



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

Prof. Fabrizio Granelli

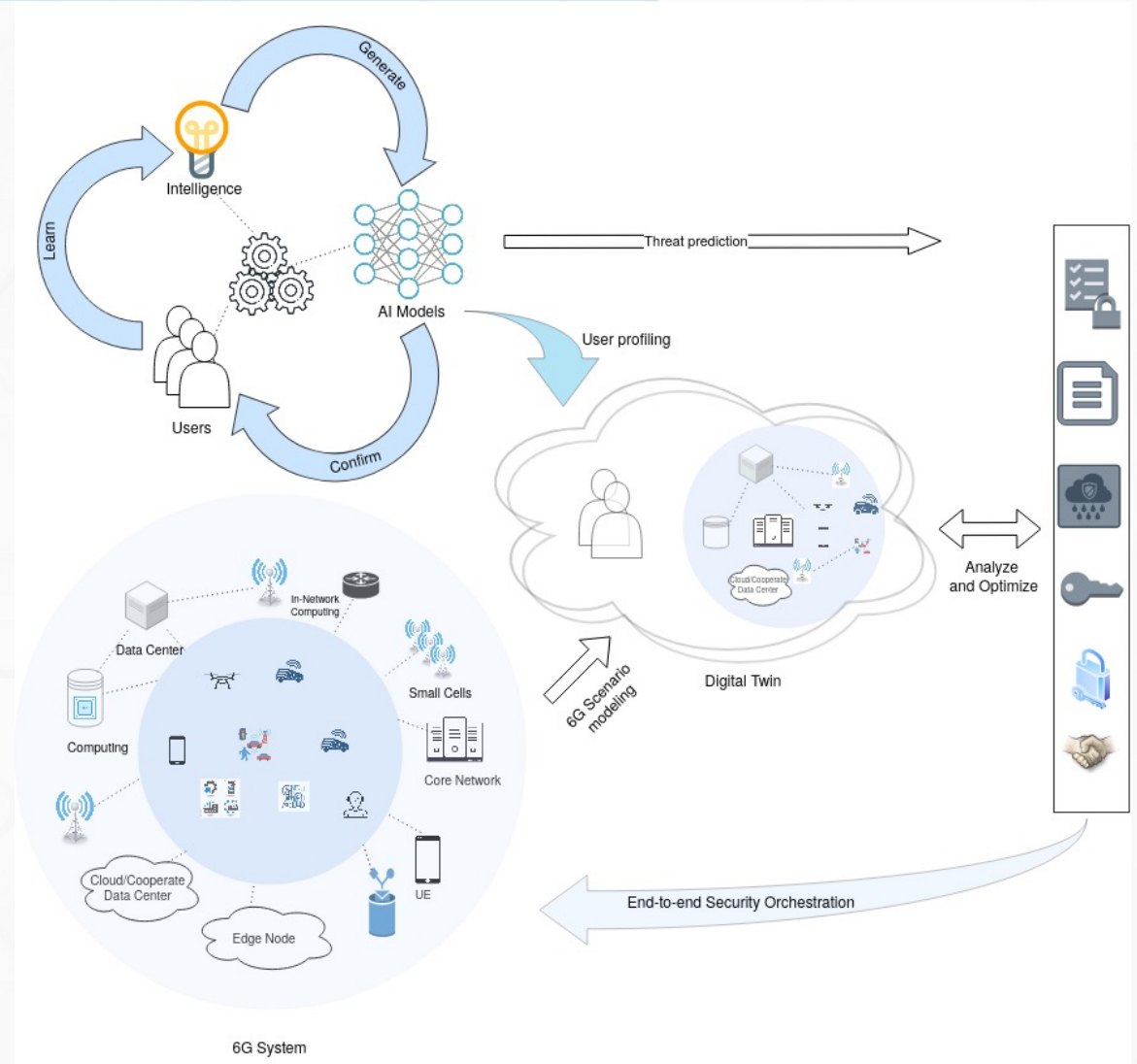
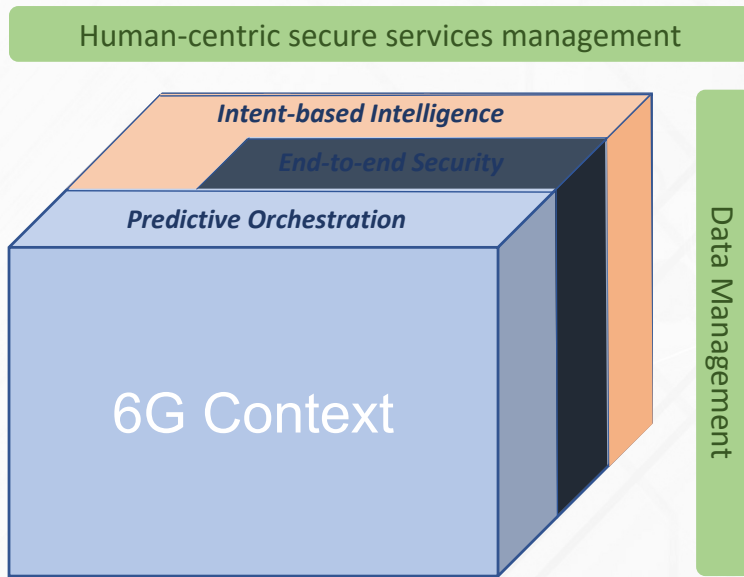
SNS Lunchtime Webinar, Feb. 23, 2023, online

