

OPEN SOURCE meets **AUTOMOTIVE.**

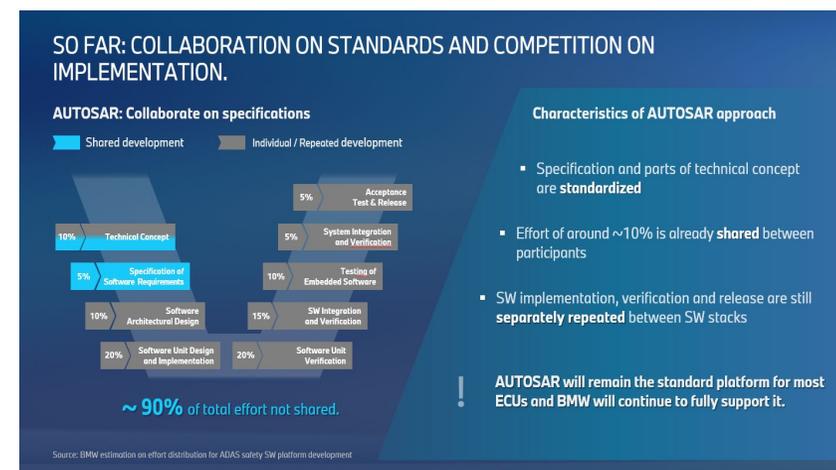
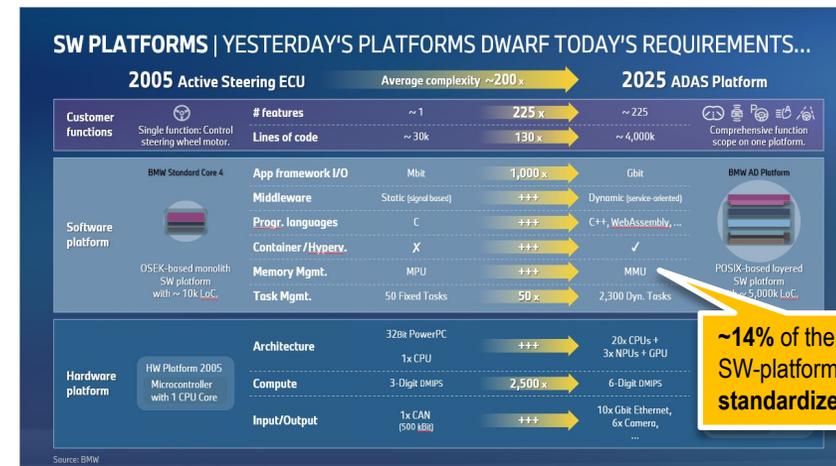
ECLIPSE MEETUP – YOKOHAMA , DEC 11TH 2025.

SVEN KAPPEL (ETAS GMBH)

MOTIVATION: WHY SW PLATFORMS? WHY OPEN SOURCE?

- HPCs (HIGH PERFORMANCE CONTROLLER)**
 to a greater extent **common in automotive**.
 Further integration of performance compute, zone architecture etc.
- INCREASING SW-COMPLEXITY IS A CHALLENGE!**
 To control the complexity and to encourage **re-use**,
we need performant SW platforms (Operating Systems, Middleware etc.).
- STANDARDIZED SW-STACK IS THE KEY**,
 since (one-time) proprietary solutions require **high effort & costs** (make)
 or bear the risk for **Lock-In** (buy).
- CLASSICAL STANDARDIZATION** -based on specifications-
are not sufficient, due to the **high implementation effort**
 (multiple time in the industry) and **time consumption**.

OPEN SOURCE IS A PROMISING SOLUTION FOR THOSE CHALLENGES AS CAN
 BE OBSERVED IN SOFTWARE INDUSTRY.



MOTIVATION: WHY A SAFE OPEN VEHICLE CORE (S-CORE)?



Common Stack & Collaboration

A common full-stack software runtime addressing shared industry problems through joint solutions.



Speed

Accelerates development by working in open source with code-centric, iterative methods.



Abstraction & Extensibility

Decouples HW and SW with flexible layers and enables project-specific extensions of the stack.



Quality & Efficiency

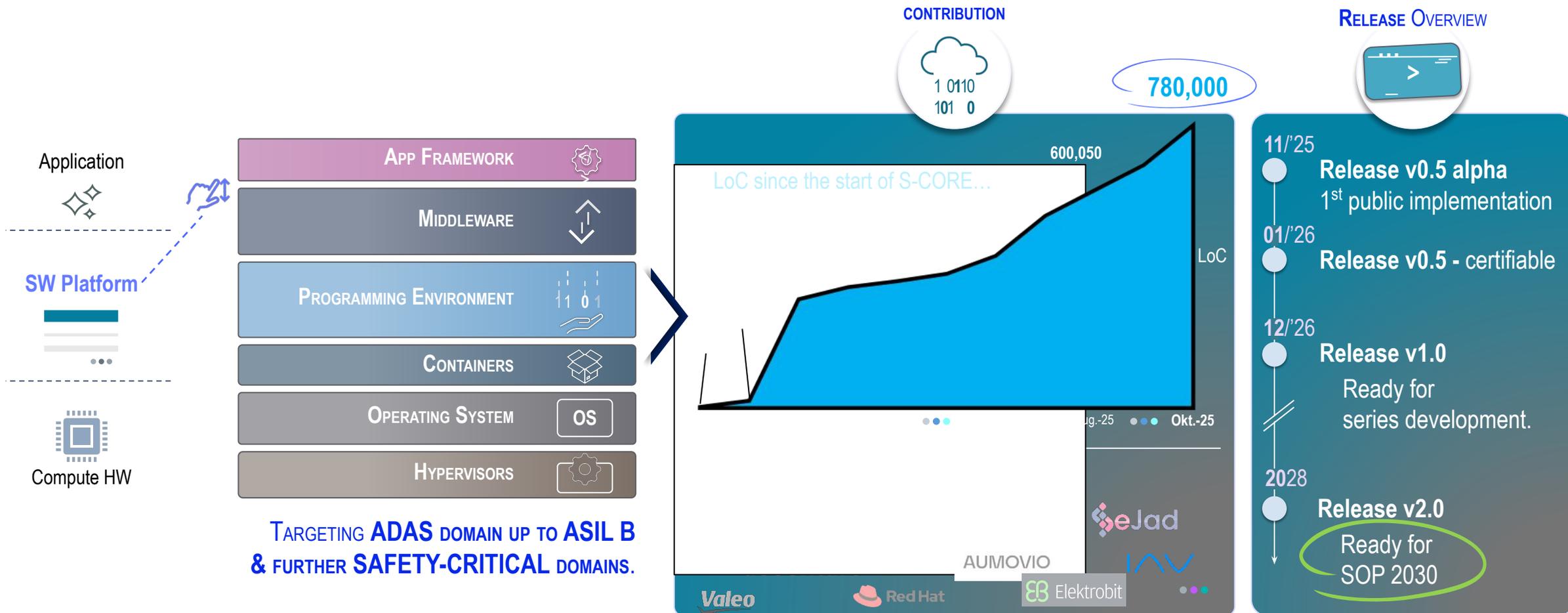
A lean, no-frills solution using modern languages, readable specs, and safe open source processes.

