

# Telco's role in Smart Sustainable Cities

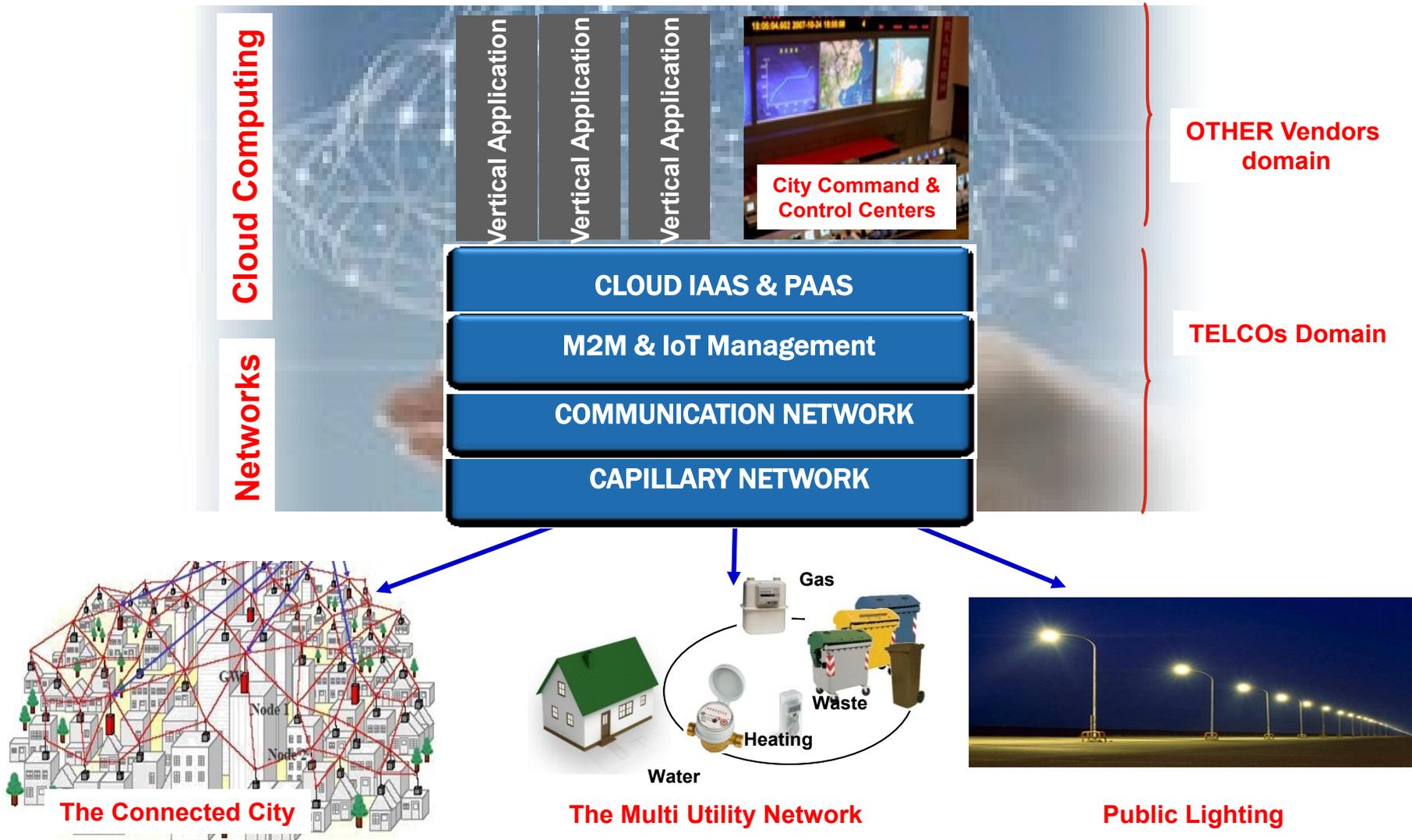
Turin, May 6th 2013

TILAB G. Rocca

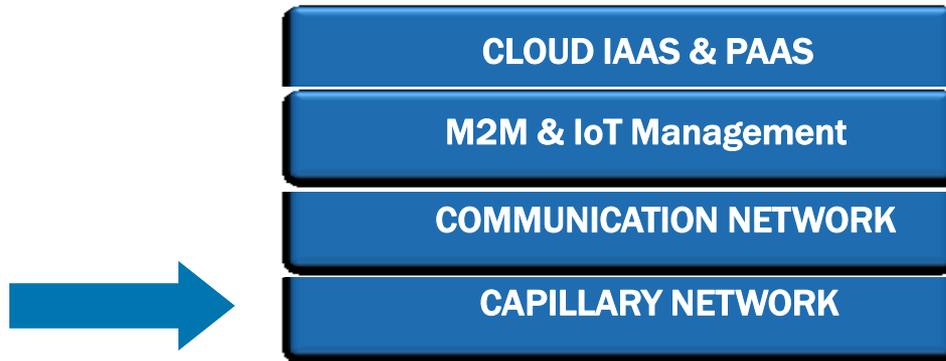
# Introduction

- ▶ Smart Sustainable City is a great concept but needs to be supported by infrastructures and enabling platforms to be concretely achievable.
