

## S-CORE, A HOLISTIC APPROACH FOR AUTOMOTIVE TOWARDS OPEN SOURCE.

ECLIPSE SDV COMMUNITY MEETUP – SEOUL , DEC 4<sup>TH</sup> 2025.



**MEMSUD GODINJAK**, BMW GROUP  
SR. MANAGER SW-PLATFORM STRATEGY



**BJÖRN REISTEL**, ETAS  
SDV ECOSYSTEM DEVELOPMENT & COMMUNITY MANAGER

## 1 ECLIPSE S-CORE BACKGROUND/ INTRO & STATUS

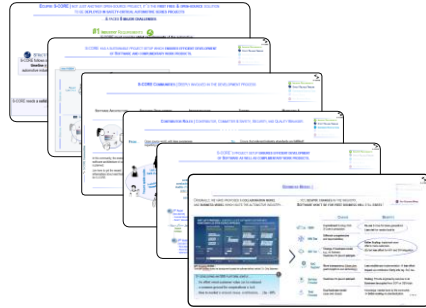


The **goal** of Eclipse S-CORE is to provide a **SW-Platform** for **safety-critical in-car components**.

**Besides code**, S-CORE comes with **additional work products**.

The **project is up and running**, has a **solid community** with more and more **global members**.

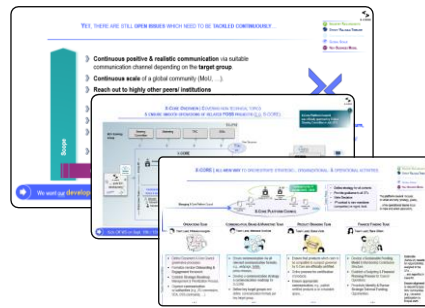
## 2 ECLIPSE S-CORE IS NOT JUST ANOTHER OPEN-SOURCE PROJECT!



Being the **first open-source standard** to be deployed in **safety-critical automotive series projects**, ...

...S-CORE faces **several challenges**, which we've started to tackle.

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



**X-CORE –**  
An all-new organizational unit helps us to boost needed ecosystem for S-CORE (...and for future upcoming open-source projects).

## 4 THE BEST WAY TO TACKLE GIVEN CHALLENGES IS TO DELIVER!



**First public release** “S-CORE 0.5 alpha” is out since Nov. 17<sup>th</sup>.

**Main deliverables**, 4 modules, almost all development processes certified, ...

## 5 OUTLOOK, WHAT'S PLANNED IN 2026.



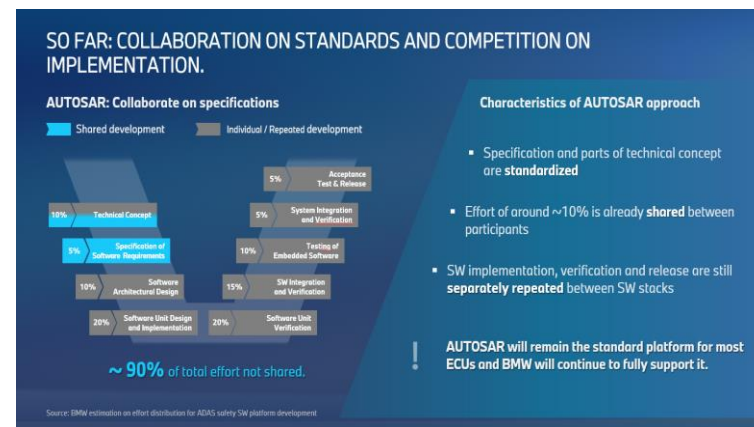
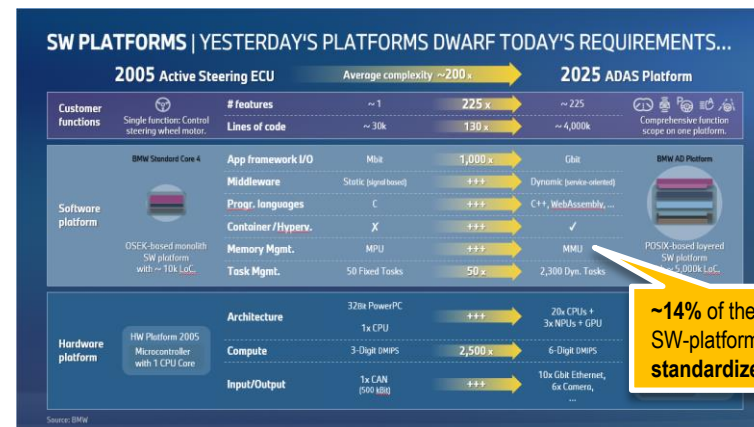
In January 2026, “S-CORE 0.5 certifiable” will be available, and we're on it to **launch S-CORE 1.0 by the end of the year 2026**.

## 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

...A PROMISING SOLUTION FOR EXISTING CHALLENGES  
 AS CAN BE OBSERVED IN SOFTWARE INDUSTRY.

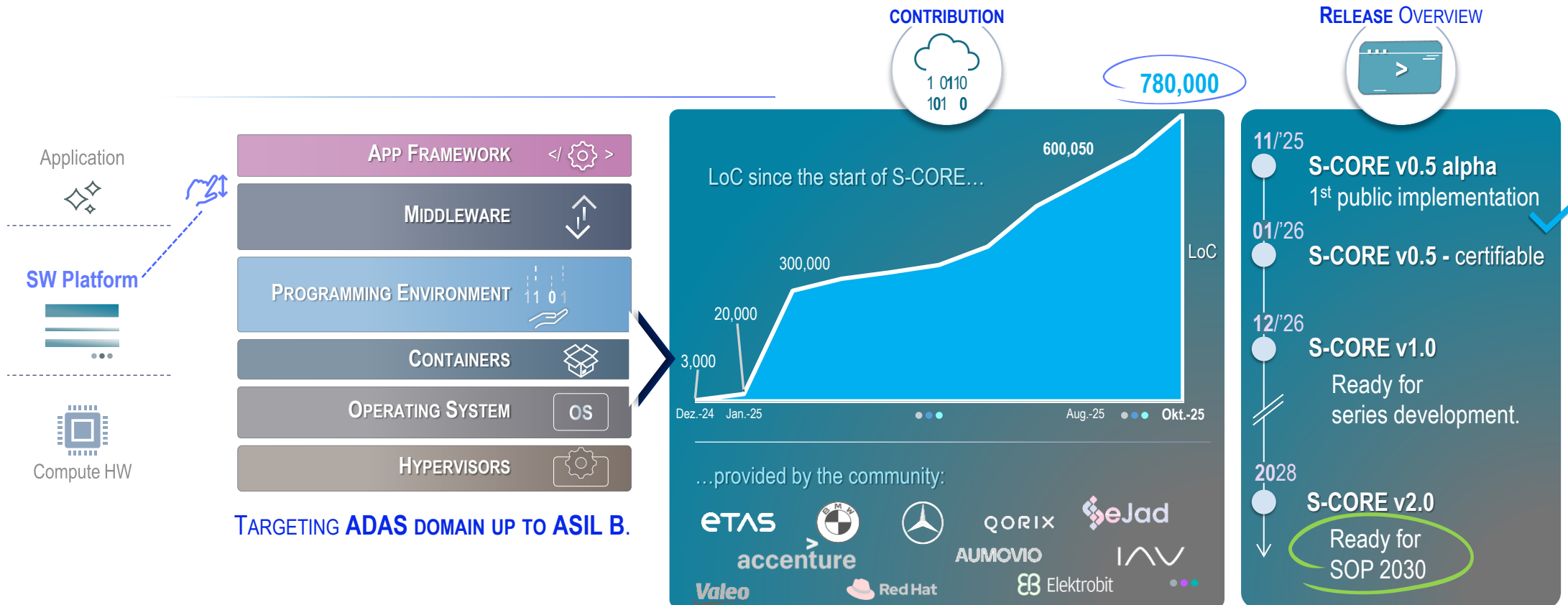


# S-CORE IN A NUTSHELL |

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

S-CORE, **first open-source standard** 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**.



# ECLIPSE S-CORE | NOT JUST ANOTHER OPEN-SOURCE PROJECT, IT'S THE FIRST 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 (ISO 26262), 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, ...).

