# HOLISTIC, OMNIPRESENT, RESILIENT SERVICES FOR FUTURE 6G WIRELESS AND COMPUTING ECOSYSTEMS (HORSE)

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horse-6g.eu

# EIGHT BELLS TODAY

- EIGHT BELLS LTD is an innovative research & technology firm based in Nicosia, Cyprus and Athens, Greece

- Specializing in **Defence**, **Security, Space**, **Telecommunications**, **Cybersecurity**, **eHeath** and **Environmental Protection**, with **disruptive IT solutions**

- Our technical capabilities include **Systems & Network Engineering**, **Cloud computing**, **Privacy**, **Security & Data Protection** and **Software development**

- Eight Bells, following a specific development plan, invests in high value-added staff, thus bringing forward an employee-centric management approach.

- **Project Name:** Holistic, Omnipresent, Resilient Services for Future 6G Wireless and Computing Ecosystems (HORSE)
  - **Project website:** horse-6g.eu

- **Members:** CNIT, ATOS, Ericsson, UPC, TUBS, Telefonica, NKUA, Suite5, EFACEC, ZORTE, 8-BELLS, HOLO-LIGHT, STS, Martel

- **Coordinator:** CNIT, ITALY

- **Ambition:** 6G infrastructure operation for smart connectivity and service management, 2 use cases: light transportation & extended reality

# PROBLEM 1: TIME & LATENCY
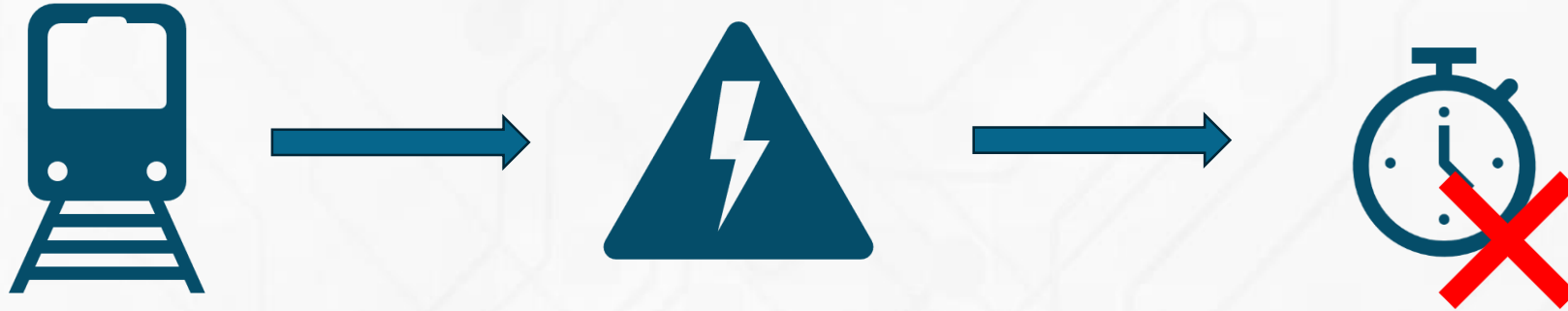


Low resilience and disaster recovery

Low availability in terms of remote operation

Latency in the decision support system

Renderings in augmented reality are not quite impressive yet

Prototype costs are high

Prototype time-to-market is not speedy

Security & Privacy Concerns

Latency concerns

## Secure Smart Light Rail Transit Systems

| Use case objective | KPI | Target |
|---|---|---|
| Resilience and disaster recovery | Down Time | Improve the down time in 50% |
| Resilience and disaster recovery (remotely operation) | Availability | Improve the availability in 20% |
| Decision support system | Statistics availability time | Capability to calculate the operation statistics data almost in real-time. |

## Remote Rendering to Power XR Industrial

| Use Case objective | KPI | Target |
|---|---|---|
| Detection of Design Fault | Decrease of errors | - 90% faults |
| Cost reduction of prototypes | Reductions of costs | - 50% costs |
| Faster time-to-market | Faster release of the product | + 20% faster release on the market |

| Use Case | Final applications | HORSE (security provisioning) | HORSE (intelligence) |
|---|---|---|---|
| *Secure Smart LRT Systems (SS-LRT)* | **Secure distributed operation:** Fast recovery and timely failures detection. | **Service management:** A threat is detected and/or predicted and the secure orchestrator launches the actions to properly react. | **Facilities:** Models running on the DT pre-assess the actions to be taken to evaluate the expected performance, considering a highly distributed scenario. |
| *Remote Rendering to Power XR Industrial (R²2XRI)* | **Secure and reliable communication:** Secure offloading and secure multiuser remote interaction. | **Service management:** HORSE will provide a secure multiuser environment for teleportation, supporting a secure and flexible 6G components orchestration. | **Facilities:** Infrastrucure modelling, considering the strict constraints imposed by XR (ultra-low latency and highly dense contexts), as well as the attcaks models driven by global XR devices availability. |