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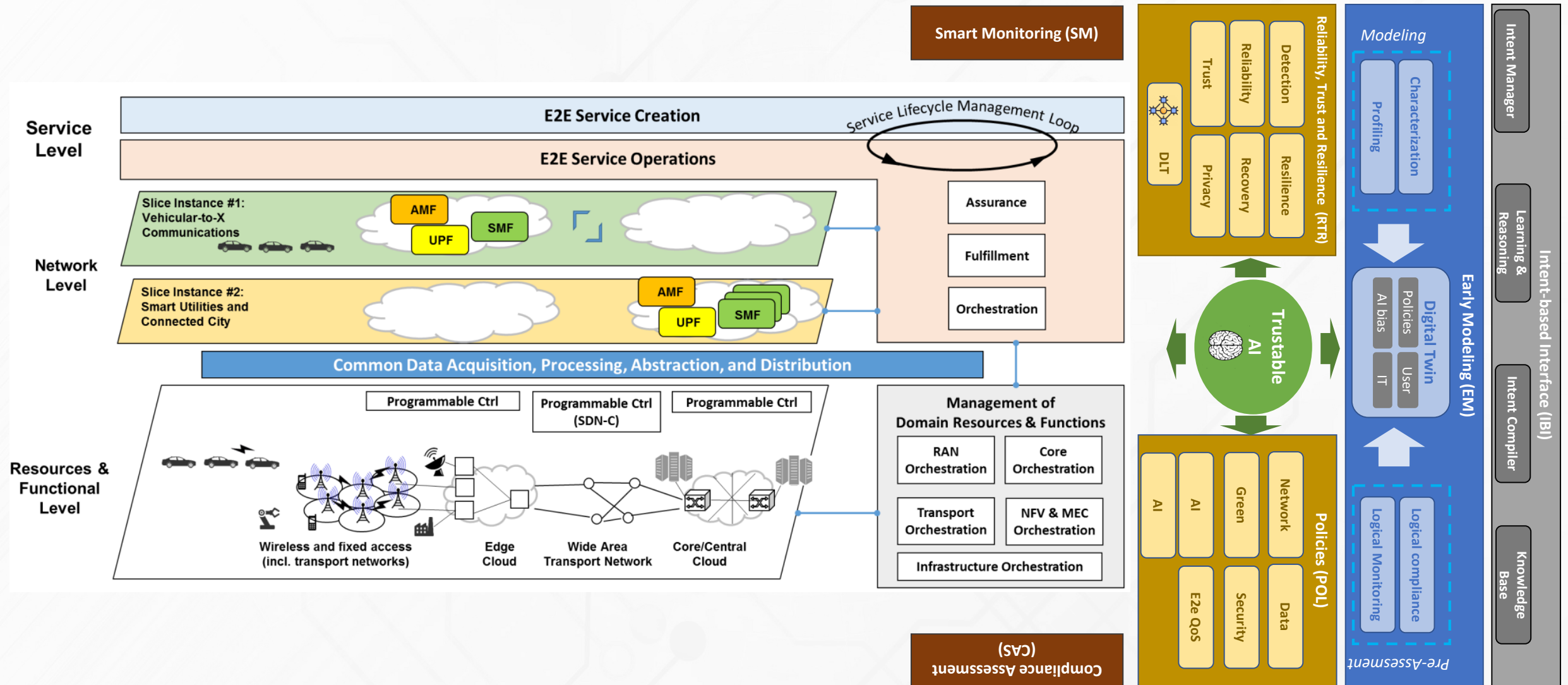
PROJECT OVERVIEW

- **Project Name:** Holistic, Omnipresent, Resilient Services for Future 6G Wireless and Computing Ecosystems (HORSE)
- **Project website:** horse-6g.eu
- **Stream:** SNS Phase 1 (2022) Stream B
- **Members:** CNIT, ATOS, Ericsson, UPC, TUBS, Telefonica, NKUA, Suite5, EFACEC, ZORTE, 8-BELLS, HOLO-LIGHT, STS, Martel
- **Coordinator:** Fabrizio Granelli (CNIT, ITALY)
- **Other:** 6G infrastructure operation for smart connectivity and service management, 2 use cases: light transportation & extended reality



