

# Panel: An overview to H2020 calls in Simulation, Physiological Computing and Robotics

## H2020 Projects in Network Virtualization and 5G: Some Application Scenarios

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CNIT – University of Genoa Research Unit and National Laboratory of Smart, Sustainable and Secure Internet Technologies and Infrastructures (S3ITI)



<http://www.tnt-lab.unige.it>

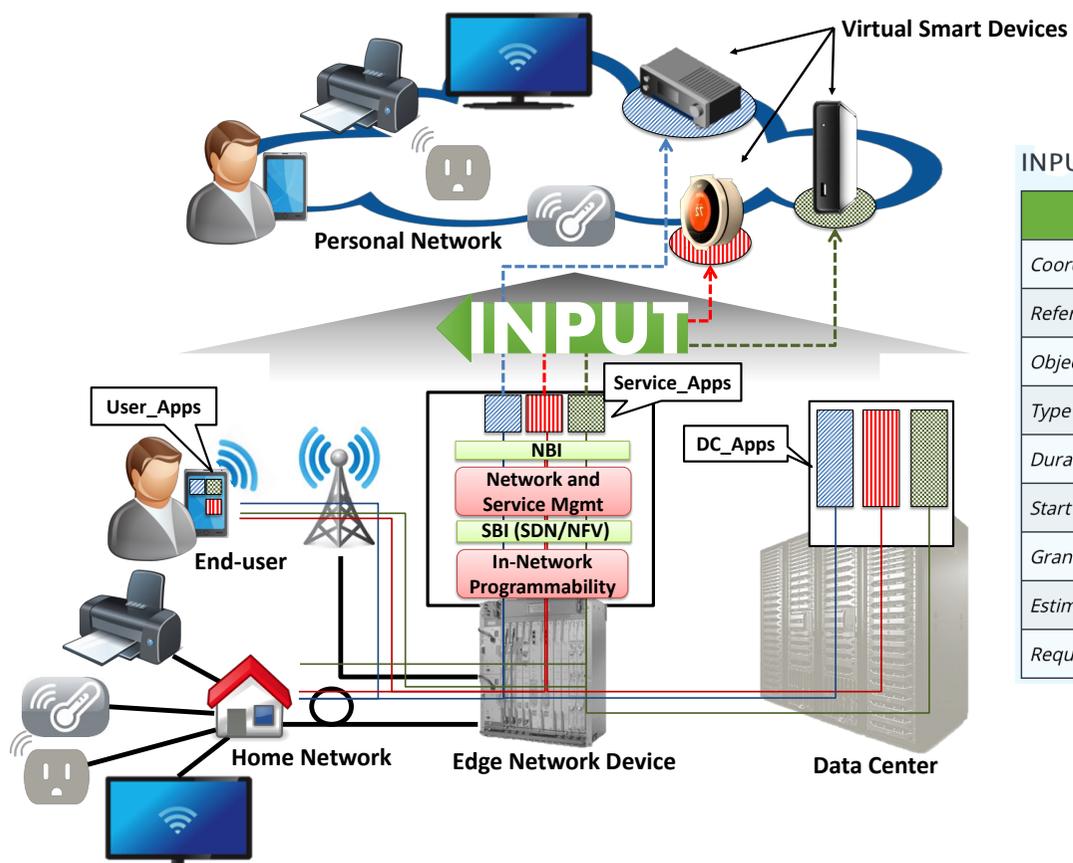
<http://www.cnit.it/en/institutes/s3iti/>



# Outline

- Short overview of two projects (INPUT & MATILDA)
- INPUT Use Cases:
  - Virtualization of existing end-user electronic devices
  - Virtualization of IoT Services in a Home Management System
- MATILDA Use Cases
  - Remote Control and Monitoring of Automobile Electrical Systems
  - Industry 4.0 Smart Factory

