



The REINDEER project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101013425.



REINDEER

REsilient INteractive applications through hyper Diversity in Energy Efficient RadioWeaves technology.

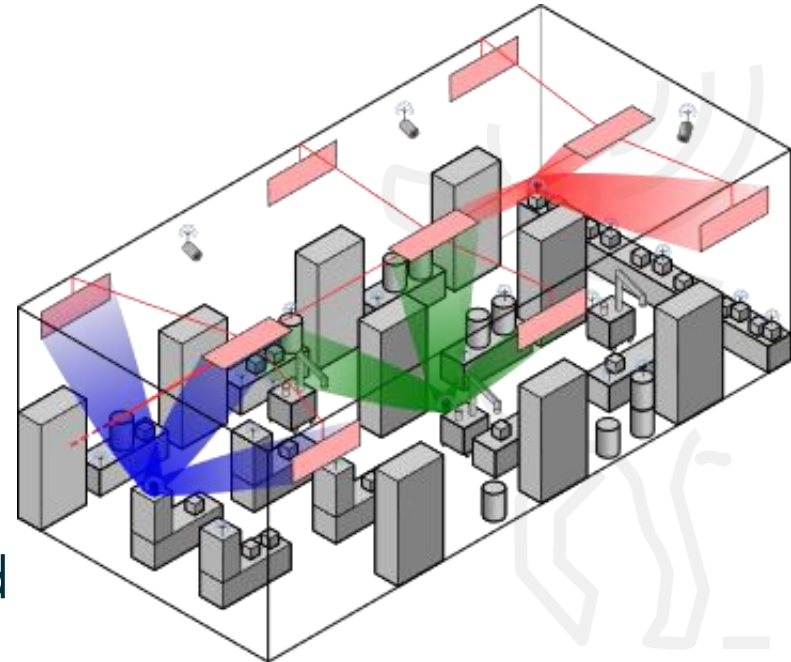
Emerging interactive use cases: technical requirements and quantification

3rd February 2022

Juan Francisco Esteban, Telefónica

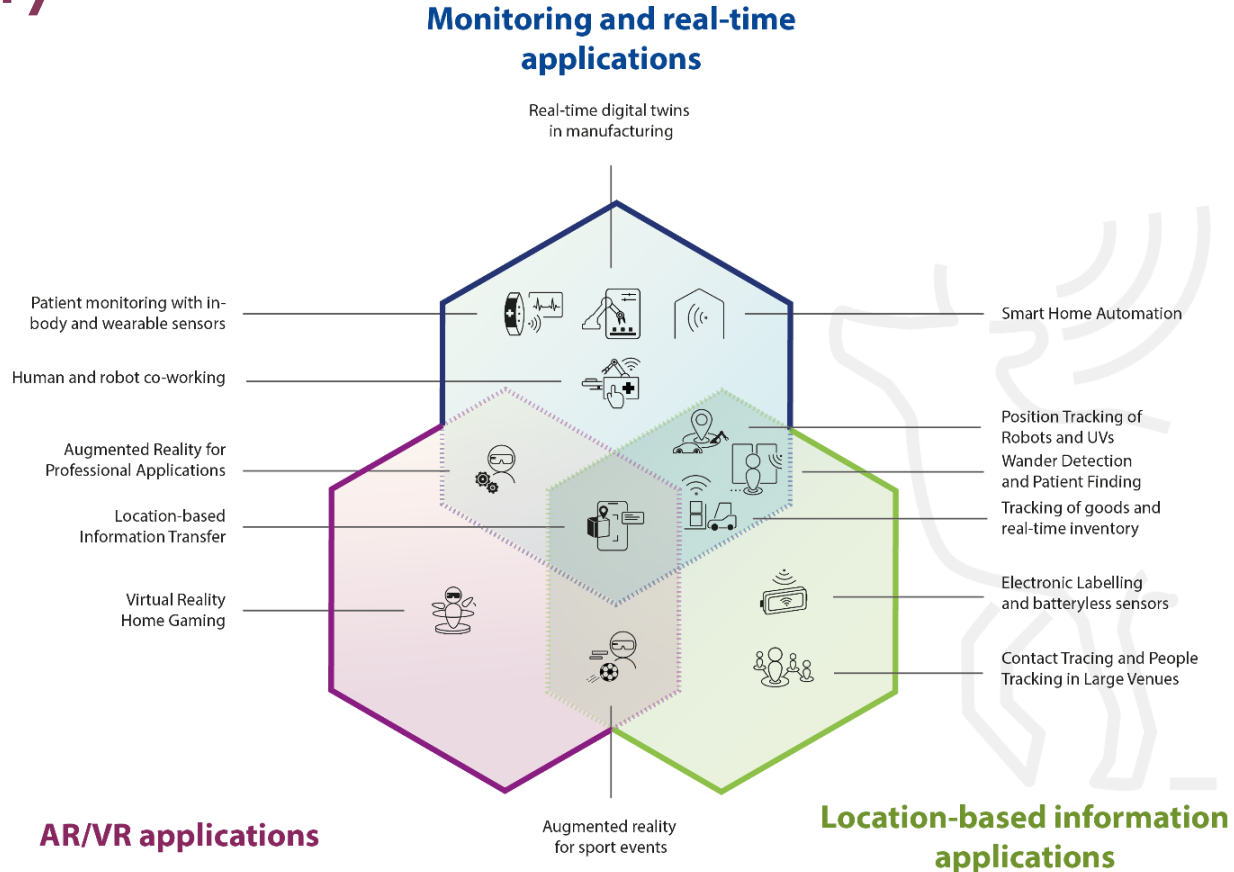
REINDEER develops RadioWeaves technology