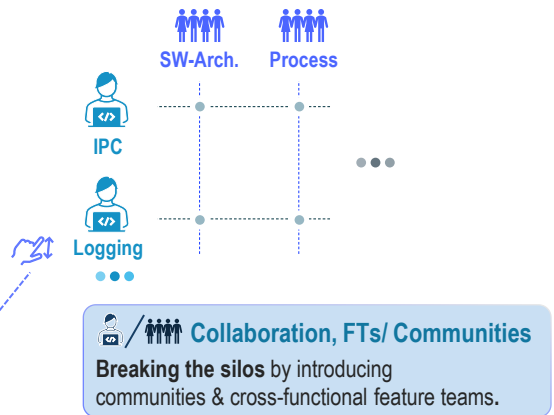
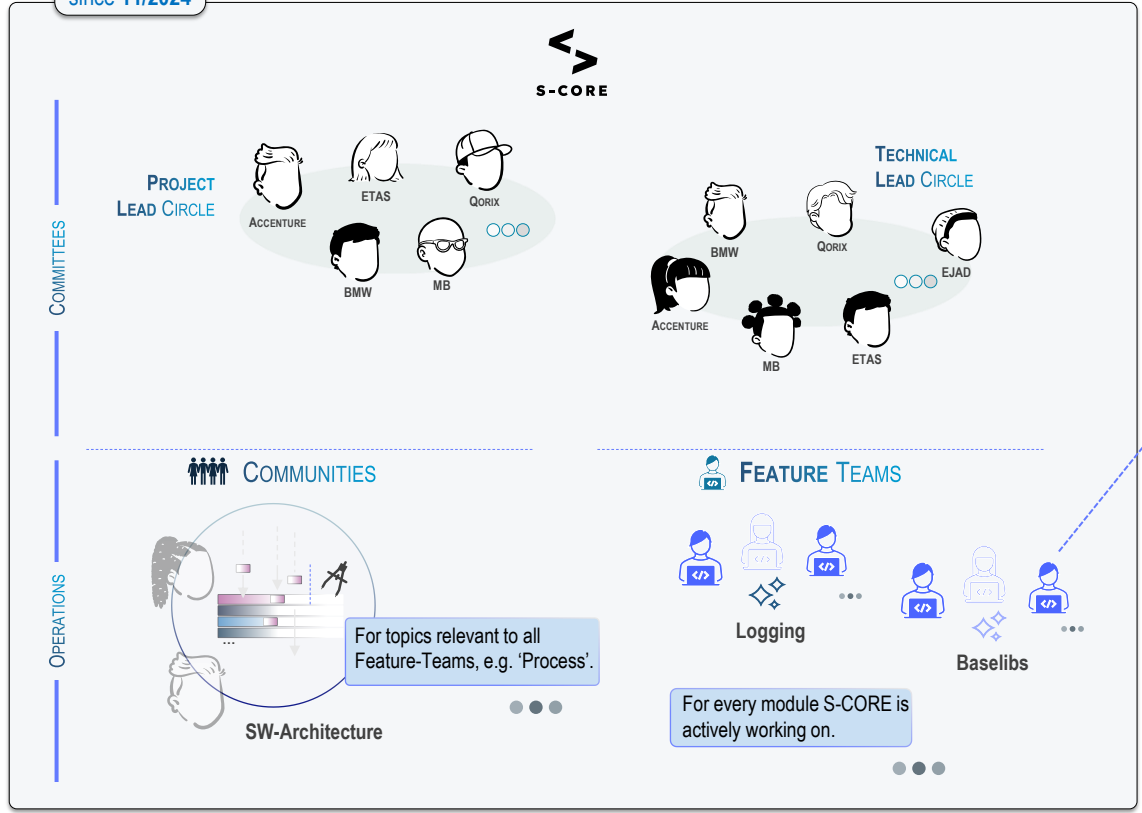
## #5 NEW BUSINESS MODEL

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

# S-CORE HAS A SUSTAINABLE PROJECT SETUP WHICH ENSURES EFFICIENT DEVELOPMENT OF SOFTWARE AND COMPLIMENTARY WORK PRODUCTS.

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

since 11/2024

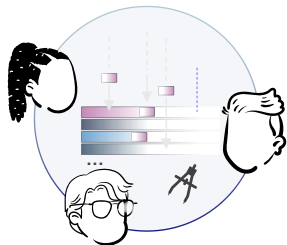


...more Details on next page

# S-CORE COMMUNITIES | DEEPLY INVOLVED IN THE DEVELOPMENT PROCESS

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
- CONTRIBUTE EXISTING CODE
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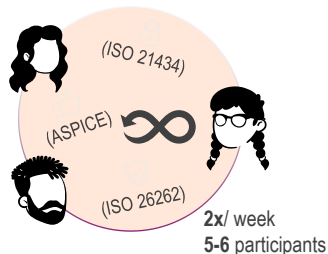
## SOFTWARE ARCHITECTURE



In this community, the **overall software architecture** of our stack is planned.

Join here to get the **recent information** about **next features** for S-CORE.

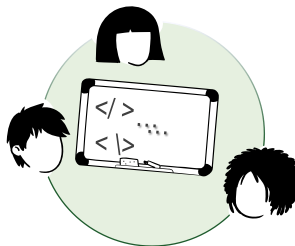
## SOFTWARE DEVELOPMENT PROCESS



Due to our goal to deliver a stack which is safety certifiable, we need **well defined software development processes**.

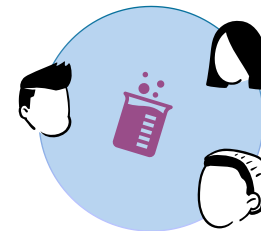
This community is **continuously designing & improving our processes**.

## INFRASTRUCTURE



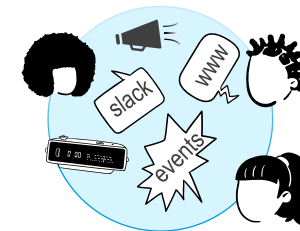
To enable a **fast and reliable development**, this community is setting up the build infrastructure, the **tooling**, process **enabling**, the CI/CD pipelines, and more...

## TESTING



To meet our **quality goals**, S-CORE needs to be tested – In this community, experienced test managers and testers are ensuring exactly this.

## MARKETING & COMMUNICATION



S-CORE can only be **successful**, **when more and more** members are joining! –

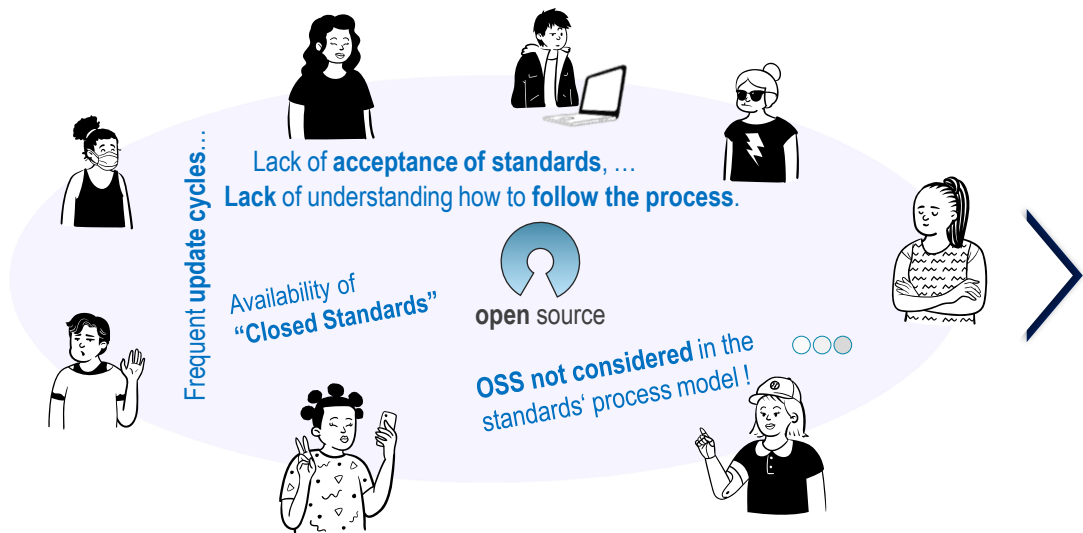
This community ensures, that the **great results** -provided by S-CORE teams- are **communicated** to the **automotive community**.

# CONTRIBUTOR ROLES | CONTRIBUTOR, COMMITTEE & SAFETY, SECURITY, AND QUALITY MANAGER.

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
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**FROM...** Open source world, with **less awareness** regarding **safety & security** standards...

**...To** Ensure that **relevant industry standards** are fulfilled!



**SAFETY** Ensure 'ISO 26262' is fulfilled, up to ASIL B.

**SECURITY** ISO 21434



**Contributor**

**Contributor** develops OSS based on existing **S-CORE process guidelines**.



**Committer**

Committers have **awareness about all relevant standards** and define **S-CORE process guidelines** accordingly. (continuous update if needed)



**Safety/ Security & Quality Manager**

Ensures result's compliance (to relevant standards), e.g., ISO26262, ISO 21434.



Continuous **external audit** ensures that S-CORE **guidelines are compliant** to the relevant standards.