- ▶ The presentation shows our vision on how a Telco Operator (like Telecom Italia) could play a strategic role in this context.

# The Smart City ICT horizontal platforms big picture



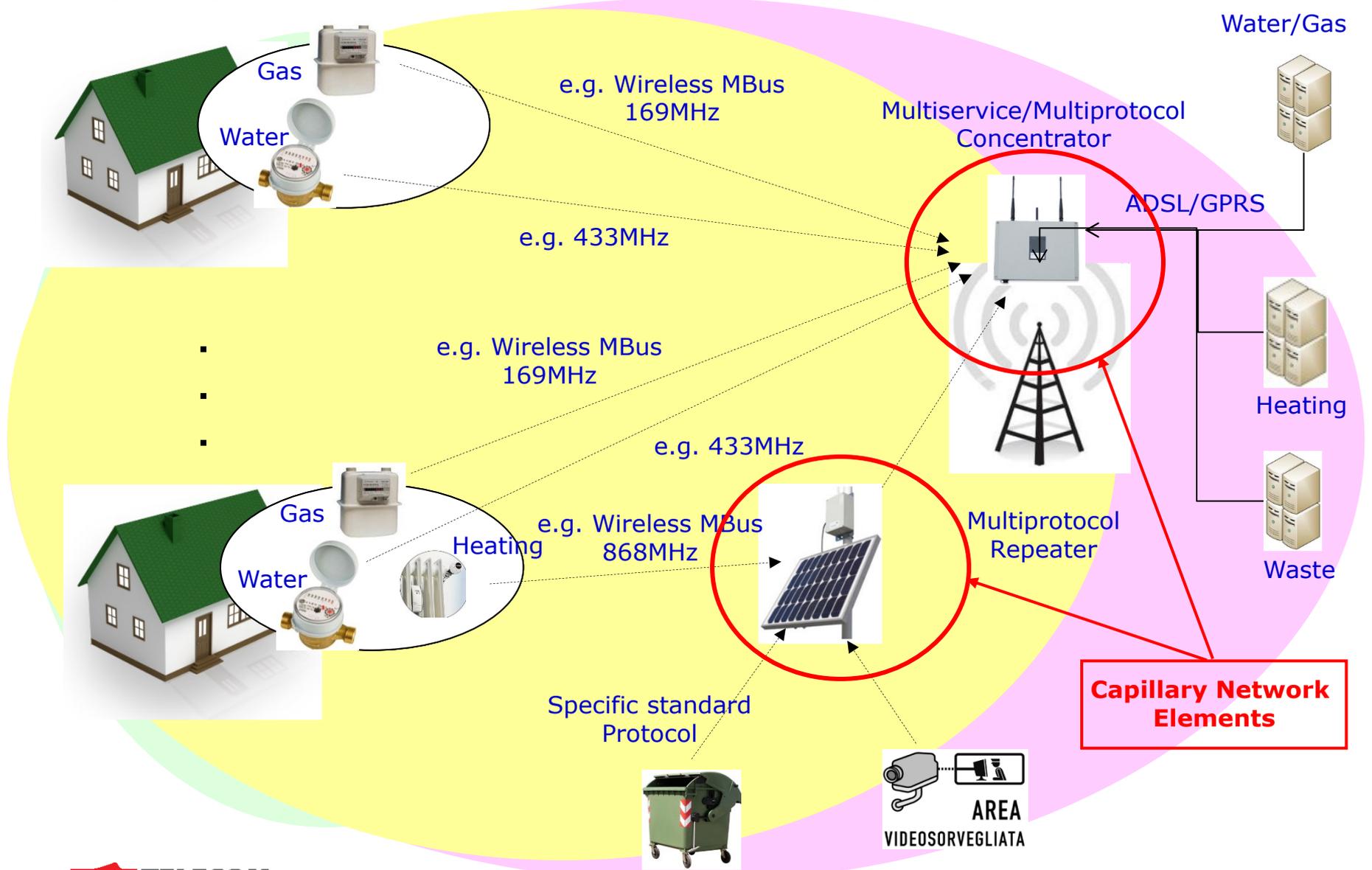
# Telco's domain: the capillary network layer



