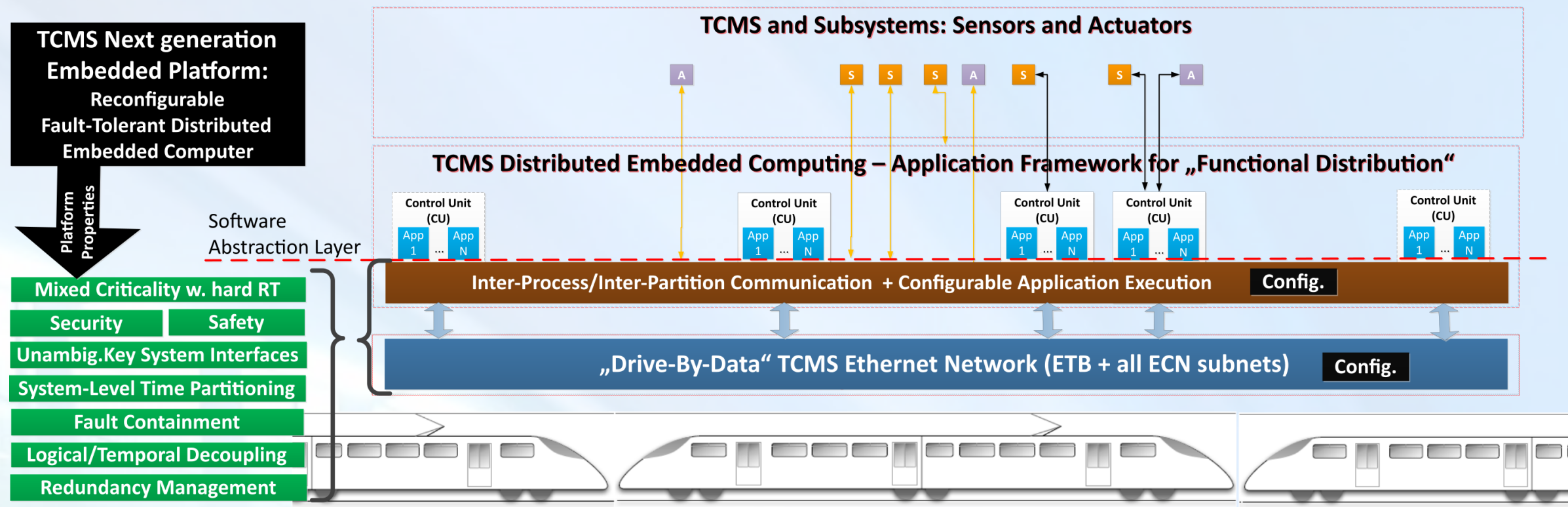


What?

In order to enhance the reliability and availability of the network, the Ethernet Train Backbone (ETB) is estimated to incorporate Deterministic Ethernet features for the use of periodic control messages. The synchronized computing infrastructure offers decreased latency and buffers, as well as jitter-less communication. Deterministic Ethernet also offers significant flexibility, as it supports both Synchronous and Asynchronous Communication. The standard also claims fault-tolerance to a Fail-silent failure (sync messages), based on redundancy.