**DeepDive**



**Trustable Software Framework**



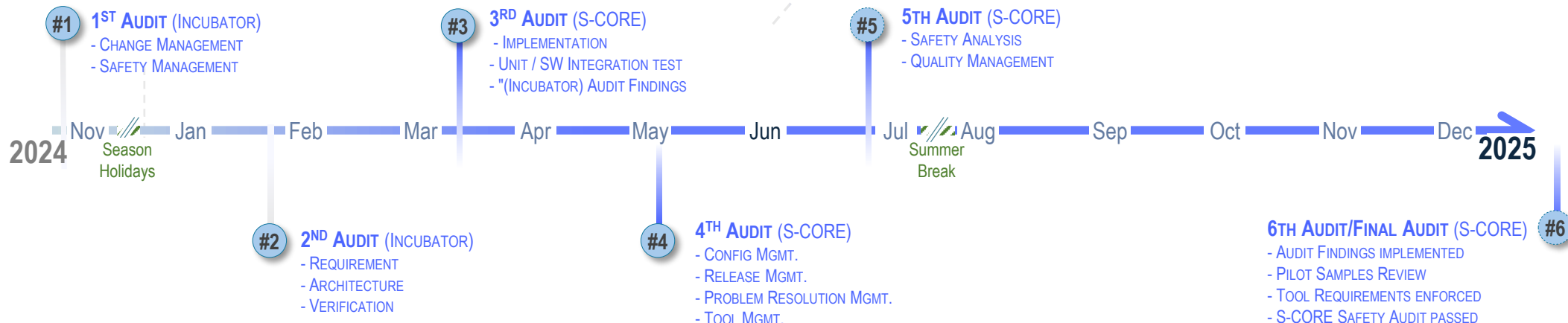
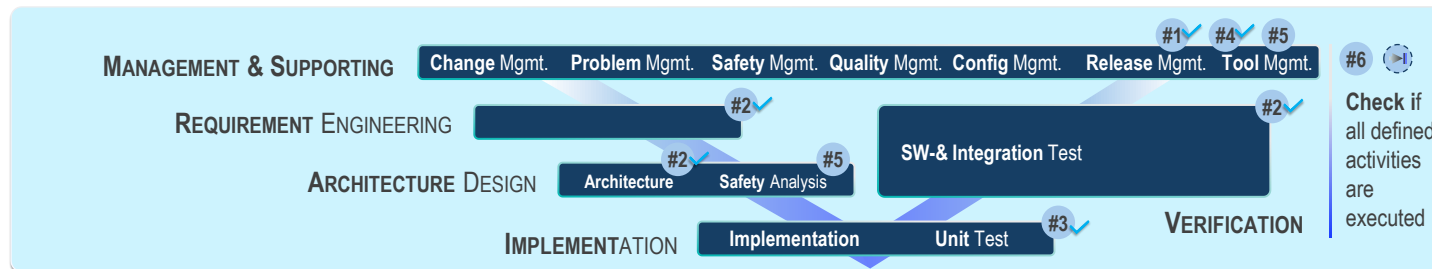
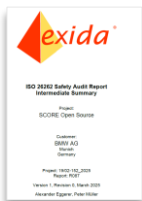
Entirely **open source toolchain**, lowering the entry barrier for newcomers.



# 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 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		
<b>BMW GROUP</b> BMW Group	Frank Weber Member of the Board of Management	
<b>BOSCH</b> Robert Bosch GmbH	Dr. Matthias Pflin CTO Mobility	
<b>Continental</b> Continental Automotive Technologies GmbH	Jean-François Tarabie Head of Architecture and Network Solutions Business Area	
<b>ETAS</b> ETAS AG	Dr. Thomas Irawan CEO	
<b>FORVIA</b> STELLIA GROUP & CO. USA	Guido Schulte EVP, Member of the Executive Board Electronics	
<b>Mercedes-Benz Group</b> Mercedes-Benz Group AG	Markus Schäfer iD Chief Technology Officer, Development & Procurement	
<b>QORIX</b> QORIX GmbH	Markus Schupfer CEO / Managing Director Dr. Nico Hartmann CTO / Managing Director	 
<b>Valeo</b> Valeo R&D Division	Joachim Mathes CTO Valeo Brain Division	
<b>VECTOR</b> Vector Information GmbH	Dr. Matthias Traub Managing Director	
<b>VOLKSWAGEN GROUP</b> Volkswagen Aktiengesellschaft	Dr. Michael Steiner Member of the Extended Executive Committee Volkswagen AG, Group R&D Axel Andorff Group Chief Technology Engineer	 
<b>ZE GROUP</b> ZF Friedrichshafen AG	Torsten Gollwieski 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 (w/ focus on S-CORE) development for automotive. Additionally, the OEMs voluntary agree to use open source SW in their products.

SIGNED & PUBLISHING PLANNED  
IN CES LAS VEGAS 01/2026

IN DISCUSSION  
ORAL COMMITMENT EXISTS

OEMs  
Other signees

+2 OEMs

+11 international members  
  
11 01

+5 additional members  
  
11 01

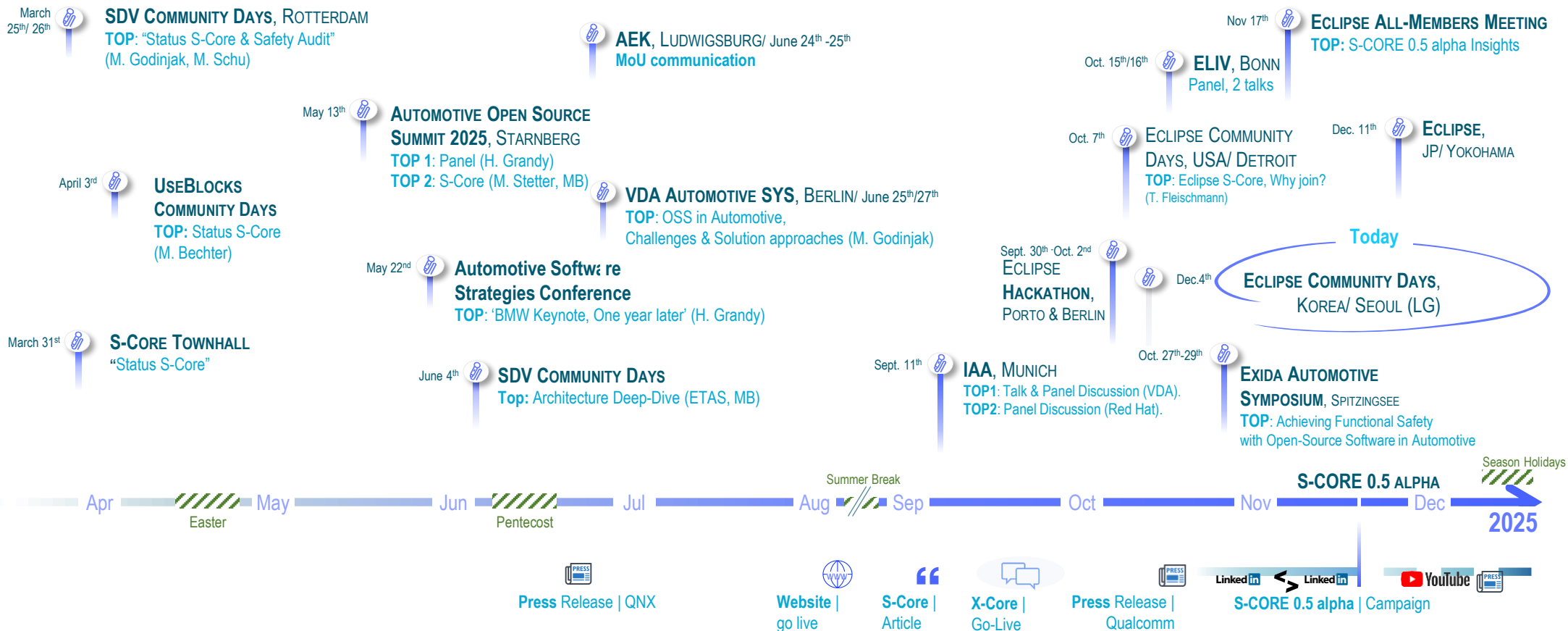
We're approaching potential members directly, ...yet we're open for proactive communication by interested companies as well.

# COMMUNICATION | S-CORE'S SUCCESS STORY IN EVENTS AND OTHER FORMATS.

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

Events

Other formats



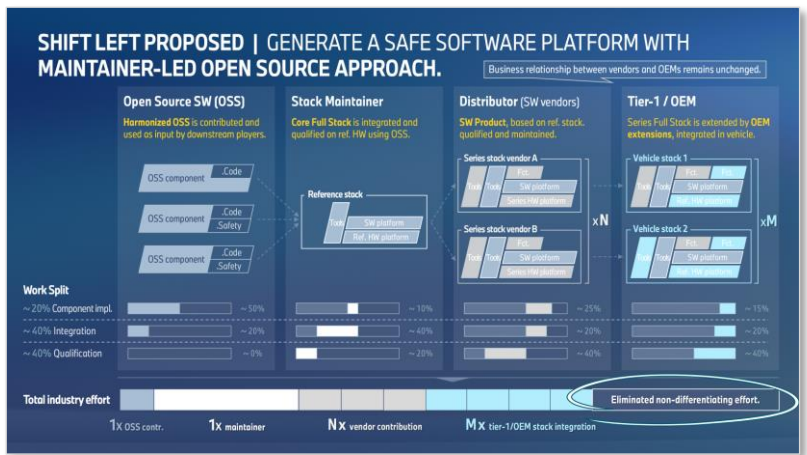
# BUSINESS MODEL | WITH OPEN SOURCE, THE BUSINESS MODEL WILL CHANGE FOR ALL PARTIES INVOLVED.

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

- INDUSTRY REQUIREMENTS
- STRICT/ RELIABLE TIMELINE
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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, ...).

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

## YET, THERE ARE STILL OPEN ISSUES WHICH NEED TO BE TACKLED CONTINUOUSLY...

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

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...