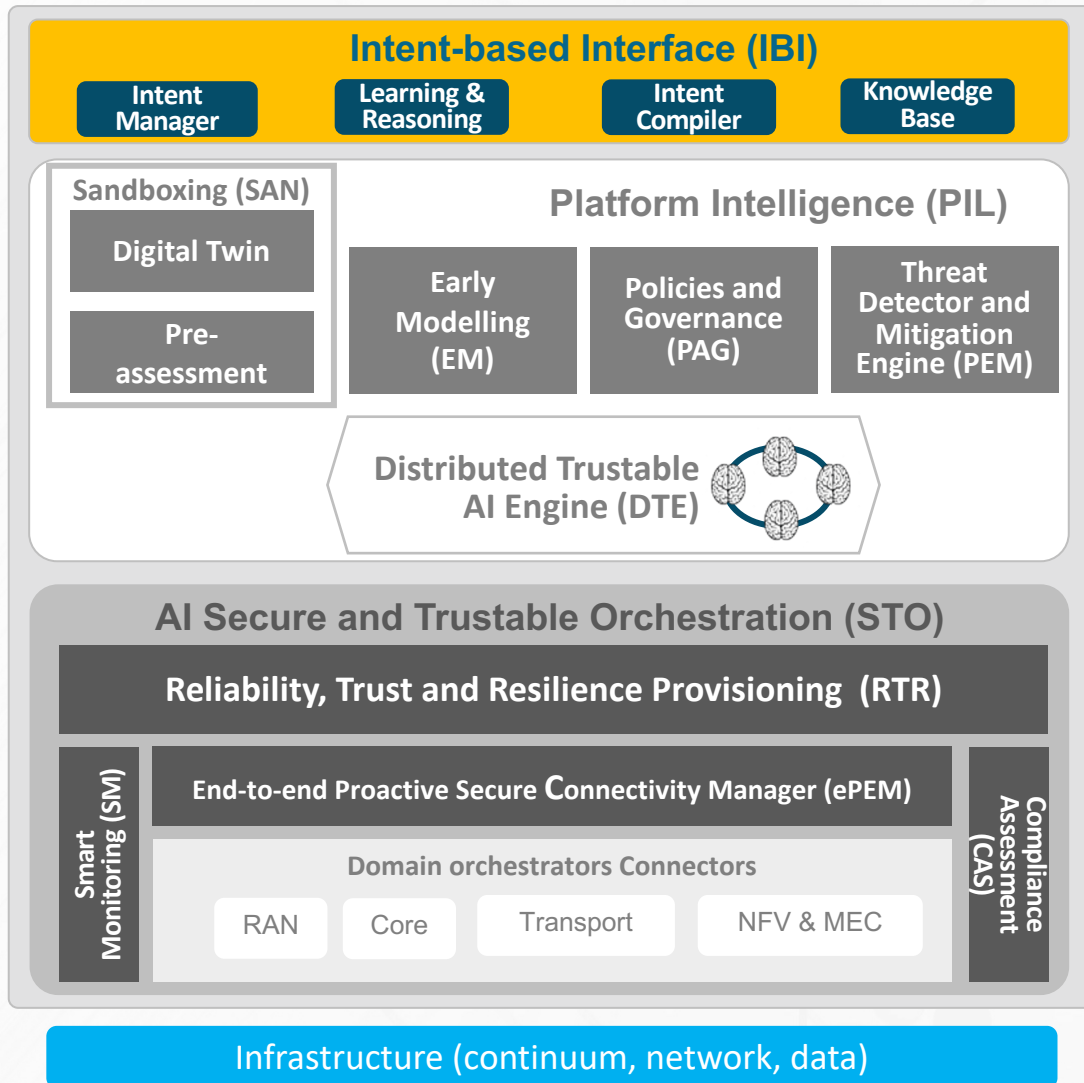


THE 6G HORSE HOLISTIC SCENARIO



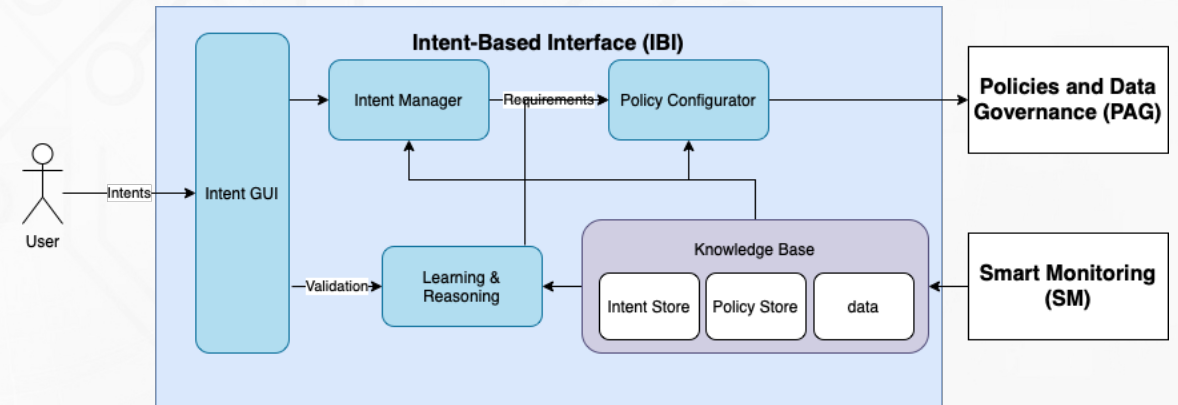
Project Key Objectives:

- Comprehensive analysis of foreseeable 6G scenarios
- Designing the necessary end-to-end security solutions
- Development of a 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 the 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