1. making a clean break from classical cellular topologies, distributing a very high number of antennas, radios and computational resources throughout the environment.
2. To overcome performance and energy efficiency bottlenecks.



Use cases summary

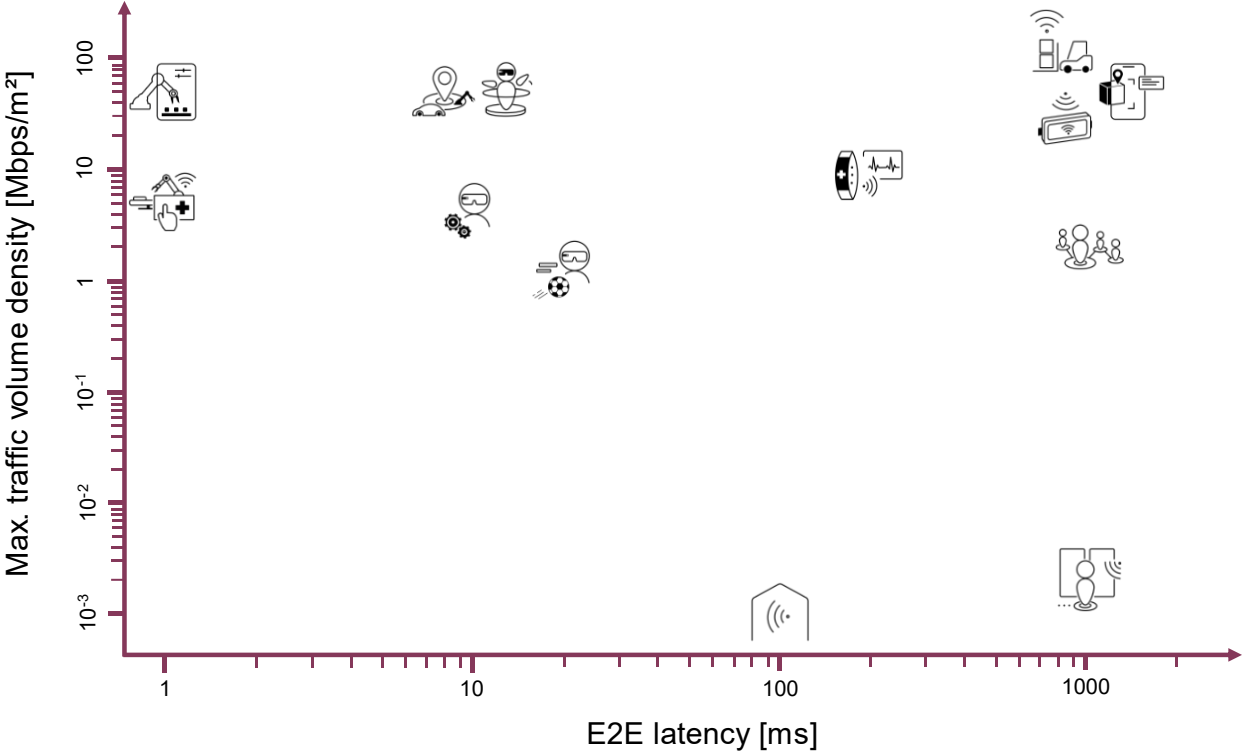
Use case ID	Use case name
1	Augmented reality for sport events
2	Real-time digital twins in manufacturing
3	Patient monitoring with in-body and wearable sensors
4	Human and robot co-working
5	Tracking of goods and real-time inventory
6	Electronic labelling
7	Augmented reality for professional applications
8	Wander detection and patient finding
9	Contact tracing and people tracking in large venues
10	Position tracking of robots and UVs
11	Location-based information transfer
12	Virtual reality home gaming
13	Smart home automation