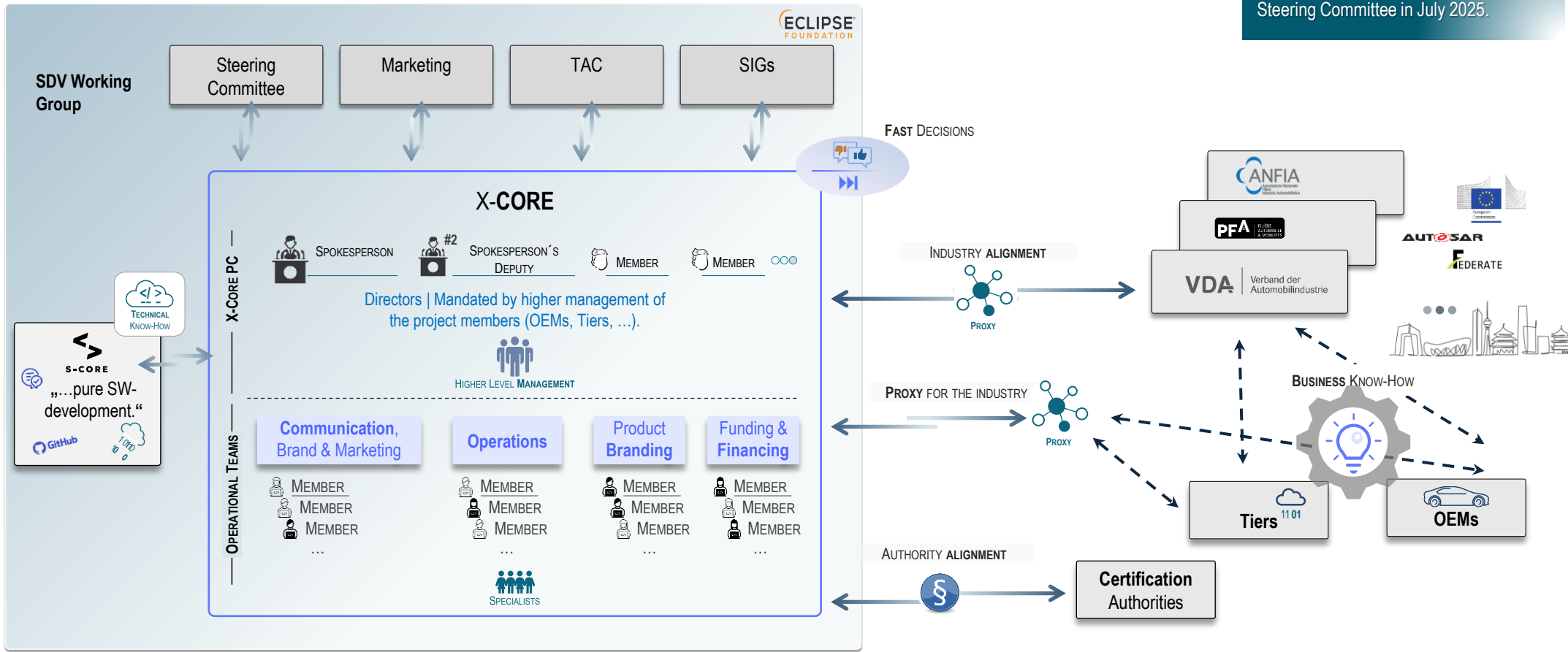
Additional **organizational structure**,  
to **speed-up** non-technical  
topics yet relevant for the projects!



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).

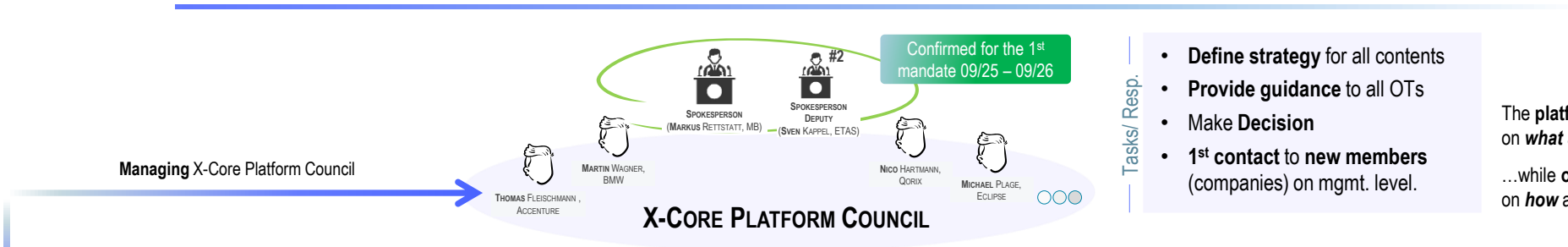
X-Core Platform Council was officially approved by Eclipse Steering Committee in July 2025.



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**
- CONTRIBUTE EXISTING CODE**
- GLOBAL SCALE**
- NEW BUSINESS MODEL**



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

Tasks/ Responsibilities

## 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, **Dana Vede**

- 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.

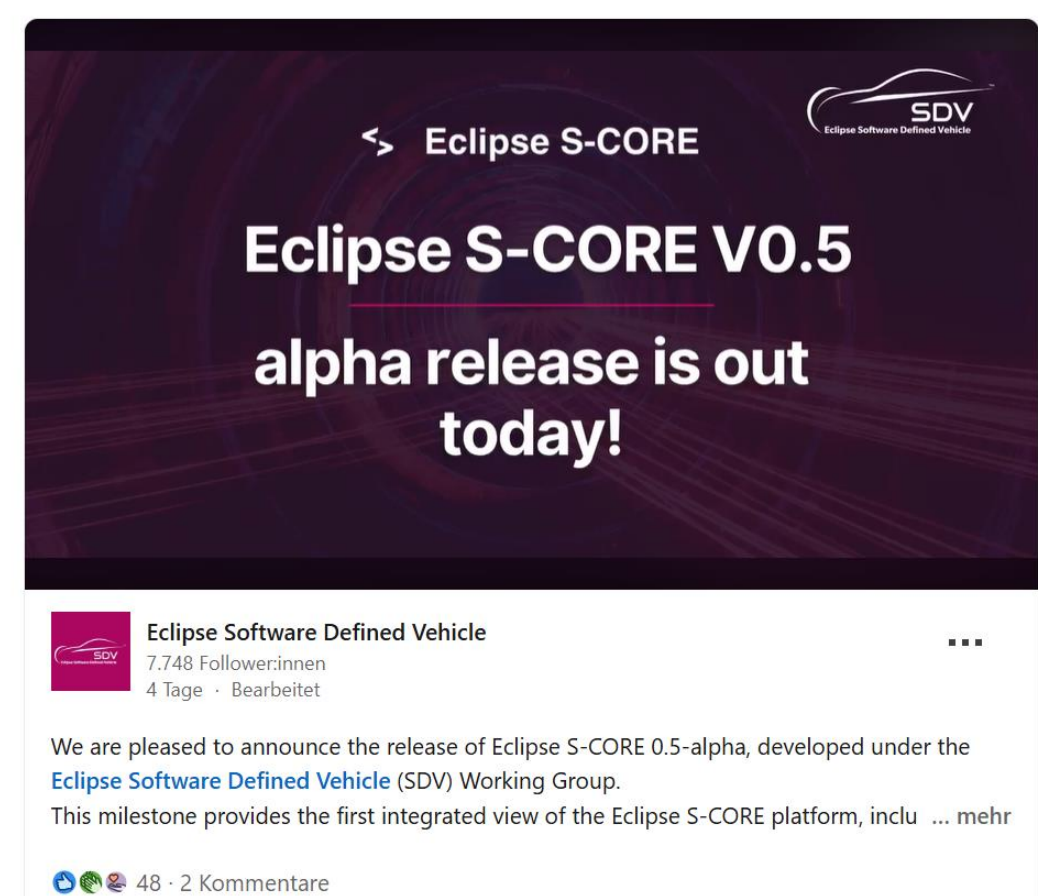
**Elaborate** (hands-on) results for responsibilities assigned to the OTs ... and **report to X-Core PC**.

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

# S-CORE RELEASE V0.5-ALPHA

## ECLIPSE S-CORE V0.5-ALPHA RELEASE IS AVAILABLE | PUBLISHED NOVEMBER 17<sup>TH</sup>!

- **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 LinkedIn post from the account "Eclipse Software Defined Vehicle". The post features a dark purple background with the Eclipse S-CORE logo and the text "Eclipse S-CORE V0.5 alpha release is out today!". Below the image, the post text reads: "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". The post has 48 likes and 2 comments.

**Eclipse S-CORE**

**Eclipse S-CORE V0.5**

**alpha release is out today!**

**Eclipse Software Defined Vehicle**  
7.748 Follower:innen  
4 Tage · Bearbeitet

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

48 · 2 Kommentare

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

### WITH A BROAD SET OF DELIVERED ELEMENTS

01

#### Initial Core Modules:

- Communication (zero-copy shared memory)
- Persistency
- Orchestration (including Kyron async runtime for Rust),
- Basic utility libraries

02

#### Robust CI/CD Workflows:

- Implemented CI/CD (including build and test)
- Comprehensive integration testing of all modules

03

#### Foundational Infrastructure

- Process\_description module for organizational rules (ASPICE, ISO 26262 aligned)
- Docs-as-code tooling
- ITF (Integration Testing Framework) with test\_scenarios for robust verification.