# Capillary Network

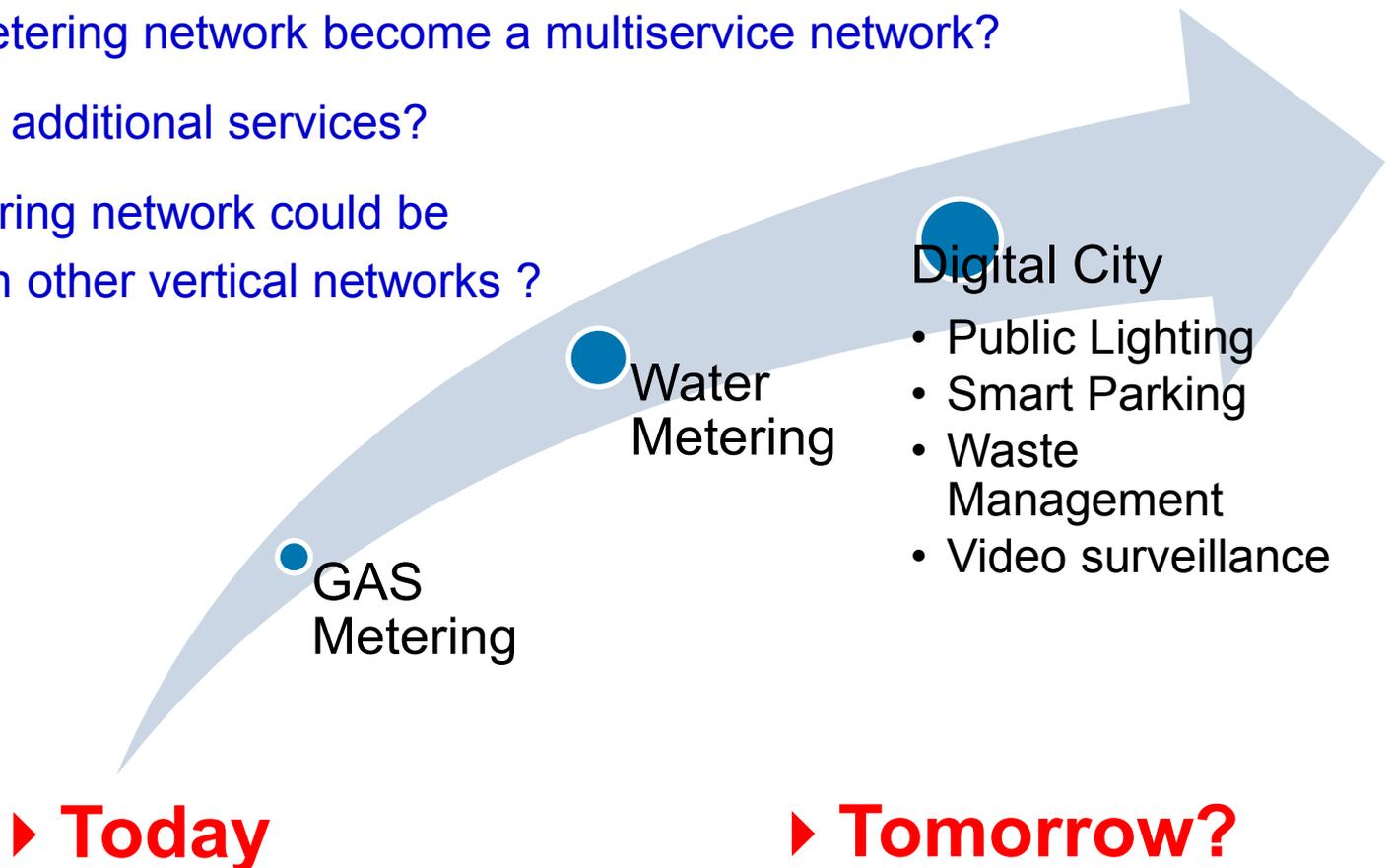
- ▶ A “new” communication layer for receiving/sending information from/to new types of sensors and actuators
  - ▶ Utility Metering (Gas, Water, Electricity)
  - ▶ Waste Management
  - ▶ Pollution and traffic control
  - ▶ Smart Lighting
  - ▶ Heating Control in private and public building
- ▶ Why ?
  - ▶ Traditional infrastructure too expensive and energy consuming
  - ▶ Meters should work several years without battery changes
  - ▶ Million devices/very limited traffic
  - ▶ Standard approach to enable easier service applications development