Safe4RAIL

Networking for Drive-by-Data

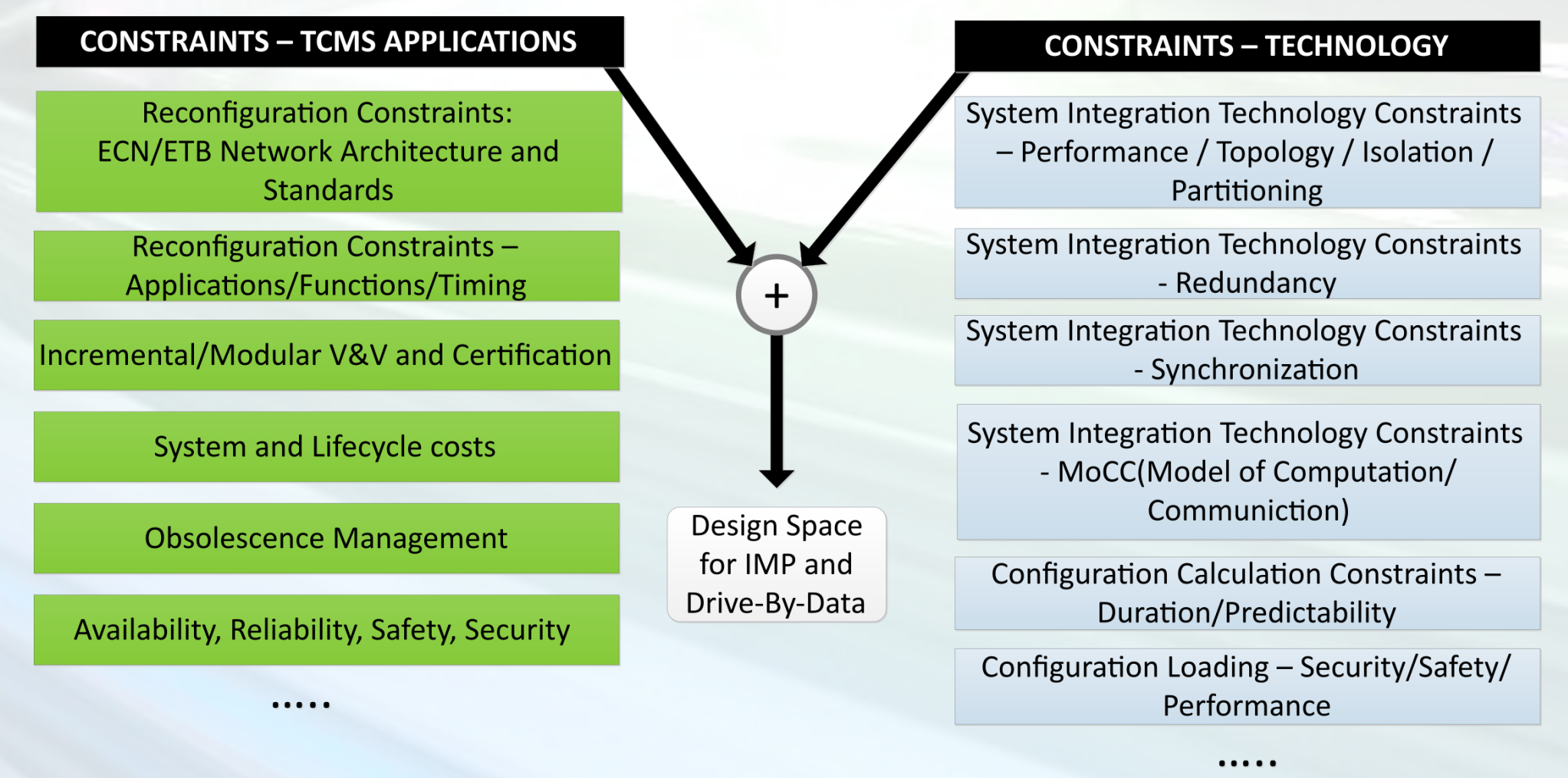
Why?

The network in an advanced integrated architecture hosts all system function traffic with different timing and safety requirements. **Drive-by-Data** translates into predictable and **safe Ethernet networking** technology enabling full electronic control. Deterministic Ethernet networking technology is a core technology for the design of an integrated architecture and enables the convergence of functional integration on one network, with the following features:

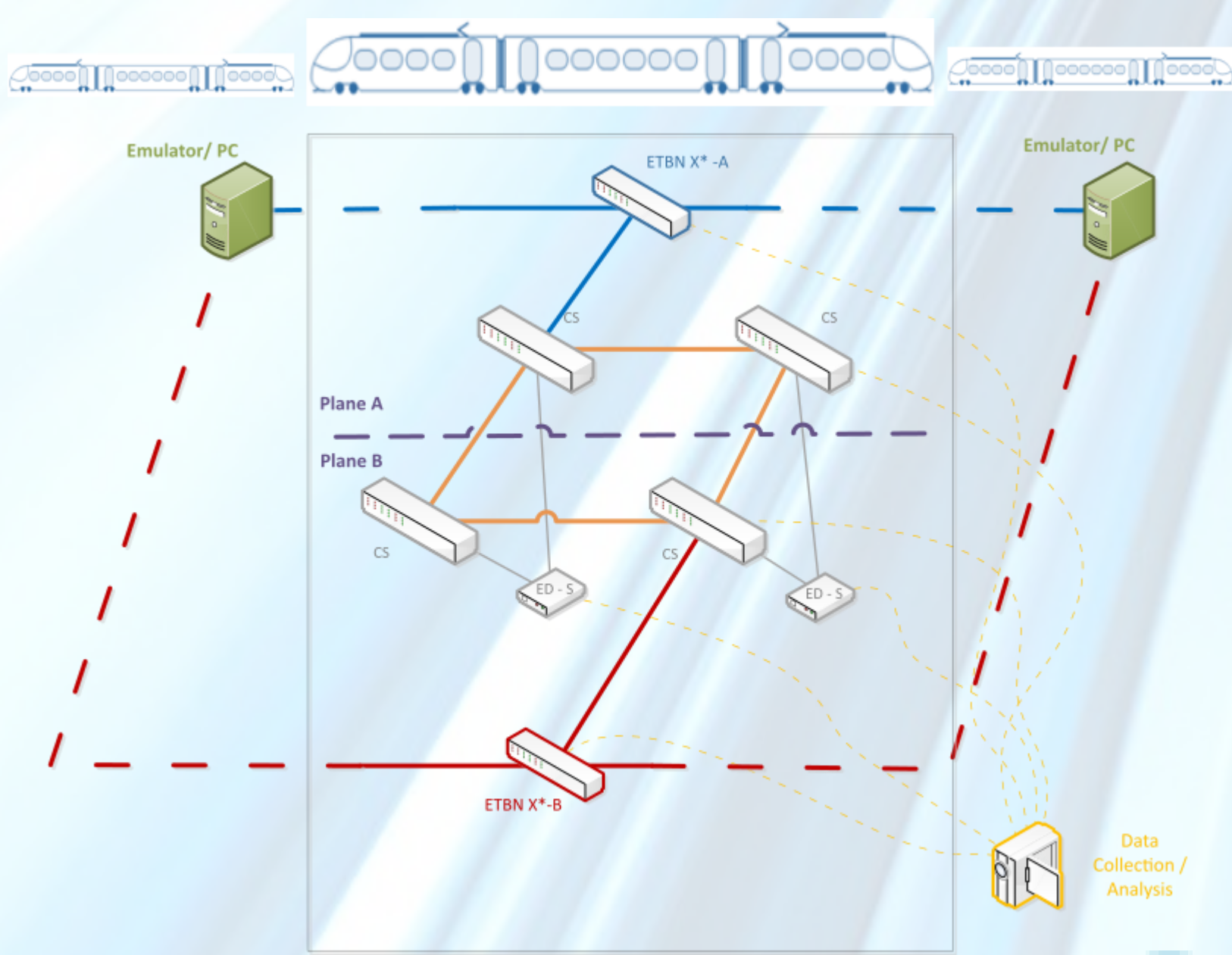
- Enable the hosting of critical (**up to SIL4**) and non-critical functions in Ethernet networks based on strict temporal and spatial partitioning.
- Support design of open and closed systems, i.e. including both predefined critical and other a-priori unknown network traffic for robust integration.
- **Enhance modularity** and composability of embedded platforms and architectures from the networking perspective; thus **reducing the complexity** of system design, integration, reconfiguration, verification, certification and maintenance.
- **Lower the costs** and effort of integration and certification for different subsystems and functions.