04

#### Multi-Platform Support:

- Provided experimental reference images for
  - QNX
  - Red Hat AutoSD Linux
  - Elektrobit Corbos Linux for Safety Applications

05

#### Reference Integrations:

- Sample demo application for multiple experimental target images, showcasing practical application deployment.

# ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE WITH A BROAD SET OF DOCUMENTATION



S-CORE introduction & background, and what's out of scope.

S-CORE technology, e.g. tools, repo structure, programming languages.

SW-Architecture & Module Structure Overview.

Description of the Integration Process.

Step-by-Step description on How to setup the "Communication" module.

Step-by-Step description, How to create an own module "scrample".

[Open the Handbook](#)

Overview of contained modules (link to code), the reference integration, bug fixes & improvements etc.

[Release notes](#)

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

## EACH MODULE COMES WITH A COMPREHENSIVE DOCUMENTATION

### Feature Request

**Communication (v0.5 alpha)**

**Communication**

tags: feature\_request

**Feature flag**

To activate this feature, use the following feature flag:

`feature:communication_v0.5`

**Abstract**

The Communication Module contains:

- an abstraction layer to enable different communication mechanisms (aka Frontends)
- different bindings which provide the communication functionality (e.g. IPC or Some/IP)

The abstraction layer is designed in a way to ensure full testability for an end-user, while enabling runtime selection of the underlying communication mechanism with the help of different bindings (e.g. IPC, Some/IP ...).

It provides the user with a high-level API to focus on the content of information - and not on low level specifics of the used binding.

### Architecture

**Architecture**

**Overview**

A brief overview of communication is described [here](#).

**Description**

A description of the communication module is located [here](#).

**Static Architecture**

As discussed in [\[1\]](#), the overall architecture of the communication framework must be layered. This is required, to separate the framework from the underlying communication mechanisms (also called bindings).

This ensures a stable public API, independent of the underlying bindings. At the same time, the communication framework can support many different communication protocols in a flexible manner.

**Feature Architecture Communication**

includes [\[1\]](#), [\[2\]](#), [\[3\]](#), [\[4\]](#), [\[5\]](#), [\[6\]](#), [\[7\]](#), [\[8\]](#), [\[9\]](#), [\[10\]](#), [\[11\]](#), [\[12\]](#), [\[13\]](#), [\[14\]](#), [\[15\]](#), [\[16\]](#), [\[17\]](#), [\[18\]](#), [\[19\]](#), [\[20\]](#), [\[21\]](#), [\[22\]](#), [\[23\]](#), [\[24\]](#), [\[25\]](#), [\[26\]](#), [\[27\]](#), [\[28\]](#), [\[29\]](#), [\[30\]](#), [\[31\]](#), [\[32\]](#), [\[33\]](#), [\[34\]](#), [\[35\]](#), [\[36\]](#), [\[37\]](#), [\[38\]](#), [\[39\]](#), [\[40\]](#), [\[41\]](#), [\[42\]](#), [\[43\]](#), [\[44\]](#), [\[45\]](#), [\[46\]](#), [\[47\]](#), [\[48\]](#), [\[49\]](#), [\[50\]](#), [\[51\]](#), [\[52\]](#), [\[53\]](#), [\[54\]](#), [\[55\]](#), [\[56\]](#), [\[57\]](#), [\[58\]](#), [\[59\]](#), [\[60\]](#), [\[61\]](#), [\[62\]](#), [\[63\]](#), [\[64\]](#), [\[65\]](#), [\[66\]](#), [\[67\]](#), [\[68\]](#), [\[69\]](#), [\[70\]](#), [\[71\]](#), [\[72\]](#), [\[73\]](#), [\[74\]](#), [\[75\]](#), [\[76\]](#), [\[77\]](#), 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### Requirements

**Requirements**

**Support for Time-based Architecture**

Inter-process Communication

Some/IP-Gateway

All-Complete Data Types

Configuration

Diagnostic and Fault Management

Frameworks

Infrastructure

Integration

Lifecycle

Orchestration (v0.5 alpha)

Resiliency (v0.5 alpha)

Security & Cryptography

Time

The communication framework shall provide API to support a time-based architecture.

**Support for Data-driven Architecture**

Inter-process Communication

Some/IP-Gateway

All-Complete Data Types

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The communication framework shall provide API to support a data-driven architecture.

**Support for Request-driven Architecture**

Inter-process Communication

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Orchestration (v0.5 alpha)

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Time

The communication framework shall provide API to support a request-driven architecture.

### Safety Planning

**Safety Planning**

**Orchestration Safety WPs**

Inter-process Communication

Some/IP-Gateway

All-Complete Data Types

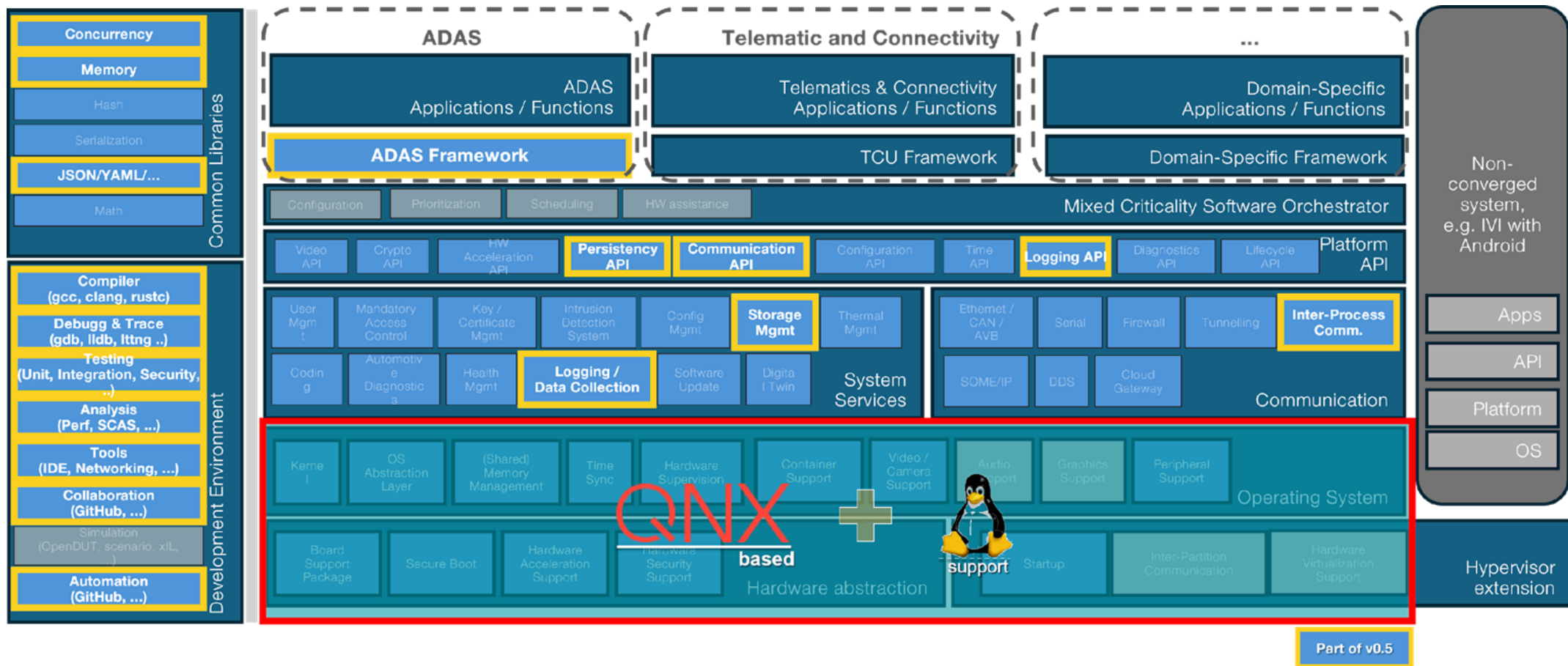
Configuration

Diagnostic and Fault Management

Frameworks

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

## SCOPE & HIGH LEVEL ARCHITECTURE



## ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE WITH A BROAD SET OF DELIVERED ELEMENTS

01

### Initial Core Modules:

- Communication (zero-copy shared memory)
- Persistency
- Orchestration (including Kyron async runtime for Rust),
- Basic utility libraries

02

### Robust CI/CD Workflows:

- Implemented CI/CD (including build and test)
- Comprehensive integration testing of all modules

03

### Foundational Infrastructure

- Process\_description module for organizational rules (ASPICE, ISO 26262 aligned)
- Docs-as-code tooling
- ITF (Integration Testing Framework) with test\_scenarios for robust verification.

