



# The HEADS project

Heterogeneous and  
Distributed Services  
for the Future Computing Continuum

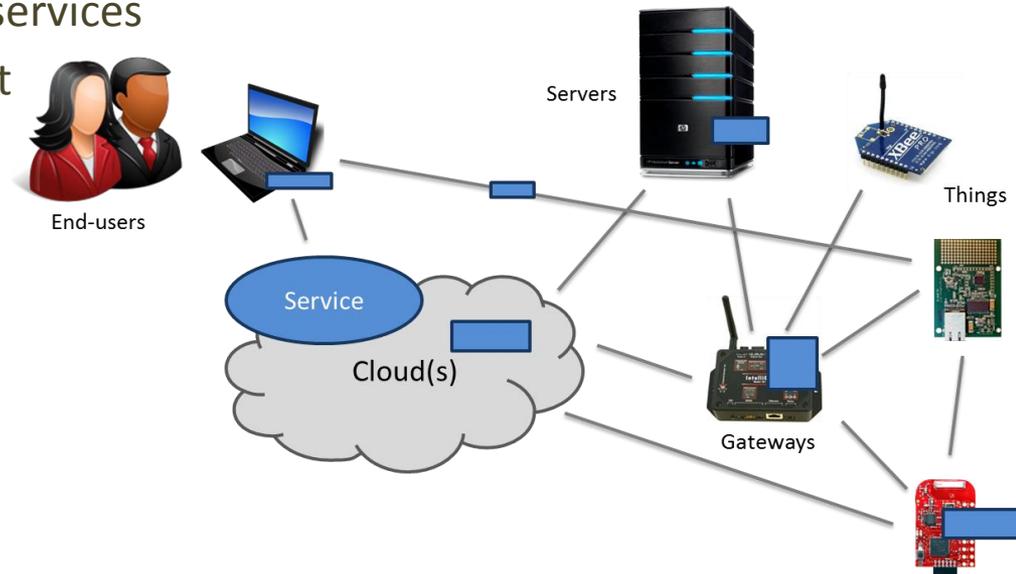
# HD-Services

- Heterogeneous and Distributed Services
  - **Heterogeneous:** The infrastructure on which the service runs is composed of a set of different nodes and networks.
    - The "Future Computing Continuum" which ranges from microcontroller based sensors and devices to cloud.
  - **Distributed:** The implementation of the services is composed of a set of independent processes communicating asynchronously.
    - Truly distributed services implementation is required in order to provide useful and reliable services which take advantage of the infrastructure.

# Benefits of HD-Services

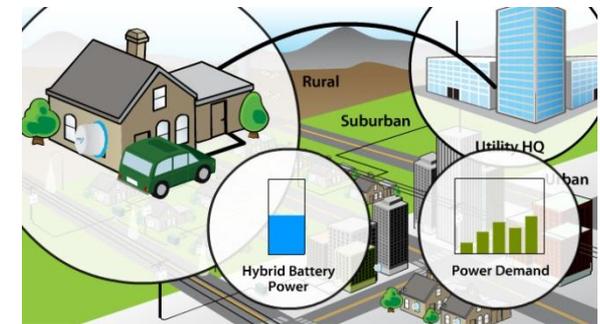
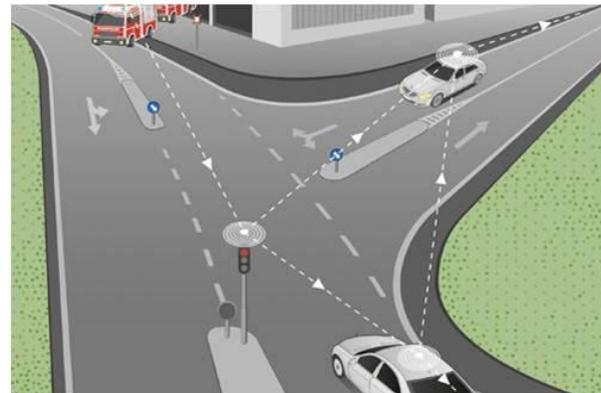
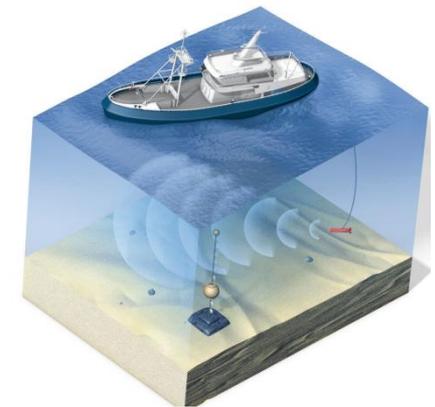
- Complex to develop, lots of different skills involved but...
  - Allows fully exploiting the features of each platforms
  - Allow for local and/or decentralized decision making
  - Robust to partial and/or temporary failures
  - Push processing close to data sources
  - Allow for real-time and critical services
  - Can scale in a "big data" context