# Capillary Network : Multiservice & Multiprotocol Network



# The Capillary Network open issues

- ▶ Can the gas metering network bear this evolution?
- ▶ Can a multimetering network become a multiservice network?
- ▶ Which are the additional services?
- ▶ How the metering network could be integrated with other vertical networks ?



# Power Consumption

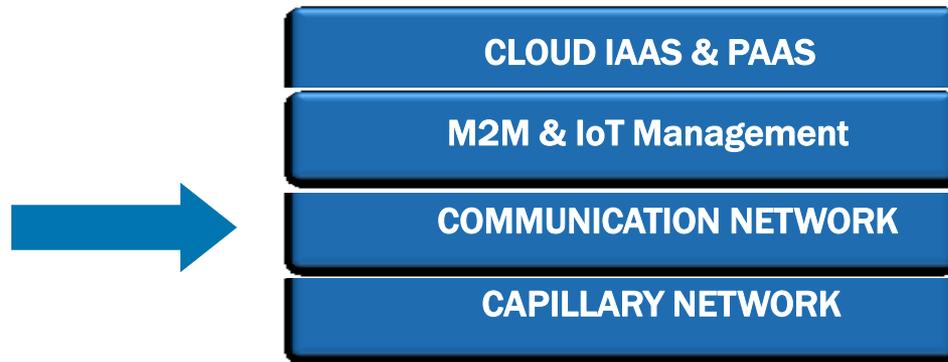
- To send a data packet of 1 Kb

TECHNOLOGY	POWER CONSUMPTION
GPRS	22.64 J/day
868 MHZ	69 mJ/day
169 MHZ	84 mJ/day

Capillary Network

- GPRS power consumption is something like 260 times bigger !

