
- Is a collaborative collection of network element spanning the internet .

ADVANTAGES

- 1) Botnets and spams attacks protection.
- 2) Enhancing global content availability.
- 3) Website security improvement.
- 4) Handle website traffic spikes.
- 5) Faster website page loads.

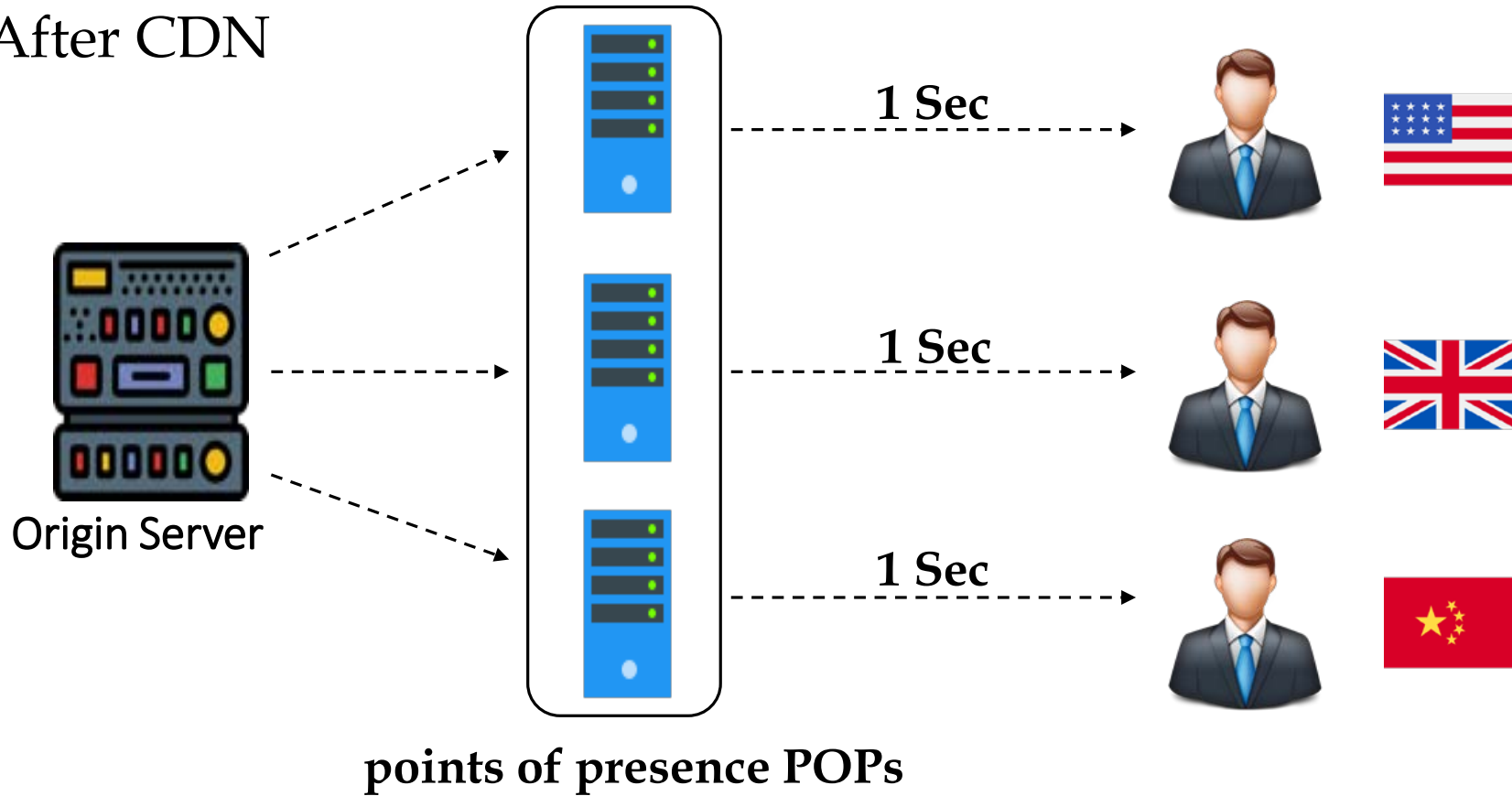
EXAMPLE

- Before using CDN

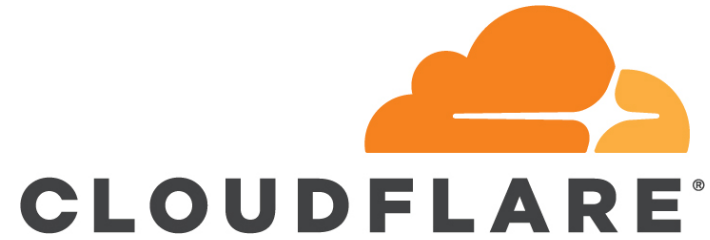


EXAMPLE

- After CDN



CDN Platforms



CONCLUSION

- Edge computing offers minimized latency and better quality of service (QoS)
- Presently, lots of services are pushed from the cloud to edge of the network.
- Bandwidth might also be conserved if a bigger portion of data can be taken care of at the edge instead of uploaded to the cloud.

CONCLUSION

- The difficulty of searching available parking lots has been completely eliminated.
- Smart Parking System saves user time in search of parking space available in such a large parking area.
- CDN performs transparent and effective delivery of content to the end-user.
- CDN improves the system performance on the internet.

QUESTIONS?