04

### Multi-Platform Support:

- Provided experimental reference images for
  - QNX
  - Red Hat AutoSD Linux
  - Elektrobit Corbos Linux for Safety Applications

05

### Reference Integrations:

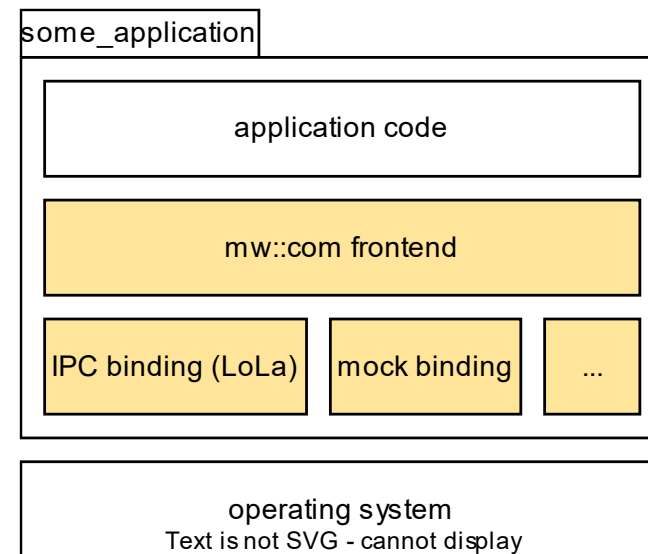
- Sample demo application for multiple experimental target images, showcasing practical application deployment.

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

## INITIAL CORE MODULES: COMMUNICATION

1.0	Initial S-CORE Modules	02	Initial S-CORE Modules
6.0	Functional Extensions	04	Runtime Support
9.0	Reference Integrations		

- **Core Functionality:** Provides a versatile communication framework.
- **Key Components:**
  - **Abstraction Layer (Frontend):** Enables various communication mechanisms.
  - **Multiple Bindings:** Offers specific communication functionalities (e.g., IPC, SOME/IP).
- **Benefits:**
  - **Enhanced Testability:** Designed for full end-user testability.
  - **Runtime Flexibility:** Allows dynamic selection of communication mechanisms via bindings.
  - **High-Level API:** Users focus on data content, not low-level binding specifics.

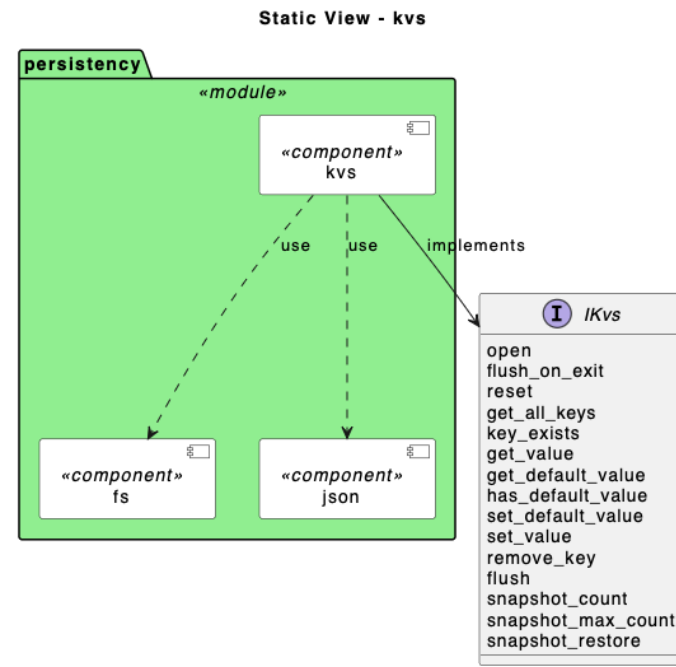


# ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

## INITIAL CORE MODULES: PERSISTENCY

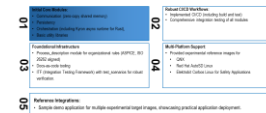
1.0	Initial S-CORE Release	0.2	Initial S-CORE Release
0.1	Initial S-CORE Release	0.1	Initial S-CORE Release
0.0	Initial S-CORE Release	0.0	Initial S-CORE Release
0.0	Initial S-CORE Release	0.0	Initial S-CORE Release

- **Core Feature:** Ensures long-term storage and retrieval of data within S-CORE.
- **Mechanism:** Key-Value Storage (KVS) for easy data persistence.
- **Purpose:**
  - Preserves application state and data integrity over time.
  - Enables seamless system resumption after shutdowns or failures.
  - Guarantees persistence of critical data (user content, configurations).
- **Key Benefits:**
  - **High-Level Access:** KVS accessible from any supported language via native interfaces.
  - **Automotive Relevance:** Ideal for storing application data (e.g., car settings for seamless user experience).
  - **S-CORE Optimized:** Addresses specific S-CORE needs, unlike current solutions.
  - **Advanced Features:** Designed for specific data types, rollback/replay, and simplified analysis tool integration.
  - **Unique Selling Point (USP):** Integration of a tracing framework for event interaction analysis.

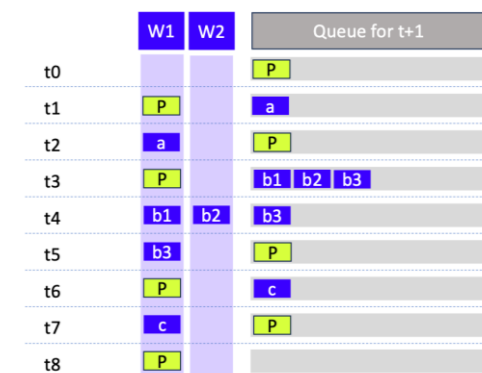
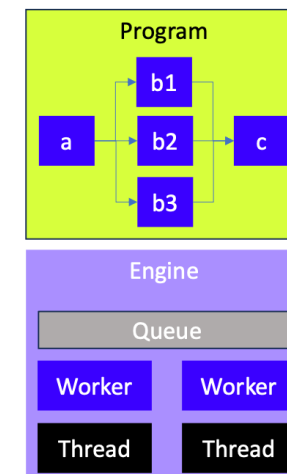


# ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE

## INITIAL CORE MODULES: ORCHESTRATION



- **Core Purpose:** Frameworks for deterministic, scalable, and maintainable execution of mixed-criticality software.
- **Executor: Cooperative Multitasking:** Configurable thread pool for user-space tasks.
  - **Reduced Overhead:** Improves control over scheduling without one-thread-per-task models.
  - **Key Features:** Supports safety-critical preemptive tasks, dedicated blocking threads, and structured observability.
- **Orchestrator:**
  - **Declarative Model:** Defines cause-effect chains, timing, and fault handling logic.
  - **Runtime-Static Graphs:** Maps programs to Executors, separating logic from deployment.
  - **Integration Workflows:** Distinguishes developer and system integrator responsibilities.
- **Combined Benefits:**
  - **Reduced Integration Effort:** Simplifies complex system assembly.
  - **Improved Predictability:** Enhances timing and cross-component timing chain validation.
  - **Enhanced Observability:** Correlates application logic with OS scheduling for debugging.
  - **Robustness:** Prevents runtime surprises from implicit assumptions in threading and timing.



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

## INITIAL CORE MODULES: BASE LIBRARIES

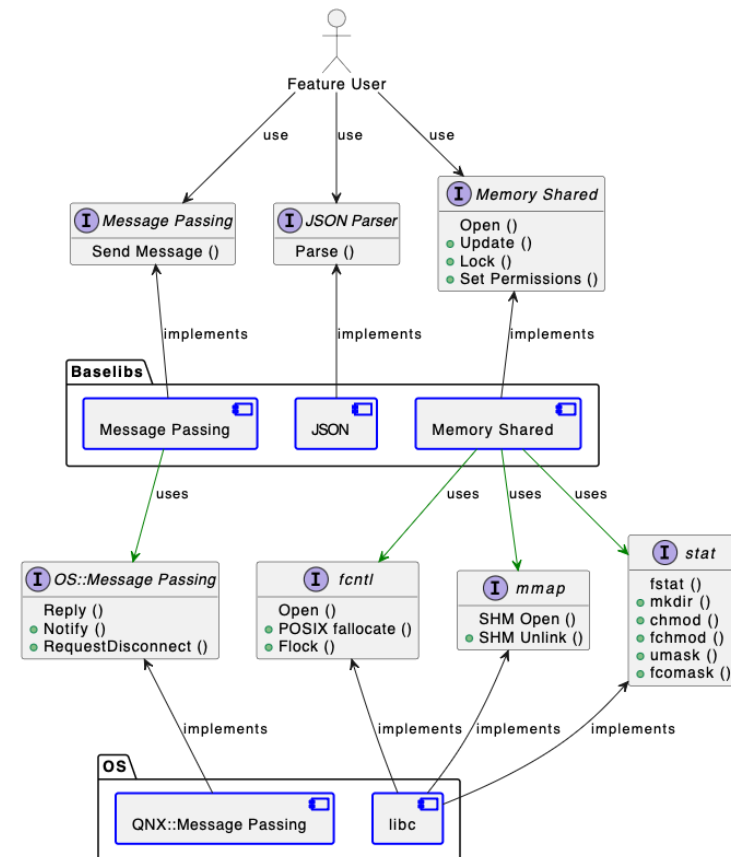
1.0	Initial Release	02	Initial S-CORE Modules
0.1	Initial Release	01	Initial S-CORE Modules
0.0	Initial Release	00	Initial S-CORE Modules

- **Core Purpose:** Provides essential C++ and Rust libraries for S-CORE components  
Offers common, reusable functionalities

- Ensures consistent implementations across S-CORE
- Reduces code duplication
- Promotes interoperability between components

- **Included Utilities:**

- Bit manipulation
- Concurrency management
- Containers
- JSON processing
- Filesystem operations
- Memory handling
- OS abstraction
- Error handling
- Serialization
- Logging
- And other common utilities



## ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE WITH A BROAD SET OF DELIVERED ELEMENTS

01

### Initial Core Modules:

- Communication (zero-copy shared memory)
- Persistency
- Orchestration (including Kyron async runtime for Rust),
- Basic utility libraries

02

### Robust CI/CD Workflows:

- Implemented CI/CD (including build and test)
- Comprehensive integration testing of all modules

03

### Foundational Infrastructure

- Process\_description module for organizational rules (ASPICE, ISO 26262 aligned)
- Docs-as-code tooling
- ITF (Integration Testing Framework) with test\_scenarios for robust verification.

