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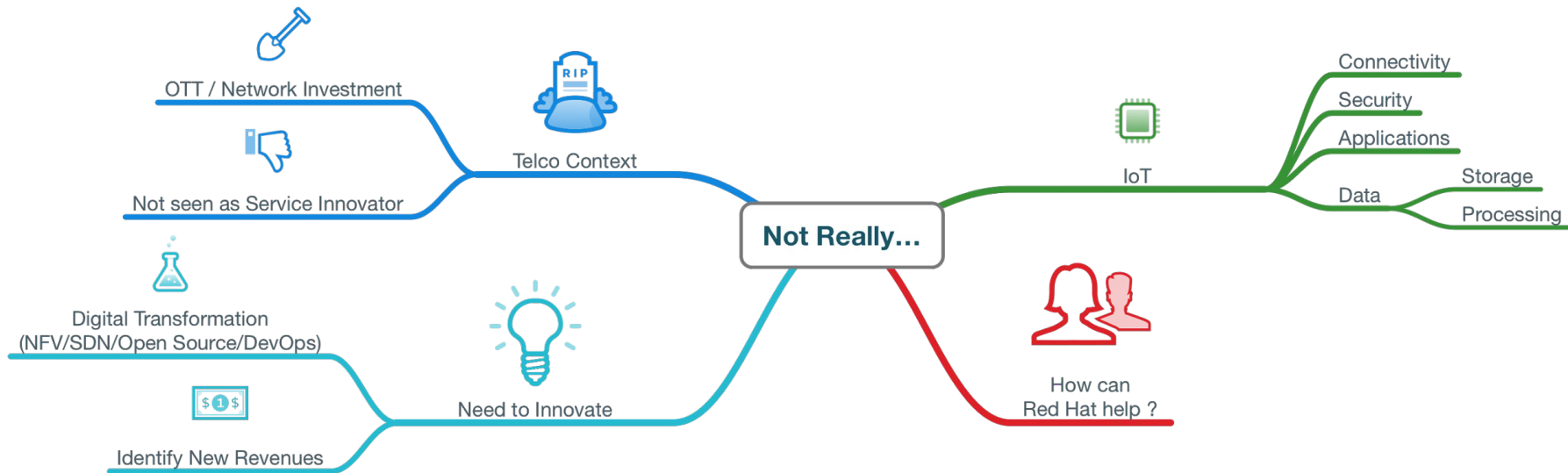