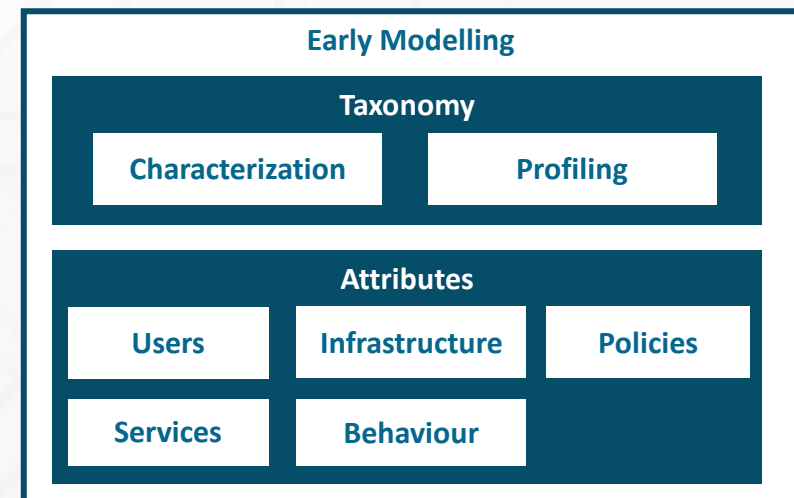
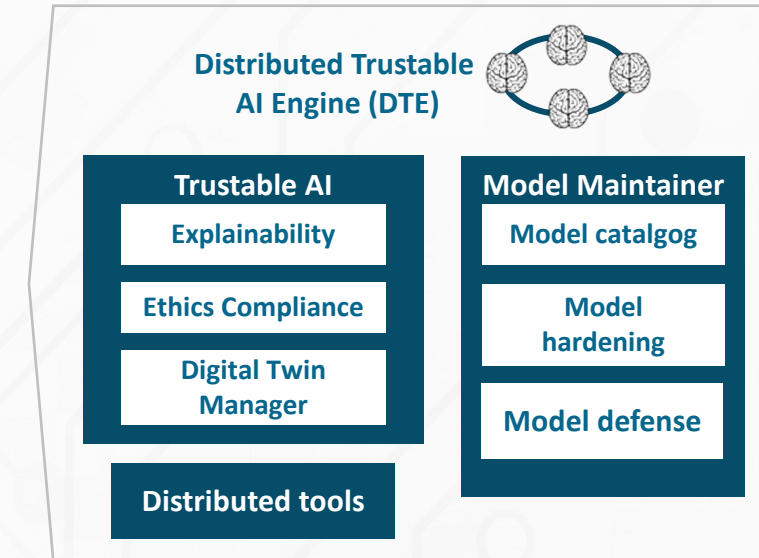
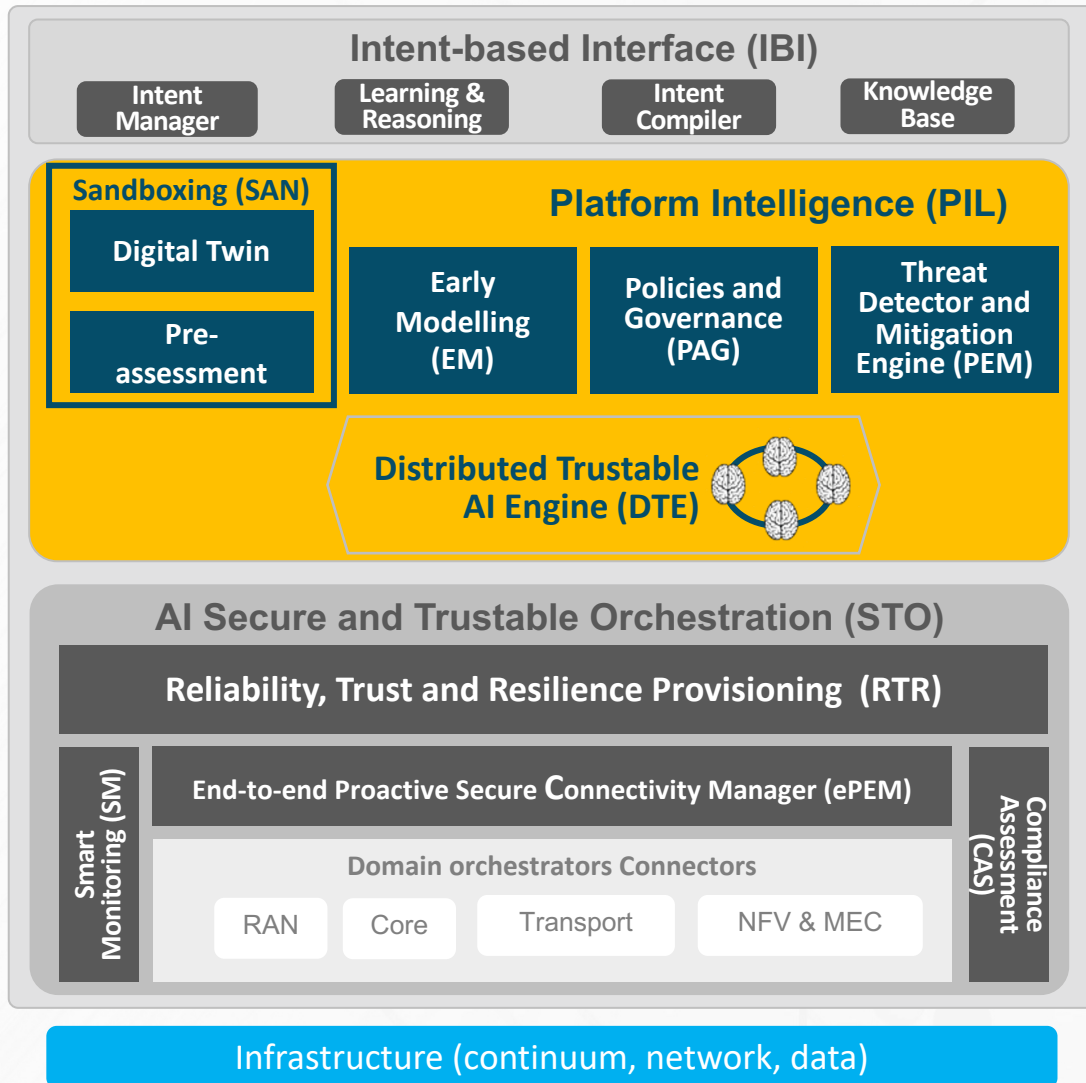