04

### Multi-Platform Support:

- Provided experimental reference images for
  - QNX
  - Red Hat AutoSD Linux
  - Elektrobit Corbos Linux for Safety Applications

05

### Reference Integrations:

- Sample demo application for multiple experimental target images, showcasing practical application deployment.

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

## ROBUST CI/CD WORKFLOWS

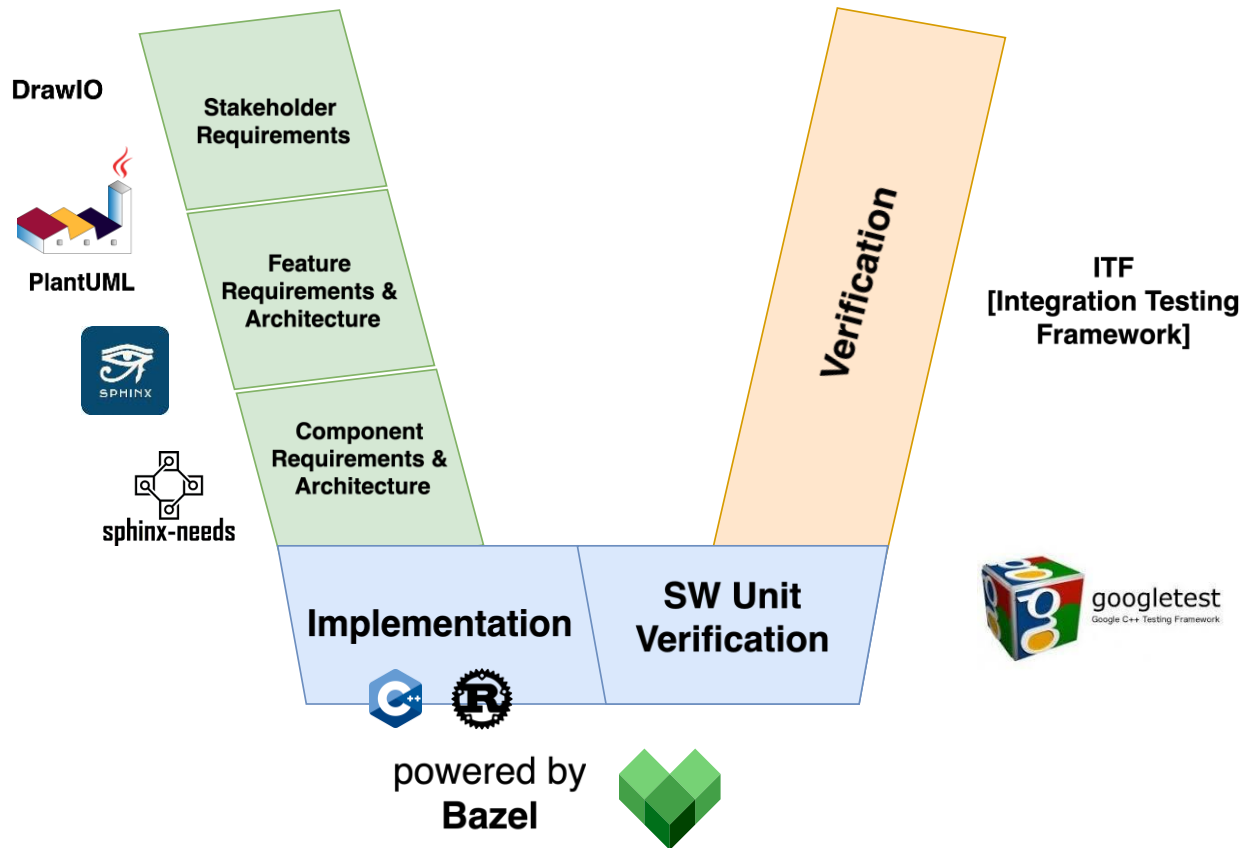
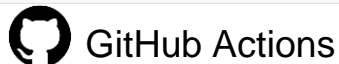
1.0	<ul style="list-style-type: none"> <li>Initial release</li> <li>Core features</li> <li>Documentation (including User manual for PaaS, SW and HW)</li> </ul>	02	<ul style="list-style-type: none"> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>
2.0	<ul style="list-style-type: none"> <li>Enhanced capabilities</li> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>	03	<ul style="list-style-type: none"> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>
3.0	<ul style="list-style-type: none"> <li>Enhanced capabilities</li> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>	04	<ul style="list-style-type: none"> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>
4.0	<ul style="list-style-type: none"> <li>Enhanced capabilities</li> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>	05	<ul style="list-style-type: none"> <li>Support for SW and HW</li> <li>Support for PaaS and HW</li> </ul>

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



```
release_verification.yml
on: push

- build_host: 9m 0s
- build_target: 8m 40s
- test_host: 9m 2s
- release_verification: 0s
```



## ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE WITH A BROAD SET OF DELIVERED ELEMENTS

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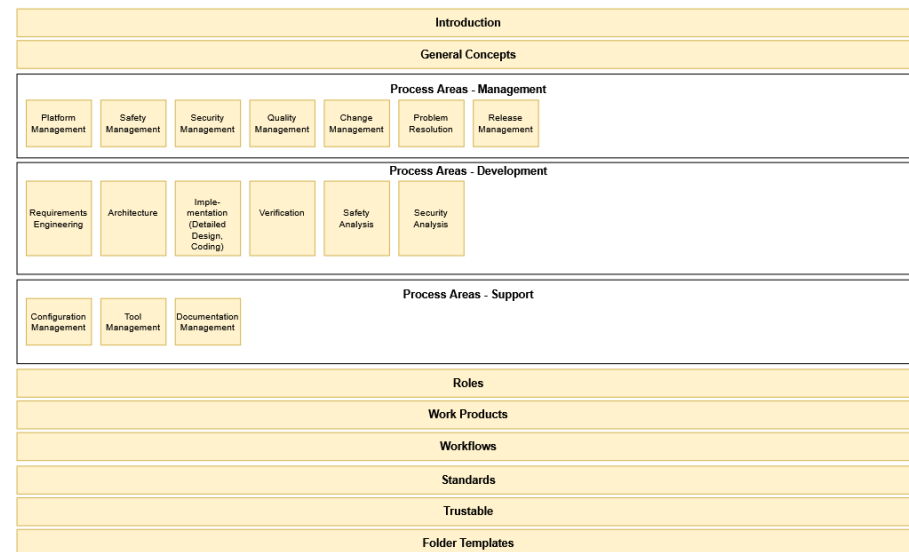
- Sample demo application for multiple experimental target images, showcasing practical application deployment.

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

## FOUNDATIONAL INFRASTRUCTURE

1.0	1.1	1.2	1.3	1.4
1.0	1.1	1.2	1.3	1.4
1.0	1.1	1.2	1.3	1.4
1.0	1.1	1.2	1.3	1.4
1.0	1.1	1.2	1.3	1.4

- Motivation:** The process model aims to establish organization rules for developing open source software in the automotive industry, which can be used in safety and security context.
- Objectives:** Conform to state-of-the-art standards
  - ASPICE
  - ISO 26262
  - ISO 21434
  - ISO PAS 8926
- Approach:**
  - We aim for a process model as common basis for process documentation
  - We work code centric (trace text as code) and iteratively.
  - We aim to develop the process in conformance to the targeted standards
  - We aim to establish traceability from the beginning
  - We aim to verify conformity and traceability by tool automation as much as possible
  - We aim for an iterative collaboration model initiated by change requests



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

### WITH A BROAD SET OF DELIVERED ELEMENTS

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

## MULTI-PLATFORM SUPPORT

<b>1.0</b> Initial Release - Initial release (2020-09-01) - Initial release (2020-09-01) - Initial release (2020-09-01)	<b>2.0</b> Initial Release - Initial release (2020-09-01) - Initial release (2020-09-01)
<b>3.0</b> Initial Release - Initial release (2020-09-01) - Initial release (2020-09-01)	<b>4.0</b> Initial Release - Initial release (2020-09-01) - Initial release (2020-09-01)
<b>5.0</b> Initial Release - Initial release (2020-09-01) - Initial release (2020-09-01)	<b>6.0</b> Initial Release - Initial release (2020-09-01) - Initial release (2020-09-01)



## ECLIPSE S-CORE RELEASE V0.5-ALPHA | FIRST RELEASE WITH A BROAD SET OF DELIVERED ELEMENTS

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

### REFERENCE INTEGRATIONS REPOSITORY

1.0	Initial Release	Initial S-CORE Release
2.0	Initial Release	Initial S-CORE Release
3.0	Initial Release	Initial S-CORE Release
4.0	Initial Release	Initial S-CORE Release
5.0	Initial Release	Initial S-CORE Release

- All Eclipse S-CORE modules are integrated together to ensure, that they match to each other. It integrates all software modules into reference images (e.g., a qnx x86 image) to verify that:
  - all module dependencies are consistent
  - modules work correctly together
  - feature requirements are fulfilled
  - Feature integration tests are executed on these reference images to validate the complete platform.