# OPEN SOURCE, IoT & THE TELCO OPPORTUNITY WITH RED HAT

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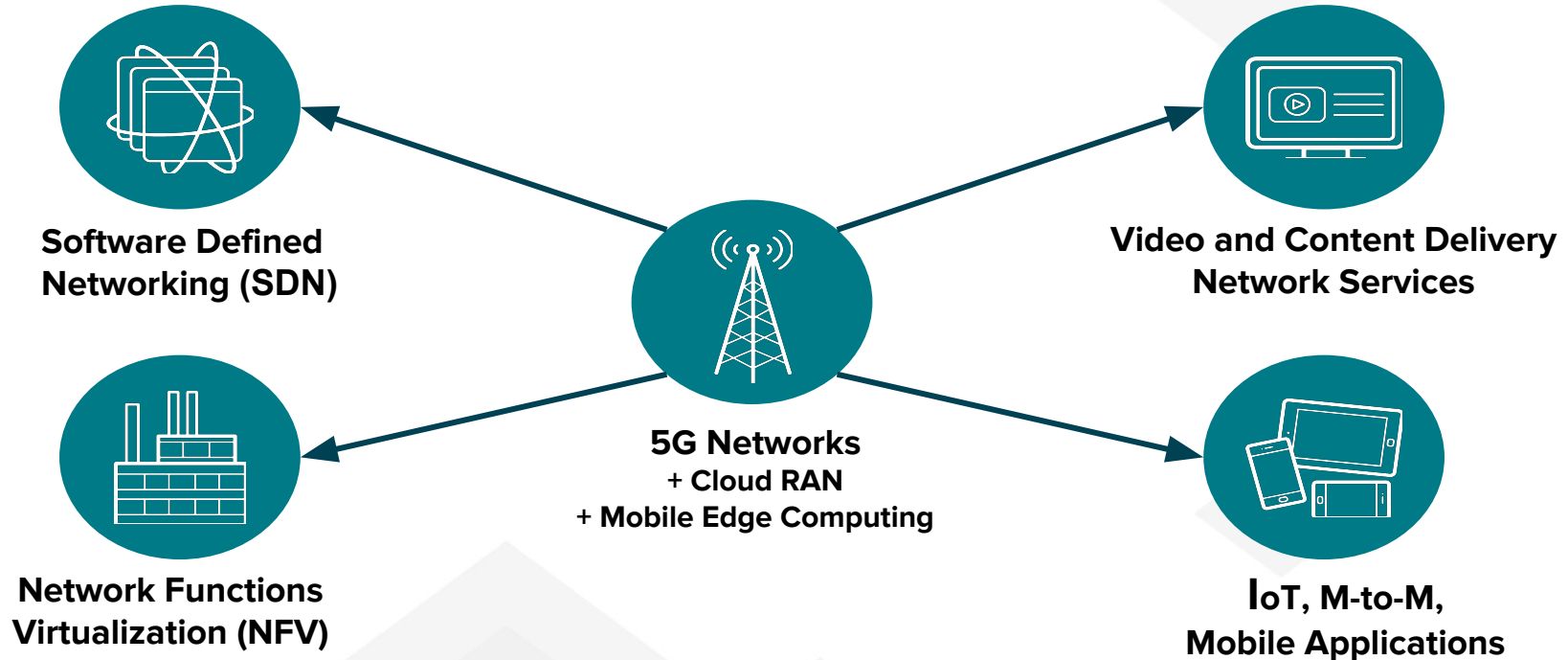
# OPEN SOURCE, IoT & TELCO

## A STRANGE COMBINATION ?



# TELCO INDUSTRY IS INVESTING

## MUCH OF THIS IS ENABLED BY OPEN SOURCE



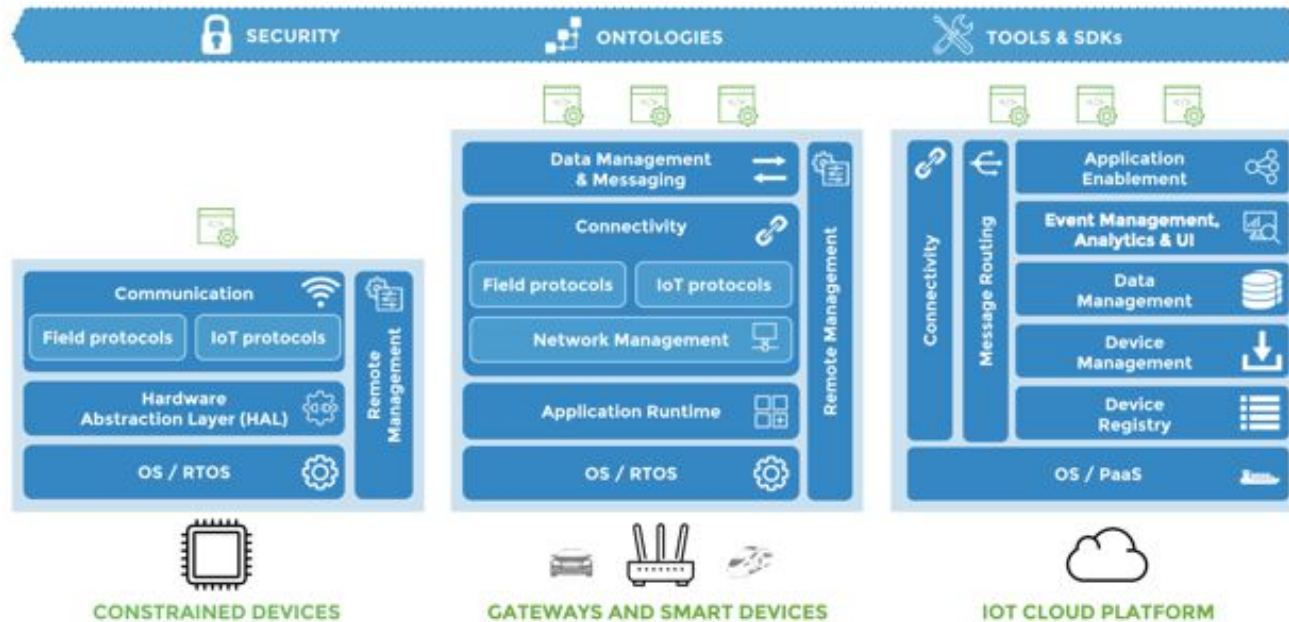
# TELCO INDUSTRY IS INVESTING IN IoT ONLY INTERESTED IN CONNECTIVITY ?



