






# Telco Edge Cloud in Europe

DT, Orange, TIM, Telefónica  
8<sup>th</sup> July 2021



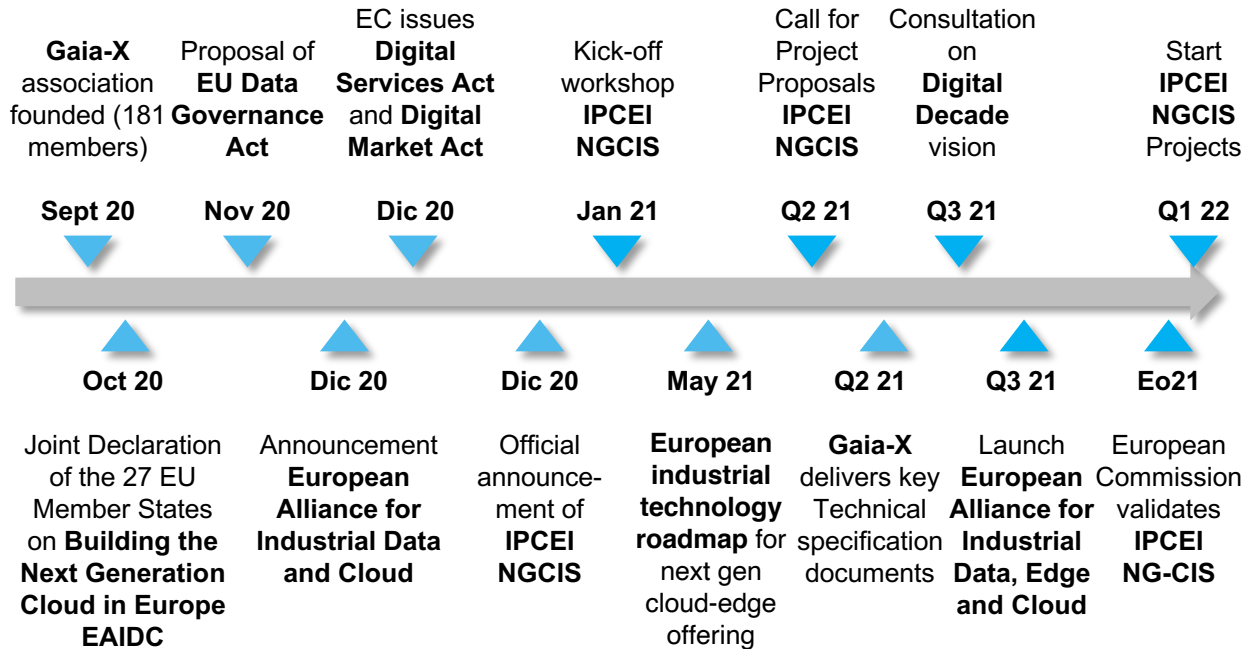
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# Edge and Cloud in Europe

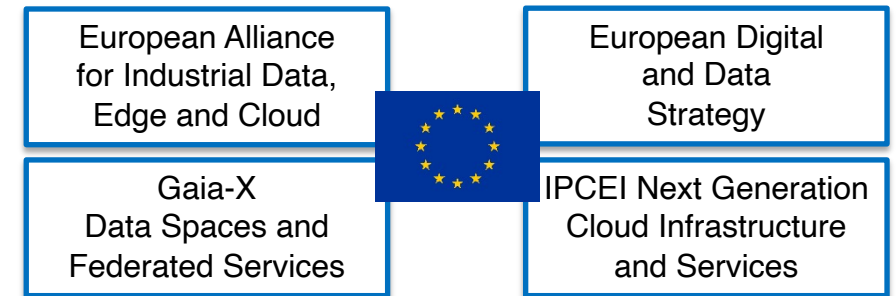
Since 2020, the activity at the EU on Data, Edge and Cloud has increased significantly with relevant regional initiatives at Technology, Business and Public Policy levels, combining public and private efforts



Supported by European and National Recovery and Resiliency plans and other European programs (Digital Europe, Horizon Europe, CEF2...)