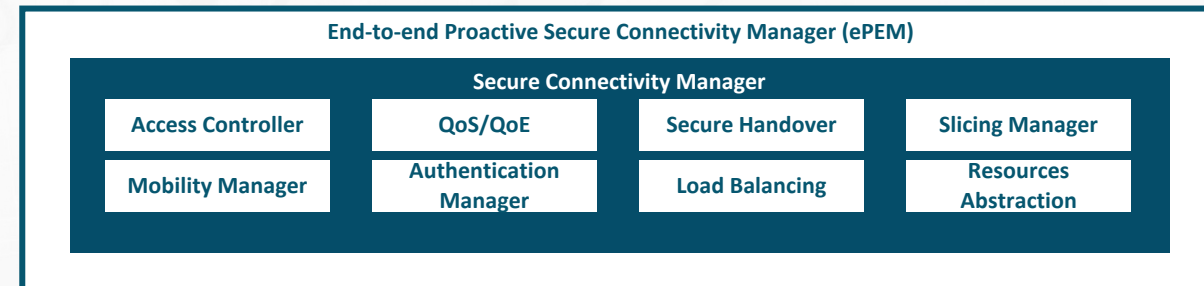
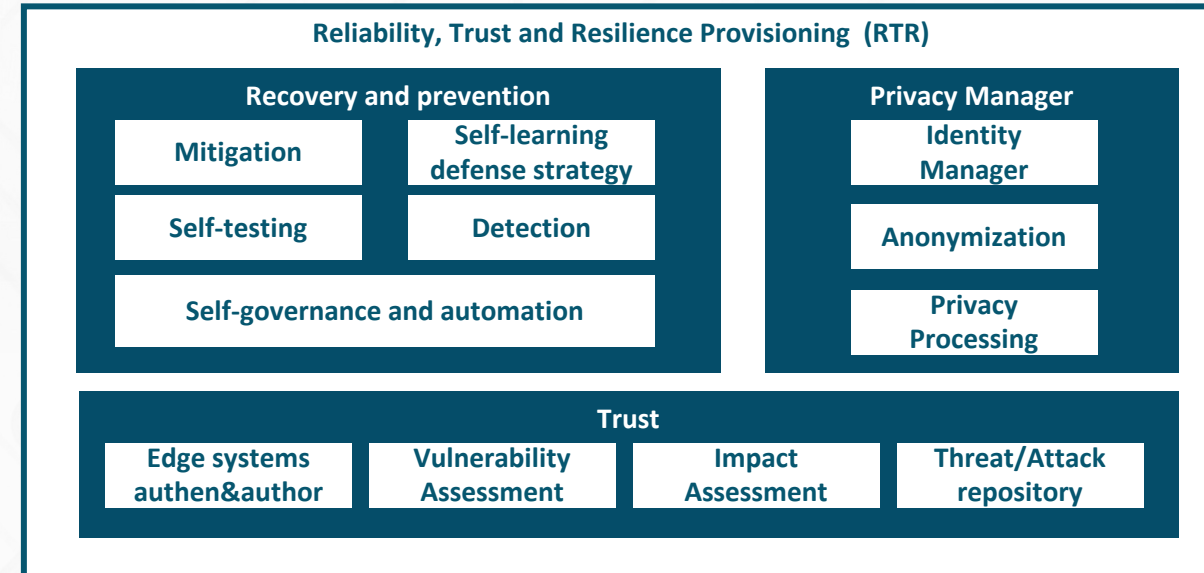
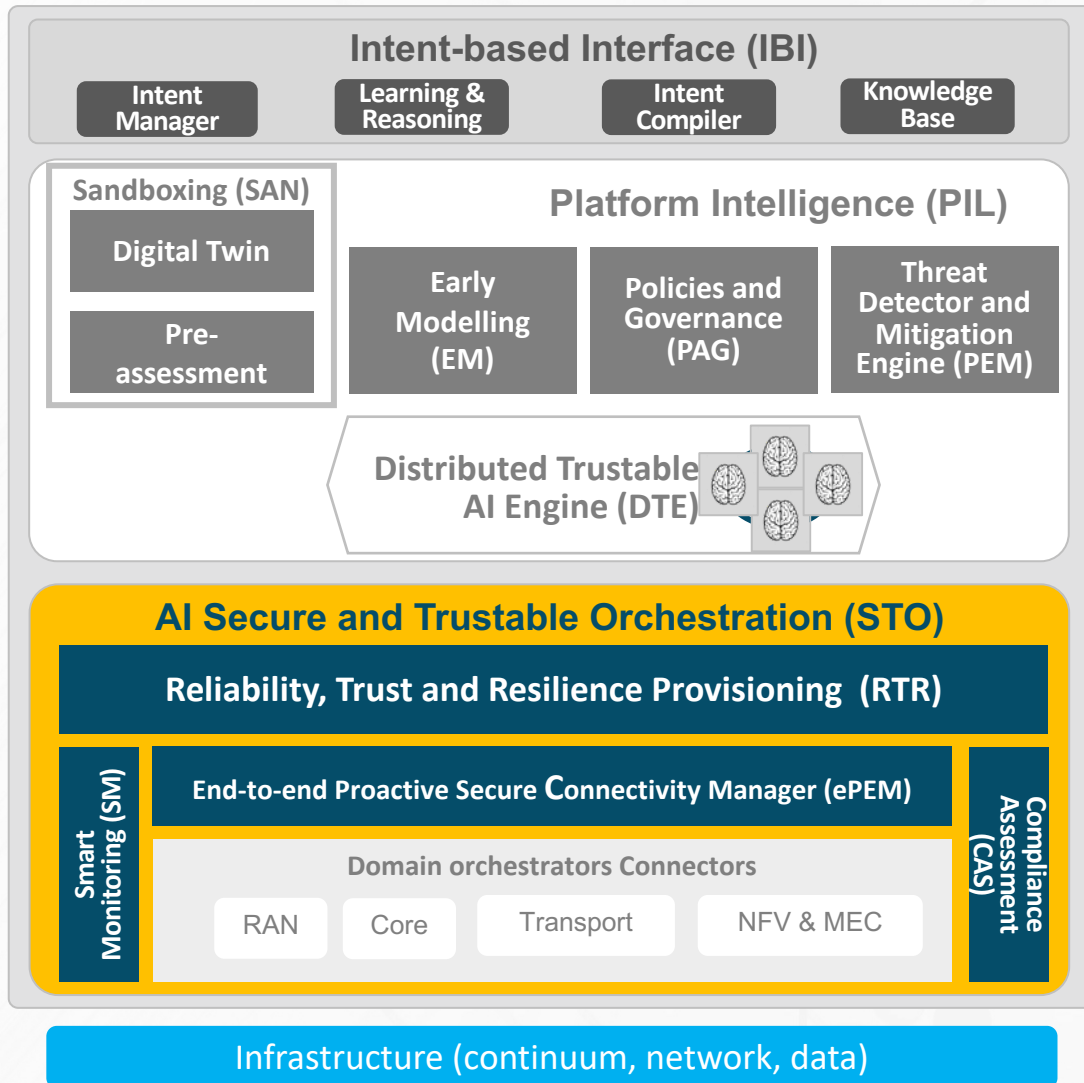
The Intent-Based Interface (IBI) is responsible for mapping high-level intents into security workflows able to react to security threats and vulnerabilities, which will itself use AI for intent optimisation:

- Maintaining the «Human-in-the-Loop»
- Understanding service demands

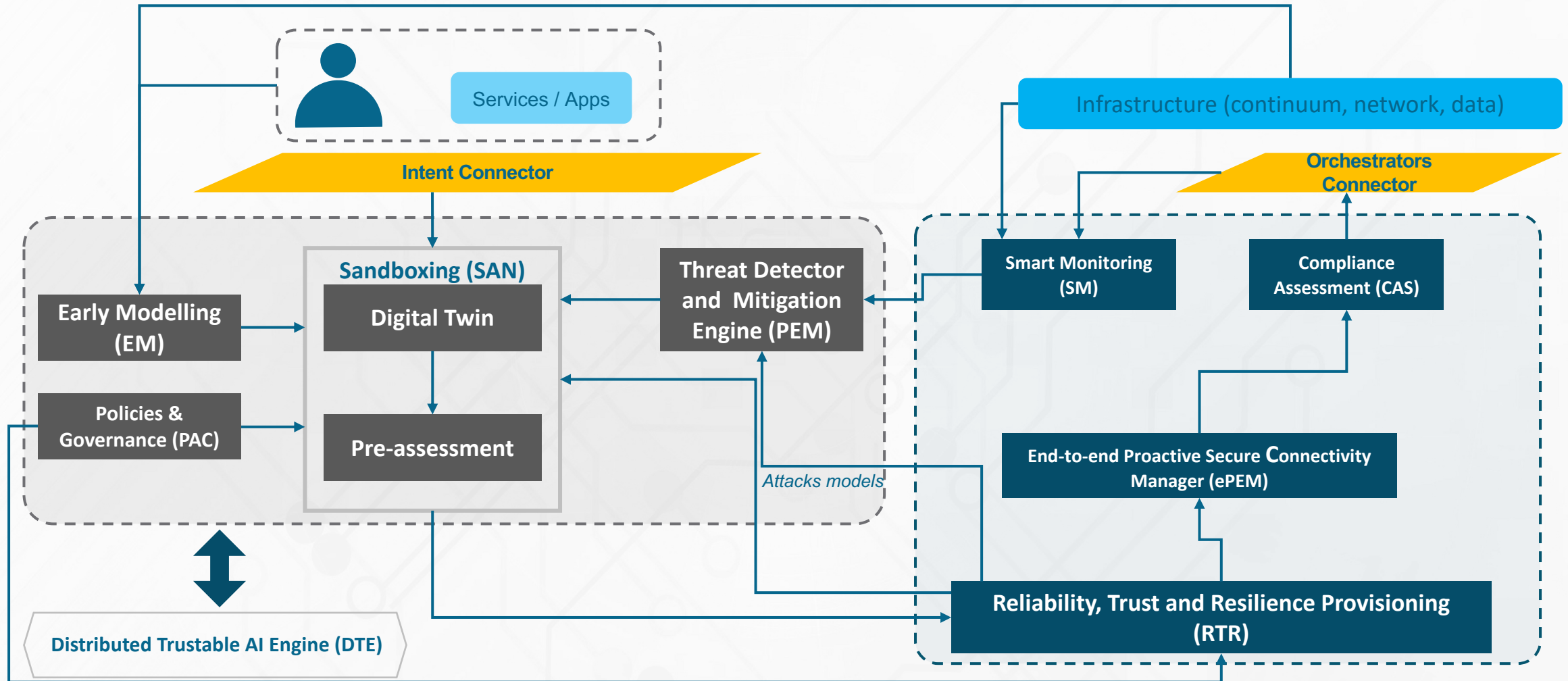


HORSE ARCHITECTURE





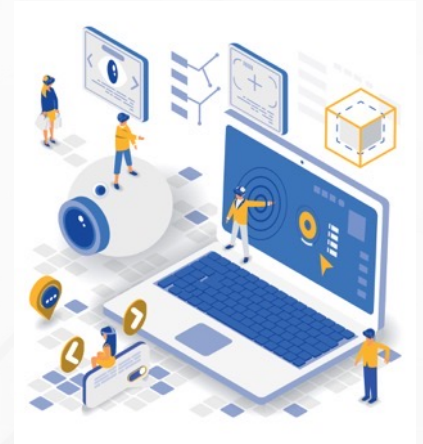
HORSE CONCEPTUAL OPERATING MODEL



Secure Smart Light Rail Transit Systems



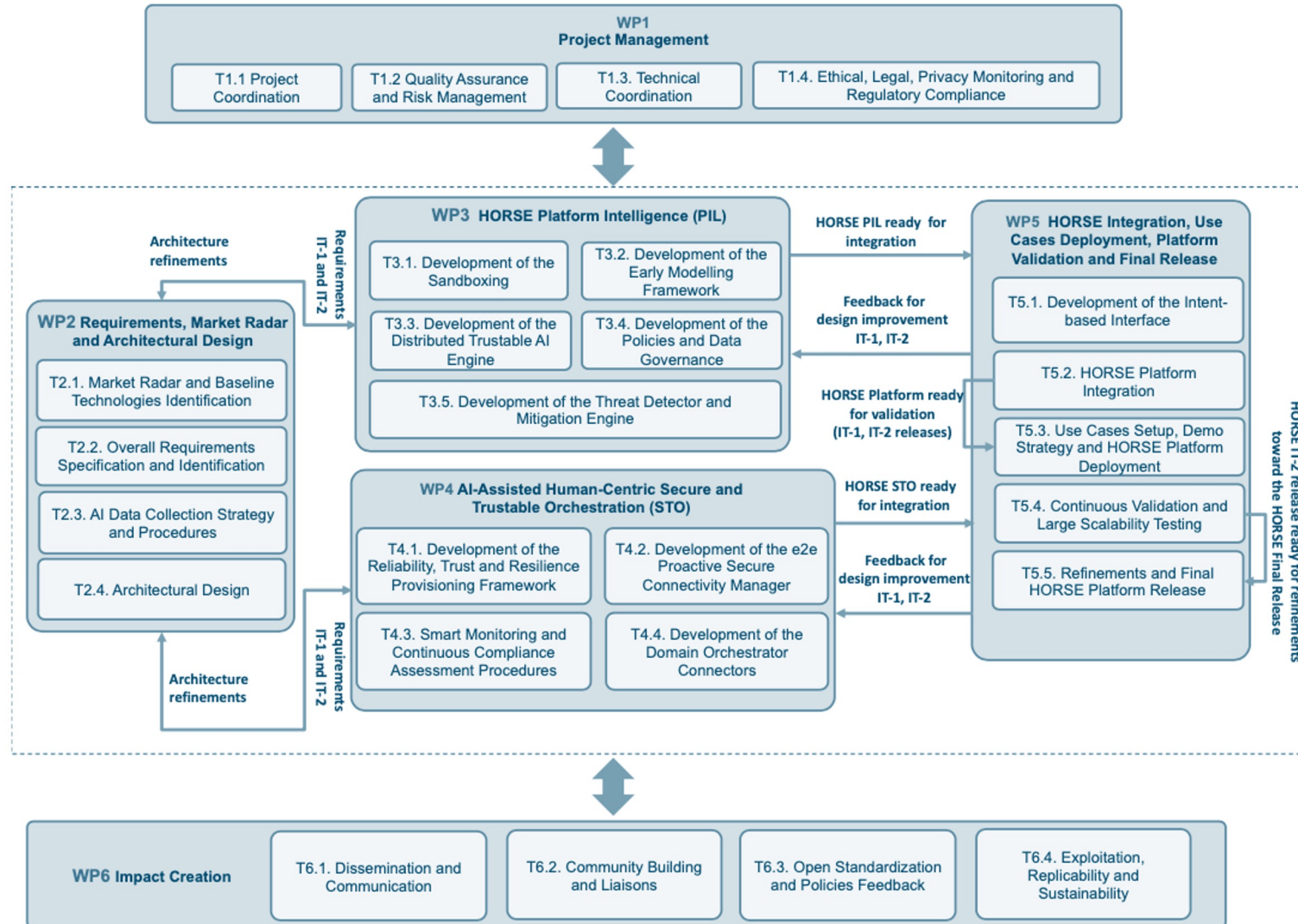
Remote Rendering to Power XR Industrial



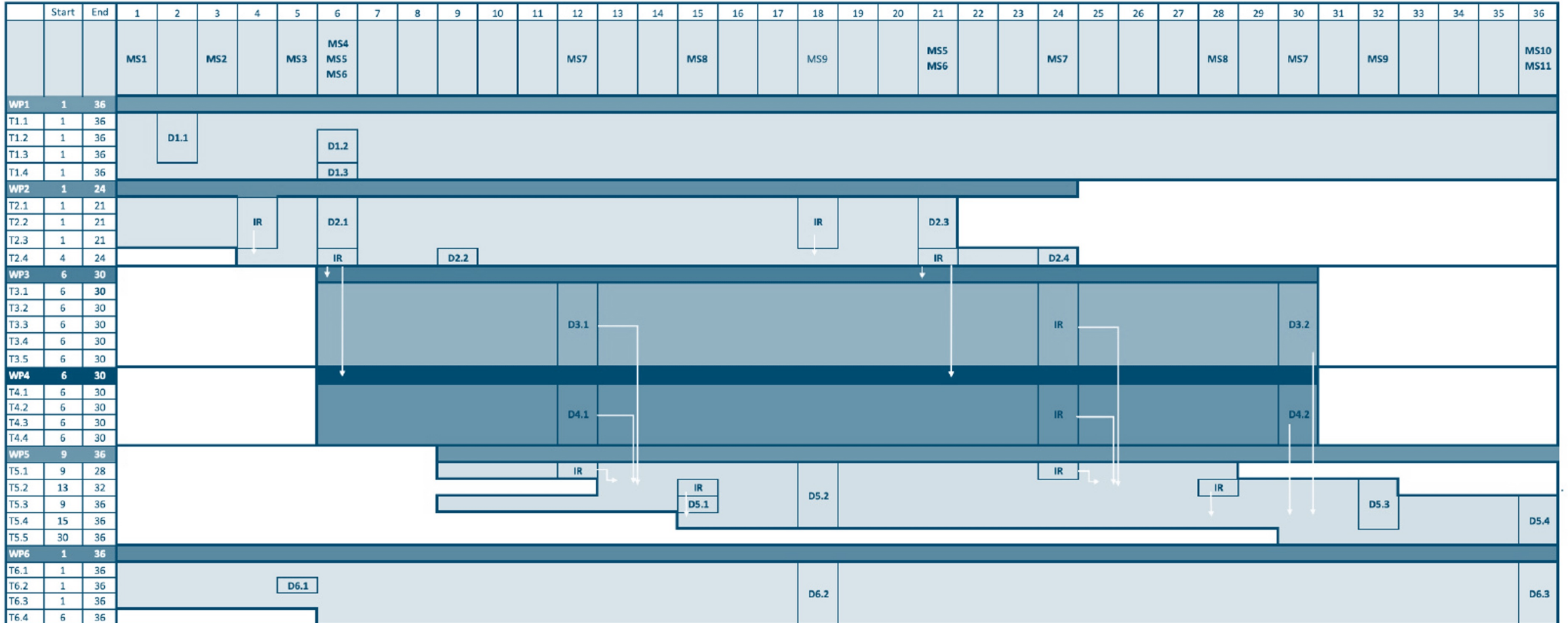
Use case objective	KPI	Target
Resilience and disaster recovery	Down Time	Improve the down time in 50%