S-CORE IN A NUTSHELL |

THE PROJECT IS UP AND RUNNING, AND ON TRACK ACCORDING TO ITS RELEASE PLAN.

S-CORE, the open-source SW standard with implementation to be deployed in safety-critical automotive series projects.

After ~1 year, the project is up and running, ... and on-track to provide a complete solution by 2028.



S-CORE IS PLANNED AS A GLOBAL INITIATIVE – COMMUNICATION OF THE NEXT BATCH PLANNED FOR CES 2026.

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
- CONTRIBUTE EXISTING CODE
- GLOBAL SCALE
- NEW BUSINESS MODEL

VDA

MoU initiated by VDA in Europe...



...now handed over to the ECLIPSE Foundation to foster an international ecosystem.



1st batch of MoU signees, published in AEK Ludwigsburg, June 2025

Signing Parties		
	Frank Weber Member of the Board of Management	
	Dr. Mathias Pillin CTO Mobility	
	Jean-François Tarabbia Head of Architecture and Network Solutions Business Area	
	Dr. Thomas Iravani CEO	
	Guido Schütte EVP, Member of the Executive Board Electronics	
	Markus Schäfer RD Chief Technology Officer, Development & Procurement	
	Markus Schupfner CEO / Managing Director Dr. Nico Hartmann CTO / Managing Director	
	Joachim Mathes CTO Valeo Drive Division	
	Dr. Matthias Traub Managing Director	
	Dr. Michael Steiner Member of the Extended Executive Committee Volkswagen AG, Group R&D Axel Andorff Group Chief Technology Engineer	
	Torsten Gollewski Executive Vice President Corporate R&D Innovation & Technology	

Signed MoU

The MoU is a **voluntary commitment** by all signees to actively contribute to open source SW development for automotive. Additionally, the OEMs voluntarily agree to use open source SW in their products.

SIGNED & PUBLISHING PLANNED
IN CES LAS VEGAS 01/2026

IN DISCUSSION
ORAL COMMITMENT EXISTS

OEMs



+2
OEMs

Other signees

+11 international
members
(incl. LGE) 1101

+5
additional
members 1101



We're approaching potential members directly, ...yet we're open for proactive communication by interested companies as well.

ECLIPSE **S-CORE** | NOT JUST ANOTHER OPEN-SOURCE PROJECT, IT'S THE **LARGE SCALE FREE & OPEN-SOURCE SOLUTION**
TO BE **DEPLOYED IN SAFETY-CRITICAL AUTOMOTIVE SERIES PROJECTS**

...& **FACES 5 MAJOR CHALLENGES.**

#1 **INDUSTRY REQUIREMENTS** 

S-CORE must consider **strict requirements** of the automotive industry, e.g., safety (ISO26262), security (ISO 21434).



STRICT/ RELIABLE TIMELINE #2

S-CORE follows a **strict and reliable timeline** in order to be used in automotive industrialization projects.



#3 **CONTRIBUTE EXISTING CODE** 

S-CORE doesn't start on the greenfield, a way to **contribute existing implementation also from non-automotive domains and enhance them to meet the automotive industry requirements.**



GLOBAL SCALE #4

S-CORE needs a **solid global ecosystem** in order to **scale** ...which **consists of different players** (OEMs, Tiers, SoC providers, ...).

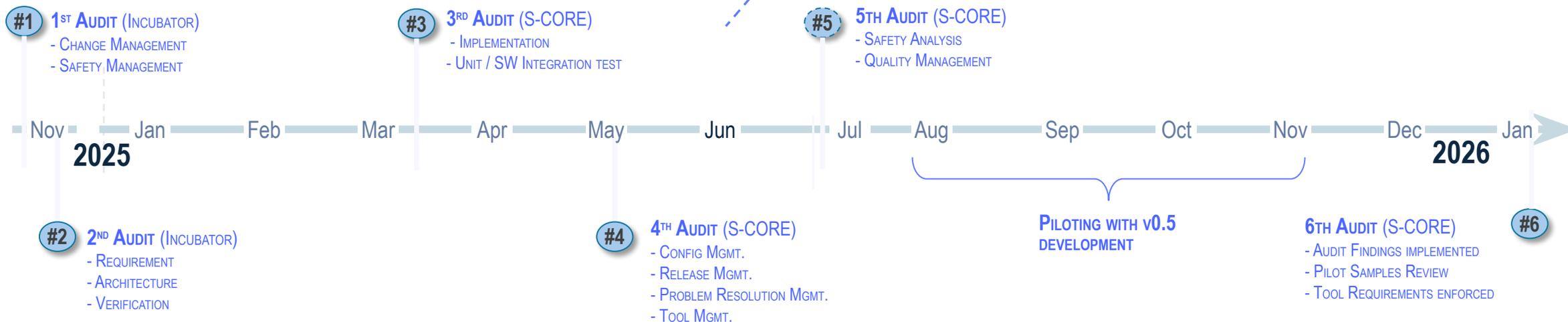
#5 **NEW BUSINESS MODEL** 

S-CORE comes with new **business models** for all parties involved.

S-CORE'S PROJECT SETUP ENSURES EFFICIENT DEVELOPMENT OF SOFTWARE AS WELL AS COMPLIMENTARY WORK PRODUCTS.

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
- CONTRIBUTE EXISTING CODE
- GLOBAL SCALE
- NEW BUSINESS MODEL

Exida is continuously conducting Safety Audits of S-CORE, in order to ensure standard compliance.