Joint declaration of the 27 EU member states, October 2020.  
*Building the next generation cloud for business and the public sector in the EU.*

**"The EU has a unique opportunity to address the need for more data sharing and decentralised data processing, closer to the user (at the edge).** The volume of generated data is greatly increasing and a growing proportion of data is being processed at the edge. The next big wave of digital transformation will be powered by industrial data. To be ahead of the curve, **we need to ensure favourable conditions for EU businesses to develop cloud capacities with global reach meeting the emerging needs of industrial data, especially in terms of processing close to the user and guaranteeing users' data sovereignty.** To make the most out of the data we produce, we also need to enable the deployment of EU data spaces in key public and private sectors. Only by integrating data and network technologies at European scale can we attain the next generation of resilient and competitive cloud offering. But we must act rapidly and together"



Focus points for next decade:

- a digitally skilled population and highly skilled digital professionals
- secure and substantial digital infrastructures
- digital transformation of businesses
- digitisation of public sectors



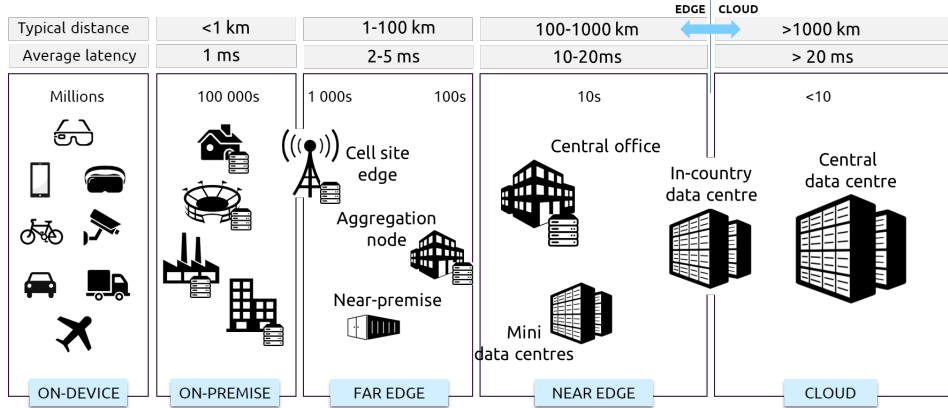
Some targets for next decade:

- 20 M ICT specialists and 80% pop w/ basic digital skills
- 5G/Gigabit for everyone
- 10.000 edge nodes.
- 75% EU companies using Cloud/AI/Big Data, > 90% SMEs w/ basic digital level