HOW & WHEN

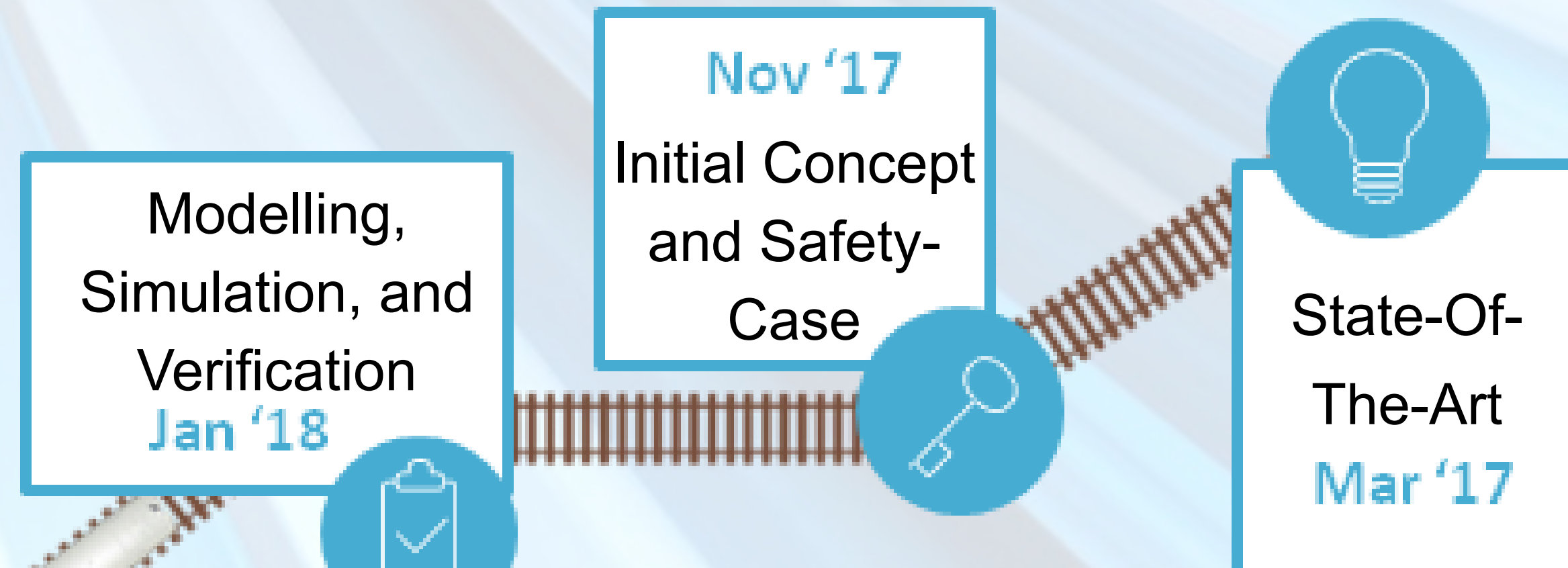
Design Space Exploration as the basis for initial concepts



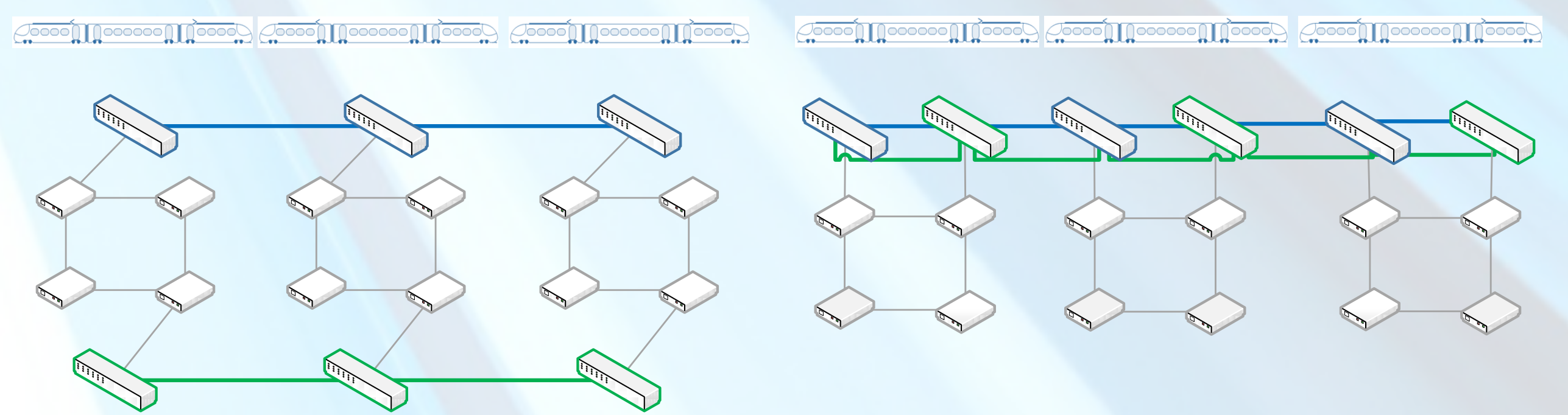
Proof-of-Concept are planned by the end of the project