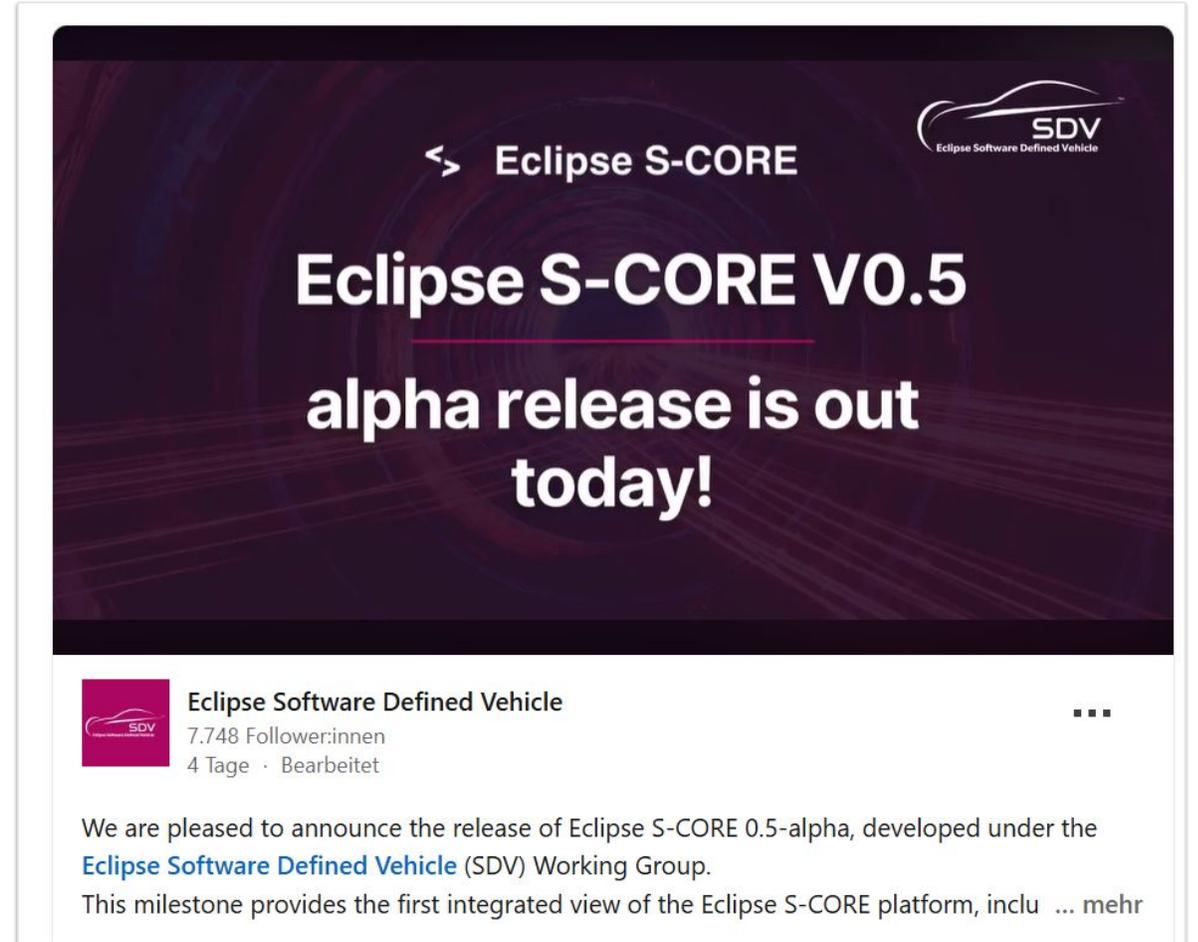
S-CORE RELEASE V0.5-ALPHA

ECLIPSE S-CORE v0.5-ALPHA RELEASE IS AVAILABLE | PUBLISHED NOVEMBER 17TH!

- **Why:**
 - Establish release processes
 - Lower the barrier to start using and developing Eclipse S-CORE
 - Engage with the community

- **How:**
 - Reference Integration Repo & Release Documentation

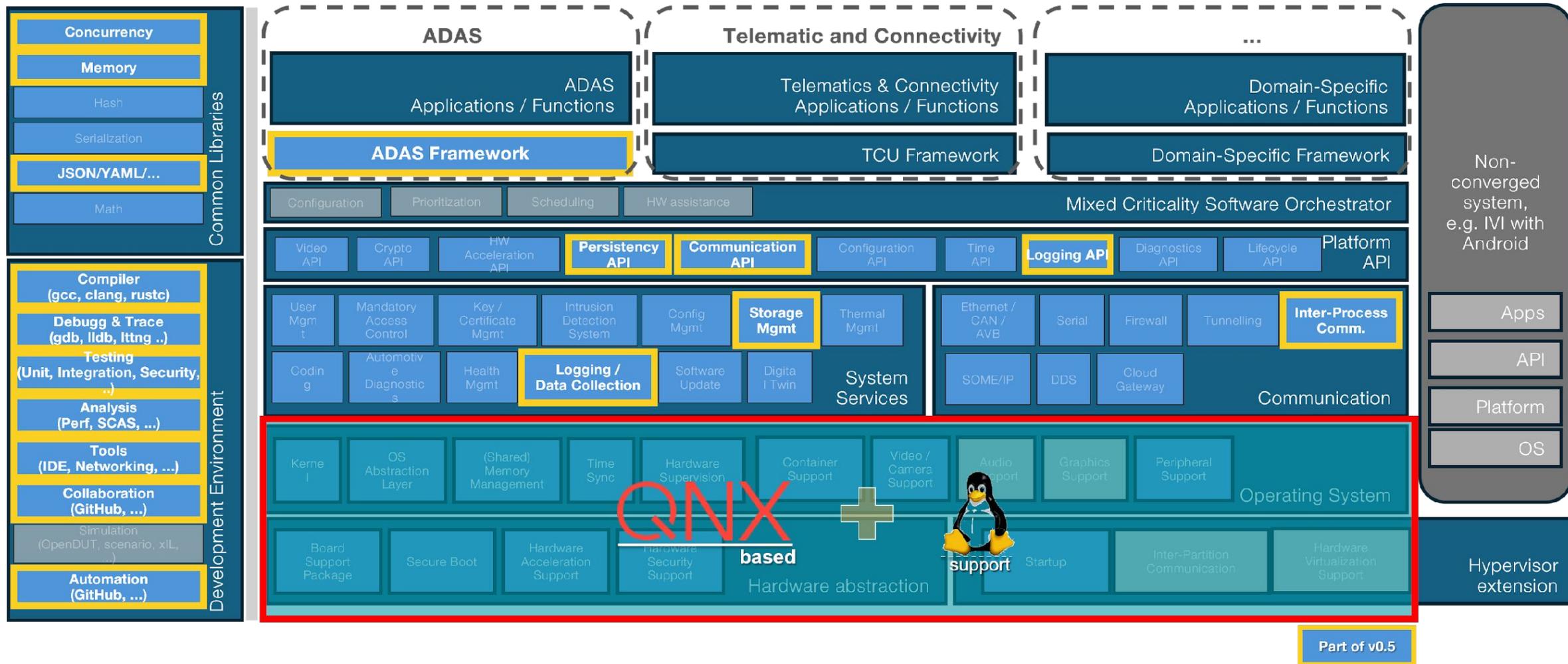
- **What:**
 - Initial release of core SW modules
 - Infrastructure for Build & Test
 - Multi-target integration capabilities
 - Execute example applications



The screenshot shows a social media post with a dark purple background. At the top right is the SDV logo. The main text reads: "Eclipse S-CORE" with a double arrow icon, followed by "Eclipse S-CORE V0.5" in large white font, and "alpha release is out today!" in white font below it. The post is from the account "Eclipse Software Defined Vehicle" which has 7,748 followers and was updated 4 days ago. The text of the post says: "We are pleased to announce the release of Eclipse S-CORE 0.5-alpha, developed under the Eclipse Software Defined Vehicle (SDV) Working Group. This milestone provides the first integrated view of the Eclipse S-CORE platform, inclu ... mehr".

ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

SCOPE & HIGH LEVEL ARCHITECTURE



ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

EACH MODULE COMES WITH A COMPREHENSIVE DOCUMENTATION

Feature Request

The screenshot shows the 'Communication (v0.5 alpha)' feature request page. It includes a 'Section Navigation' sidebar, a 'Feature flag' section with the flag 'experimental_comm', an 'Abstract' section describing the communication module's purpose, and a 'This Page' section with a 'Show Source' link.

Architecture

The screenshot shows the 'Architecture' page for the communication module. It includes an 'Overview' section, a 'Description' section, and a 'Static Architecture' section. A 'Feature Architecture Communication' diagram is visible at the bottom, showing the relationship between the communication module and other system components.

Requirements

The screenshot shows the 'Requirements' page for the communication module. It lists three feature requirements: 'Support for Time-based Architecture', 'Support for Data-driven Architecture', and 'Support for Request-driven Architecture'. Each requirement includes a status, security ID, and a link to the source code.

Safety Planning

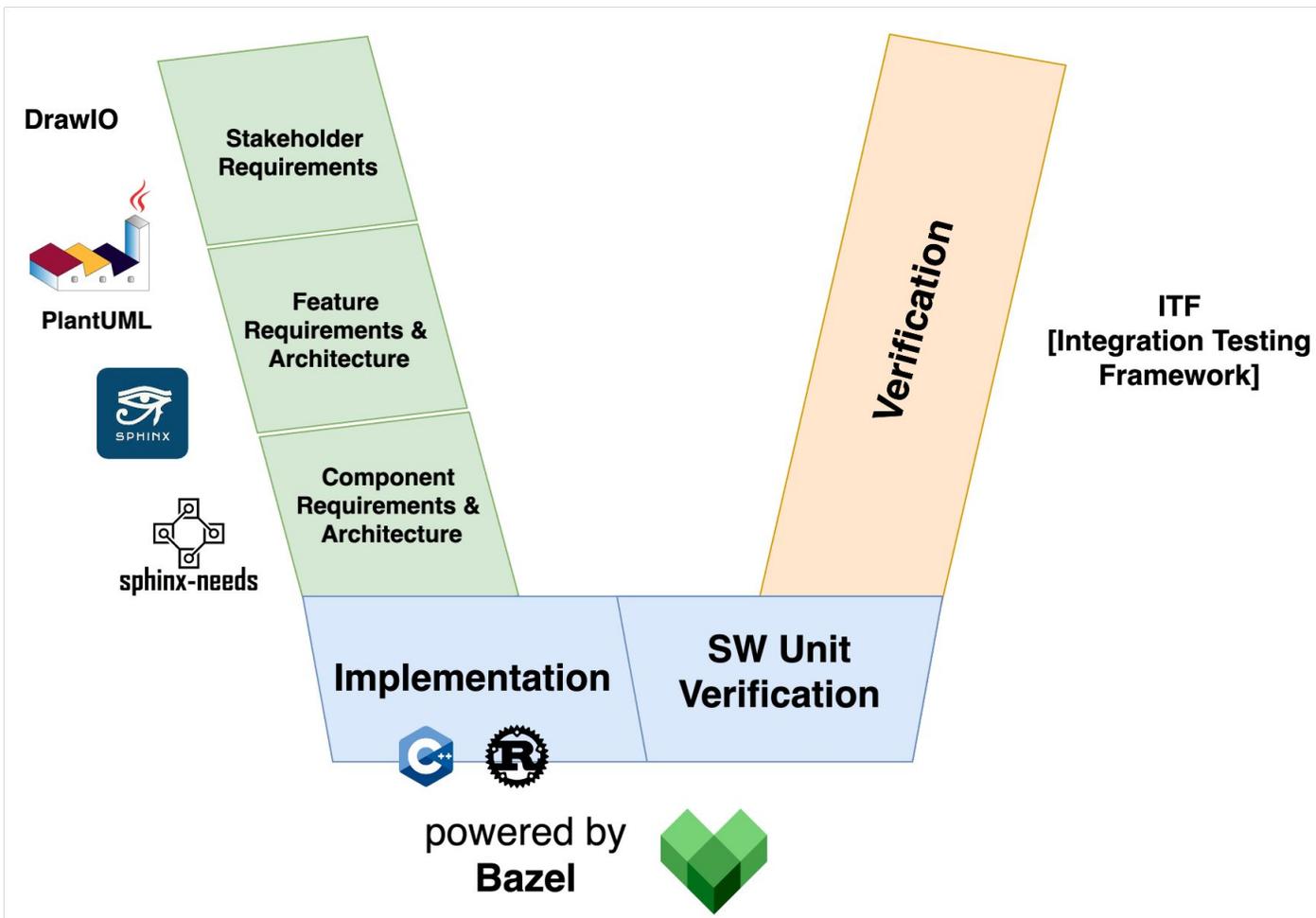
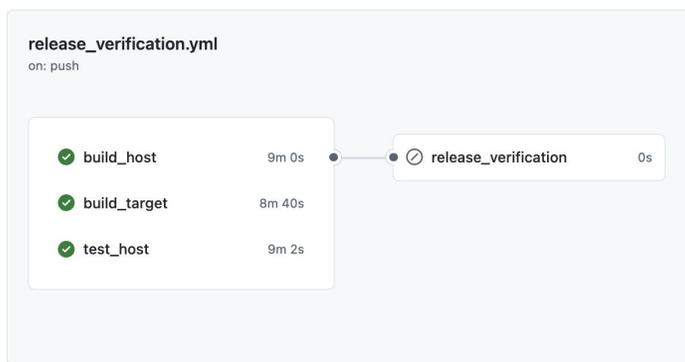
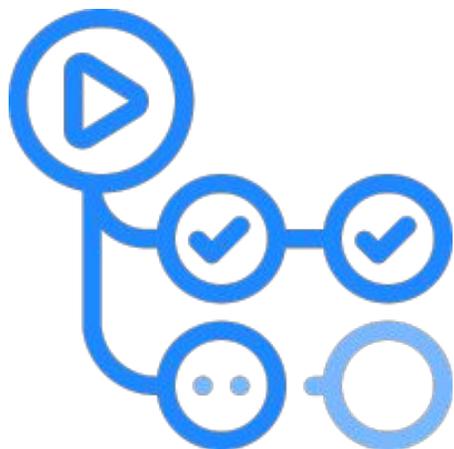
The screenshot shows the 'Feature Safety Planning' page for the orchestration module. It includes a table of 'Orchestration Safety WPs' with columns for 'Work product id', 'Link to process', 'Process status', 'Link to issues', and 'Link to WP'. The table lists various safety work products and their associated processes and issues.

ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

ROBUST CI/CD WORKFLOWS

01	Build Core Features: <ul style="list-style-type: none"> Continuous integration (shared runners) Continuous deployment (Kubernetes native for Build) Security Scanning 	02	Build Core Features: <ul style="list-style-type: none"> Deployment (CI/CD) (shared runners) Continuous integration (shared runners)
03	Functional Verification: <ul style="list-style-type: none"> Feature, implementation model for organizational rules (MPLS), etc. Code coverage CI/CD (Integration Testing/Performance) with test scenarios for robust verification 	04	Multi-Platform Support: <ul style="list-style-type: none"> Multiple experimental reference targets for: <ul style="list-style-type: none"> Linux ARM PowerPC Hardware Co-Simulation External Control Loops for Safety Applications
05	Release Integration: <ul style="list-style-type: none"> Sample demo application for multiple experimental target images, showcasing practical application deployment. 		

S-CORE, the open-source SW standard with implementation to be deployed in safety-critical automotive series projects.



ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

HOW TO GET STARTED?

EXPLORE

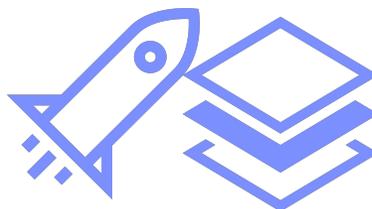


Release Notes:

Get an overview of all features and functions available in the first S-CORE v0.5-alpha release

[Release notes](#)

Test & Deploy



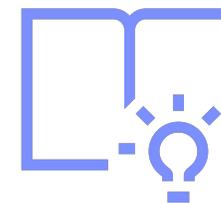
Reference Integration:

The full initial integrated platform, including modules and the scramble demo, is available for exploration.



[Explore the Repo](#)

Read more



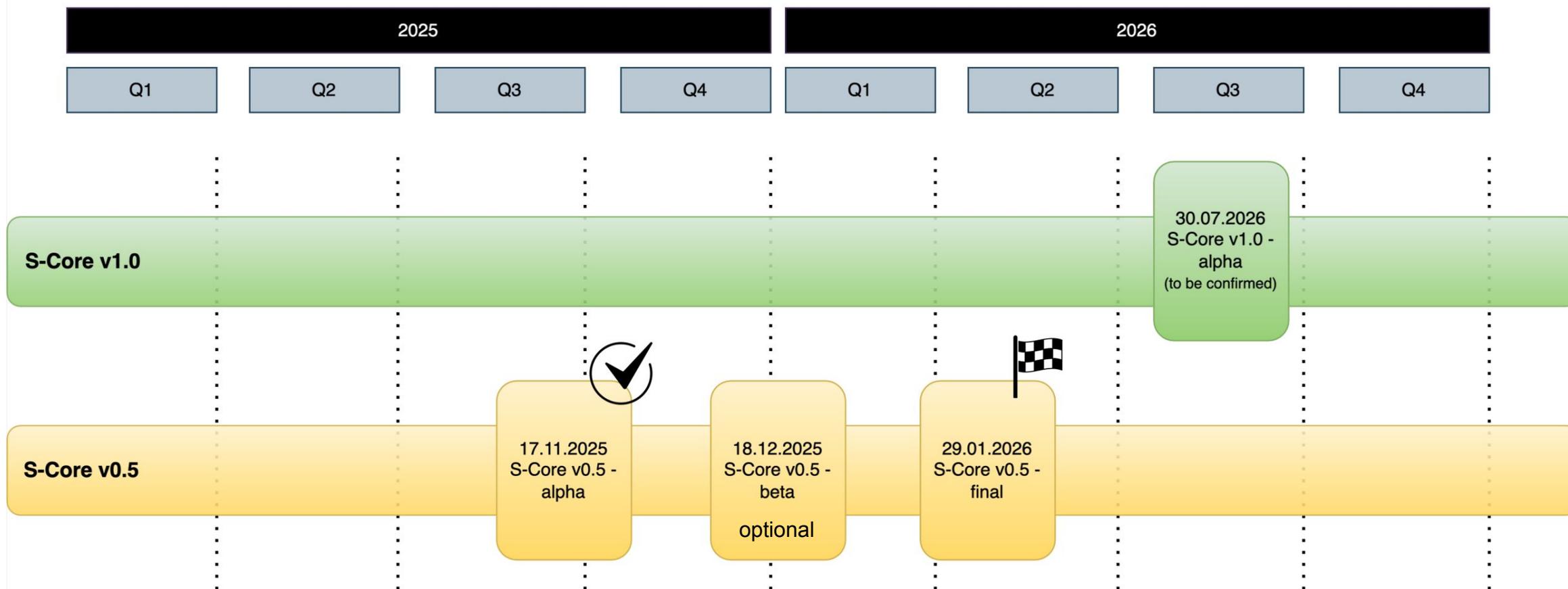
Use the S-CORE Handbook:

A detailed “how-to-guide” introducing core concepts and walking through application building step-by-step

[Open the Handbook](#)

ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

S-CORE v.05 RELEASE PLAN



[Detailed planning overview](#)

ROADMAP TO ECLIPSE S-CORE V1.0

ECLIPSE S-CORE MILESTONE PLAN 2026 AND FOLLOWING



S-CORE SW-PLATFORM | THE CORE MIDDLEWARE IS IN FOCUS OF THE RELEASE 0.5. RELEASE 1.0 WILL HAVE A BIGGER SCOPE & COVER MOST PARTS OF THE SW-PLATFORM

The image shows a software architecture diagram with two feature request lists overlaid. The left sidebar lists categories: Common (Concurrency, Memory, Hash, Serialization, JSON/YAML/..., Math) and Development (Compiler, Debug & Trace, Testing, Analysis, Tools, Collaboration, Simulation, Automation). The main diagram shows layers: Application (ADAS, Configuration), Platform API (Video API, Crypto API, HW, Persistency API, Communication API, Configuration API, Time API, Logging API, Diagnostics API, Lifecycle API), User Mgmt., Coding, Kernel, Board Support Package, and OS. Two feature request lists are shown:

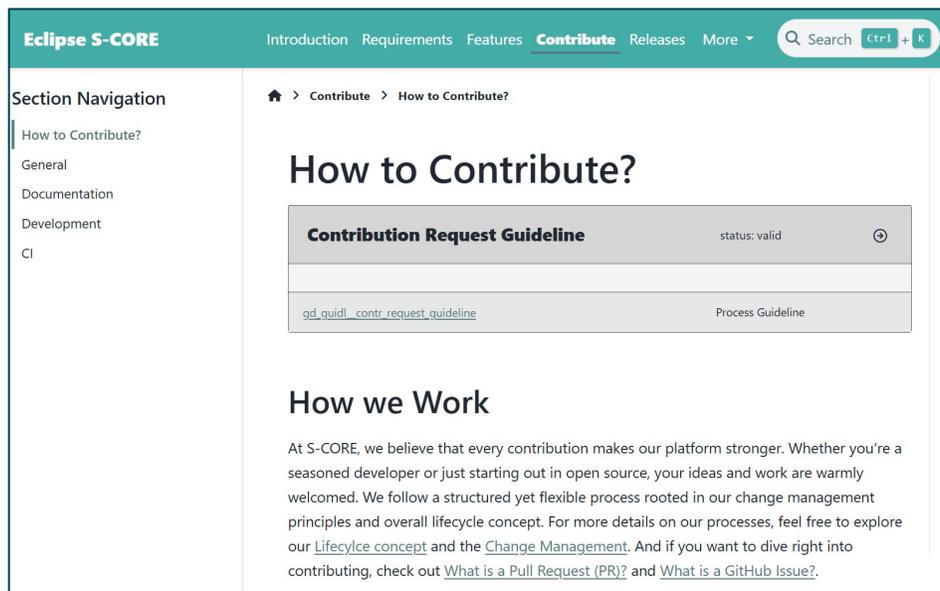
ID	Request	Status
1	Feature Request for FEO #67	Accepted
2	Feature Request for IPC #69	Accepted
3	Feature Request Orchestration #273	Accepted
4	Feature Request for Logging #68	Accepted
5	Feature Request for Persistency #95	Accepted

ID	Request	Status
1	Feature Request for ABI compatible datatypes #917	Accepted
2	Feature Request for Config Management #754	Accepted
3	Feature Request for Health & Lifecycle #909	Accepted
4	Feature Request for Time #910	Accepted
5	Feature Request for Diagnostic Services & Fault Management #911	Accepted
6	Feature Request AI - GenAI #913	Accepted
7	Feature request AI - Inference engine #1479	Accepted
8	Feature Request for SOME/IP Gateway #914	Accepted

Logos for Joint partners: accenture, QORIX, and TITAS are visible at the bottom left.

S-CORE SW-PLATFORM |

Let's collaborate!



The screenshot shows the Eclipse S-CORE website's 'How to Contribute?' page. The page has a teal header with navigation links: Introduction, Requirements, Features, **Contribute**, Releases, and More. A search bar is located in the top right. On the left, there is a 'Section Navigation' sidebar with links for How to Contribute?, General, Documentation, Development, and CI. The main content area is titled 'How to Contribute?' and features a 'Contribution Request Guideline' card with a 'status: valid' indicator and a refresh icon. Below this is a table with one row containing the link 'gd_guidl_contr_request_guideline' and the text 'Process Guideline'. The page also includes a 'How we Work' section with introductory text about the contribution process and links to 'Lifecycle concept', 'Change Management', 'What is a Pull Request (PR)?', and 'What is a GitHub Issue?'.

- **Have a new idea?**
Start by raising a new feature request to help expand the scope of our platform.
- **Ready to code?**
Submit a contribution pitch for a specific feature request if you have a solution you'd like to share.
- **Looking to improve what's already there?**
Contribute enhancements to existing implementations or get involved with one of our feature teams.

X-CORE

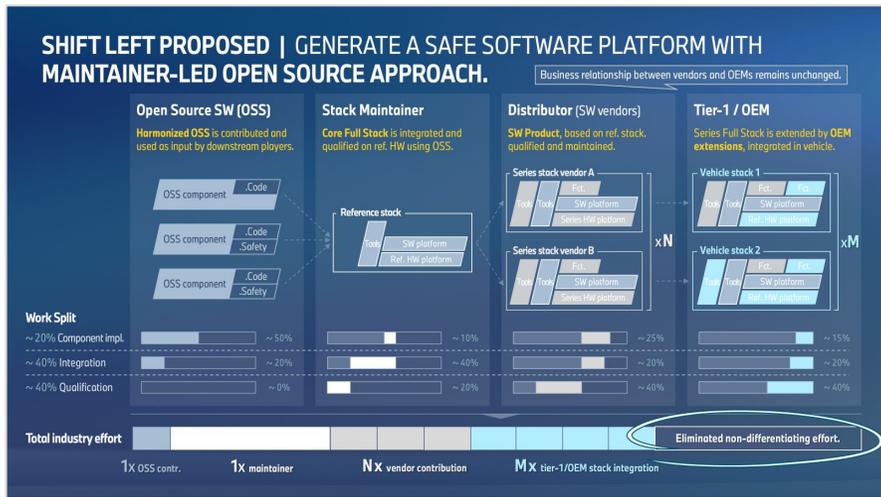
BUSINESS MODEL | WITH OPEN SOURCE, THE BUSINESS MODEL WILL CHANGE FOR ALL PARTIES INVOLVED.

WE MAKE SURE, THERE IS A POSITIVE IMPACT FOR THE WHOLE COMMUNITY.

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
- CONTRIBUTE EXISTING CODE
- GLOBAL SCALE
- NEW BUSINESS MODEL

ORIGINALLY, WE HAVE PROPOSED A **COLLABORATION MODEL** AND **BUSINESS MODEL** WHICH SUITS THE AUTOMOTIVE INDUSTRY...

...YET, DESPITE CHANGES IN THE INDUSTRY, **SOFTWARE WON'T BE FOR FREE/ BUSINESS WILL STILL EXISTS !**



AEK Kongress 06/2024 – “Software-centered board net development towards the software-defined vehicle”, Dr. Chris Salzmann

BY DEVELOPING AN OSS PLATFORM JOINTLY, ...

- ...the **effort w/out customer value** can be reduced.
- ...a **common ground for cooperations** is built.
- ...**time to market** is reduced (reuse, contributions, ...) by **~30%**
- ...

