A LIGHTWEIGHT SOFTWARE STACK AND SYNERGETIC META-ORCHESTRATION FRAMEWORK FOR THE NEXT GENERATION COMPUTE CONTINUUM

Fact Sheet

Project Information

NEPHELE
Grant agreement ID: 101070487

DOI
10.3030/101070487

Funded under
Digital, Industry and Space

Total cost
€ 9 127 711,25

EU contribution
€ 9 127 711

Coordinated by
ETHNICON METSOVION POLYTECHNION
Greece

Project description

A software stack and orchestration framework for the compute continuum

The next generation IoT and Edge Computing technologies are evolving at a rapid pace. This evolution moves in parallel with the increase in the heterogeneity of the IoT technologies. To efficiently manage hyper-distributed applications across heterogeneous infrastructure in the Cloud-to-Edge-to-IoT continuum, convergence of
IoT technologies and development of synergetic orchestration mechanisms has to take place. NEPHELE aims to tackle these challenges and enable the efficient, reliable and secure end-to-end orchestration of hyper-distributed applications over programmable infrastructure across the compute continuum, considering the integration of IoT devices with the rest part of the infrastructure. A set of use cases across various vertical industries are considered, including disaster management, logistic operations in ports, energy management in smart buildings and remote healthcare services.

Objective

The vision of NEPHELE is to enable the efficient, reliable and secure end-to-end orchestration of hyper-distributed applications over programmable infrastructure that is spanning across the compute continuum from Cloud-to-Edge-to-IoT, removing existing openness and interoperability barriers in the convergence of IoT technologies against cloud and edge computing orchestration platforms, and introducing automation and decentralized intelligence mechanisms powered by 5G and distributed AI technologies.

The NEPHELE project aims to introduce two core innovations, namely:
(i) an IoT and edge computing software stack for leveraging virtualization of IoT devices at the edge part of the infrastructure and supporting openness and interoperability aspects in a device-independent way. Through this software stack, management of a wide range of IoT devices and platforms can be realised in a unified way, avoiding the usage of middleware platforms, while edge computing functionalities can be offered on demand to efficiently support IoT applications’ operations.
(ii) a synergetic meta-orchestration framework for managing the coordination between cloud and edge computing orchestration platforms, through high-level scheduling supervision and definition, based on the adoption of a “system of systems” approach.

The NEPHELE outcomes are going to be demonstrated, validated and evaluated in a set of use cases across various vertical industries, including areas such as disaster management, logistic operations in ports, energy management in smart buildings and remote healthcare services. Two successive open calls will also take place, while a wide open-source community is envisaged to be created for supporting the NEPHELE outcomes.

Fields of science

- engineering and technology
- electrical engineering
- electronic engineering
- information engineering
- information engineering
- telecommunications
- telecommunications networks
- mobile network
- 5G
- natural sciences
- computer and information sciences
- internet
- internet of things
Programme(s)

HORIZON.2.4 - Digital, Industry and Space

HORIZON.2.4.7 - Advanced Computing and Big Data

Topic(s)

HORIZON-CL4-2021-DATA-01-05 - Future European platforms for the Edge: Meta Operating Systems (RIA)

Call for proposal

HORIZON-CL4-2021-DATA-01

See other projects for this call

Funding Scheme

HORIZON-AG - HORIZON Action Grant Budget-Based

Coordinator

ETHNICON METSOVION POLYTECHNION

Net EU contribution

€ 2 379 875,00

Address

Heroon Polytechniou 9 Zographou Campus
157 80 Athina

Region

Κεντρικός Τομέας Αθηνών > Αττική > Αττική

Activity type

Higher or Secondary Education Establishments
Participants (16)

CONSORZIO NAZIONALE INTERUNIVERSITARIO PER LE TELECOMUNICAZIONI

Italy

Net EU contribution
€ 558 750,00

Address
Viale G. P. Usberti 181a
43124 Parma

Region
Nord-Est > Emilia-Romagna > Parma

Activity type
Higher or Secondary Education Establishments

Links
Contact the organisation  Website  Participation in EU R&I programmes  HORIZON collaboration network

Other funding
€ 0,00

SIEMENS AKTIENGESELLSCHAFT

Germany

Net EU contribution
€ 799 375,00

Address
Werner-von-siemens-str. 1
80333 Munchen
Bayern > Oberbayern > München, Kreisfreie Stadt

Private for-profit entities (excluding Higher or Secondary Education Establishments)

ATOS IT SOLUTIONS AND SERVICES IBERIA SL
Spain
Net EU contribution
€ 408,375,00
Address
Ronda De Europa 5
28760 Tres Cantos Madrid

Comunidad de Madrid > Comunidad de Madrid > Madrid

Private for-profit entities (excluding Higher or Secondary Education Establishments)

