# Task 2: Train CS

The target functionality of Train CS aims to develop specifications that enable CCS onboard equipment based on harmonised operating rules in expandable and digestible migration / evolution steps improvements towards the goal of SERA.
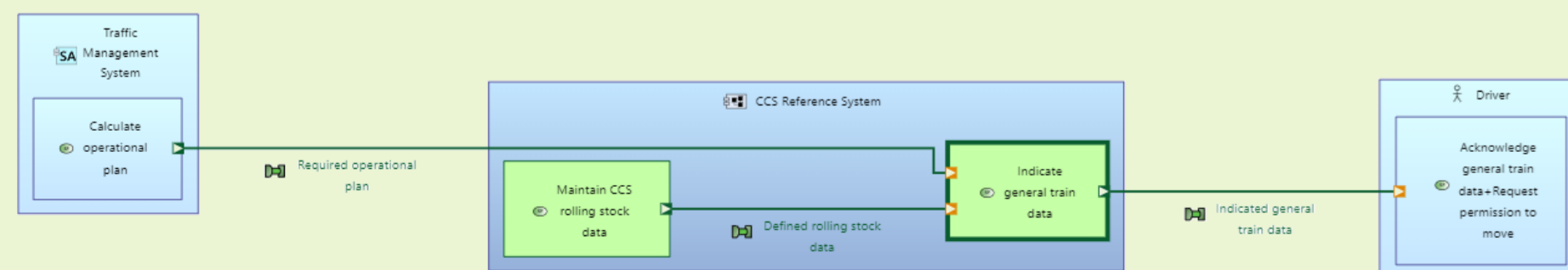
Modularity Onboard, enabling simplified improvements with functions such as high precision localization, automated up to autonomous train operation, new communication technologies as well as the support of digital automated coupler.