# THE SOLUTION: HORSE

## OBJECTIVES

- Comprehensive analysis of foreseeable 6G scenarios

- Designing the necessary end-to-end security solutions

- Development of human-centric, holistic, omnipresent, and resilient smart services management and operation programmable platform

- Deploying AI technologies driving a completely predictive approach to security management, fully addressing high services, systems, risks and threats dynamicity

- Characterize the user profile and the 6G system as a digital twin, to feed AI distributed decision processes

- Designing the system interface to be intent-based to implement the role of the "Human-In-The-Loop"

- Deploy, demonstrate and validate HORSE in selected use cases

- Creating impact and promoting of open access to the HORSE platform for broad and sustainable exploitation of results

# HORSE'S CHALLENGES ON THE 6G LANDSCAPE
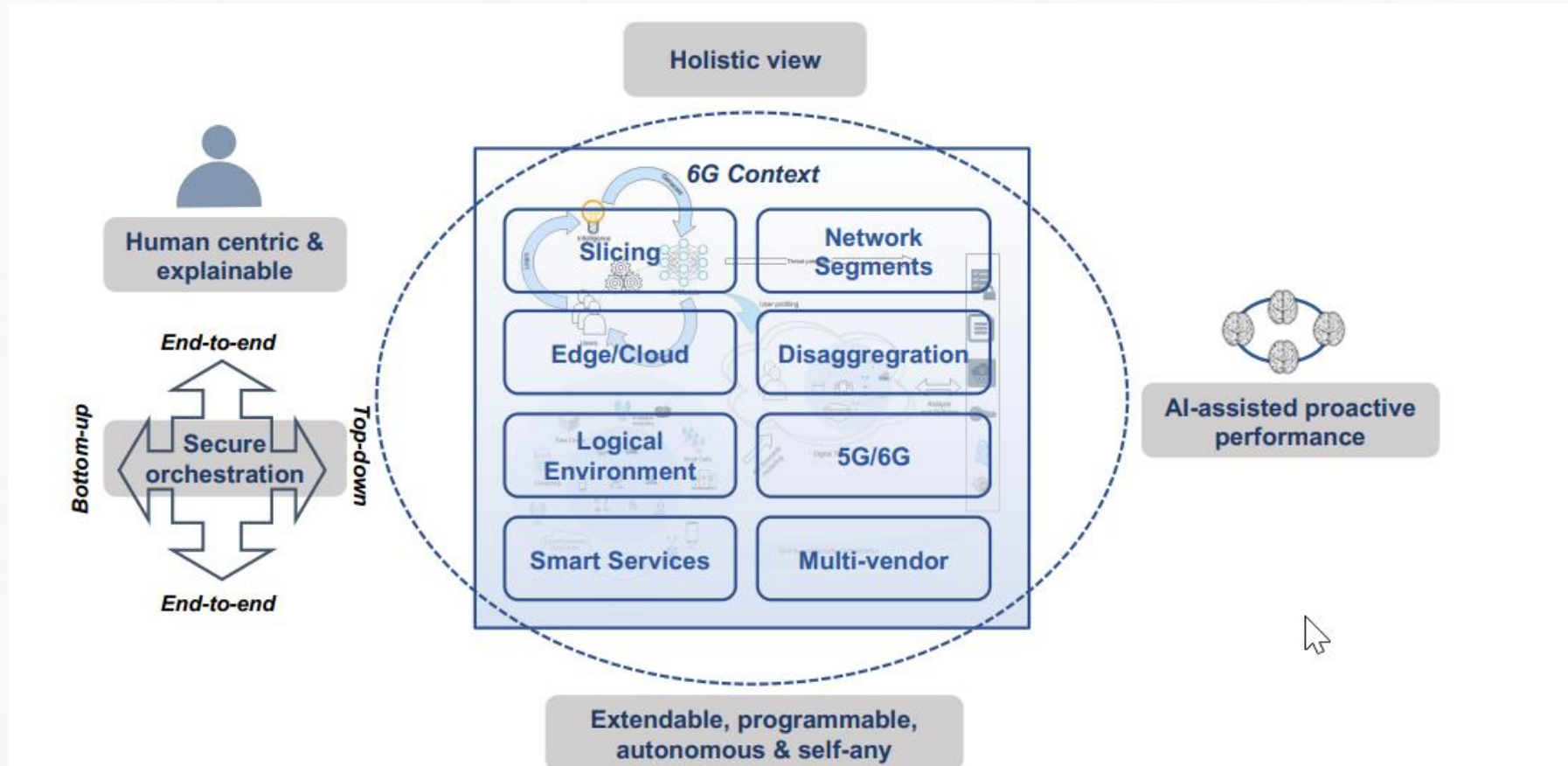
# THE 6G HORSE HOLISTIC SCENARIO

# PLANNED STANDARDIZATION ACTIVITIES
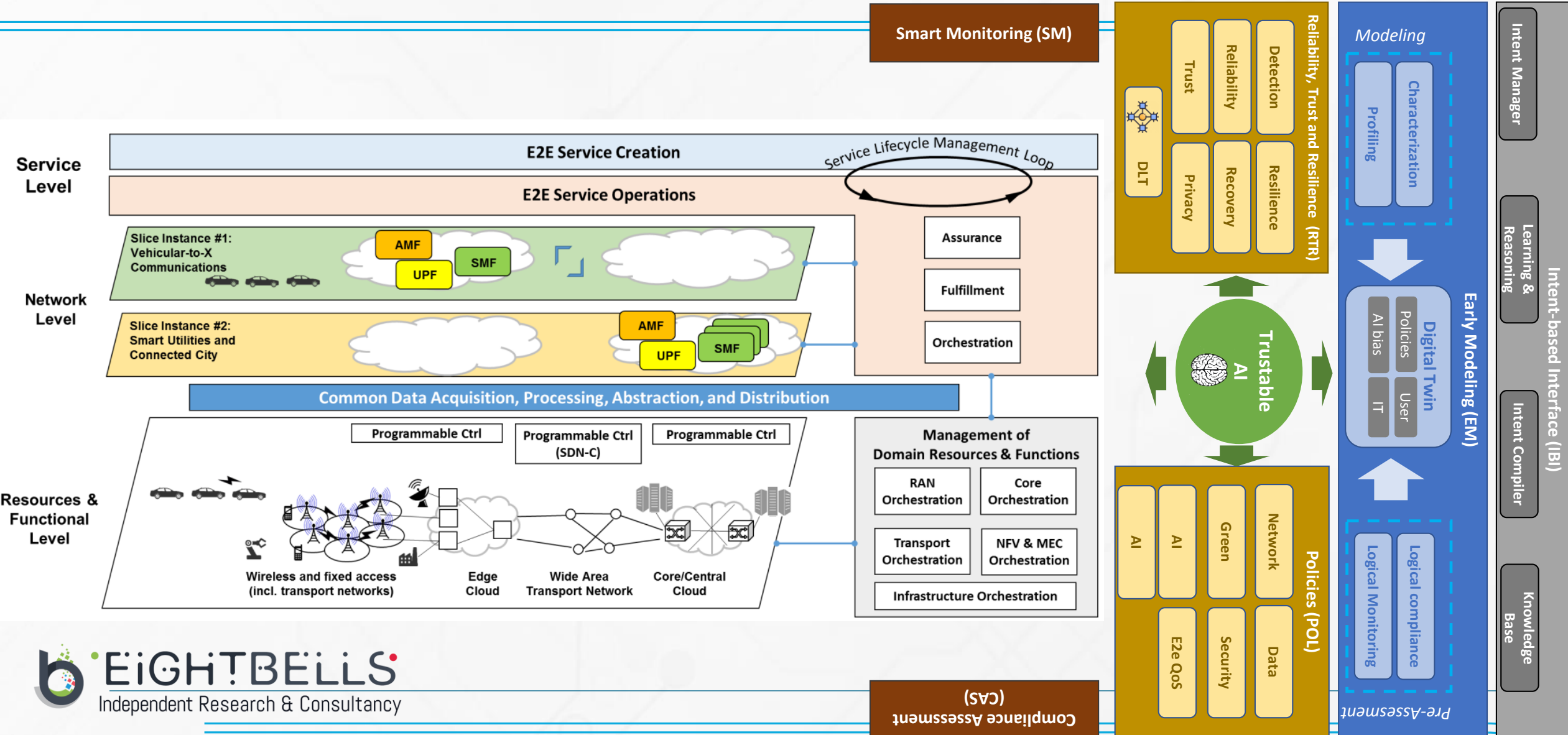
- **Potential targeted standardization bodies / groups:**

  - IETF WGs (I2NSF, SACM, ACME, PPM)

  - ETSI MEC, NFV, ENI, ZSM, SAI

  - 3GPP, SA3 (security) and SA5 (management aspects)

  - ITU-T FGAN (Focus Group on Autonomous Networks)

  - Open source: Linux Foundation ONAP, Akraino, Anuket, ETSI OSM and TFS

  - Open source / open specs: OpenConfig, O-RAN

# OUR AMBITION

- Evolution towards disaggregation, virtualized and multi-vendor 6G based infrastructures

- New software-based paradigms in architecting and operating future connectivity platforms

- Embracing features of computing, automation and smartness, trust, privacy and security

- **HORSE proposes a novel human-centric, open-source, green, sustainable, coordinated provisioning and protection evolutionary platform**

- **HORSE's platform can inclusively yet seamlessly combine advancements in several domains, as they get added to the system**

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# THANK YOU FOR YOUR ATTENTION

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