Technical requirements

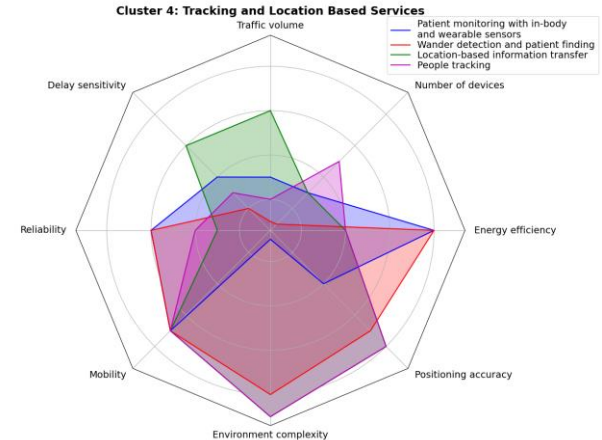
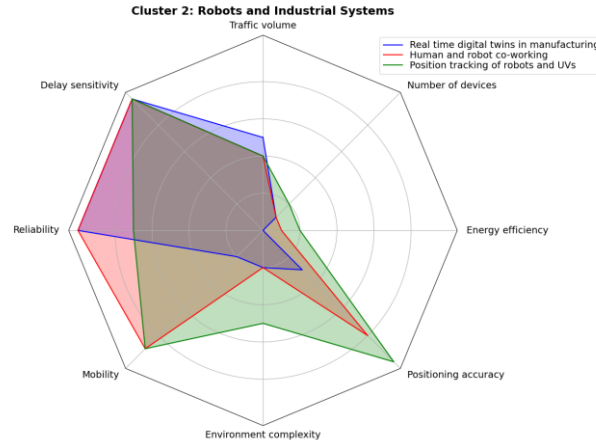
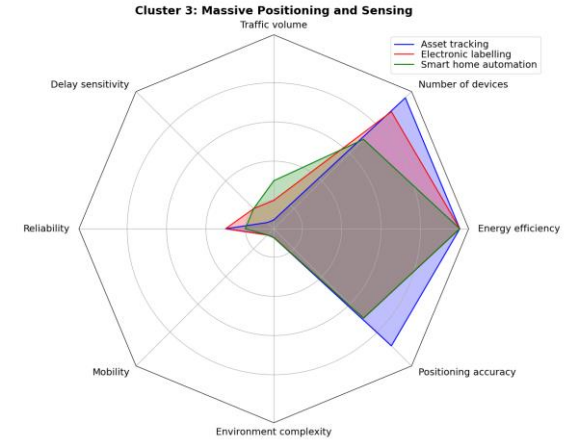
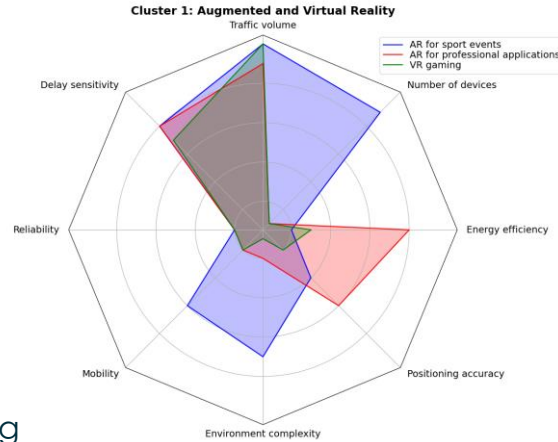
Key Performance Indicator	Use Case												
	1	2	3	4	5	6	7	8	9	10	11	12	13
Carrier frequency (GHz)	2.4 5+	2.4 3.8	0.9 2.4 5+	2.4 3.8	0.9 2.4 3.8 5+	2.4 5+	2.4 3.8 5+	0.9 2.4 3.8 5+	0.9 2.4 3.8 5+	0.9 2.4 3.8 5+	2.4 5+	5+	2.4 5+
Device density (per m ²)	2	100	2	1	100	20	0.1	2	2	100	10	1	100
Maximum number of simultaneous devices	10k	1000	20	10	50k	10k	10	50	10k	500	100	2	10k
User experience data rate (Mbps)	5	1	1	5	<1	≪1	45 / 3000	<1	1	10	10	150	0.5
Dominant traffic direction	DL	Both	UL	Both	UL	DL	DL	UL	UL	UL	DL	DL	UL
Mobility (m/s)	10	10	1	0	10	2	2	7	2	10	2	2	0
Positioning Accuracy (m)	0.5	0.1	1	-	0.1	0.5	0.1	1	1	0.1	0.5	0.1	0.1
Reliability (packet loss)	10 ⁻³	10 ⁻⁵	10 ⁻⁴	10 ⁻⁵	10 ⁻³	10 ⁻⁵	10 ⁻²	10 ⁻³	10 ⁻³	10 ⁻⁶	10 ⁻²	10 ⁻²	10 ⁻²
End to end latency (ms)	20	1	200	1	100	1000	10	1000	1000	10	1000	10	100
Traffic volume density (Mbps/m ²)	10	20	10	5	<100	<0.1	4.5	<1	2	50	50	50	0.1
Power density (mW/m ²)	-	-	<1	-	-	0.25	>10	0.1	0.1	-	-	-	0.25