# INPUT - In-Network Programmability for next-generation personal cloud service support



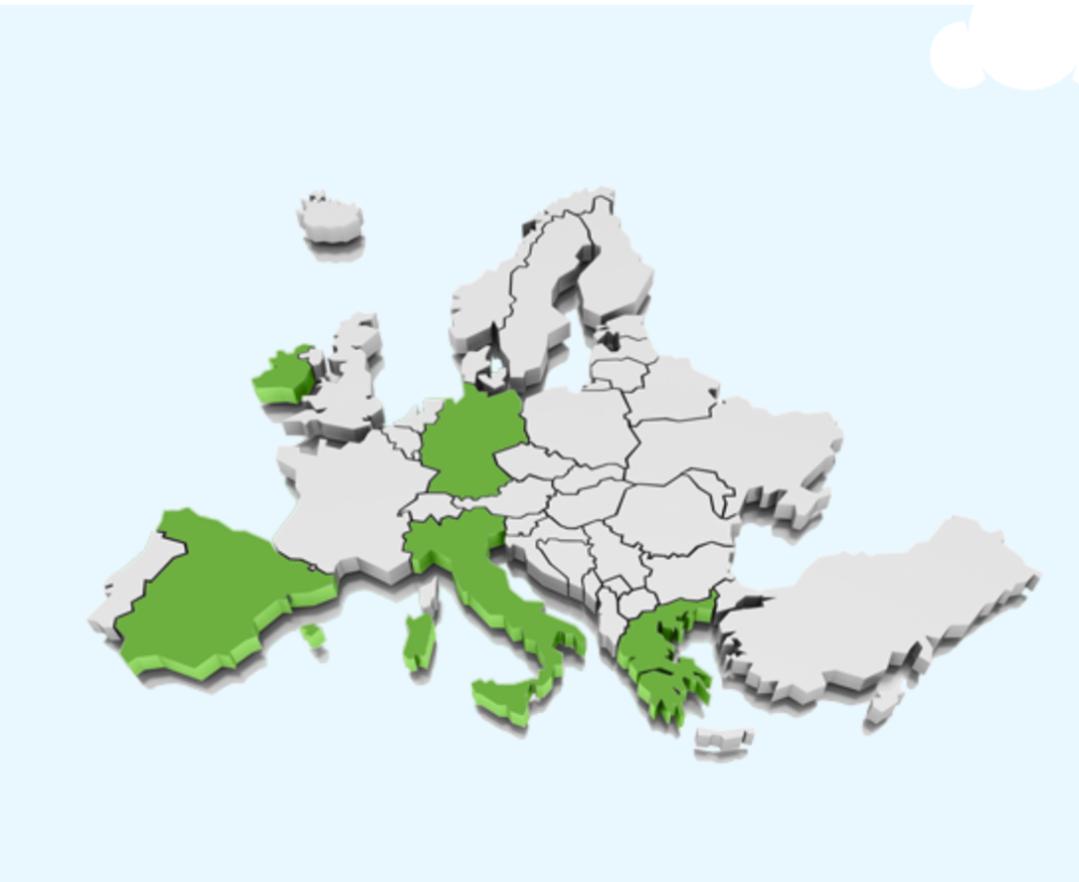
## INPUT at a glance

<i>Coordinator:</i>	Dr. Roberto Bruschi (CNIT)
<i>Reference Call:</i>	H2020-ICT-2014-1
<i>Objective:</i>	ICT-07-2014: Advanced Cloud Infrastructures and Services
<i>Type of Action:</i>	Research and Innovation Action (RIA)
<i>Duration:</i>	36 months
<i>Start Date:</i>	2015-01-01
<i>Grant Agreement Number:</i>	644672
<i>Estimated Project Cost:</i>	€3,108,001.00
<i>Requested EU Contribution:</i>	€3,108,001.00