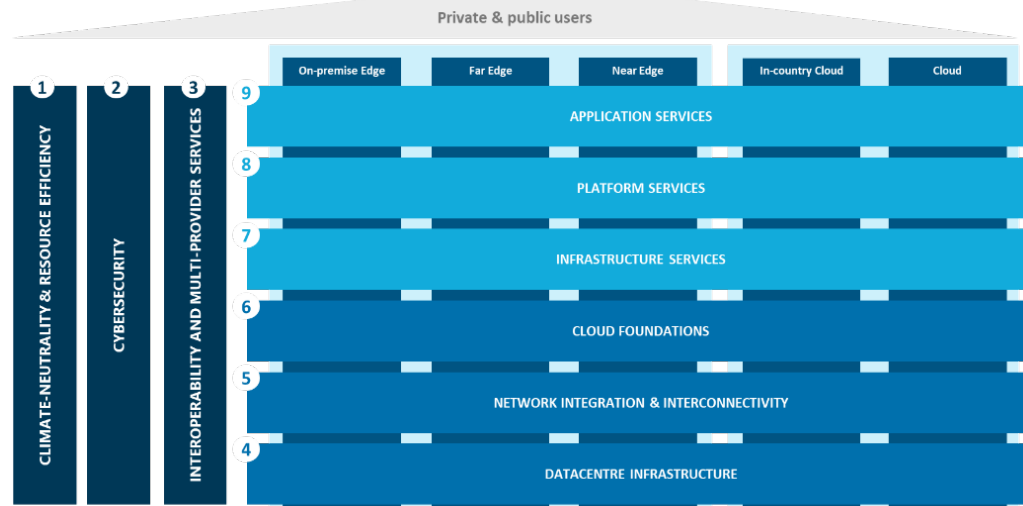


# Edge and Cloud in Europe

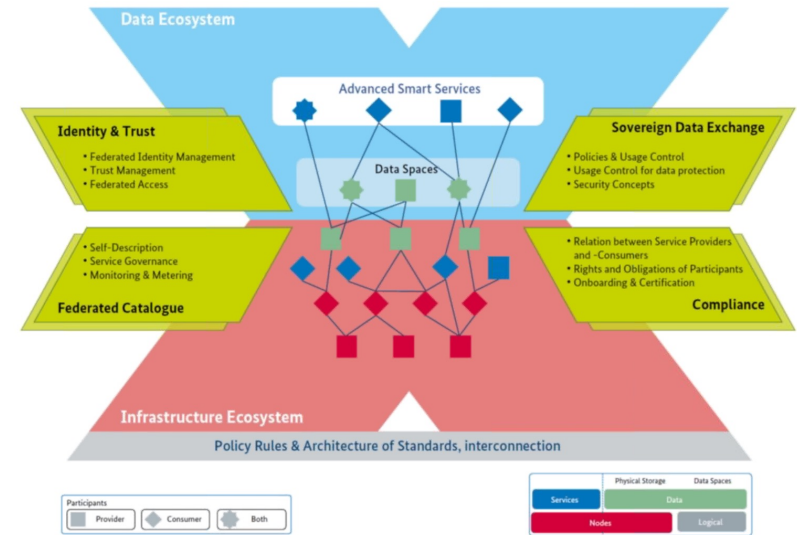
## Cloud and Edge Continuum



## Edge and Cloud Technology Priorities



## Gaia-X – Architecture (Data and Infra Ecosystems)





# Holoverse, the videoconference evolution

- **Background:** Video calling exploded during Covid, forcing many to work, be educated and stay in touch with friends & family from home. AR / VR takes conferencing to the next level, to be “virtually there” in the same environment, to socialise, work, collaborate, interact, share, in a way beyond what video allows.
- **Scope:** Multi-operator trial to demo the benefit of TEC with a service that can be understood as public utility in current socio-economic context: **holographic communications & virtual shared world.**
- **The Partners:**
  - DT, Orange, TIM and Telefonica providing the network and edge infra.
  - MobileEdgeX as telco edge platform provider
  - DoubleMe provides “TwinWorld” the holographic and virtual world application to be deployed on TEC.



- **The objective:**

- Improve **end user experience on holographic communications** by bringing the relevant application components closer to the end-user (relying on the better latency and jitter, saving transport bandwidth and offloading graphic processing from the device to the network).
- Demonstrate key MNO features in the telco edge: primarily **roaming** and **interconnection**, as well as the **multi-MNO aggregation** (federation) & **smart Edge Discovery**.

- **What we will need develop:**

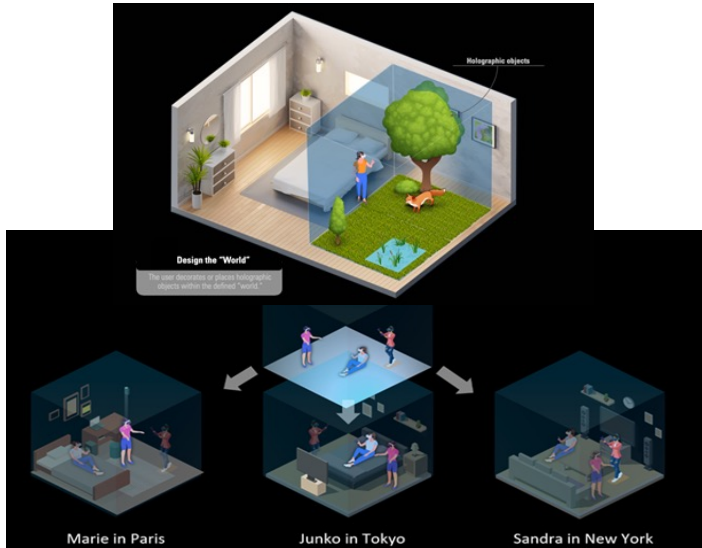
- Adapt the application design to work in a distributed environment where users from different MNOs need to communicate altogether.
- Enable **local break out while roaming** at network layer to enable Edge Service Availability in Visited Networks.
- Expose specialized hardware resource in the TEC cloudlets (**GPU – graphical processing units**).



