



...**UniServer** facilitates the advent of IoT and Smart City solutions through the adoption of a distributed infrastructure where decisions are taken more locally with advanced **Edge-based Micro-Server Technology** ...

### Contact:

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### Project info:

**Horizon 2020-Call:** H2020-ICT-04-2015

**Type of action:** RIA

**Starting date:** Feb 01, 2016

**Duration:** 36 months

**Contract number:** 688540

## Objectives

1. Achieve sustainability through Edge-based Micro-Sever Technology
2. Explore Intrinsic Heterogeneity for Improved Energy/Performance
3. Rethink and Optimize System Software
4. Demonstrate and Exploit UniServer Technologies

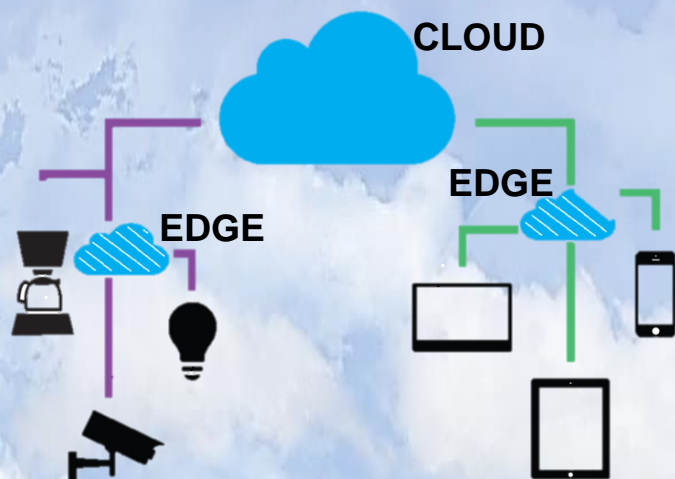




### Objectives 1-2

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## 1- Achieve sustainability through Edge-based Micro-Server Technology

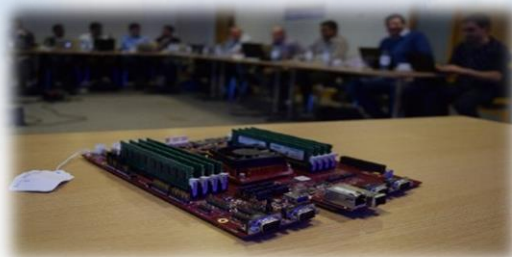


UniServer architecture: cloud and edge-based technology

Edge-based Technology enables to run a service close to the data sources and, consequently, presents an opportunity to improve energy efficiency. Specifically, the latency to communicate through the public network to a cloud resource can be leveraged to run a service with much less power or get more work done in the same power envelope. Edge-based Technology has the potential to eliminate most of the communication latency and, therefore, can permit to run the service at lower frequency and voltage.

## 2- Explore Intrinsic Heterogeneity for Improved Energy/Performance

Processor and memory manufacturers waste power and performance optimization opportunities by using margins to account for worst case scenarios that may seldom occur under a realistic workload. In UniServer such margins are unstressed to achieve optimization. Novel concepts of innovation, such as intrinsic heterogeneity, are not seen as a problem but as an opportunity to improve energy efficiency and develop the methodology that drives the next evolution of cloud computing. This consortium will develop effective means to expose the intrinsic heterogeneity, harness it and use it to our advantage for improving energy efficiency or performance. Indeed, techniques will be developed to constantly monitor and improve the energy efficiency of the system.



UniServer commercial chip-test: 64-bit ARM x-gene2 platform developed by APM



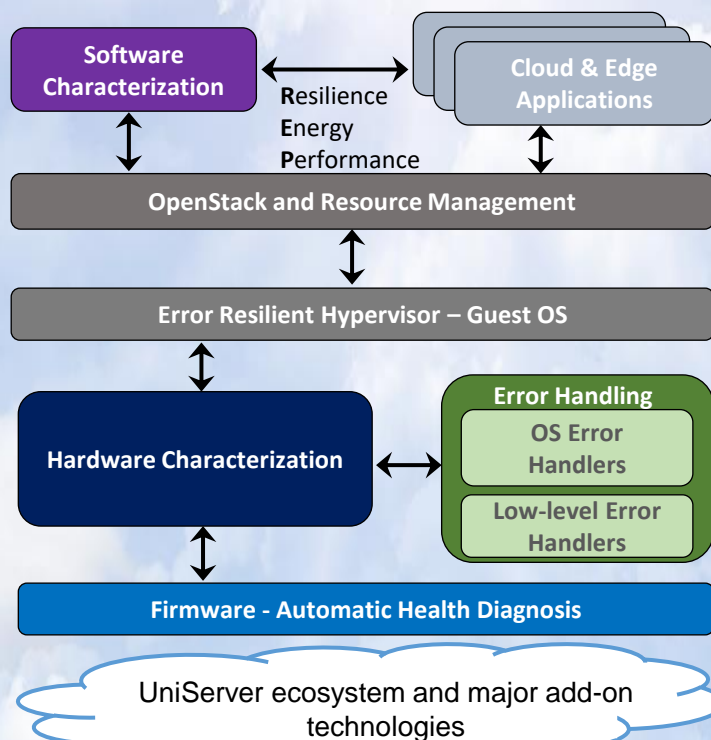


### Objectives 3-4

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## 3- Rethink and Optimize System Software Stack

UniServer plans to succeed, where recent advanced concepts have failed by developing techniques that can be adopted in commercial systems and are application agnostic. UniServer will not require hardware changes and modifications to the application software. UniServer will expose the margins by reporting hardware monitors measurements to the system software stack through lightweight firmware and software. The system software stack will be enhanced with new margin-aware runtime and resource management policies, while considering the requirements of various application domains.