# Telco's domain: the communication network layer

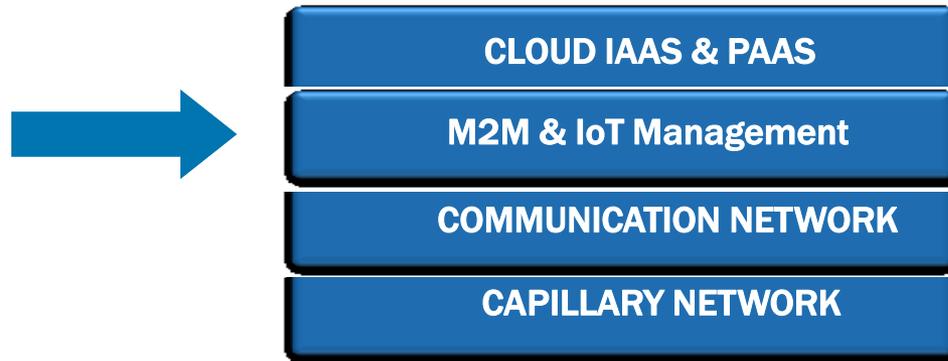


# TelCo commercial networks benefits for Smart Cities

- ▶ **Maturity:** the network is already there, to build an ad hoc network takes time!
- ▶ **Fixed & Mobile at a glance**
- ▶ **Latency and bandwidth**
- ▶ **Planning & Management:** never neglect network planning & management issue complexity!
- ▶ **Network & Data Security**
- ▶ **AAA protocols (Authentication, Authorization, Accounting)**
- ▶ **Costs:** more expensive to build a new broadband network than to adopt the already existing



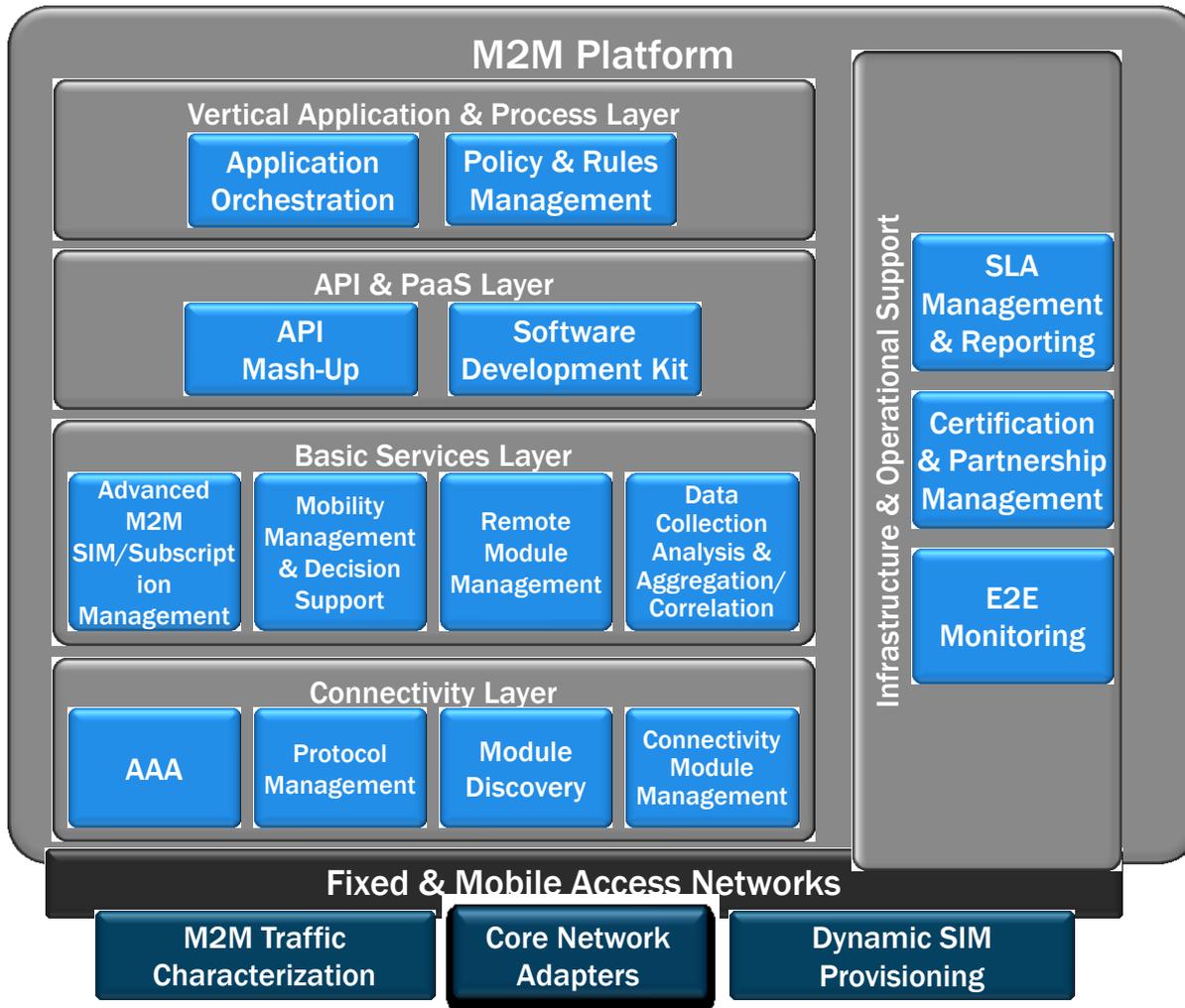
# Telco's domain: M2M & IoT management layer