Lots of recent announcements of major Telco's investing in the 3GPP LPWA technologies such as LTE-M and NB-IoT

# IoT ARCHITECTURE

## THE THREE TIERS



Source: The Three Software Stacks Required for IoT Architectures - <http://iot.eclipse.org/white-paper-iot-architectures>

# IoT ARCHITECTURE & OPEN SOURCE



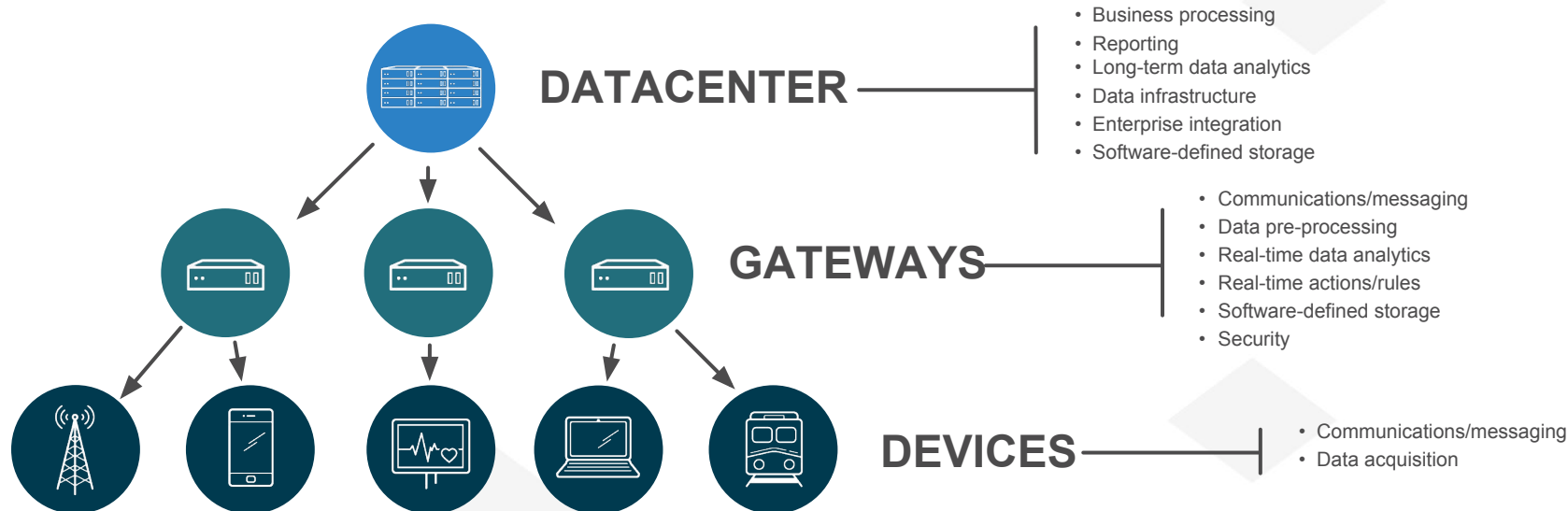
Source: <http://iot.eclipse.org/white-paper-iot-architectures>

- Open source: no lock-in, community innovation,...
- 25+ open source projects under Eclipse IoT
- Kapua project launched by Eurotech & Red Hat
- Kura project positioned at the gateway level