Latency vs traffic volume density



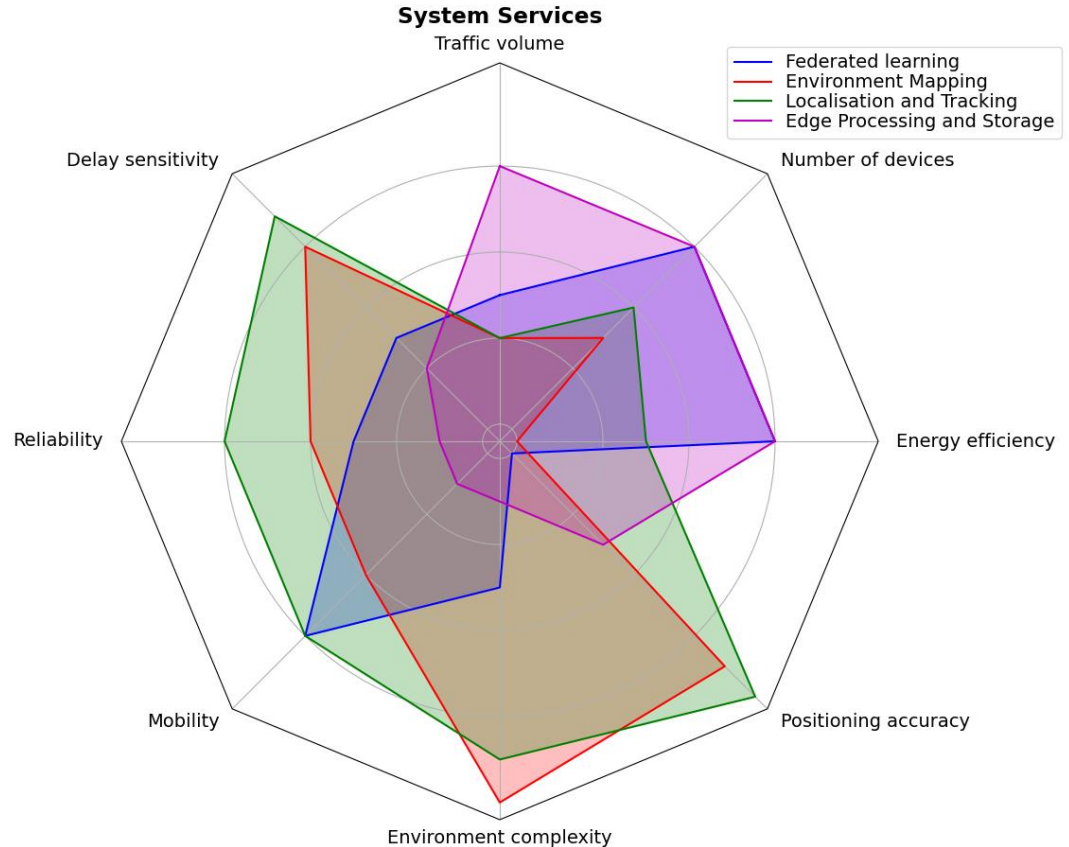
Challenges clasification

- Cluster 1: Augmented and virtual reality
- Cluster 2: Robots and industrial systems
- Cluster 3: Massive positioning and sensing
- Cluster 4: Tracking and location based services