<http://www.input-project.eu>

# INPUT - In-Network Programmability for next-generation personal cloud service support

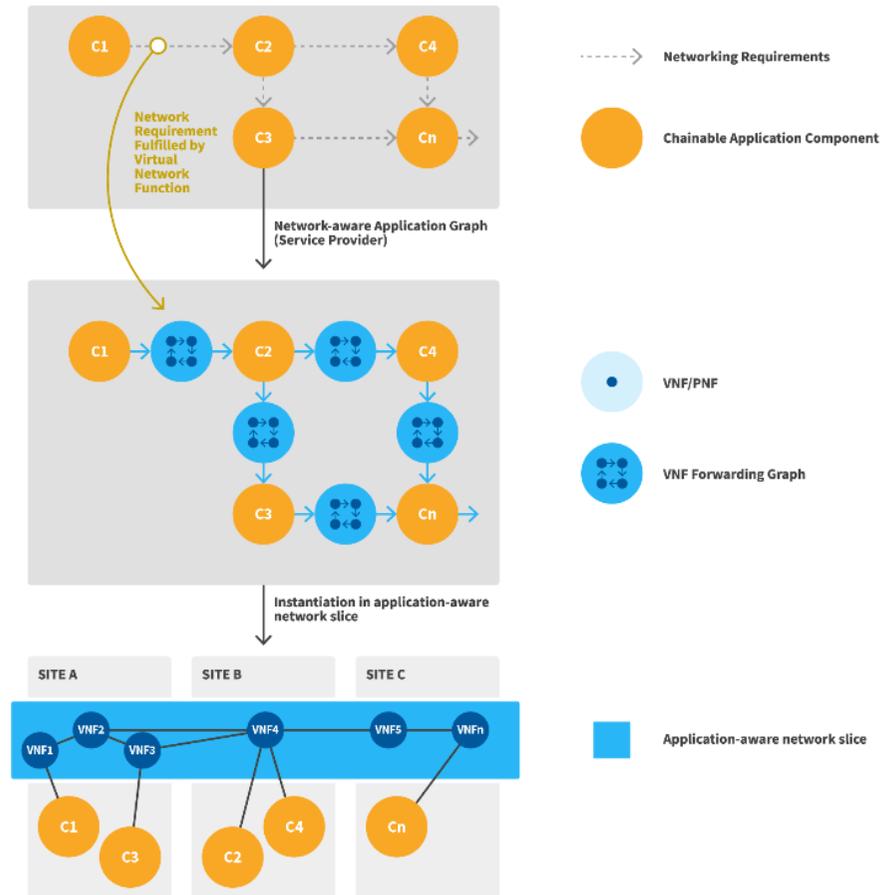
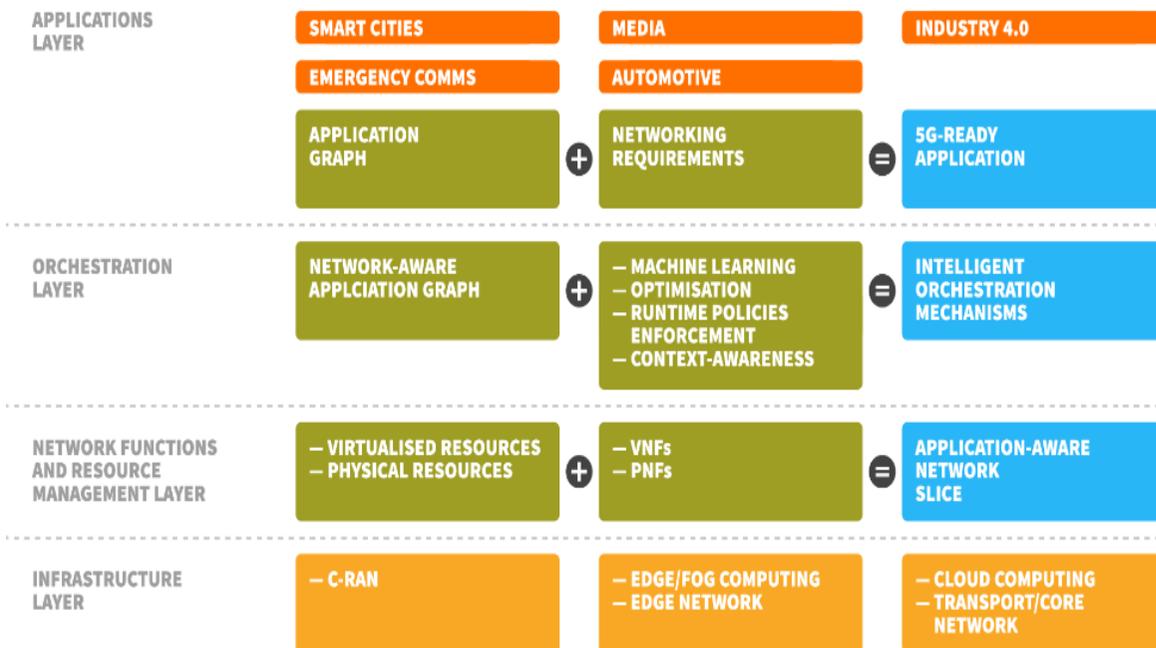
N.	Partner Name	Nation
1	CNIT Coordinator: Dr. Roberto Bruschi <i>Via all'Opera Pia 13, 16145, Genova (GE), Italy phone: +39 010 353 2075 email: roberto.bruschi &lt;AT&gt; cnit.it</i>	
2	Ericsson Telecomunicazioni S.p.A.	
3	UBITECH	
4	Dublin City University	
5	HOP Ubiquitous S.L.	
6	Infocom S.R.L.	
7	COSMOTE	
8	Telecom Italia S.p.A.	
9	Julius-Maximilian's Universitaet Würzburg	