**In practice for more and more real-world services are HD-Services**

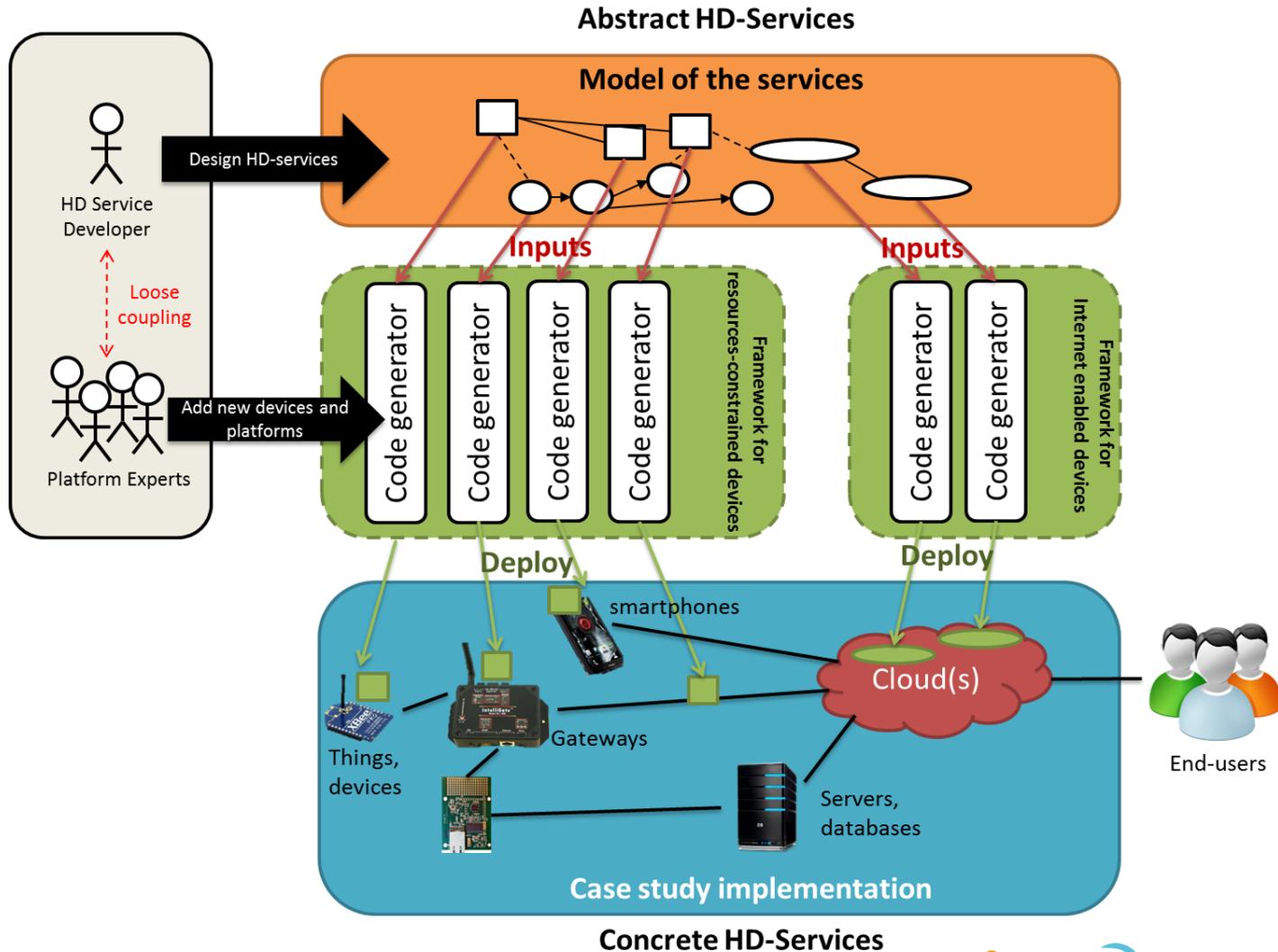


# Examples

- Health domain and ambient assisted living
- Energy domain and smart grids
- Environmental monitoring and oil and gas
- Safety in hazardous environments
- Intelligent Transport Systems (ITS)
- ...



