



HORIZON EUROPE FRAMEWORK PROGRAMME

# CloudSkin

(grant agreement No 101092646)

## Adaptive virtualization for AI-enabled Cloud-edge Continuum

### D1.1 Public Project Website

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<b>Abstract</b>	This document summarizes the structure, the content and the functionalities of the public website of the CloudSkin project.
<b>Keywords</b>	website, dissemination, communication

## History of changes

Version	Date	Author	Summary of changes
1.0	31-01-2023	Vanesa Ruana	Initial version.

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## **1 Executive summary**

The CloudSkin website has been designed, developed and populated with initial content. The website was launched in January 2023 and can be found at <http://cloudskin.eu>

Key features of the website are:

- Responsive web design. The website will dynamically adjust to the device of the viewer.
- The Homepage showcases the project objectives, latest news and events, deliverables and other outcomes of the project.
- Project information including use cases and partners.
- Links to the CloudSkin Social Media pages

The website will continue to be maintained and updated as the project progresses. The project social media presence will be further developed by updates, interactions and community building activities.

## 2 Introduction

The project public website is part of the management and dissemination strategy of the CloudSkin project. It serves as a first source of information to the general public, particularly with regards to activities, news and public project results. In addition, it aims to attract potential collaborators to the project.

The website implemented and described below is the initial version of the site that will be further maintained and updated with new information and functionalities as the project advances.

## 3 CloudSkin website

The CloudSkin website is available at <http://cloudskin.eu> and <http://www.cloudskin.eu> and is hosted at <https://cloudskin-eu.github.io/>. The website was designed and developed with the following requirements:

- Attractive and functional design: to achieve an effective dissemination of the latest project news, events and results available.
- Responsive web design: the layout changes based on the size and capabilities of the device (phone, tablet, desktop computer, ...).
- Simple management tool: the maintenance must be easy and fast.

### 3.1 Website management tool

The CloudSkin website was built using Jekyll<sup>1</sup>, a static-site generator that provides some of the benefits of a Content Management System (CMS) while avoiding the performance and security issues introduced by such database-driven sites.

A Jekyll webpage content can be maintained using lightweight text editors instead of web forms. Additionally, Jekyll allows us to use version control to track changes to the website. Jekyll is written in Ruby and it is distributed under the open source MIT license.

### 3.2 Website structure

The Website has been structured using a single page design that provides a quick and easy navigation to all the information about the project. The primary navigation of the site will be via the menu located at the top. Specifically, the Website (Fig. 1) is divided into several sections, including:

- Objectives: This provides a basic overview of the project objectives.
- Use cases: This contains information about the 4 use cases of the project: Edge orchestration and video analytics, metabolomics, surgery and Agriculture IoT.
- Deliverables: A list of all public deliverables and peer reviewed publications specifically related to the project. As the project advances, this section will include links to data sets, prototypes and other project outcomes.
- News: News and events concerning the CloudSkin Project. This section will be periodically updated.
- Partners: A list of all CloudSkin Partners, including their logos and links to their institutional websites.
- About: This provides a general information of the project.
- Footer: This section includes contact details, links to social media, and the acknowledgement to the Horizon Europe (HORIZON) programme.

The website uses a fully responsive Bootstrap<sup>2</sup> template that allows it to dynamically adjust to different sizes of device. This template also supports responsive, full screen modal windows that are used to expand news or show more details about the use cases.

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<sup>1</sup><https://jekyllrb.com/>

<sup>2</sup><https://getbootstrap.com/>

**CLOUDSKIN** OBJECTIVES USE CASES DELIVERABLES NEWS PARTNERS ABOUT

# CLOUDSKIN

## Adaptive virtualization for AI-enabled Cloud-edge Continuum

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### Objectives

CLOUDSKIN aims to design a cognitive cloud continuum platform to fully exploit the available Cloud-edge heterogeneous resources, finding the "sweet spot" between the cloud and the edge, and smartly adapting to changes in application behavior via AI. To facilitate automatic deployment, mobility and security of services, CloudSkin will build an innovative universal container-like execution abstraction based on WebAssembly that allows the seamless and trustworthy execution of legacy applications across the Cloud-edge continuum.

CLOUDSKIN

The goals of CLOUDSKIN are the following:

- Smart management for the Cloud-edge continuum:** The overall objective is to leverage the generated knowledge from state-of-art AI methods to transparently orchestrate Cloud-edge resources. The key goal is to build a "Learning Plane" that, in cooperation with the application execution framework and continuum infrastructure, can enhance the overall orchestration of Cloud-edge resources. Such plane is the materialization of the cognitive cloud, where decisions on the cloud and the edge are driven by the continuously obtained knowledge and awareness of the computing environment through AI, and particularly, neural networks and statistical learning, taking the challenge of enabling these methods into low-power edge devices.
- Virtual execution for the Cloud-edge continuum:** This goal focuses on a new universal and flexible execution abstraction, we called it "Cloud-edge cells", that will enable the execution of legacy and highly granular applications in the cloud continuum. The new container-like execution abstraction will be based on the WebAssembly technology. It will enable the execution of the same computation on a wide-range of cloud and embedded devices and make task execution migratable across different servers and devices in the continuum infrastructure. We will integrate our WebAssembly executor with Kubernetes. More specifically, we will contribute new features to Kubernetes that will support the efficient migration of WebAssembly containers between different levels of the continuum, exploiting WebAssembly's capability for state virtualization.
- Infrastructure support for the Cloud-edge continuum:** This objective is to prepare the infrastructure to turn it into a virtual resource continuum, where the large set of Cloud-edge cells composing applications can be allocated flexible resources, according to their dynamically changing needs. One of the major challenges here is to design an infrastructure to support extremely short-lived Cloud-edge cells and tasks (of 1s to 10ms, or less) and extremely intense bursts with fast data access requirements. This requires delivering bare metal resource performance to storage, despite virtualization and dynamic reallocation, which today is not possible in the cloud continuum. CLOUDSKIN will achieve this by leveraging high-performance I/O (RDMA networking) and near-storage CPU compute capacity (GPUs, FPGAs) to the fine-grained application tasks.