# INPUT - In-Network Programmability for next-generation personal cloud service support

- Personal Cloud Services
- Replace physical Smart Devices (SDs) with their Virtual Images, providing them to users “as a Service” (SD as a Service – SDaaS)...
- ...by means of virtual cloud-powered Personal Networks
- ...introducing computing and storage capabilities to edge network devices (“in-network” programmability), to allow users/telecom operators create/manage private clouds “in the network”
- ...moving cloud services closer to end-users and smart devices, in order both to avoid pointless network infrastructure and datacenter overloading, and to provide lower latency reactivity to services.

# MATILDA – A Holistic, Innovative Framework for the Design, Development and Orchestration of 5G-Ready Applications and Network Services over Sliced Programmable Infrastructure



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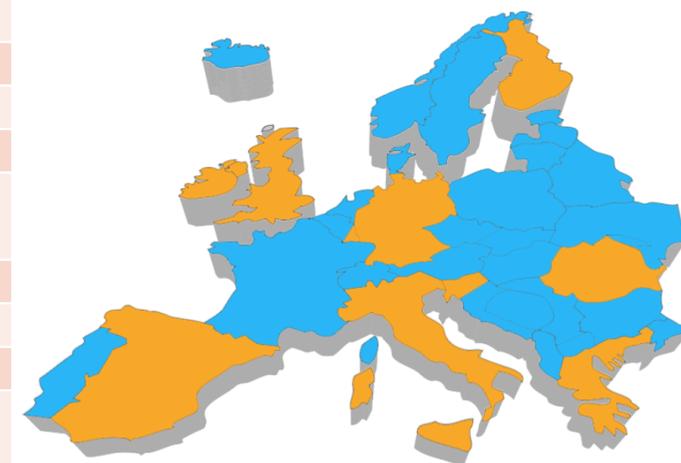
## In a Nutshell

