EdgeIoT: Mobile Edge Computing for the Internet of Things[1]
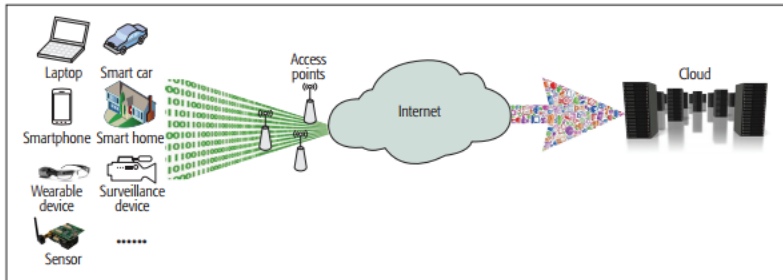
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12 11, 2016

Outline

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Introduction

- Today, a tremendous number of IoT device are appeared.
- Enormous data generated from the distributed IoT devices and transmit to remote cloud.
- **The smart ''brain'' processing big data via Internet of traditional IoT architecture.**
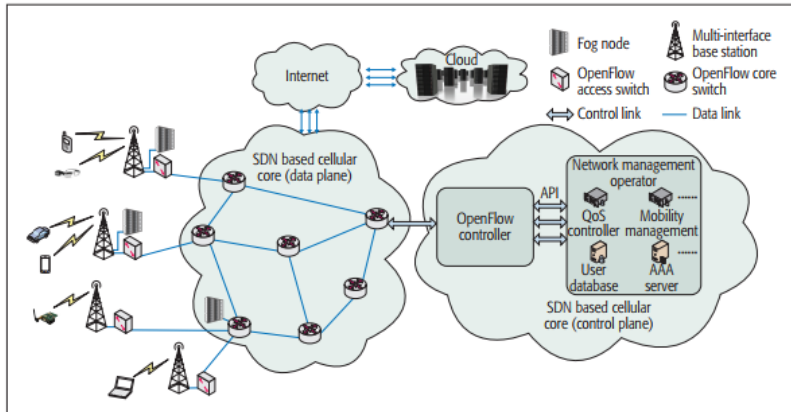
Introduction

Introduction

- This paper proposed IoT architecture, edgeIoT with three main ideas as followed.
  - edgeIoT architecture
  - hierarchical fog computing architecture
  - novel proxy virtual machine migration scheme
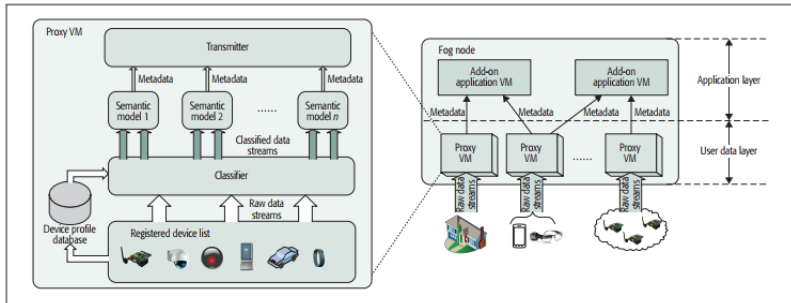
The EdgeIoT Architecture

The EdgeIoT Architecture

- ► The fog node can be directly connect to BS (local), or deployed at the edge of CN (remote) for different situation.

The Hierarchical Fog Computing Architecture

The Hierarchical Fog Computing Architecture

- ▶ Each proxy VM will match to one user.
- ▶ Device belongs to the user have to register to corresponded proxy VM.
- ▶ In proxy VM, the raw data will be processed by semantic model to generate metadata which will pass to application VM and not violate user privacy.
- ▶ For instance, in the terrorist detection application only need timestamp and location rather than the original image.

