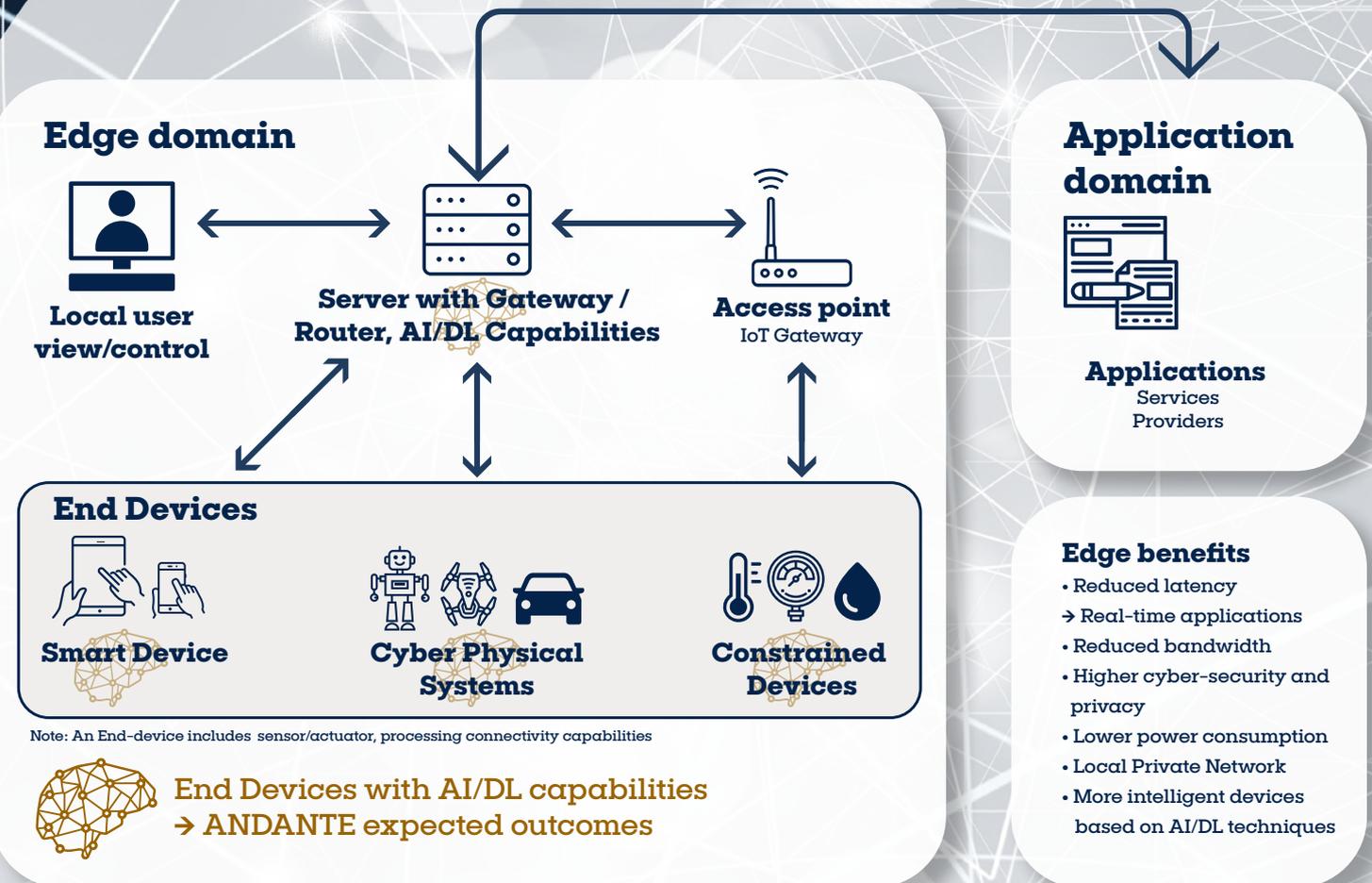


# ANDANTE

Contributions to develop advanced and intelligent solutions in the Edge domain

## Edge Domain System Architecture



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## Main Goal of IoT Systems

Analyse the data gathered, from the system environment, for decision-making

## Context

### Current IoT System solutions

- Centric solutions based on cloud computing
  - Not adapted for real-time applications
- Data storage, data analysis performed on the Cloud
  - Huge memory and processing resources required
- Data gathered sent to the cloud
  - Bandwidth and energy spent unnecessary for many applications
- Larger end-to-end path to ensure cyber-security and privacy
  - Increasing the risk and surface for attacks and data theft.
- Infrastructure to be shared between many users to be cost effective
  - Huge storage and computing power required that implies high level of energy consumption.
- For many IoT applications, cloud computing not adequate
  - More efficient data processing vs energy consumption is required.

### Moving from Cloud to Edge computing

- Many IoT applications can be locally performed at the edge
  - Reducing latency then allowing real-time applications
  - Performing data analysis in the Edge

### Main Benefits

- Reduce bandwidth use
  - Less amount of data to transmit
- Reduce storage needs
  - Data is processed in line
- Increase the data security and personal data protection levels
  - Less surface for attacks
- Reduce overall power consumption
  - Significant energy savings
- Creation of Local Private Networks
  - Higher data confidentiality, recurrent cost savings, distributed intelligence

## ANDANTE contributions for data analysis on the Edge

### Introduction of advanced eNVM technologies allowing

- The design of powerful and cost-effective Neuromorphic solutions (Artificial, Spiking and Analog Neural Networks)
- The implementation of Intelligent end-devices for different applications
- The development several demonstrators, in different Application Areas, to validate and evaluate project outcomes.

### Main Challenges

- Very complex Neural Networks (several 10's Mbytes of eNVM)
- Very high performances at ultra-low power consumption (several Tops/mW)
- High integrated solutions
- Low cost



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