
Internet of Things Networking Architectures, Handling New Internet Edges

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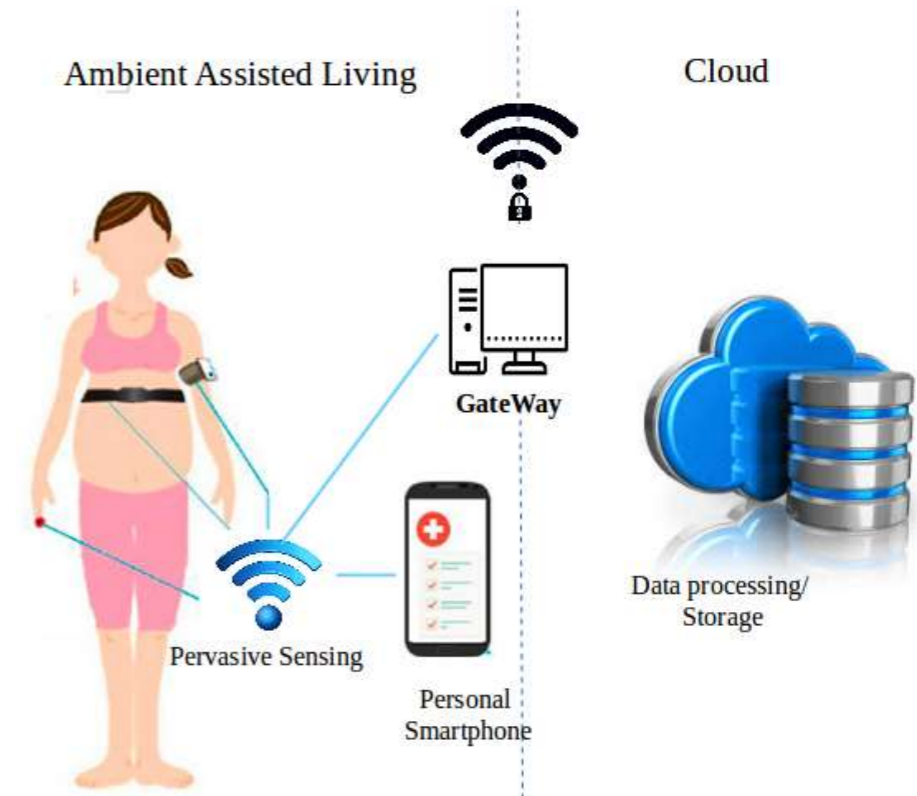
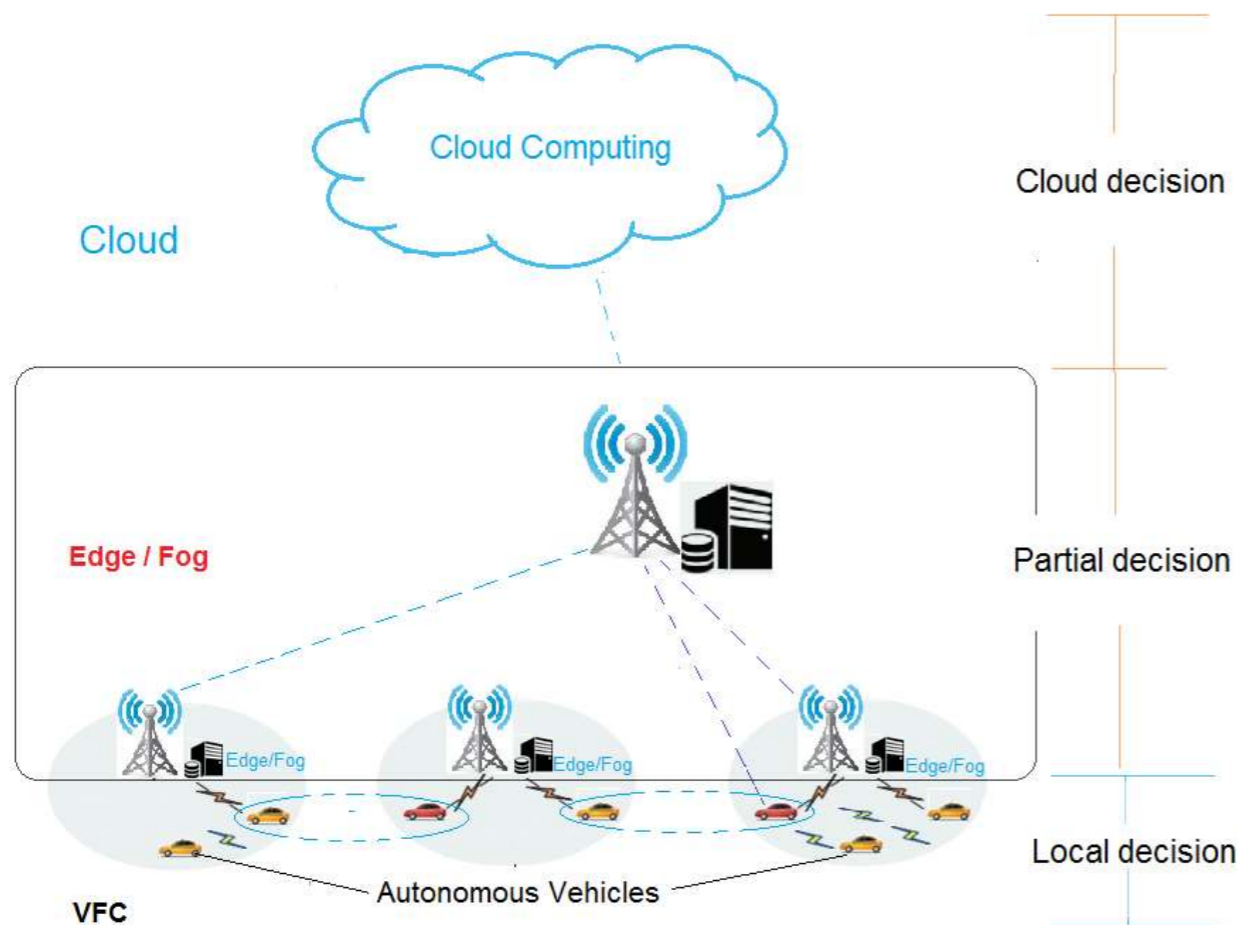
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New Scenarios for IoT