The Hierarchical Fog Computing Architecture

- ▶ The application VM also can be deployed locally, remotely and as an add-on.
- ▶ Local application VM can be applies to the ParkNet system.
- ▶ Remote application VM can be applies to navigation system.
- ▶ Add-on application VM can be created when some event occur, like terrorist detection system.
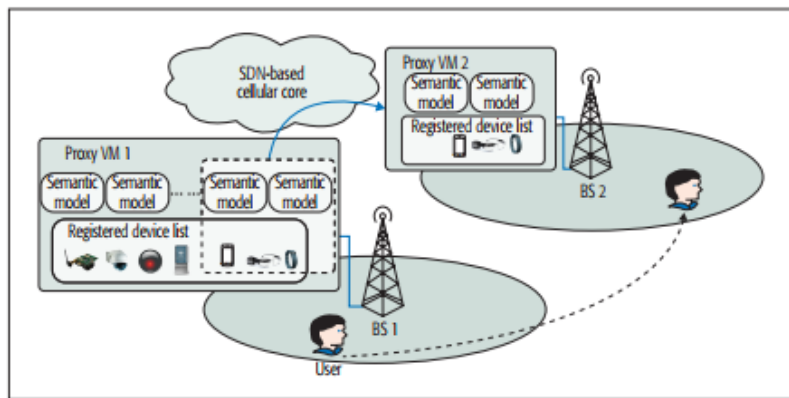
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The Hierarchical Fog Computing Architecture

- ▶ The location of proxy VM can be allocated dynamically.
- ▶ The proxy VM for mobile device can be decompose from the original one to reduce the E2E delay between device and proxy VM.

The Hierarchical Fog Computing Architecture

Proxy VM Mobility Management

- ▶ When the device roam from BS1 to BS2, it should report it's new location to MME, so that the new proxy VM can be create.
- ▶ There are two mechanisms to update the location for devices:
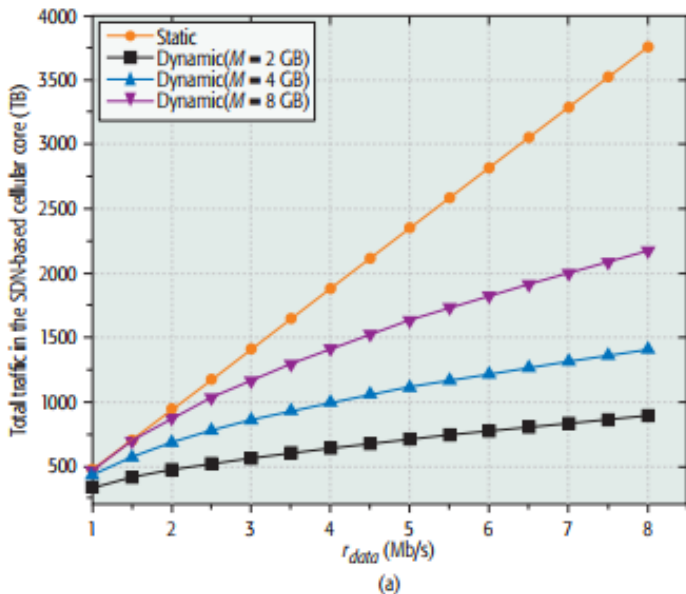 - each device equip a SIM card
  - use mobile phone as gateway
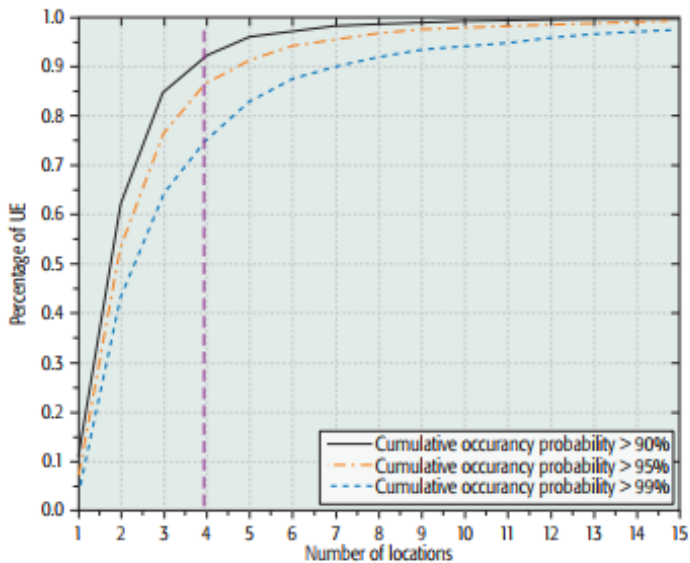
IoT Device Migration Management

- ► As mention before, proxy VM can be decompose and migrated among the fog nodes.

- ► It is not necessary to migrate the VM whenever the migration cannot reduce the traffic load.

IoT Device Migration Management

(a)

(b)

References

[1] X. Sun and N. Ansari, "EdgeIoT: Mobile Edge Computing for the Internet of Things," *IEEE Communications Magazine*, vol. 54, no. 12, pp. 22–29, December 2016.

Thanks for Your Attentions