The interTwin Digital Twin Engine: a platform for building and managing scientific Digital Twins

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EOSC Symposium 2025, Berlin, Germany

Funded by the European Union

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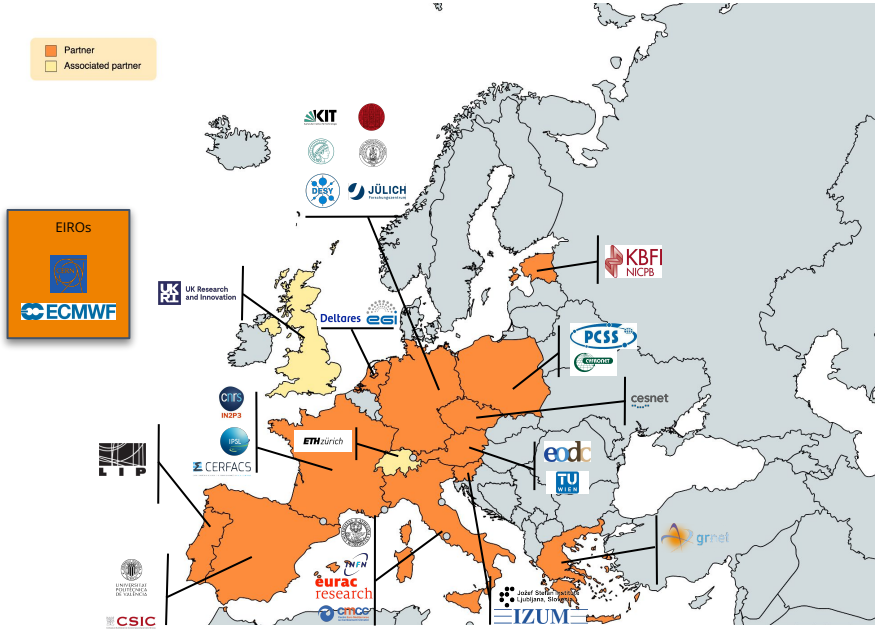
interTwin Consortium



1.09.22 - 31.08.25

Budget 11,7 M euro

EGI Foundation as coordinator

30 **Participants**, including 1 affiliated entity and 2 associated partners

Consortium at a glance

10
Providers

cloud, HTC , HPC resources and access to Quantum systems

11
Technology providers

delivering the DTE infrastructure and horizontal capabilities

14
Community representants

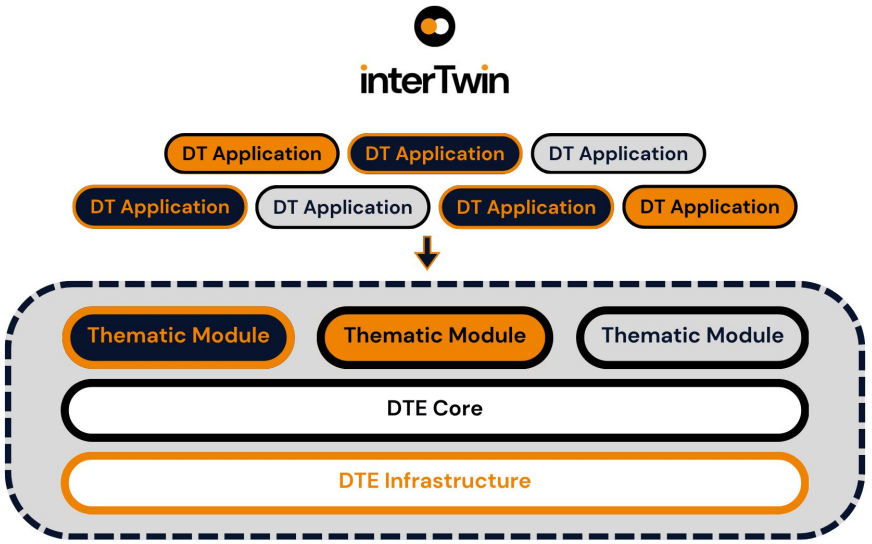
from 5 domains requirements and developing DT applications and thematic modules