New Internet Edges

- **Internet of Things (IoT) integrates different scenarios**
 - Industrial IoT.
 - Consumer IoT/Personal IoT
- **New Internet Edges are increasingly mobile and heterogeneous**
 - Self-driving cars, satellites, personal devices...
- **Cloud computing does not cope with the new requirements**
 - Latency sensitive apps, limited energy devices



Communication in IoT Environments

The need for Unified Communication

IETF	ETSI	Industrie 4.0
<ul style="list-style-type: none"> • Focus on: IPv6, CoAP • Network layer interoperability • IPv6 in Low Power Networks; for resource constrained devices, etc. • Security, mobility, etc. 	<ul style="list-style-type: none"> • Application-independent 'horizontal' service platform which is capable of supporting a very wide range of services including smart metering, smart grids, eHealth, city automation, consumer applications and connected vehicles. • M2M communications interoperability • Data security and management, data transport, data processing • Focus on: interoperability (IPv6 based) 	<ul style="list-style-type: none"> • Common M2M Service Layer • Focus on: OPC-UA, DDS

IETF: Internet Engineering Task Force
 ETSI: European Telecommunications Standards Institute

- Lack of interoperability is a major issue
- New directions are going into publish/subscriber models
- Service de-centralization needs to be smoothly supported
- Communication needs to consider complementary cloud support (edge/fog computing)

Handling New Internet Edges in IoT

The IoT Lab Experimental Project @COPELABS
(09.18-07.19)