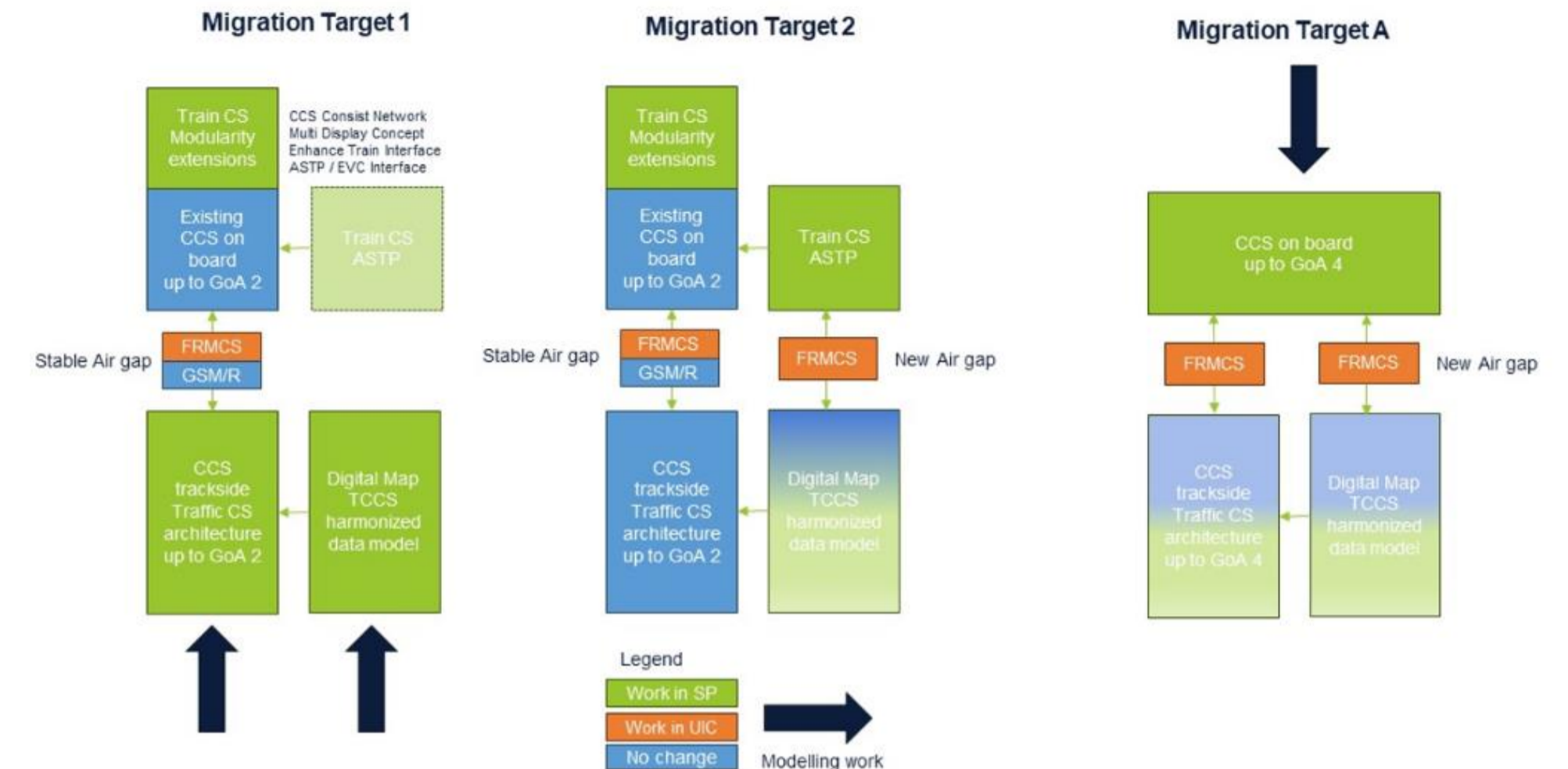## Train CS current logical architecture
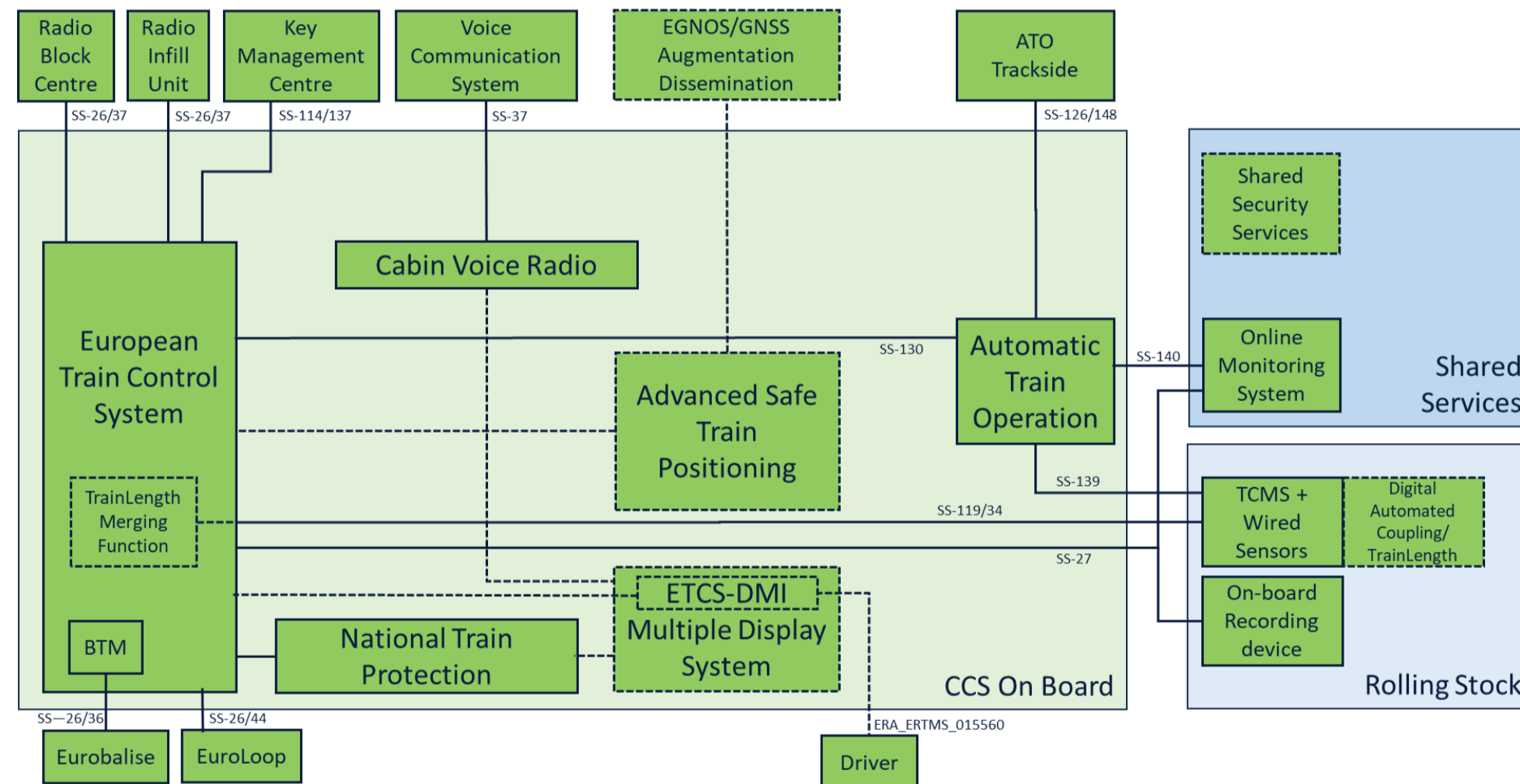
2025-04-10

System Function: Indicate general Train Data

Evolution of Train CS and focus of work

Remark: Realisation of all migration targets (1,2,A) is currently under discussion. Consideration of the quality and stability of the individual planned topics for upgrade / release topics.