# M2M & IoT Management

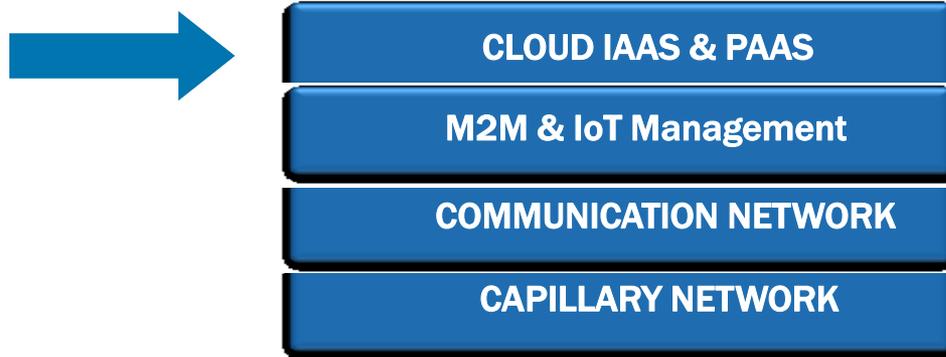
- ▶ All Telcos are considering M2M business one of the most profitable in the future, with high CAGR
- ▶ BUT:
  - ▶ No standard communication and data model representation for devices
  - ▶ No standard firmware upgrade process
  - ▶ High volumes in data repositories
  - ▶ High volumes of connected devices but low traffic and low ARPU
  - ▶ Provisioning and billing with different rules and needs than traditional SIM-based businesses

# M2M Platform Blueprint: reference model



- Manage SIM M2M
- Manage M2M Devices
  - Firmware update
- Store and normalize data
- Hide technical complexity and protocol diversities
- End-to-end monitor the whole M2M chain with SLA assurance
- Accounting and billing for usage
- Provide API to application layer
- ETSI M2M / OneM2M compliancy.....