INSTITUT NATIONAL DE RECHERCHE EN INFORMATIQUE ET AUTOMATIQUE
France
Net EU contribution
€ 432,147,50
Address
Domaine De Voluceau Rocquencourt
UNIVERSITY OF MACEDONIA
Greece
Net EU contribution
€ 370 000,00
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Egnatia Street 156
540 06 Thessaloniki
Region
Θεσσαλονίκη > Κεντρική Μακεδονία > Βόρεια Ελλάδα
Activity type
Higher or Secondary Education Establishments
Links
Contact the organisation 🌐 Website 🌐 Participation in EU R&I programmes 🌐 HORIZON collaboration network 🌐
Other funding
€ 0,00

FUNDINGBOX ACCELERATOR SP ZOO
Poland
Net EU contribution
€ 195 476,00
Address
Ul Postepu 15
02-676 Warszawa

SME  
Yes

Region
Makroregion województwo mazowieckie > Warszawski stoleczny > Miasto Warszawa

Activity type
Other

Links
Contact the organisation  
Participation in EU R&I programmes  
HORIZON collaboration network

Other funding
€ 0,25

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THIRD-PARTY  
FUNDINGBOX COMMUNITIES SL

Spain
Net EU contribution
€ 105 750,00

Address
Calle Mendez Alvaro 20
28045 Madrid

SME  
Yes

Region
Comunidad de Madrid > Comunidad de Madrid > Madrid

Activity type
Other

Links
Contact the organisation  
Participation in EU R&I programmes  
HORIZON collaboration network

Other funding
€ 0,00
ODIN SOLUTIONS SOCIEDAD LIMITADA

Spain

Net EU contribution

€ 433 187,50

Address

Calle Peru 5, Num. 5, Planta 3, Puerta 5, Polígono L Oeste-edificio Forum
30820 Alcantarilla Murcia

SME

Yes

Region

Región de Murcia > Murcia

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding

€ 0,00

ALTER WAY

France

Net EU contribution

€ 586 250,00

Address

1 Rue Royale
92210 Saint-cloud

Region

Ile-de-France > Ile-de-France > Hauts-de-Seine

Activity type

Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links

Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding

€ 0,00
INTERNET INSTITUTE, COMMUNICATIONS SOLUTIONS AND CONSULTING LTD

Slovenia

Net EU contribution € 398 000,00

Address
Crna Vas 128
1000 Ljubljana

SME Yes

Region
Slovenija > Zahodna Slovenija > Osrednjeslovenska

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

ECLIPSE FOUNDATION EUROPE GMBH

Germany

Net EU contribution € 362 500,00

Address
Berliner Allee 47
64295 Darmstadt

SME Yes

Yes

Region
Darmstadt > Darmstadt, Kreisfreie Stadt

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

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WINGS ICT SOLUTIONS INFORMATION & COMMUNICATION TECHNOLOGIES
IKE

Greece

Net EU contribution
€ 453 750,00

Address
189, Syggrou Avenue
171 21 Nea Smyrni

SME
Yes

Region
Νότιος Τομέας Αθηνών > Αττική > Αττική

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

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IBM IRELAND LIMITED

Ireland

Net EU contribution
€ 641 775,00

Address
Ibm House, Shelbourne Road
D blin 4B ll bid

SME
Yes

Region
Nótioc Τoméaς Αθηνων > Αττική > Αττική

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00
Dublin 4 Ballsbridge  
Region
Ireland > Eastern and Midland > Dublin

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation  
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HORIZON collaboration network

Other funding
€ 0,00

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ESAOTE SPA
Italy
Net EU contribution
€ 273 750,00

Address
Via Enrico Melen 77
16152 Genova

Region
Nord-Ovest > Liguria > Genova

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation  
Website  
Participation in EU R&I programmes  
HORIZON collaboration network

Other funding
€ 0,00

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LUKA KOPER, PORT AND LOGISTIC SYSTEM, D.D.
Slovenia
Net EU contribution
€ 244 987,50

Address
Partners (1)

Vojkovo Nabrezje, 38
6000 Koper

Region
Slovenija > Zahodna Slovenija > Obalno-kraška

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
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Other funding
€ 0,00

GEIE ERCIM

France
Net EU contribution
€ 483 762,50

Address
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SME
Yes

Region
Provence-Alpes-Côte d’Azur > Provence-Alpes-Côte d’Azur > Alpes-Maritimes

Activity type
Other

Links
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Other funding
€ 0,00

Partners (1)
ZURCHER HOCHSCHULE FUR ANGEWANDTE WISSENSCHAFTEN

Net EU contribution
€ 0,00

Address
Gertrudstrasse 15
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Region
Schweiz/Suisse/Svizzera > Zürich > Zürich

Activity type
Higher or Secondary Education Establishments

Links
Contact the organisation
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Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 0,00

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