EULYNX Position Paper on Migration Steps

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EULYNX commits to SERA

The EULYNX Consortium strongly supports standardization of Control, Command and Signalling Systems (CCS) and the strategic vision of the Single European Railways Area (SERA). Digitalization with already specified and yet to be specified systems, as well as efficient processes that match the new architecture and operational design, are the key to the establishment of a SERA.

EULYNX interfaces are a first mature building block on the journey to SERA outside the TSI CCS. Many more building blocks will be specified in the System Pillar (SP) as a part of the Europe's Rail Joint Undertaking (ERJU) program. The members of the EULYNX Consortium will over the time comply with the strategic vision of SERA by adjusting their strategies.[1]

The long-standing underfunding of signalling technology in recent decades has led to an increased need for investment. With budgets rising sharply in many member states, the investment backlog must be cleared immediately and in the coming years, if not decades. Above that, there are large and challenging rollout programs coming up within the next 10 years across Europe.

A step-by-step migration to the SERA target is therefore unavoidable, to channel investments and reap early fruits of standardization. The alternative is an uncoordinated migration towards the SERA target, diversifying sector resources and funding across multiple unaligned and uncoordinated solutions. An uncoordinated migration will inevitably lead to SERA becoming unattainable.

Need for Migration Steps

For this reason, this position paper advocates a coordinated approach on the path to SERA. Clearly defined migration steps[2] that build on one another will help the entire rail sector to drive forward the digitalization of signalling technology in a predictable and coordinated manner.

The migration steps define a series of requirements that lead to systems and operational rules. These are available for all railways from a defined point in time and form the basis for all rollouts from the defined point in time.

For the supplier industry, migration steps provide a stable and predictable framework for the further development of their product range. Migration plans must therefore be defined jointly between the IMs and the suppliers with sufficient lead time.

A first migration step will primarily have an impact on the infrastructural equipment while further steps will partly require changes in software. Furthermore, the members of the consortium are aware that all vehicles need to be equipped with ETCS for an initial migration step, which represents a major challenge, as does the rollout of the infrastructure.

It is not the aim of this position paper to define the number or the design of further migration steps. Nevertheless, the consortium recognizes the need for a larger time gap between the migration steps, assuring predictability and stability in the process of migration. Rather, this position paper promotes a

[1] The architectural view on SERA is summarized in the CER/EIM position paper on railway system architecture: https://cer.be/cer-positions/cer-eim-position-on-railway-system-architecture

[2] Migration steps sometimes are also referred to as migration plateaus.

consensus in the sector in favour of such an approach and makes a proposal for defining the building blocks of an initial migration step.

The members of the EULYNX Consortium are convinced that an initial migration step must be finally defined latest in the first quarter of 2025. Due to the rollouts of signalling technology planned over the next few years, the foundations for SERA must now be laid by defining tangible steps using mature building blocks ready for tender.

Building Blocks of Migration Step 1

A first migration step is required for upcoming tenders, applying existing specifications of ETCS Level 2 without signals. ETCS Level 2 without signals is crucial for SERA.

The members of the EULYNX Consortium see ETCS Level 2 without signals together with (digital) interlockings using an IP network as the jump base for a first Migration Step. Baseline set 4 or later of EULYNX specifications is considered to be mandatory for (digital) interlockings.

ATO GoA 2 is an important component for increasing capacity on existing routes and should therefore be included in the initial migration step.

FRMCS will be an important basis for SERA and should be included as soon as possible.

With the roll-out of ETCS and ATO in particular, there is a need for including a "Digital Register" in an initial migration step for the consistent and secure provision of all topological and project planning data.

IT-Security specifications are well defined in EULYNX Baseline set 4 and in the System Pillar.

All systems allow to take a first step forward towards harmonized operating rules. On the other hand, an early harmonization of operational rules will foster unified interfaces for a standardized architecture. The members of the EULYNX Consortium are well aware that in an ideal world, concise operational rules would be the basis for elaborating standards. Unfortunately, most upcoming projects will be brownfield projects, and the chicken-or-egg problem cannot be solved. Priority shall be given to the operational rules that relate to interoperability and influence technical systems.

These building blocks must now be bundled and formalized as an initial set of specifications that can be put out to tender. This allows IMs to channel ongoing investments in the right direction in the short run and allows the sector to profit from early standardization steps.

A first migration step will give enough room for utilizing already existing national developments in the migration.

Outlook and conclusion

From the perspective of the EULYNX Consortium, migration steps are necessary to achieve the vision of a SERA. To guide and protect future investments, the definition of a first migration step within the above-mentioned timeframe is of utmost importance. This must be based on mature solutions and, where possible, on operationally harmonized rules. The CCS sector, and in particular ERJU System Pillar, under its role as the generic system integrator and the architect of the future SERA railway, are encouraged to integrate the necessary steps for defining the migration steps or mandate an alternative workbench to support the sector.