# Holoverse, the videoconference evolution

## DoubleMe's application

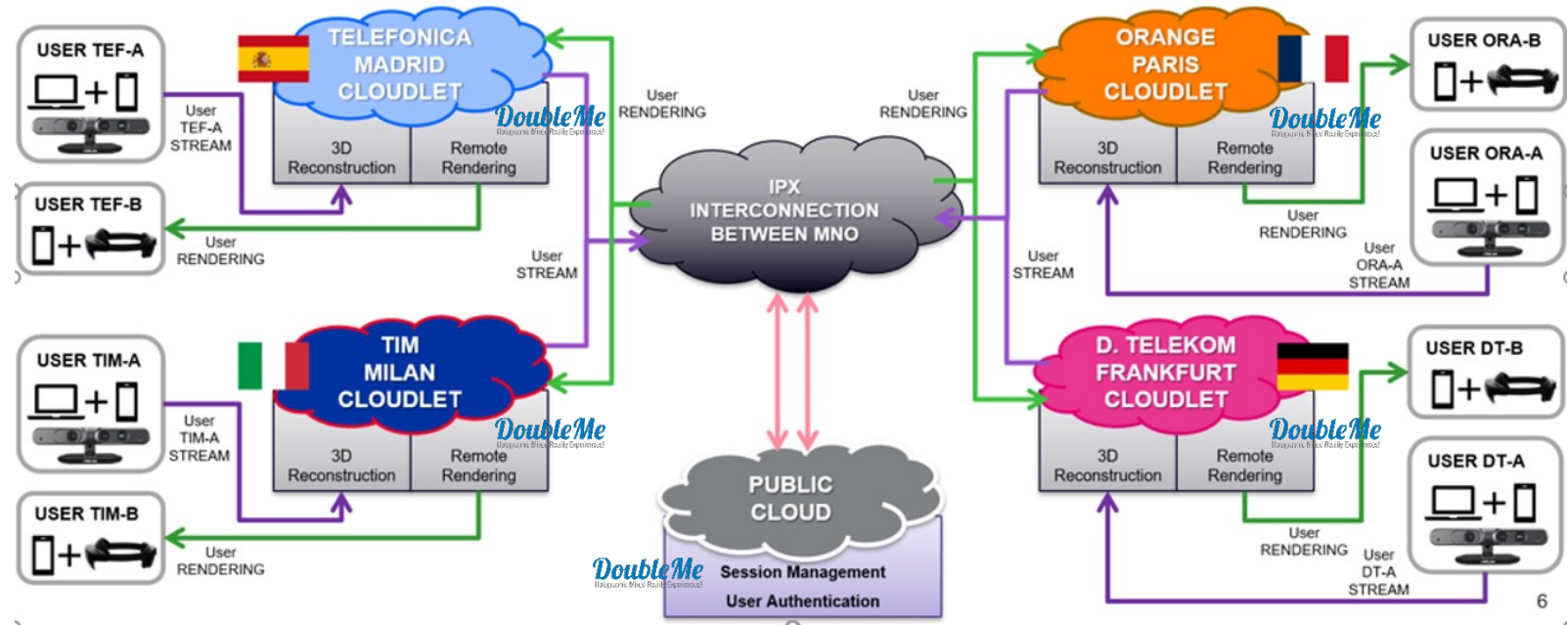
- Users can create shared virtual spaces that can decorate with virtual objects and where to collaborate and communicate with other users joining from any country or MNO.



- Users can be present in their virtual space as 3D avatars as well as as realistic holograms



## Deployment Architecture over the TEC



- The **hologram Reconstructor component and 3D rendering** component is to be deployed in the **TEC cloudlets** of each MNO, these components requires GPUs in the cloudlet.
- The session and user manager is kept centralized deployed at the the **public cloud**.
- On the end user side the holograms and avatars are captured using one depth camera at the “caller”/ producer side, and the visualization of the virtual world and holograms at the “called”/consumer side requires a mixed reality glasses like Hololens2.





# TEC Trials

**DoubleMe**  
Holographic Mixed Reality Experiences!



**STURFEE**



**bridge alliance**

**Federated Edge Hub**



REAL TIME HOLOGRAPHIC  
MIXED REALITY EXPERIENCES

**KDDI**



VISUAL POSITIONING  
SERVICE



**OPTUS**

FEDERATION OF EDGE  
COMPUTE SERVICES