	CHANGE	BENEFITS
OEM	Commitment to bring OSS S-CORE to production.	Re-use S-CORE for future generations. Less risk for vendor lock-in.
HW Tier	Different competencies and responsibilities.	Better Scaling: Implement once/ offer to more customers. (By far) less effort for HW- and SW-integration.
SW Tier	Change of business model , e.g., no licenses. Readiness for pre-investment .	
SoC Supplier	More transparency (future plan, grant insights to own technology).	Less middleware implementation = less effort Impact via contribution/ Early info reg. SoC req.
Service Provider	Readiness for pre-investment .	Scaling: Provide engineering services to all. Business decoupled from SOP on OEM-side
Tool Provider	Dual business model (open and closed).	Knowledge, needed tools by the community. = Better scaling via standardization.

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
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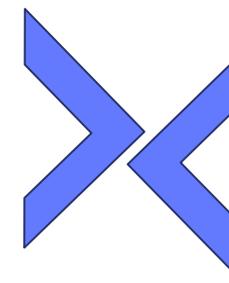
YET, THERE ARE STILL OPEN ISSUES WHICH NEED TO BE TACKLED CONTINUOUSLY...

Scope

- » **Continuous positive & realistic communication** via suitable communication channel depending on the **target group**.
- » **Continuous scale** of a global community (MoU, ...).
- » **Reach out to highly other peers/ institutions** (EU commission, VDA, PFA, ANFIA, Korean authorities??).
- » **SPOC** for new members.
- » **Onboarding** of new members.
- » Ensure **potential funding** and establish **future business model** for every player involved.
- » **Evaluate commercial products** related to S-CORE.



Continuous delivery...



X-core

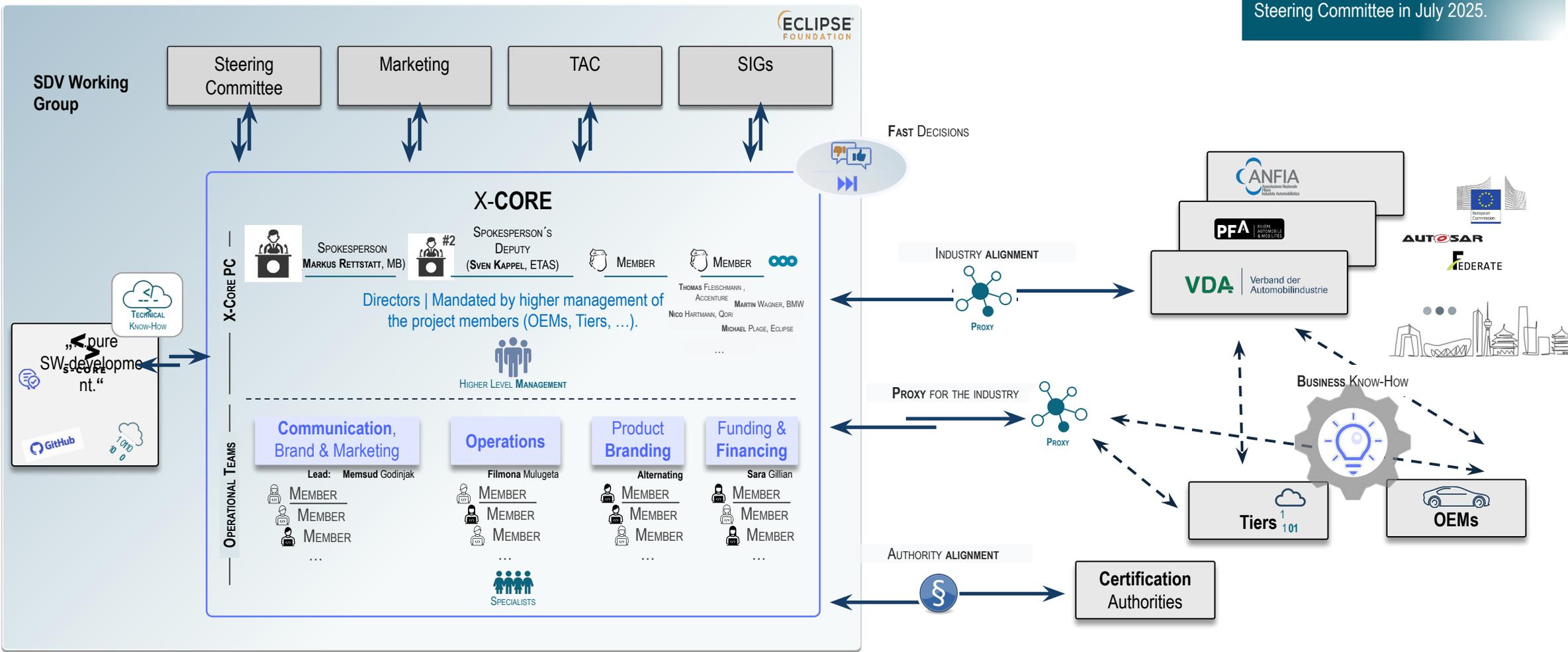
Additional **organizational structure**,
to **speed-up** non-technical
topics yet relevant for the projects!



We want our **developers** to stay focused on **delivering work products**, so we've **established an all-new organization**.

X-CORE OVERVIEW | COVERING NON-TECHNICAL TOPICS & ENSURE SMOOTH OPERATIONS OF RELATED FOSS PROJECTS (E.G. S-CORE).

X-Core Platform Council was officially approved by Eclipse Steering Committee in July 2025.

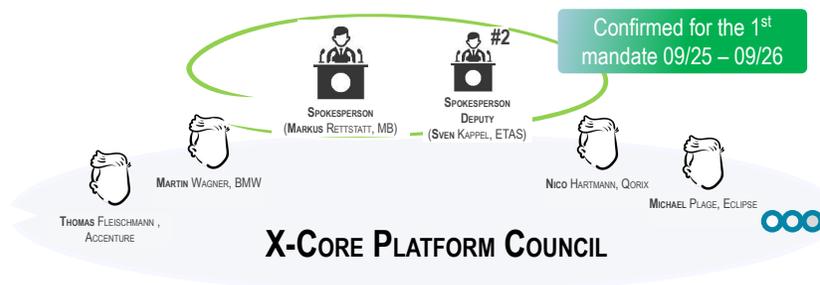


Kick-Off WS on Sept. 15th / 16th to detail X-CORE setup (Platform Council & Operational Teams) and to start w/ discussion about high priority TOPs.

X-CORE | ALL-NEW WAY TO ORCHESTRATE STRATEGIC-, ORGANIZATIONAL- & OPERATIONAL ACTIVITIES.