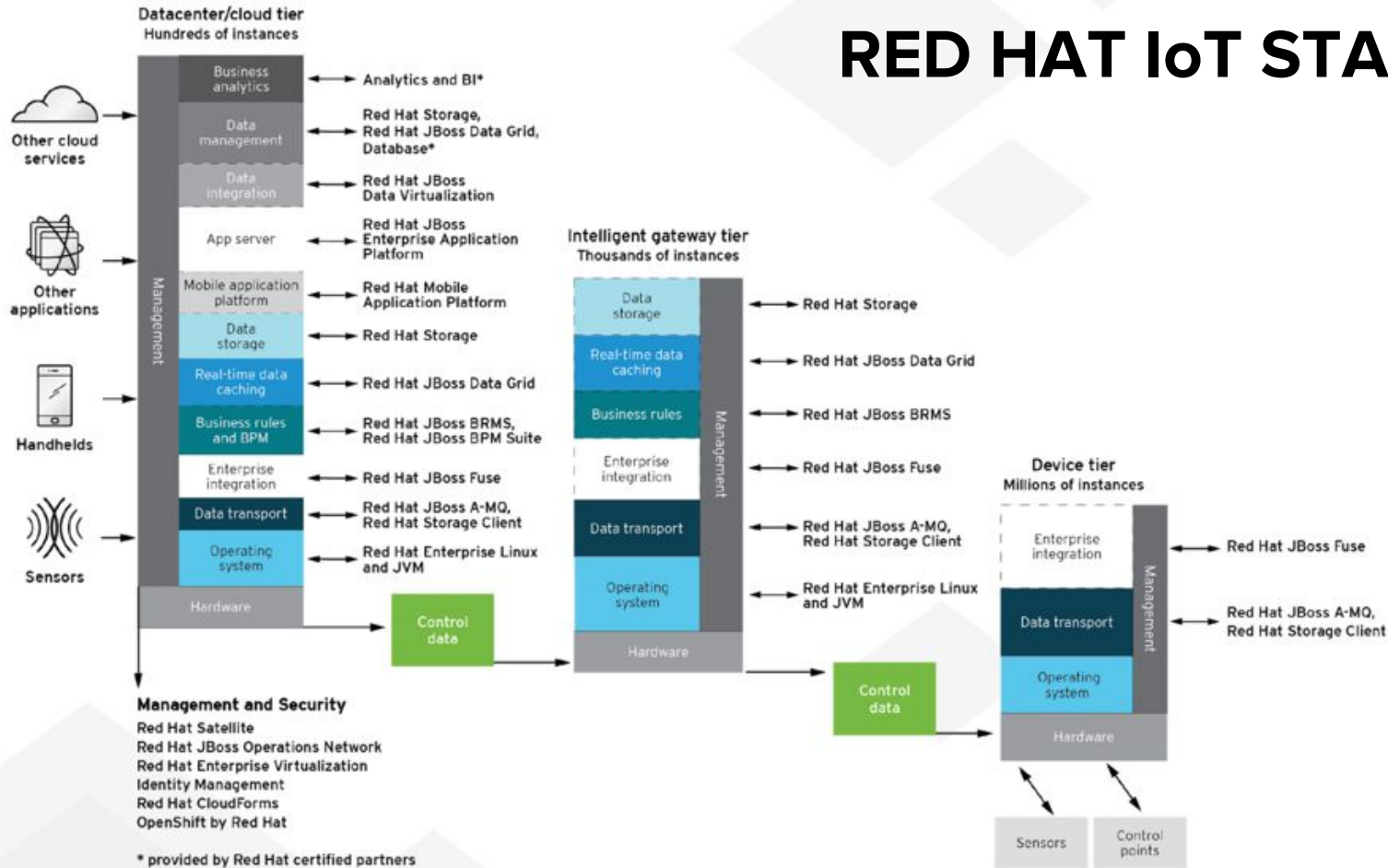


# IoT ARCHITECTURE

## DRIVING DATACENTER FUNCTION TO THE EDGE



# RED HAT IoT STACK



# IoT & NFV/SDN

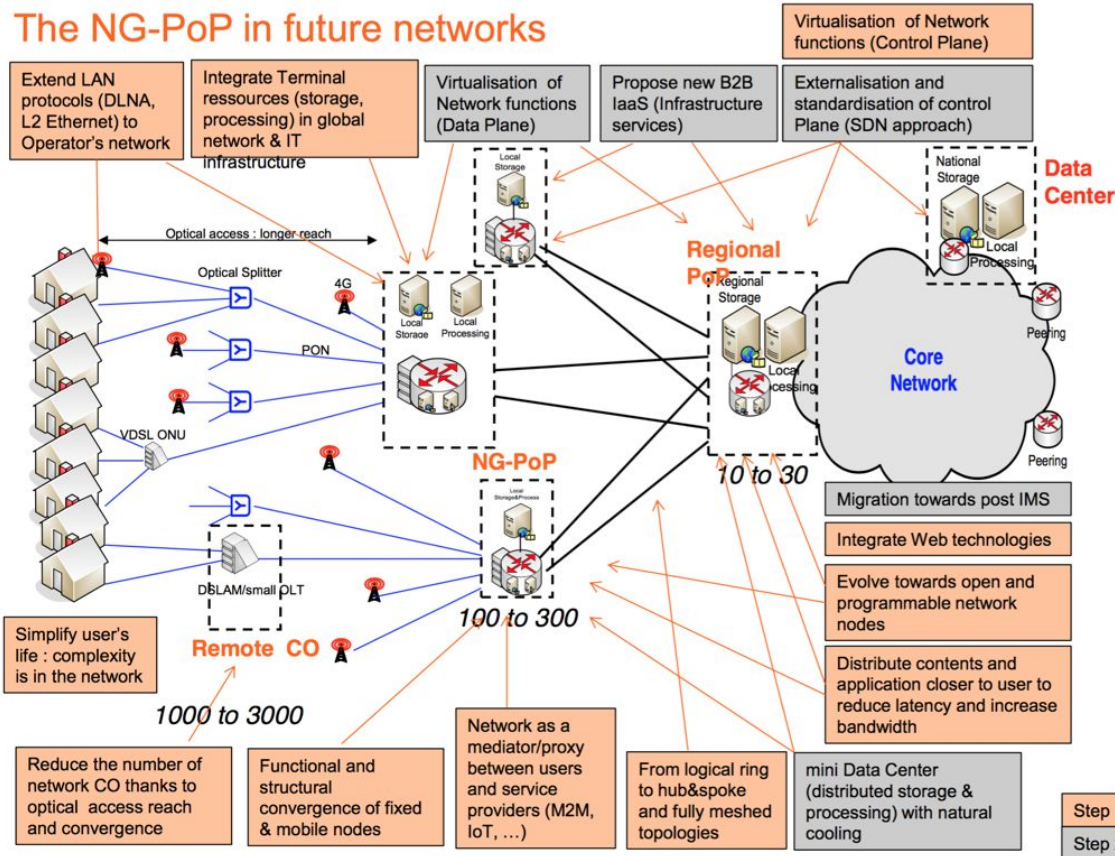
- **Network Functions Virtualization**

- Virtualization / Containerization e.g. Virtual Evolved Packet Core (vEPC)
- Mobile Edge Computing e.g. distributed IaaS / PaaS
- Network slicing

- **Software Defined Networking**

- Security policies
- Ability to create network slices
- Bring in also public cloud provider networks into OpenStack tenant
- Programmability of the networks for millions of devices
- Shipping container securely through SDN