interTwin - Digital Twin Engine for science

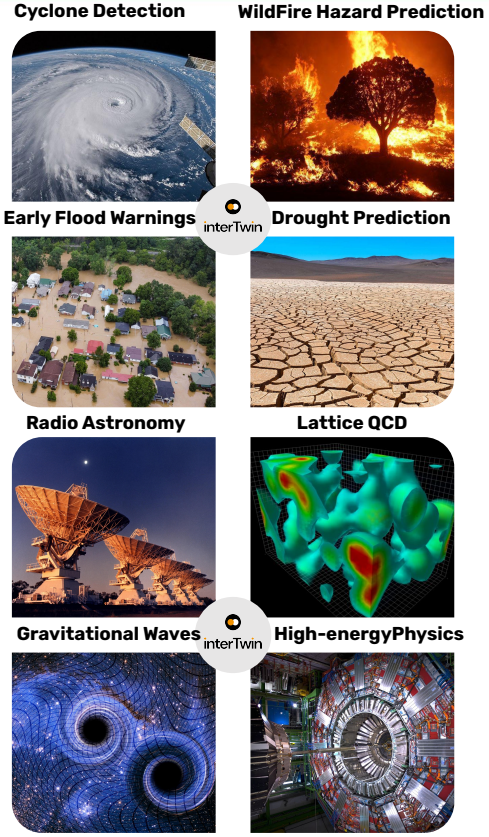
Co-designs and implements the prototype of an **interdisciplinary Digital Twin Engine**

Open-source platform based on **open standards** offering the capability to develop **application-specific Digital Twins (DTs)**

Piloted by a large spectrum of **diverse use cases** from physics and environmental sciences



The interTwin Digital Twin Engine (DTE)