<b>Project Acronym:</b>	<b>MATILDA</b>
<b>Project ID:</b>	<b>761898</b>
<b>Funded Under:</b>	<b>H2020-EU.2.1.1. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)</b>
<b>Starting Date:</b>	<b>2017-06-01</b>
<b>Ending Date:</b>	<b>2019-11-30</b>
<b>Total Cost:</b>	<b>EUR 8 378 945,36</b>
<b>EU contribution:</b>	<b>EUR 6 664 458,75</b>
<b>Coordinated by:</b>	<b>Prof. Franco Davoli S3ITI Federated National Laboratory Consorzio Nazionale Inter-Universitario per le Telecomunicazioni (CNIT), Genoa, Italy</b>
<b>Technical coordinator:</b>	<b>Dr. Panagiotis Gouvas UBITECH Athens, Greece</b>
<b>Topic:</b>	<b>ICT-08-2017 - 5G PPP Convergent Technologies</b>
<b>Call for proposal:</b>	<b>H2020-ICT-2016-2</b>
<b>Funding Scheme:</b>	<b>IA - Innovation action</b>

# MATILDA – A Holistic, Innovative Framework for the Design, Development and Orchestration of 5G-Ready Applications and Network Services over Sliced Programmable Infrastructure



PP	Partner Full Name	Short Name	Nationality
P1	Consorzio Nazionale Interuniversitario per le Telecomunicazioni	CNIT	IT
P2	ATOS Spain SA	ATOS	ES
P3	ERICSSON	ERICSSON	IT
P4	INTRASOFT INTERNATIONAL SA	INTRA	LU
P5	COSMOTE KINITES TILEPIKOINONIES A.E.	COSM	GR
P6	ORANGE Romania	ORO	RO
P7	EXXPERTSYSTEMS GMBH	EXXPERT	DE
P8	GIOUMPITEK Meleti Schediasmos Ylopoiisi kai Polisi Ergon Pliroforikis EPE	UBITECH	GR
P9	INTERNET INSTITUTE Ltd.	ININ	SI
P10	Incelligent	INC	GR
P11	SUITE5 Data Intelligence Solutions	SUITE5	IE
P12	NATIONAL CENTER FOR SCIENTIFIC RESEARCH "DEMOKRITOS"	NCSR	GR
P13	UNIVERSITY OF BRISTOL	UNIVBRIS	UK
P14	AALTO-KORKEAKOULUSÄÄTIÖ	AALTO	FI
P15	UNIVERSITY OF PIRAEUS RESEARCH CENTER	UPRC	GR
P16	ITALTEL	ITL	IT
P17	BIBA – BREMER INSTITUT FÜR PRODUKTION UND LOGISTIK GMBH	BIBA	DE