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
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Managing X-Core Platform Council



- Tasks/ Resp.
- Define strategy for all contents
 - Provide guidance to all OTs
 - Make Decision
 - 1st contact to new members (companies) on mgmt. level.

The platform council focuses on **what** and **why** (strategy, goals),
...while operational teams focus on **how** and **when** (execution).

OPERATIONS TEAM

Team Lead, **Filmona Mulugeta**



- Define/ Document X-Core Council governance processes.
- Formalize member **Onboarding & Engagement** framework.
- Establish **Strategic Roadmap** Management & Prioritization Process.
- Organize **communication w/ authorities** (e.g., EU commission, VDA, OSS-community, ...).

COMMUNICATION, BRAND & MARKETING TEAM

Team Lead, **Memsud Godinjak**



- Ensure **communication via all relevant communication formats**, e.g., webpage, SoMe, press releases,...
- Develop a **communication strategy & communication roadmap** for S-CORE.
- **Define key target groups** and define communication formats per key target group.

PRODUCT BRANDING TEAM

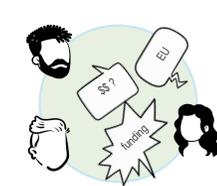
Team Lead, **Alternating**



- Ensure that **products** which claim to be compatible to a project governed by X-Core are **officially certified**.
- Define **process for certification** of products.
- Ensure **appropriate communication**, e.g., publish certified products is on a trustable space,...

FINANCE/ FUNDING TEAM

Team Lead, **Sara Gillian**



- Develop a **Sustainable Funding Model** & Membership Contribution Structure.
- Establish a **Budgeting & Financial Planning Process** for Council Operations.
- Proactively **Identify & Pursue Strategic External Funding** Opportunities.

Elaborate (hands-on) **results** for responsibilities assigned to the OTs ...
...and **report to X-Core PC**.

Ensure alignment to relevant Eclipse SDV communities (e.g., via active participation by Eclipse staff).

Tasks/ Responsibilities

GET IN TOUCH & JOIN THE COMMUNITY

Eclipse S-CORE Project | Get in Contact & Join the Community!

Discussion groups on GitHub ([link](#))

00 Steering

- Committer Circle
- Project Lead Circle
- Technical Lead Circle

01 Communities

- Architecture Community
- MarCom Community
- Operational Community
- SW Dev Process Community
- Testing Community

02 Cross Functional Teams

- Communication CFT
- FEO CFT
- Logging CFT
- Orchestration CFT
- Persistency CFT

Slack Channel ([link](#))

score-project-channel-public

Nachrichten Canvas hinzufügen Dateien +

Transport API", that was the whole point of GM's contribution of CC study what is already free and open source and consider contributing uServices and share where we got to.

Moritz Neukirchner 14:18 Uhr
I would second that approach. I think currently the most meaningful

Philipp A. 20:04 Uhr
@Daniel Krippner and @Kai Hudalla and thoughts from you?

Kai Hudalla 08:03 Uhr
Indeed, uProtocol has been created to address most (if not all) of the transport protocols like MQTT, Zenoh, SOME/IP etc and supports a

Nachricht an #score-project-channel-public

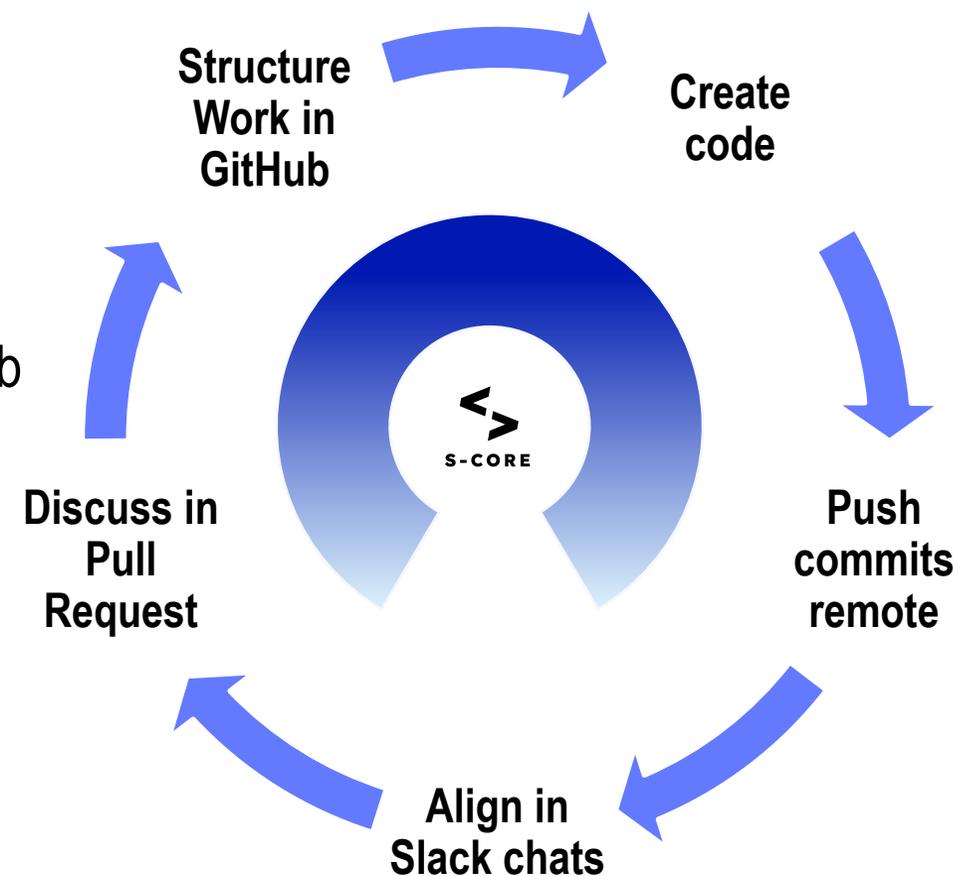
Meetings ([link](#))

November 2025		
MO 27	DI 28	MI 29
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OPPORTUNITIES FOR GLOBAL COLLABORATION

- Work is code centric
- Exchange happens via GitHub Issues & Pull requests
- Slack channels support informal exchange
- Minutes of every meeting are prepared and shared in GitHub discussions.

□ Perfect to work asynchronously on global environment



SUMMARY

- S-CORE is build for Safety critical HPC SW Platforms
- S-CORE follows the Code First paradigm to establish a standard
- S-CORE needs global acceptance in order to scale
- V0.5-ALPHA release is there!
- We are on the way to V1.0 which is the basis for Series projects
- X-CORE takes care of non-technical topics and future projects
- Everybody is invited to join the community



THANK YOU