Train CS focus on changes and adaption of present known CCS Onboard equipment to enabling quick and simplified improvements of new function and technologies for the "Harmonized European Rail Operation" under Single European Rail Area (SERA).

The work is strongly focused on the global ERJU goals:

- Improved performance, capacity and More sustainable transport
- Reduced CCS Onboard (life cycle) costs
- Harmonized approach to quick and cost-effective evolution and greater adaptability

Present technical enablers, new/extended functions, interfaces and simple, fast and cost-effective expandability to meet the changed market demands were processed, such as

- Interoperable harmonized CCS Onboard architecture based on Harmonized train Operation rules
- New Radio communication: GSM-R and FRMCS, dual at both side
- Enhancement up to precise safe train position
- Automated up to autonomous train operation
- Full support of new digital coupler & related functionalities
- Modul and interface definition of final SERA System Pillar Target Architecture

Task 2: Train CS (Update 23.05.2025)

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Lead STIP Deliverables

- **STIP_68 - Ethernet CCS consist network (full stack) -** 2025
- **STIP_71 - Train interfaces enhancement –** 2025
- **STIP_72 - On board modularity and upgradability / API for other applications** (2025)
- **STIP_30 - Support to the EGNOS Project**
- **STIP_69 - TDS FFFIS update –** 2032
- **STIP_70 - Multi-Display On-board -** 2030
- **STIP_73 - Train interface adaption for integrity handling and train length/overall consist length -** 2026
- **STIP_29 - Basic advanced safe train positioning: Odometry enhancement -** 2027

Deliverables Request for Service (SC2.4) – Year 3 [Oct-24 – Oct-25]

D01	**Ethernet CCS consist network (full stack)**– Q3 2025
D02	**Train interfaces enhancement**– Q3 2025
D03	**Multiple Display Concept** – Q3 2025
D04	**Train interface adaption for integrity handling and train length / overall consist length**– Q3 2025
D05	**On board modularity and upgradability**– Q3 2025
D06	**Basic ASTP: Odometry performance and robustness enhancement**– Q3 2025
D07	**Basic ASTP: a) General Architecture Analysis; b) Interface Spec.**– Q3 2025
D08	**Support to the EGNOS Project** – Q3 2025

Latest Achievements, Challenges and Design Decisions *(to be filled periodically by the domain)*

Latest Achievements: The following achievements have been accomplished by the domain:

- **General:** Polarion Setup: Remit Deliverables structure and detailed scope definition as well as Kanban Board with tasks required for each Remit deliverable.
- **CR Ethernet CCS Consist Network:** Work (CR clarification) in progress as planned.
- **On board modularity and upgradability:** First overview of detail Train CS logical architecture according different topics (ASPT, EGNOS, …) elaborated. Discussion and focusing done. Update for SP-domain and IP review in progress.
- **Multiple Display Concept:** Specification work ongoing, additional experts has been included.
- **Train interface adaption for integrity handling & train length:** Closed collaboration with FP5
- **Basic advanced safe train positioning:** In line with the very good cooperation, the domain members were able to work out a proposal for Basic ASTP that was acceptable to all sides. Sector questionary send out and feedback expected by end of May.

Domain Current challenges: The domain is facing the following challenges:

- **Ad hoc activities:** Too many unplanned ad hoc activities tie up some resources, which can lead to delays in individual work packages. More precise planning of actions (Review and Mandatory checks) by CG is required. Drafting the terms of reference for RfS 2.5 (no continuation of MDS, modularity and migration) has reduced motivation. The simultaneous reduction of the Manpower budget for RfS 2.5 coupled with a new focus will result in the loss of major work as well as its funding and will not enable support for the various topics for 2026/2027.
- **Discussion about the different solution proposal:** A lot and time-consuming discussion about the different solution proposals.

Design Decisions: Modularity & Architecture concept proposal. Update in progress, SP and IP review start in June 25.

Expected outcomes for sector review in the next 3 months

- **Detailed elaboration of a harmonized solution for:**
  - Multiple Display Concept – Q3 2025
  - Train interface adaption for integrity handling and train length / overall consist length – Q3 2025
  - On board modularity and upgradability – Q3 2025
  - Basic ASTP: Odometry performance and robustness enhancement– Q3 2025
  - Basic ASTP: a) General Architecture Analysis; b) Interface Spec.– Q3 2025
  - Support to the EGNOS Project – Q3 2025
  - Work Roadmap definition for further EGNOS activities.