## The NG-PoP in future networks



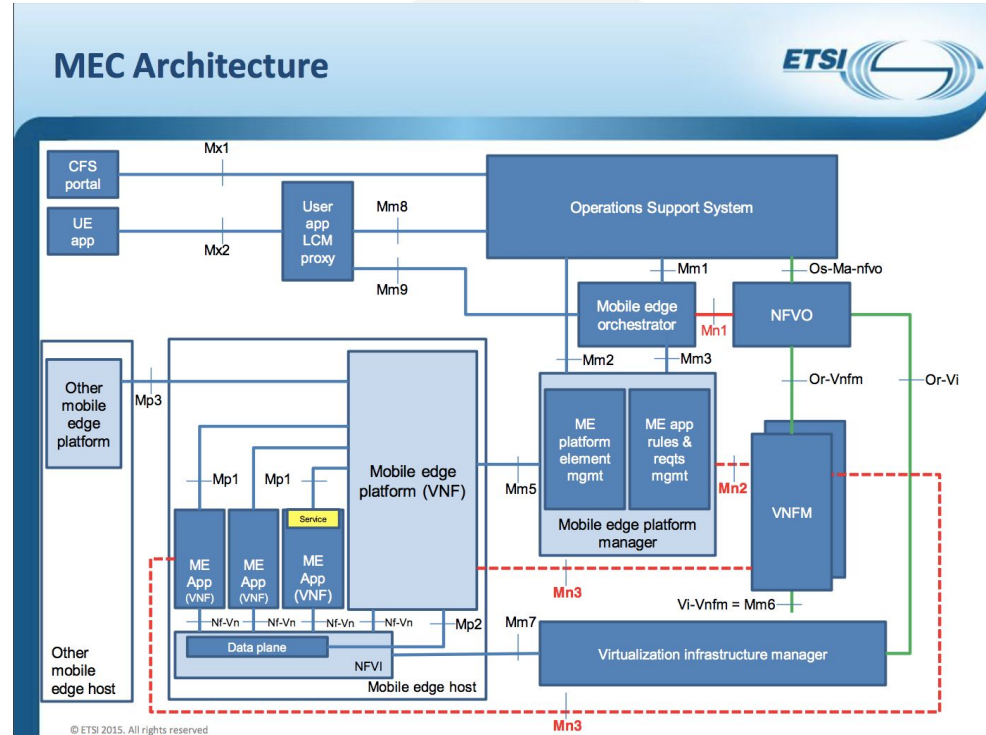
Source: Tahar MAMOUNI, Orange Labs, SDN & NFV Summit 2014, Nice, France

# IoT & NETWORK EVOLUTION

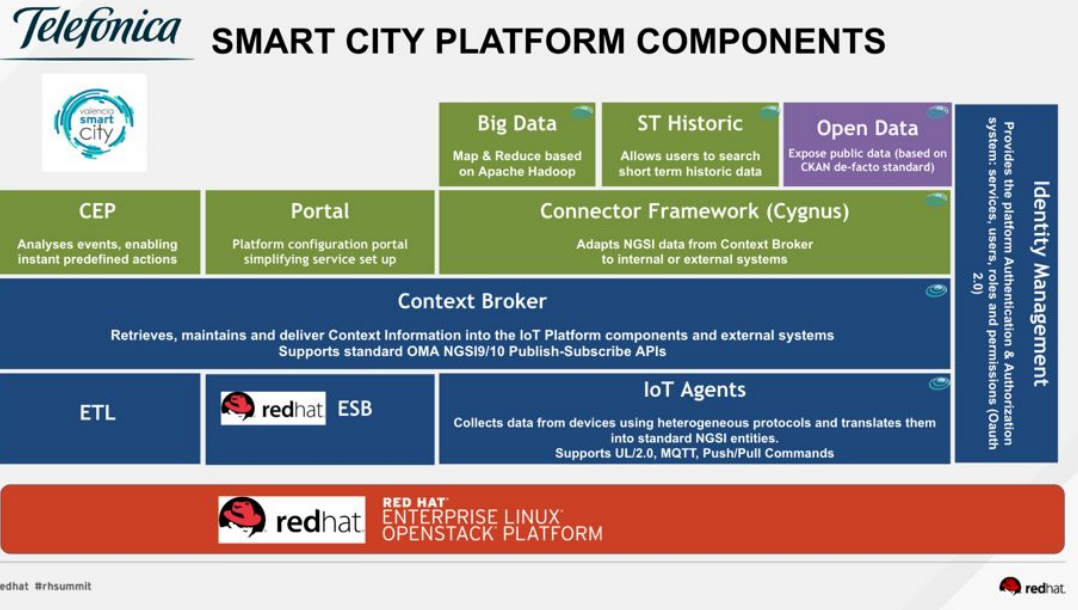
- Virtualized / containerized IoT service enablers
- Reducing latency
- Distributed storage
- Traffic optimization
- Enhanced security (SDN controlled PoP)