## 4- Demonstrate and Exploit UniServer Technologies



UniServer proposed application:  
Smart Traffic Control

The increased energy efficiency accrued by UniServer naturally lends itself for building a platform to be deployed as a micro-server within a home or in small enterprises for promoting edge computing technology. In order to demonstrate the quality of UniServer solution, big data and IoT applications will be ported, by the applications partners, in this platform. The proposed applications will be: Smart Traffic Control, Social Networks Added Value for Application Tailored Analytics, Financial Trade Management and Analysis. In these contexts, the energy efficiency will be measured for both edge and cloud deployments to validate the real innovation provided through UniServer. Finally, to better understand the benefit-cost of UniServer and facilitate its adoption, this consortium will rely on a novel Total-Cost-of-Ownership model that permits exploring various trade-offs including server configuration and type of deployment (e.g. edge vs cloud).

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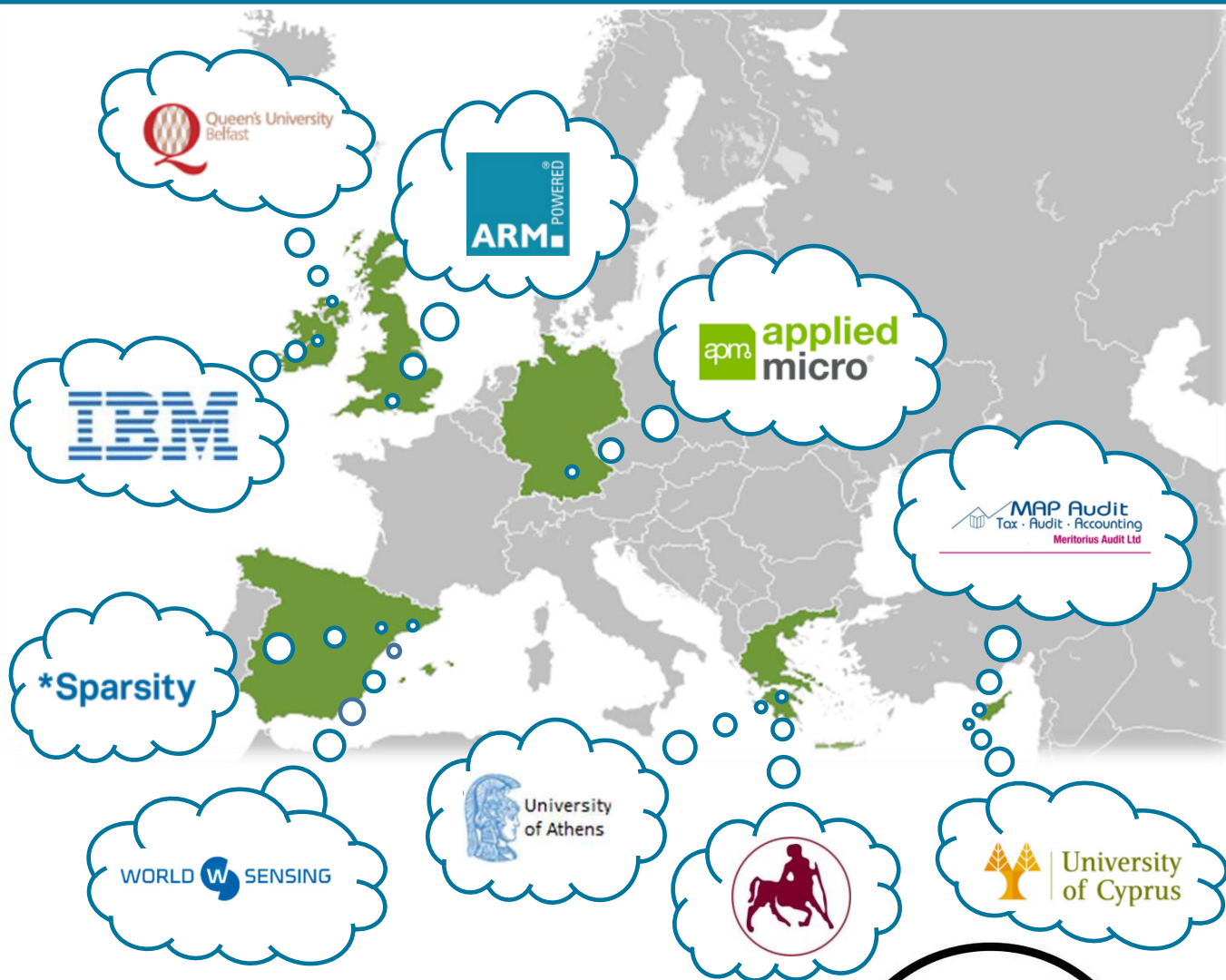
Universal Micro-Server EcoSystem

Exceeding the Energy and Performance Scaling Boundaries



Participants

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## Members of the consortium:

[The Queen's University of Belfast](#), [University of Cyprus](#), [University of Athens](#), [AMCC Deutschland GmbH](#), [ARM Ltd](#), [IBM Ireland Ltd](#), [University of Thessaly](#), [Worldsensing](#), [Meritorius Audit LTD](#) and [SPARSITY SL](#)

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Contract number: 688540

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European  
Commission

Horizon 2020  
European Union funding  
for Research & Innovation

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