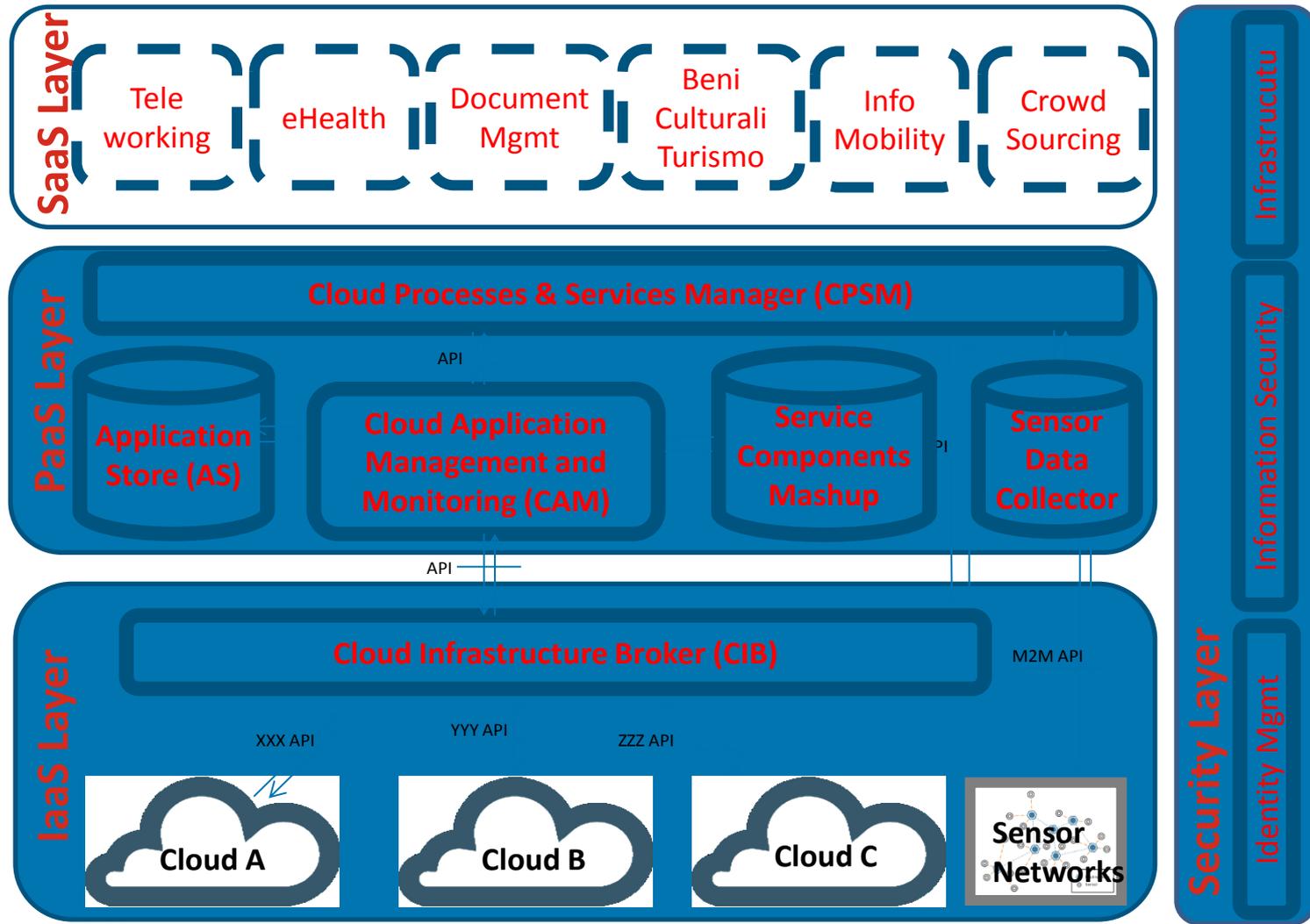
# Telco's domain: the computing layer



# Cloud Computing

- ▶ Cloud Computing Services are the new TELCO service offering on top of traditional communication services
  - ▶ Utility Computing
  - ▶ Elastic Computing
  - ▶ Hybrid Computing
- ▶ TELCO Providers can offer integrated Communication and Computing Services with end-to-end quality assurance
- ▶ TELCO Vision in Cloud Computing is to offer horizontal platforms (Infrastructure and Middleware) to enable third parties' applications development in easier and cheaper way

# Cloud Computing for Smart Cities: architectural vision



# Conclusions

## Main Telco's role is in Horizontal Platforms as they

- ▶ are “enabling platforms” for third parties involved in “Smart City” applications development
- ▶ hide technical complexity and lack of standards at the sensor layer, decoupling devices and application through well defined API
- ▶ facilitate applications exchange among different Public Administrations (Smart City Application Store)
- ▶ enable the mandatory cooperation between public and private domain and
- ▶ support an effective ecosystem among big players and niche players
- ▶ are cost effective because of large scale economies

Thanks for your attention !

Any questions:

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