### Use Cases

- Edge orchestration and video analytics:** Orchestration of edge apps with matching cloud performance and the creation of AI video-analytics
- Metabolomics:** Edge/on-premise batch analytics and reduction of cloud offloading for Hybrid Metagenase
- Surgery:** Real-time edge video analytics with dynamic resource allocation and Private Deep & Federated Learning at the edge
- Agriculture IoT:** Dynamic cloud offloading to match detail level and creation of an IoT-based agriculture data space

### Deliverables

### News

### Partners

The CloudSkin consortium is a well-balanced team of industrial and academic partners

UNIVERSITAT ROVIRA I VIRGILI, EBC, TECNIOLOGIA EMERGEN, NEARBY COMPUTING, AITHRA, EMBL, IIO, dkfz., Tradia, DELL Technologies, IBM, Imperial College London

### About

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**Partners:** European Molecular Biology Laboratory (Germany)  
IIO Networks España S. (Spain)  
Deutsches Krebsforschungszentrum Heidelberg (Germany)  
Tradia Telecom S. (Spain)  
EMC Information Systems International Unlimited Company (Ireland)  
IBM Research GmbH (Switzerland)  
Imperial College of Science, Technology and Medicine (United Kingdom)  
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Figure 1: CloudSkin website main page (desktop browser).

## 4 Social media

The website includes links to CloudSkin social media accounts (Twitter, YouTube). The CloudSkin consortium will use Twitter as its main social media platform for the project. At the same time the website was launched, we also created the Twitter account @cloudskin2023 (Fig. 2) to disseminate information about project activities. Both the website and the Twitter account will be used for the public communication of all project activities and events.

The Consortium will also use the CloudSkin YouTube channel to share promotional videos that disseminate the achievements of the project.

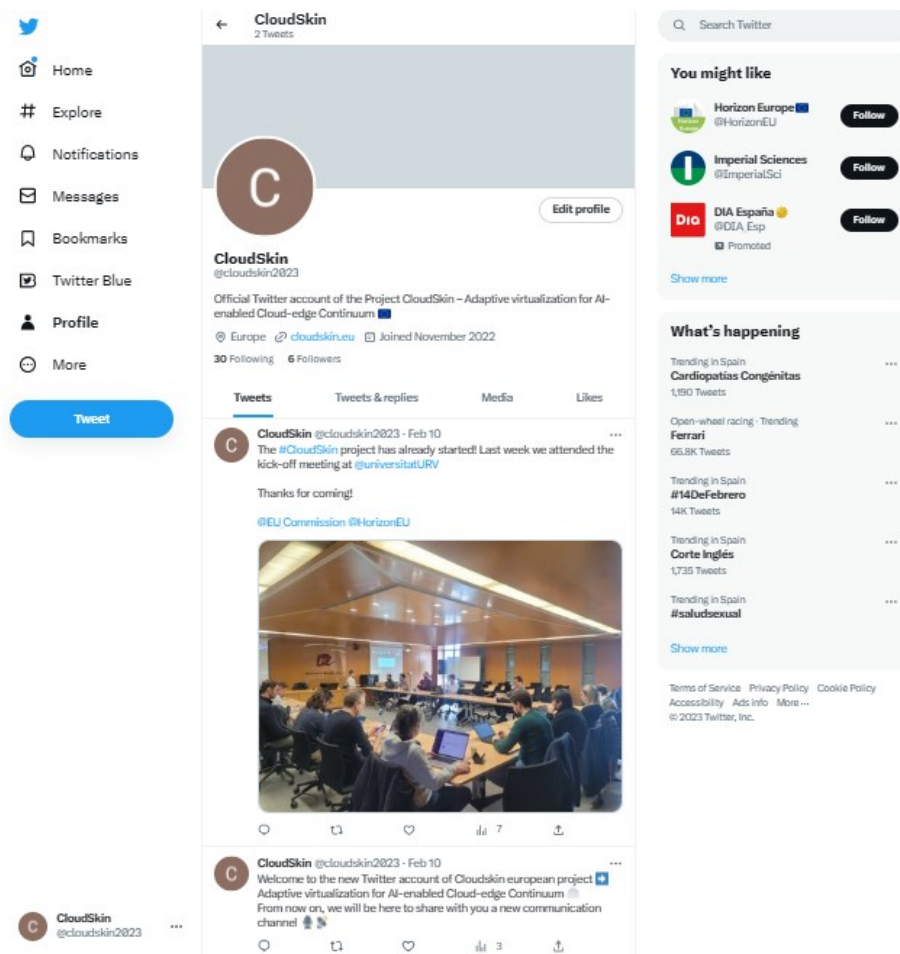


Figure 2: CloudSkin Twitter account.



## 5 Conclusions

This deliverable presents the CloudSkin public website. The objective of the website is to inform the general public about CloudSkin and its achievements, as well as to attract potential collaborators to the project.

The success of a project such as CloudSkin depends on efficient communication and coordination, and the public site is an essential tool to achieve this goal. The site provides public information, news, events and deliverables. It will be promoted through social media and during conferences and events where partners present the project.

The *.eu* domain name of `cloudskin.eu` has been registered for the site. The website will be continuously updated, adjusted and improved.