# HEADS Approach



# HEADS objectives

- Provide service developers with new abstractions to develop HD-services
  - Provide modelling languages for HD-Services
    - Both for design-time and runtime
    - Based on well-proven modelling concepts
    - Based on ThingML and Kevoree platforms
- Provide platform experts with efficient means to capture their knowledge
  - Resource constraint platforms, Cloud-based platforms
  - Using the Kevoree platform

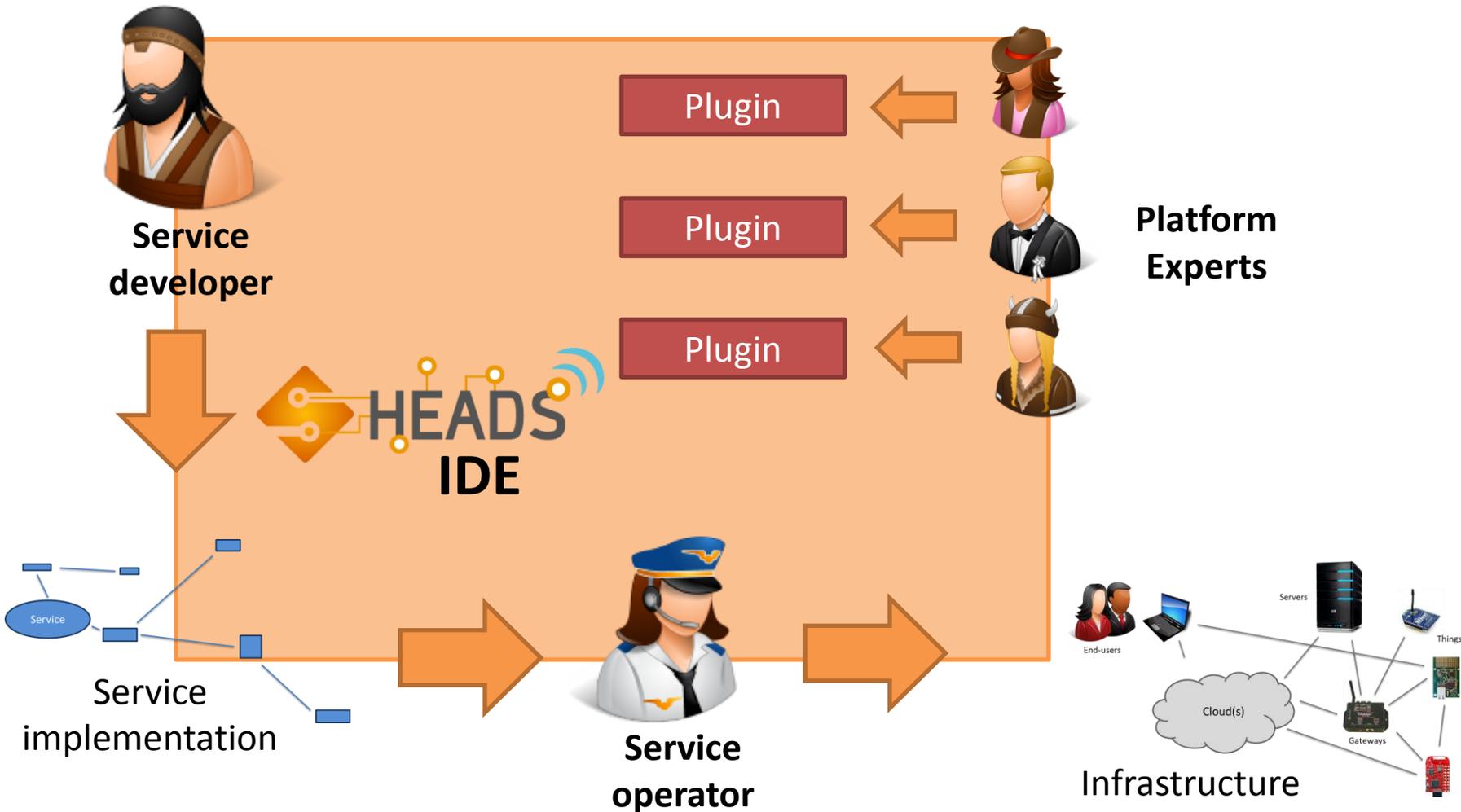
# HEADS objectives

- Make the HD-service lifecycle safe, predictable and consistent
  - Leverage cloud-based infrastructure/platform to test/simulate large scale deployments of HD-Services
  - Guide developers and platform experts with methodology
- Manage the flow of big data across the future computing continuum
  - Based on consortium's expertise in Complex Event Processing

# HEADS objectives

- Provide seamless dynamic deployment and evolution of HD-services
  - Initial IDE has been provided (based on Eclipse)
  - Runtime adaptations for resource constrained devices
- Proof of concept demonstrators

