

FOG IN 5G CURRENT OPPORTUNITIES & SECURITY CHALLENGES

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INTRODUCTION

Fog Computing

- Mediator between Cloud Computing & Edge Computing
- Computational and storage offloading
- Minimizes the usage of network bandwidth
- Reduces latency requirements

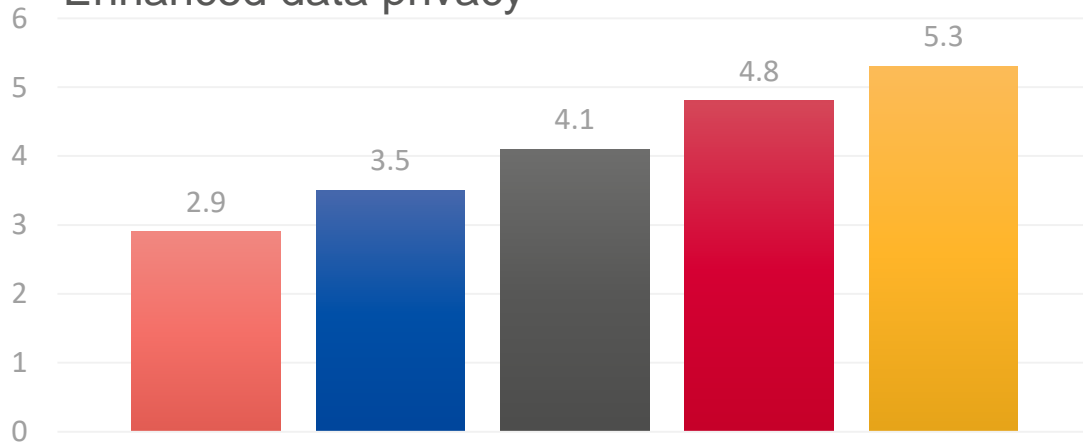
5th Generation Networks

- Cells
- Higher bandwidth than its predecessors
- Improves Quality of Service (QoS)
- SDN

INTRODUCTION

Fog Computing in 5G

- Latency improvements
- Response time improvements
- Increased Security
- Enhanced data privacy



Cellular IoT connections 2023 2024 2025 2026 2027

Landscape

- More than 64B IoT devices are expected worldwide by 2025¹
- Adopt efficient data dissemination services
- Energy Consumption

Forecast of IoT connections (in billions)¹

1. <https://techjury.net/blog/internet-of-things-statistics/>



SECURITY CHALLENGES

Single Point of Failures

- DoS in SDN controllers
- Resource exhaustion in SDN controllers and NFV hypervisors

Privacy

- Identity Management
- Authentication and Authorization
- Resource Access Control
- Sharing policy of information

MitM & Phishing

- Small Cells lack highly efficient handover authentication mechanisms
- Handover between HetNets nodes

End Device Tampering & Remote Management

- End devices vulnerable to physical attacks
- Electromagnetic eavesdropping
- Various network-based attacks over remote management



CURRENT OPPORTUNITIES & NEXT STEPS

Fog Privacy

- Efficient Encryption Techniques
- Bogus information
- User behaviour profiling
- Combination of Bogus information & user behaviour profiling

Trust & Rogue Node Detection

- Chain of trust
- End devices security

Resource Disclosure

- Attribute-Based Encryption (ABE) mechanisms
- Allow to encrypt data for multiple recipients
- Fog Computing Platform as a distributed trust authority

End Device Security

- Monitoring
- Logging
- Reporting



CURRENT OPPORTUNITIES & NEXT STEPS

Hybrid Cloud-Fog Computing

- Latency-sensitive applications
 - Public Protection
 - Disaster Relief
 - Real-Time Tele-Surgery
 - Autonomous Driving Applications

ROOF Computing

- Interaction between semi-autonomous devices with each other & the environment
- The context-aware decisions of such devices
- Real-time context building and decision making
- Backhaul connectivity to remote nodes and networks

THANK YOU FOR YOUR ATTENTION

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