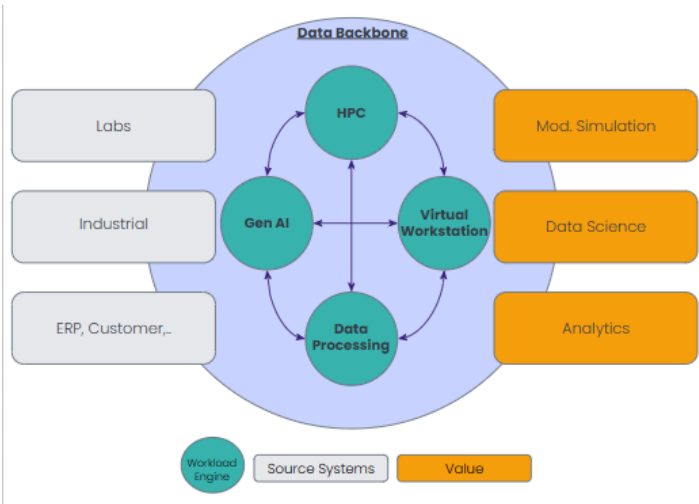


# HPC Architecture Strategy

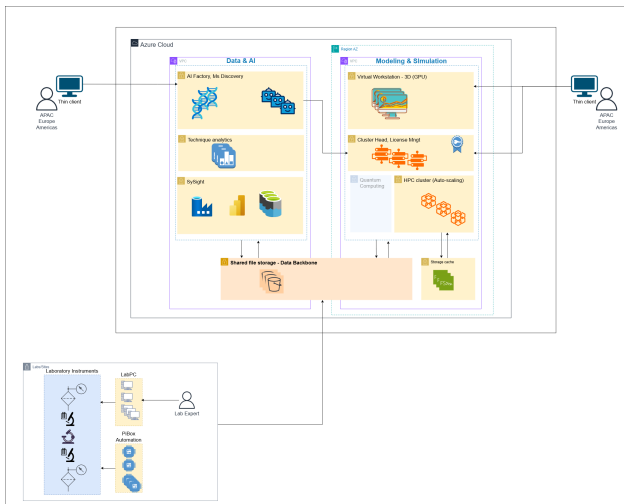
|                                |                 |
|--------------------------------|-----------------|
| Status                         | WIP             |
| Stakeholders                   |                 |
| Outcome                        |                 |
| Due Date                       | 28 Mar 2025     |
| Owner                          | Marie Goavec    |
| Solution/Domain/Data Architect | OLIVEIRA, Tiago |

- Target Architecture: Logical Model
- Target Architecture: Domain Boundaries
- Pillar & Principles
- Utility Tree

## Target Architecture: Logical Model



## Target Architecture: Domain Boundaries

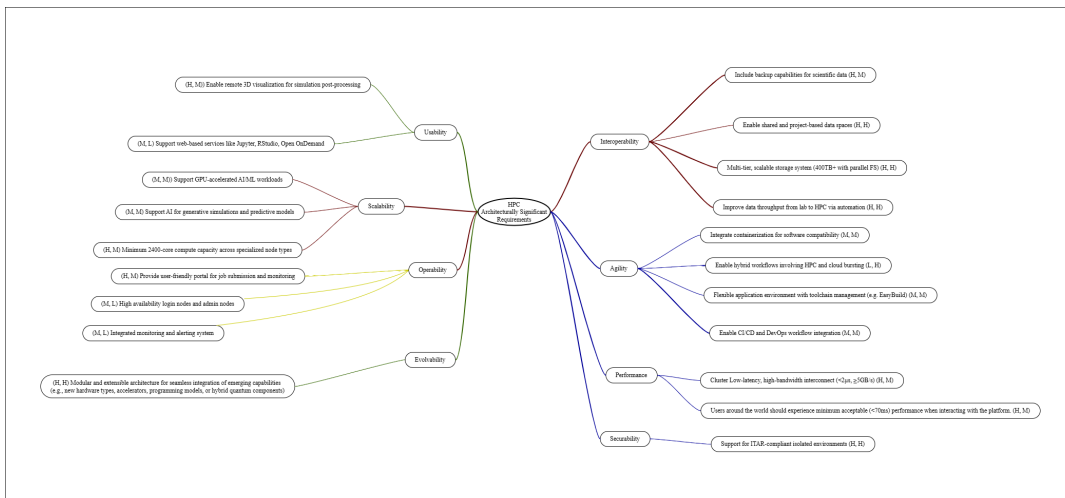


## Pillar & Principles

- Secure by design:** Architected to meet strict regulatory, ITAR, and compliance standards, embedding security and data isolation into every component - from lab to cloud.
- Globally distributed:** Enables distributed collaboration while respecting data sovereignty and regulatory zones, with secure interconnects optimized for compliance and performance.
- High Interoperability and Ready for Automation:** Designed to leverage Agentic Architecture to automate scientific workflow tasks on simulation tools and enterprise platforms across heterogeneous environments - securely and without friction.
- Cost Efficient & Scalable:** Scales elastically to support burst compute, large simulations, and AI workflows while optimizing cost through dynamic resource allocation and tiered data strategies.
- Unified UX:** Offers a seamless, role-aware user experience - from lab scientists to HPC engineers—ensuring consistent access, visualization, and orchestration across environments.
- Data Backbone** (Data-Centric by Design leveraging SySight): Establishes a governed, high-throughput data layer that ensures seamless access and movement of data across the platform — enabling consistent ingestion, transformation, AI-driven learning, synthetic data generation, and simulation workflows.
- Sustainability-Aligned Computing** (Green by Architecture): Leverages cloud elasticity, workload-based optimization, and infrastructure modernization to reduce energy usage, eliminate underutilized on-prem resources, and support sustainability goals through measurable carbon footprint reduction.
- Quantum-Ready Architecture** (Future-Proof by Design): Lays the foundation for seamless integration with quantum computing by enabling hybrid classical-quantum workflows, simulator access, and modular expansion paths - ensuring the HPC platform evolves in parallel with emerging computing paradigms.

## Utility Tree

The Utility Tree brings a view on the most architecturally significant requirements. With this tool, the business capabilities are assessed in terms of importance for the business and architectural complexity for being accomplish, so a value engineering can be performed and strategic decisions been taken.





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Utility