# HEADS IDE



# HEADS in the Social Media



[www.heads-project.eu](http://www.heads-project.eu)

[@HEADSeu](https://twitter.com/HEADSeu)



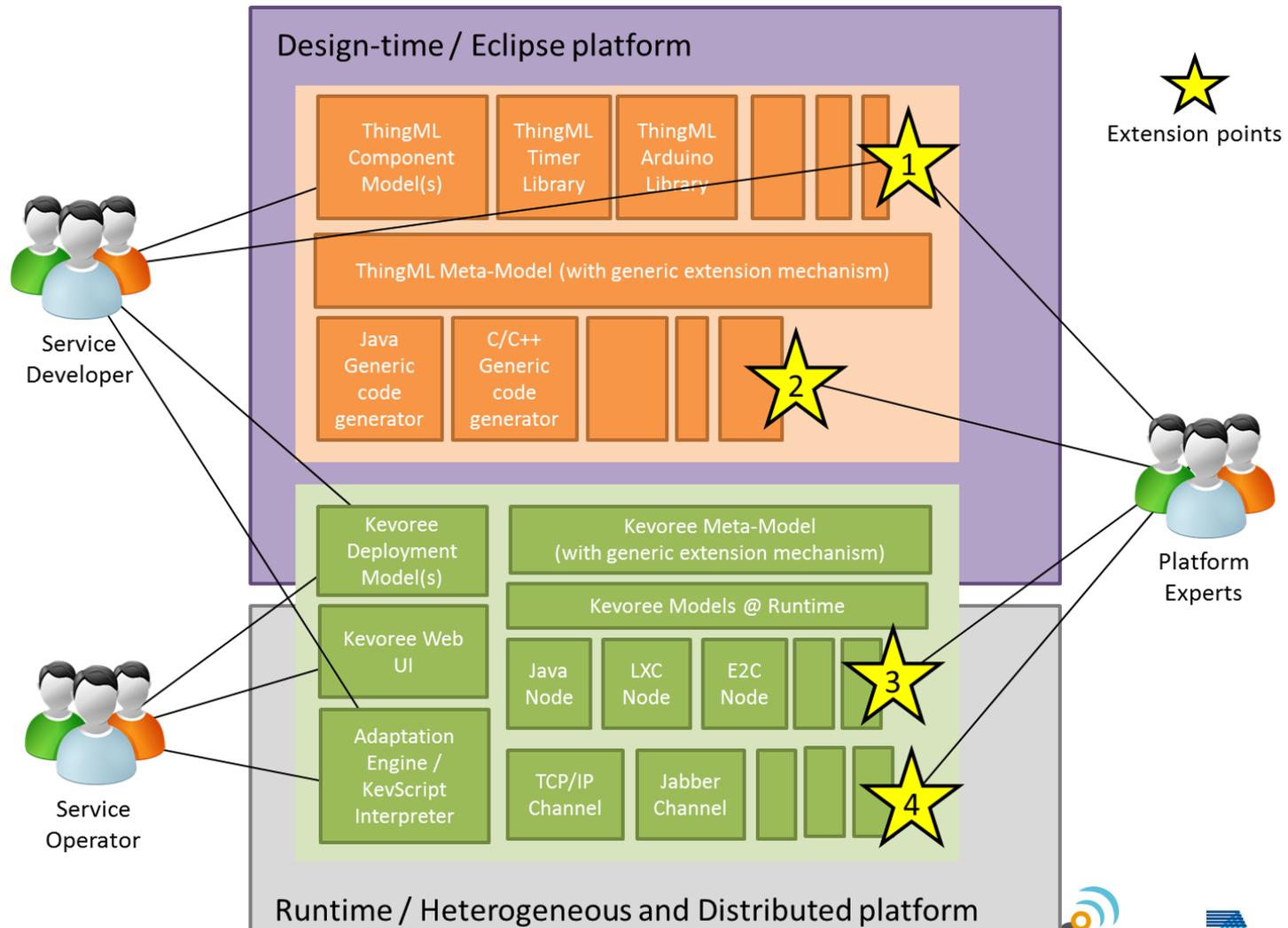
<https://www.youtube.com/channel/UCnXtQ7jowtkXwEYOhieXPBw>

# Consortium



# Thank you!

# HEADS IDE Architecture



# HEADS Objectives

1. Provide service developers with new abstractions to develop HD-services
2. Provide platform experts with efficient means to capture their knowledge
3. Make the HD-service lifecycle safe, predictable and consistent
4. Manage the flow of big data across the future computing continuum
5. Provide seamless dynamic deployment and evolution of HD-services
6. Demonstrate its interest and generality and disseminate HEADS results