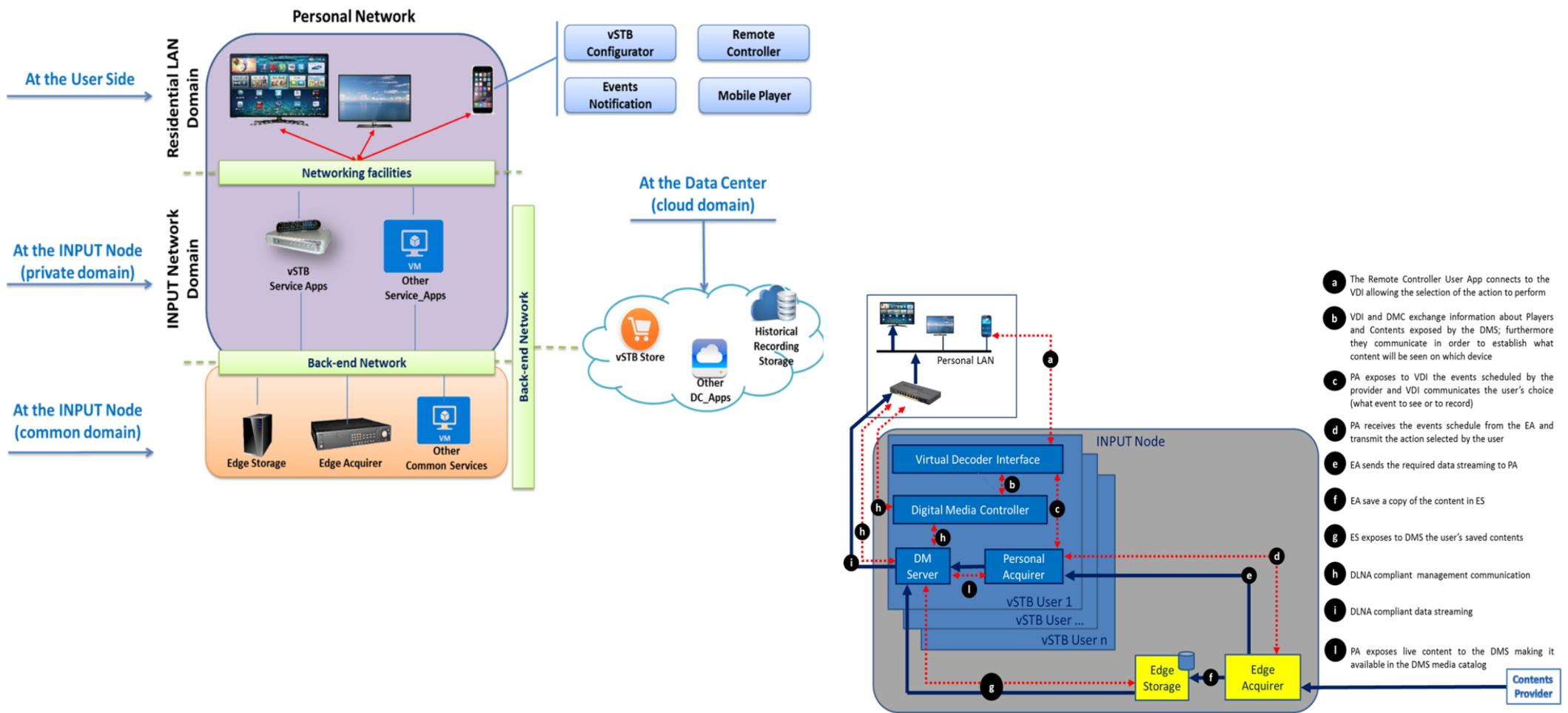


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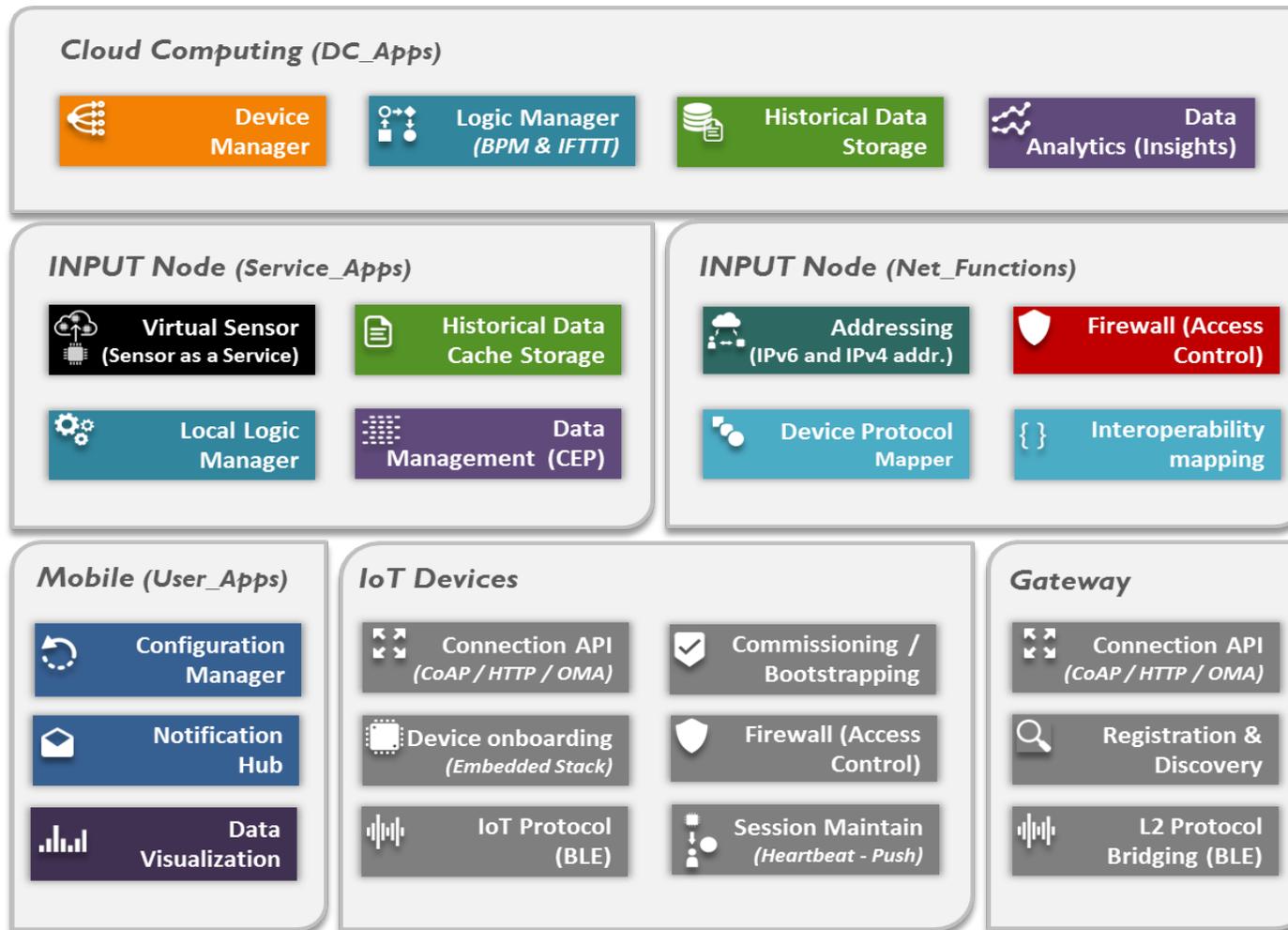


- Define appropriate **abstractions for the design of 5G-ready applications**;
- Develop an **agile programming and verification platform** for developing and verifying **industry vertical 5G-ready applications** and **network services**;
- Support mechanisms for **automated or semi-automated translation of application-specific** requirements to **programmable infrastructure** requirements;
- Support **intelligent orchestration mechanisms** for managing the entire lifecycle of 5G-ready applications and network services;
- Support mechanisms for **multi-site network, compute and storage** resource management;
- Involve **key actors of the value chain** in the operational model.

# INPUT Use Case: Virtualization of existing end-user electronic devices – The virtual Set-Top-Box



# INPUT Use Case: Virtualization of IoT Services in a Home Management System – Virtual Collector Device



# MATILDA Use Case – Remote Control and Monitoring of Automobile Electrical Systems

- Interconnecting ECUs (**Electronic Control Units** – stand-alone black boxes that are not integrated into a single cohesive control unit, 100 on average in today's cars) in test automobiles by means of FastWAN technology
- Enable automobile manufacturers and their supply chain to permanently remotely connect to these different ECUs in real time over 5G communication, in order to control and monitor the behavior of these ECUs.
- The MATILDA architecture will ensure real-time secure communication of the involved ECUs over a multi-site 5G infrastructure and support the orchestration of the overall network-aware application, while enabling complex decision making based on monitoring and analytics.

# MATILDA Use Case – Industry 4.0 Smart Factory