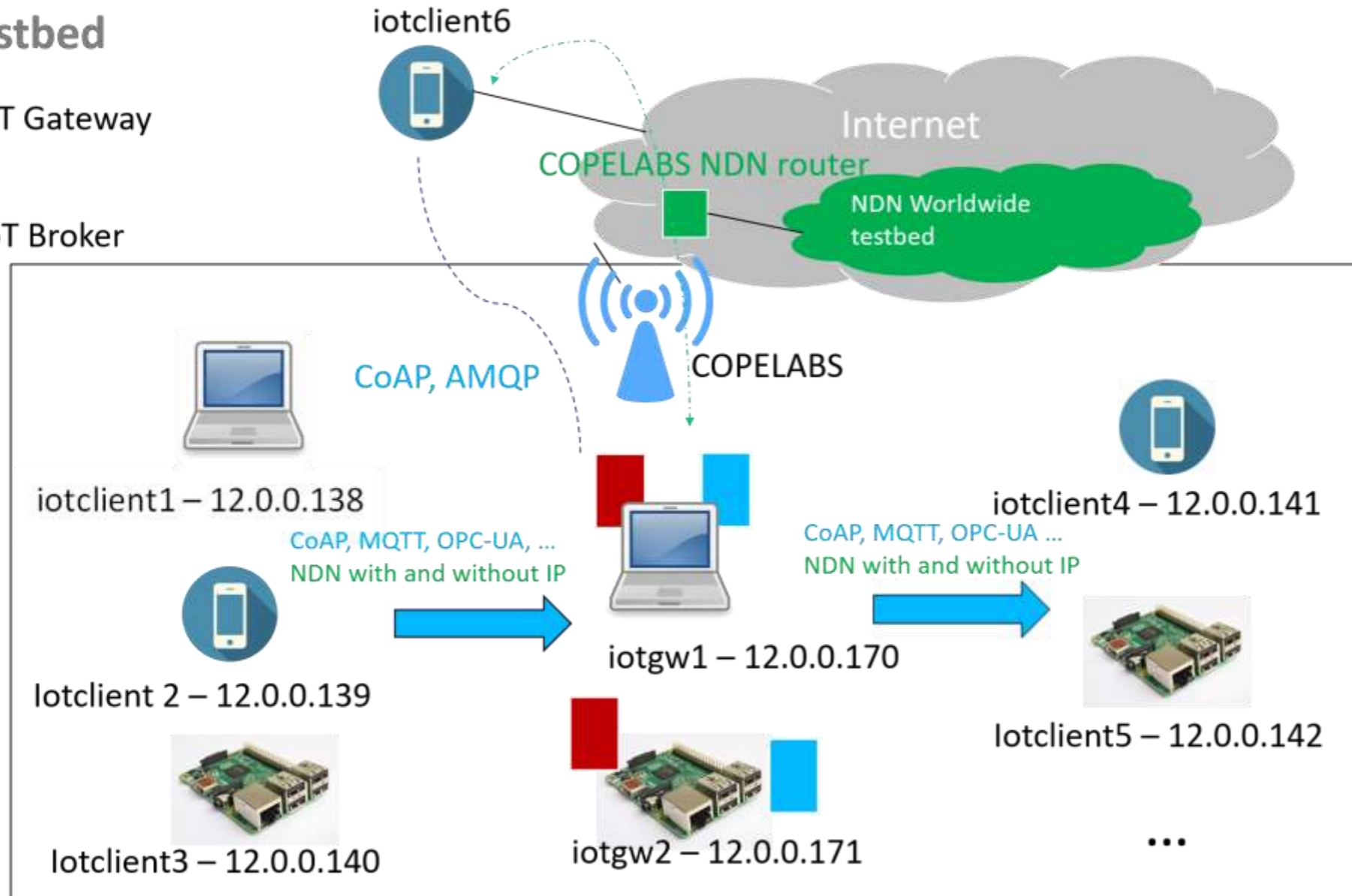


IoT Lab

Testbed

IoT Gateway

IoT Broker



Note: IPv4 and IPv6 accessible

Gateways will be accessible from the internet

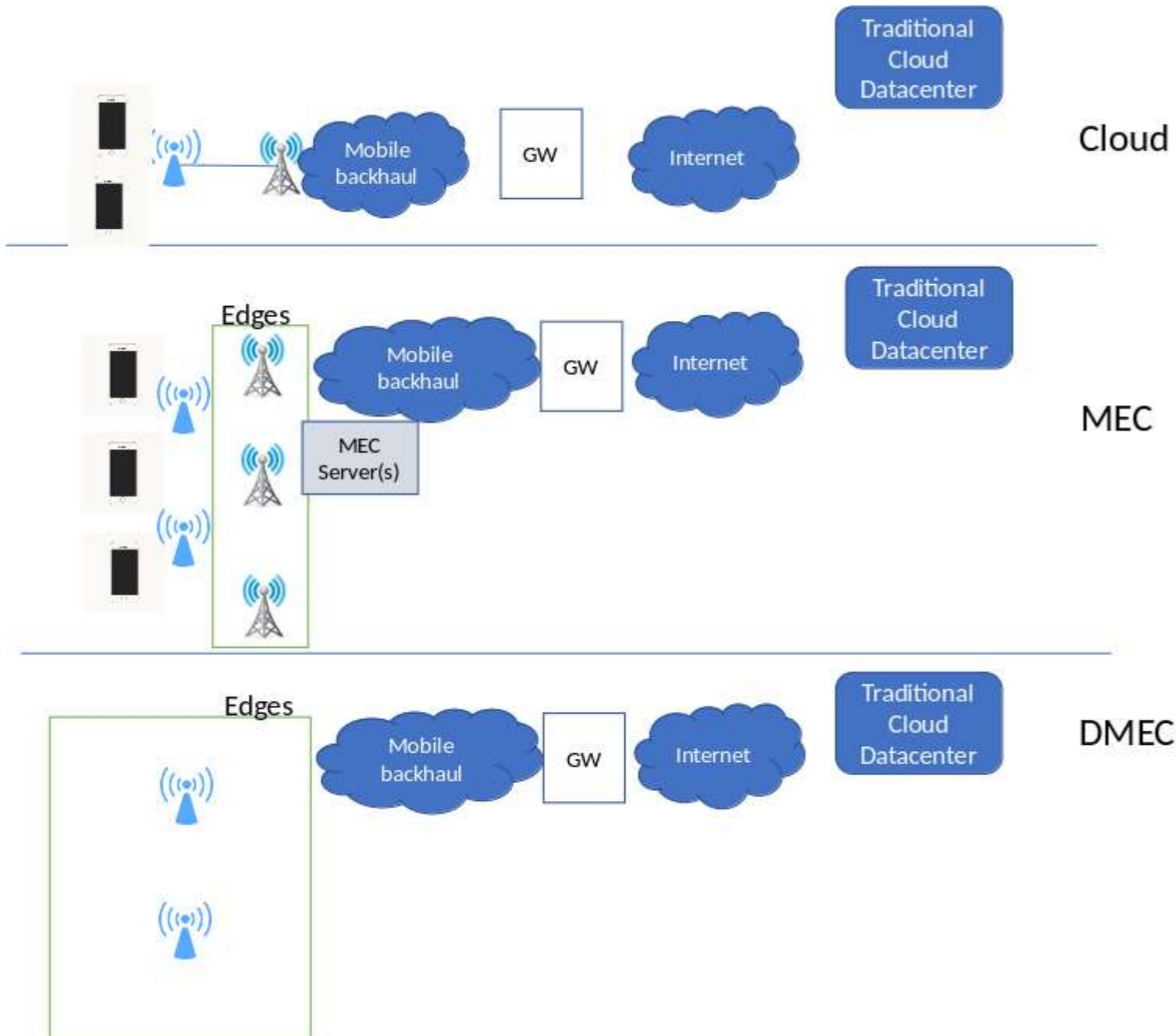
Goals

- Exploring and Evaluating Communication Paradigms in IoT
- Interconnected with other testbeds, e.g., **Named Data Networking; FIT-IoT**
- Better understanding of **Pros and Cons of information-centric approaches vs. IP-based approaches**
- Different protocols, which advantages and disadvantages

<http://copelabs.ulusofona.pt/index.php/research/projects/324-iotlab>

The IoT Lab Experimental Project

Ongoing Work



Rationale:

Mobile systems need to evolve to support **large-scale, data-centric** networking services by including deeper awareness of **mobile** crowd behavior and **context**.

Work in Progress

- Context-awareness to support DMEC, Daniel Silva, Rute C. Sofia (PhD)
- DMEC to support large-scale sensing, Liliana I. Carvalho, Rute C. Sofia (PhD)
- Performance evaluation aspects (M.Sc.)
 - José Soares, R. C. Sofia
 - Information-centric IoT Home control Kit, Rogério Costa, R. C. Sofia

MEC: Mobile Edge Computing

DMEC: Distributed Mobile Edge Computing



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