Resilience and disaster recovery (remotely operation)	Availability	Improve the availability in 20%
Decision support system	Statistics availability time	Capability to calculate the operation statistics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

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)
<i>Secure Smart LRT Systems (SS-LRT)</i>	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.
<i>Remote Rendering to Power XR Industrial (R²2XRI)</i>	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: Infrastructure modelling, considering the strict constraints imposed by XR (ultra-low latency and highly dense contexts), as well as the attacks models driven by global XR devices availability.



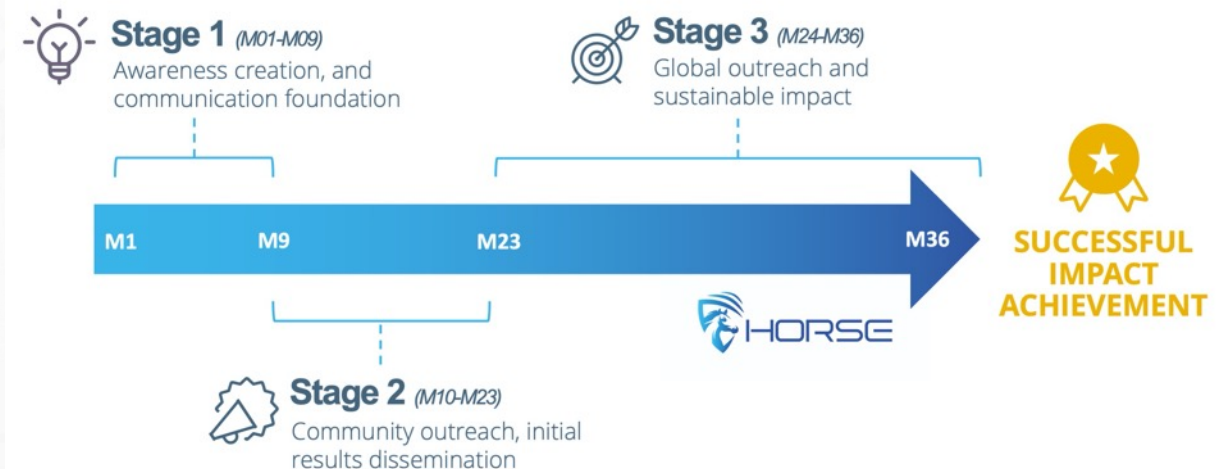
HORSE GANTT CHART



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

Standardization planning and estimated time plan:





THANK YOU FOR YOUR ATTENTION



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