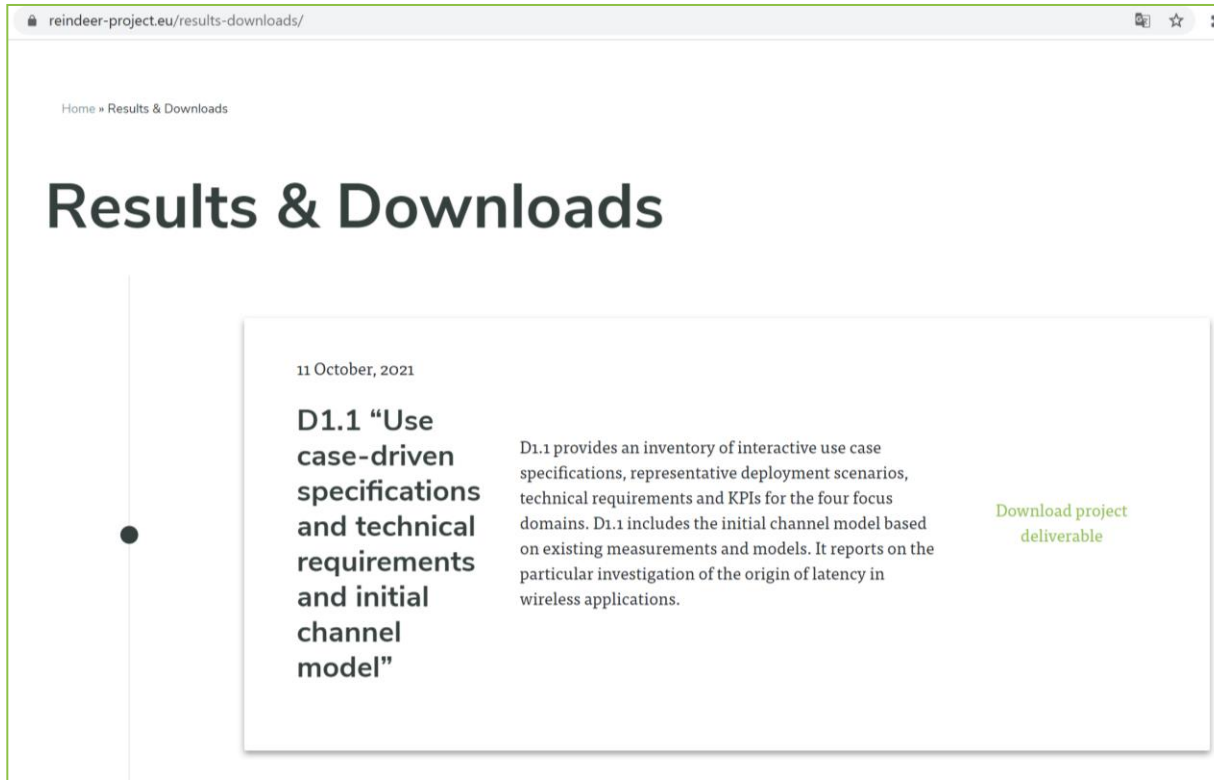


Novel System services

- Federated learning
- Environment mapping
- Localisation and tracking
- Edge processing and storage



D1.1 ‘Use case-driven specifications and technical requirements and initial channel model’



The screenshot shows a web browser window with the URL `reindeer-project.eu/results-downloads/`. The page title is "Results & Downloads" and the breadcrumb is "Home » Results & Downloads". The main heading is "Results & Downloads". A card displays the date "11 October, 2021" and the title "D1.1 'Use case-driven specifications and technical requirements and initial channel model'". The card contains a description of the deliverable and a "Download project deliverable" link.

reindeer-project.eu/results-downloads/

Home » Results & Downloads

Results & Downloads

11 October, 2021

D1.1 "Use case-driven specifications and technical requirements and initial channel model"

D1.1 provides an inventory of interactive use case specifications, representative deployment scenarios, technical requirements and KPIs for the four focus domains. D1.1 includes the initial channel model based on existing measurements and models. It reports on the particular investigation of the origin of latency in wireless applications.

[Download project deliverable](#)

available @ Reindeer-project.eu
To be approved by EU upon review



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