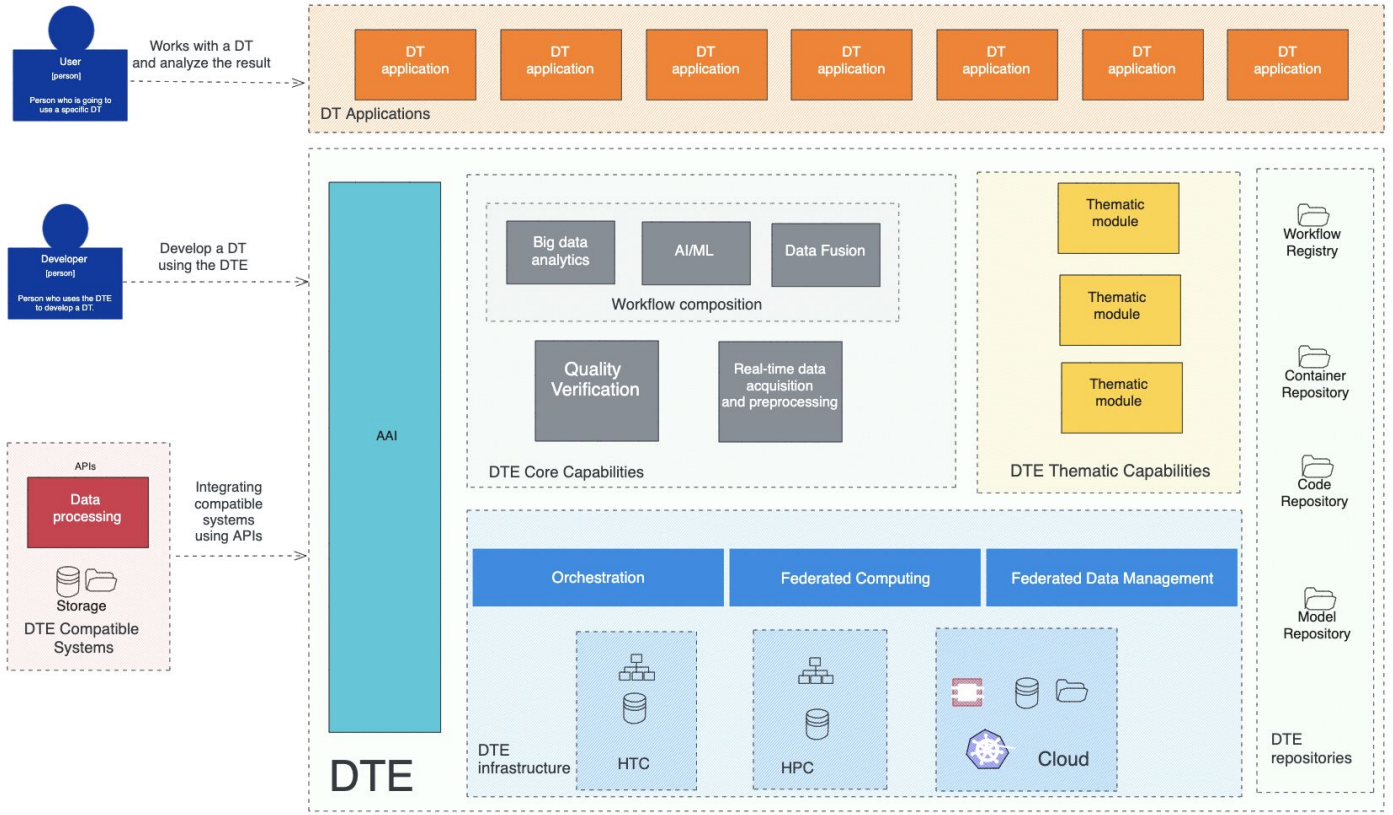


DTE Blueprint Architecture

Second version of the Blueprint architecture and design specifications is available in Zenodo

Final version is planned for Q4 2024

Also includes the analysys of relevant initiatives and projects (*DestinE, EOSC, ESCAPE, C-Scale, Digital Twin Consortium and EU Data Spaces, DT-GEO and BioDT*) to identify potential architectural components that can be incorporated within the interTwin context and where interoperability is desirable.



Timeline

interTwin DTE first release available
- 38 components in Total
- New components developed and extension to existing software
- interTwin GitHub

Project Year 1 COMPLETED

05 - 06.2023 — **DTE Design and specifications**

Deliverables: Report on requirements for all use cases and Design specs

DTE blueprint architecture

Deliverable: DTE blueprint architecture, functional specifications and requirements analysis v1

08.2023 — **DT Applications Design**

Deliverable: First Architecture design of the DTs capabilities

Project Year 2 COMPLETED

11-12.2023 — **Software Releases**

Deliverables: Software releases for all use cases and modules

01.2024 — **DTE blueprint architecture II**

Deliverable: DTE blueprint architecture, functional specifications and requirements analysis v2

04.2024 — **Validation**

Deliverables: DT application development and integration report

09.2024 — **Design and specifications II**

Deliverables: Updated report on requirements for all use cases

Project Year 3 Focus now!

10.2024 — **DTE blueprint architecture III**

Deliverable: DTE blueprint architecture, functional specifications and requirements analysis v3

01-04.2025 — **Software Releases II**

Deliverables: Final Software releases for all use cases and modules

07-08.2025 — **Validation II**

Deliverables:
DT application development and integration report
Report on software architecture concepts based on DestinE and InterTwin
Final Architecture design of the DTs capabilities

2023 | 2024 | 2025

Conclusion - integration with EOSC

Objective 3. Extend the technical capabilities of the European Open Science Cloud with modelling & simulation tools integrated with its compute platform

Initial plan:

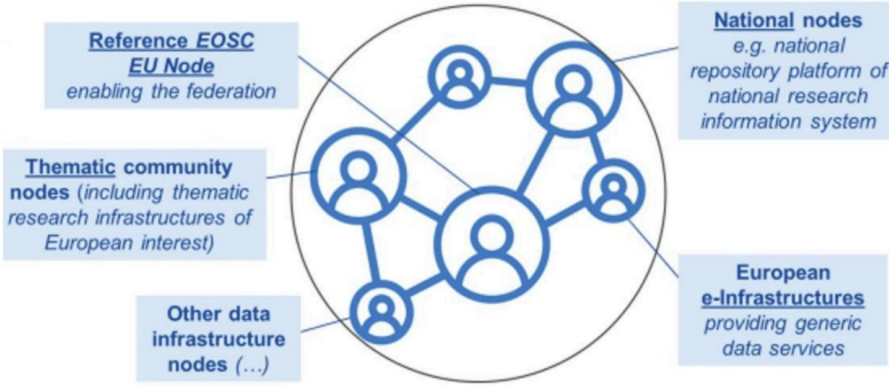
- Integrate with EOSC Core (e.g. AAI)
- Onboard higher-TRL components and services to EOSC portal (marketplace)

Evolving landscape:

- EOSC becoming a federation of Nodes

Several options for future integration:

- Deliver Digital Twin capabilities as a thematic node
- Deliver interTwin services part of EGI Node
- Onboarding services to EOSC EU Node



Thank you!

Questions?

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