Simulation and Fault-Injection Framework

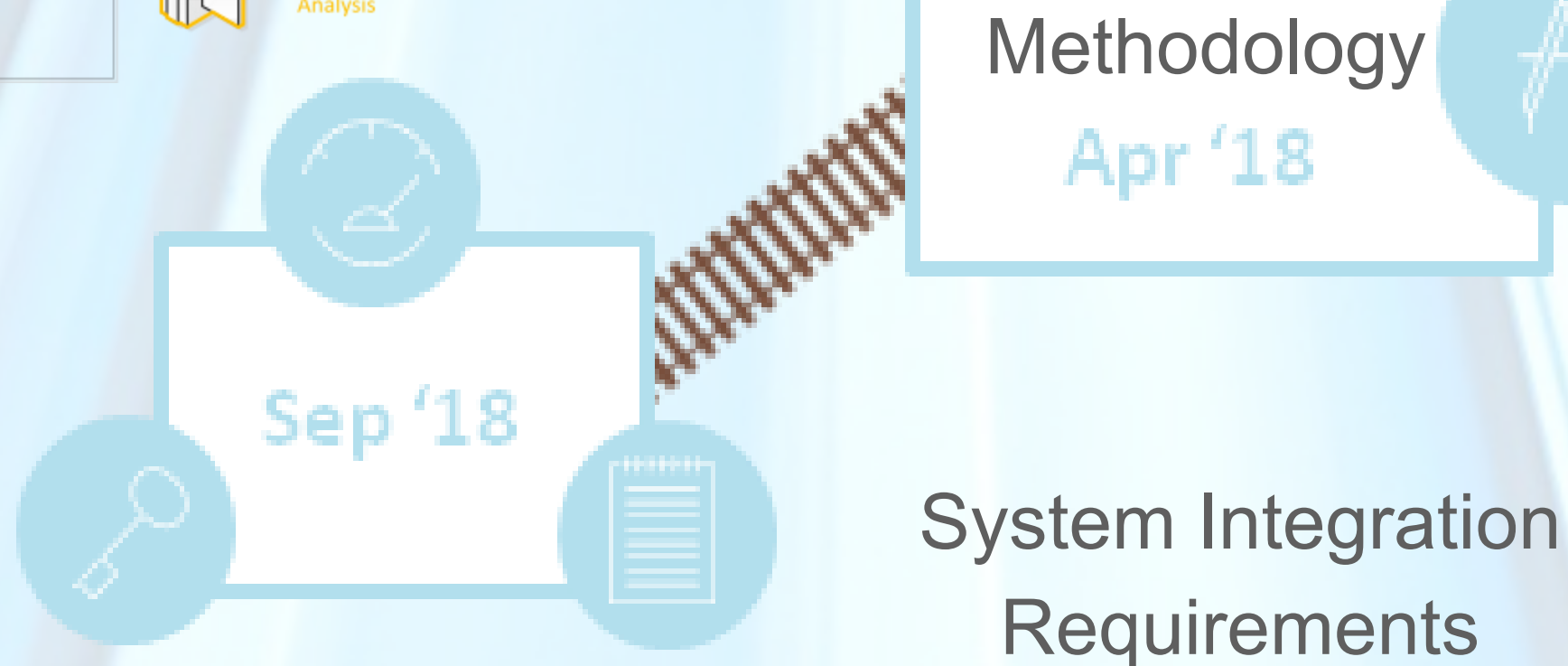


Different topologies are investigated for the next generation TCMS. **Current Topology Variants** include redundant ETB lines for increased Reliability



Proof-of-concepts

Concept and Safety-Case



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