# IoT & MOBILE EDGE COMPUTING

- Can become a major use case for Containerized VNFs
- Opens for new services and development models in different market verticals (e.g. Edge PaaS for some of the IoT gateway functionalities)

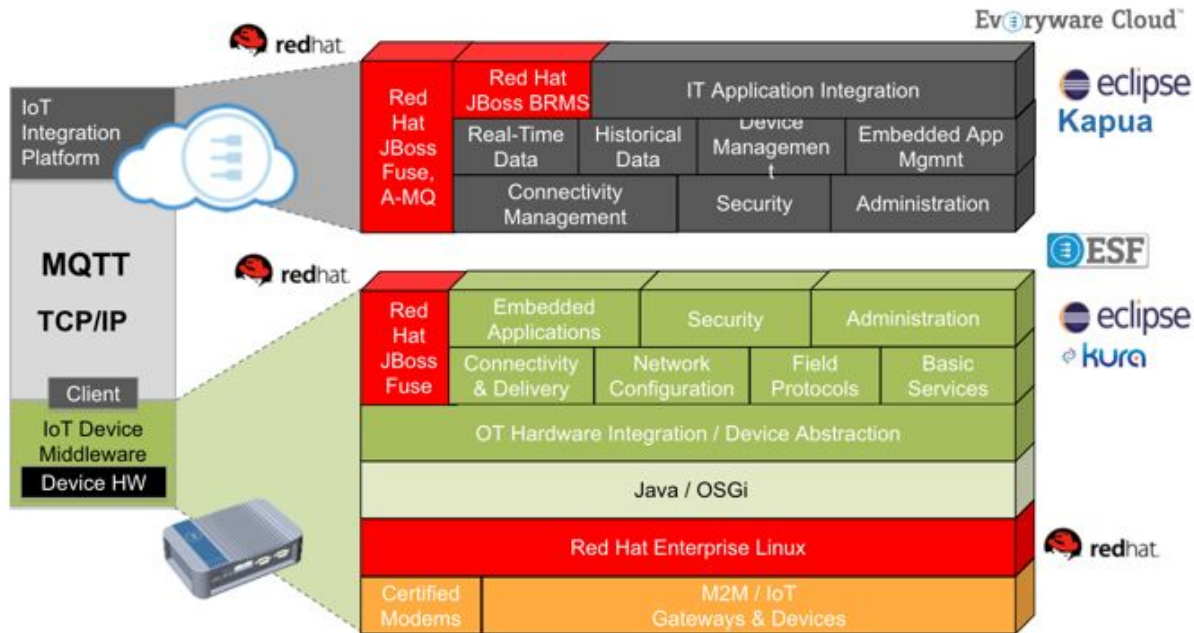


# EXAMPLE: TELEFONICA SMART CITIES



- Valencia has selected Telefonica's Global Internet of Things (IoT) platform
- Allowing citizens to consume real-time information shared by several city facilities like parking, and others, to make their lives easier.
- Platform runs on Red Hat OpenStack, leverages Red Hat Mobile Application Platform and the Red Hat JBoss Fuse solution for IoT to be the foundation for their Smart City project.

# EXAMPLE OF PARTNERSHIP - EUROTECH



- Red Hat and Eurotech launch End-to-End, Fully Open Source IoT Cloud Platform Project: Eclipse Kapua
- Contributing, developing and testing code, collaborating with other contributors, and integrating existing open source projects that are integral to IoT solutions (e.g. Apache Camel, ActiveMQ, Drools, etc.)

# KEY TAKE-AWAYS

- **The IoT opportunity for Telco is real and beyond connectivity**
- Telcos are investing today in Open Source, DevOps, NFV and SDN
- Telcos can leverage this investment to provide new IoT-related services
  - IoT application development platforms
  - IoT application hosting e.g. application hosting & data storage
  - IoT service enablers e.g. data analytics, business rules,...
  - IoT security e.g. SDN policy based security, network slicing...
- Evolution towards distributed IaaS (OpenStack) / PaaS (OpenShift) with functions moving to the network's edge brings new challenges
- Red Hat is helping the Telcos on this IoT journey



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