The screenshot shows the GitHub repository 'reference\_integration' (Public) with 3 branches and 1 tag. The commit history table is as follows:

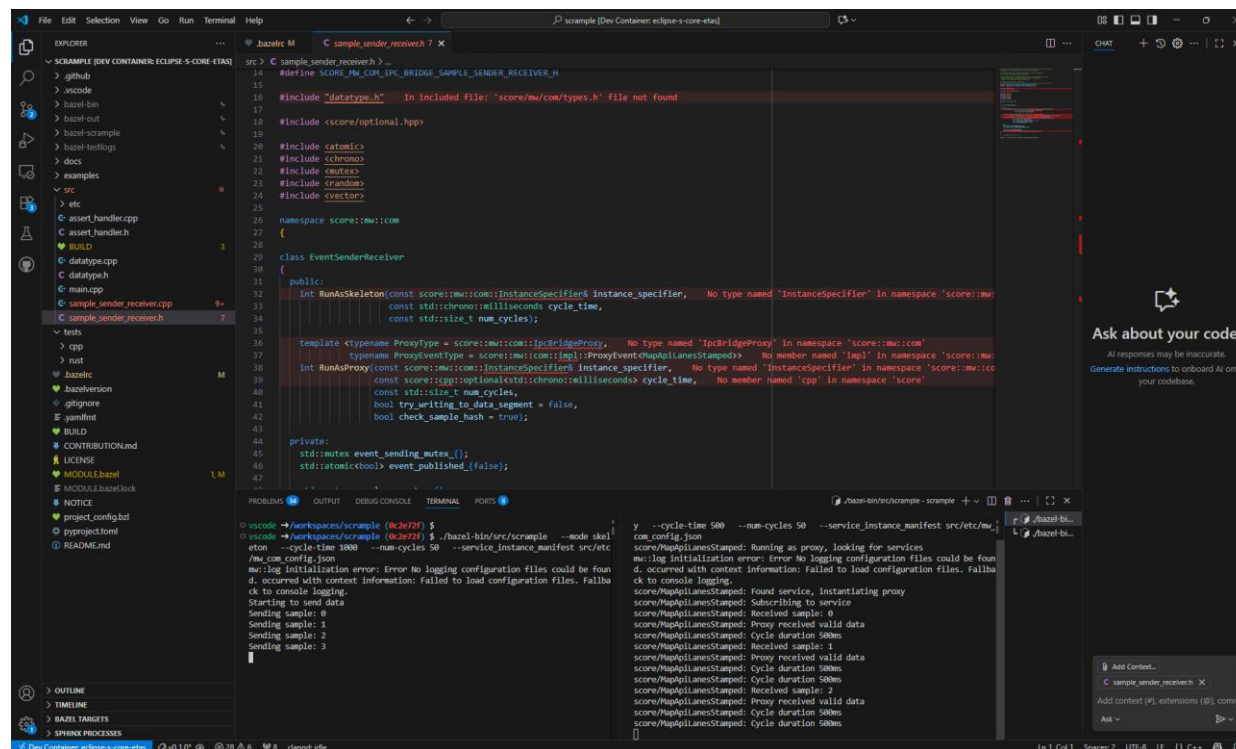
Commit	Message	Time
kgraeper	update modules to latest mains (#31) ✓	9ca0c07 · 22 minutes ago · 63 Commits
	.devcontainer	Integrate EB corbos Linux for Safety Applications (#27) · 2 weeks ago
	.github	update modules to latest mains (#31) · 22 minutes ago
	.vscode	Enable rust support for IDE · 3 weeks ago
	autosd	Autosd fix ci (#40) · 2 weeks ago
	ci	Integrate orchestration and persistency rust · 3 weeks ago
	docs	upgrade score platform to 0.4.2 (#39) · 2 weeks ago
	ebclfsa	Fix scramble execution in EBclfsa (#37) · 2 weeks ago
	feature_integration_tests	add test attributes (#36) · 2 weeks ago
	feature_showcase	Enable rust support for IDE · 3 weeks ago
	qnx_qemu	Add persistency to qnx qemu img (#26) · 2 weeks ago
	tools	update modules to latest mains (#31) · 22 minutes ago

# ECLIPSE S-CORE RELEASE V0.5-ALPHA | LIVE DEMO – SCRAMBLE APP

## DEMONSTRATES A PRODUCER-CONSUMER PATTERN USING S-CORE'S MIDDLEWARE COMMUNICATION LAYER

### The Demo illustrates:

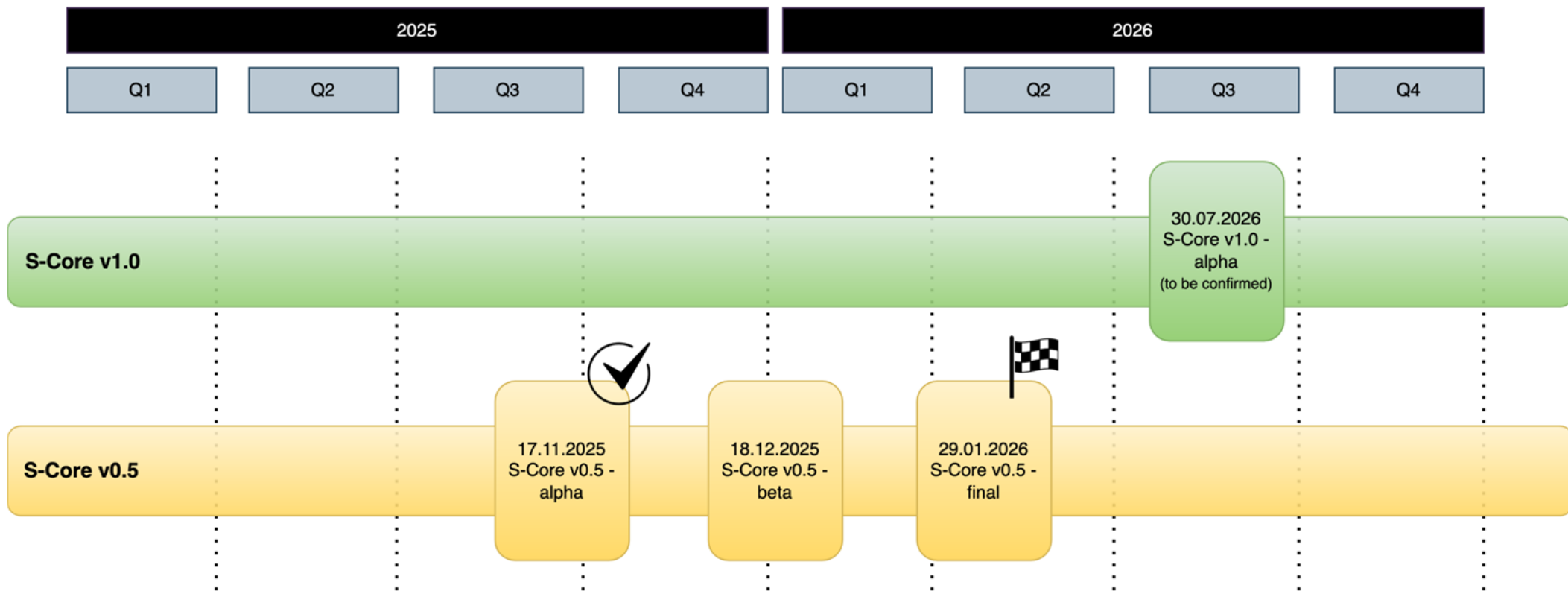
- Event-based communication using the S-CORE middleware (`score::mw::com`)
- Shared memory IPC for high-performance data transfer between processes
- Type-safe serialization of complex automotive data structures
- Skeleton-Proxy pattern following established concepts
- The sample exchanges `MapApiLanesStamped` messages containing lane information data structures, simulating real-world automotive HD map data exchange scenarios.



The screenshot shows the Eclipse IDE interface for the Scramble application. The main editor displays the source code for `sample_sender_receiver.h`, which includes headers like `score::mw::com` and `score::optional.hpp`. The code defines a `Class EventSenderReceiver` and a `template <typename ProxyType = score::mw::com::IpcBridgeProxy>` `int RunAsProxy` function. The terminal at the bottom shows the execution of the application with various command-line options like `--cycle-time 500` and `--num-cycles 50`. The output displays the exchange of `MapApiLanesStamped` messages between the sender and receiver, including details like cycle duration and sample numbers.

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

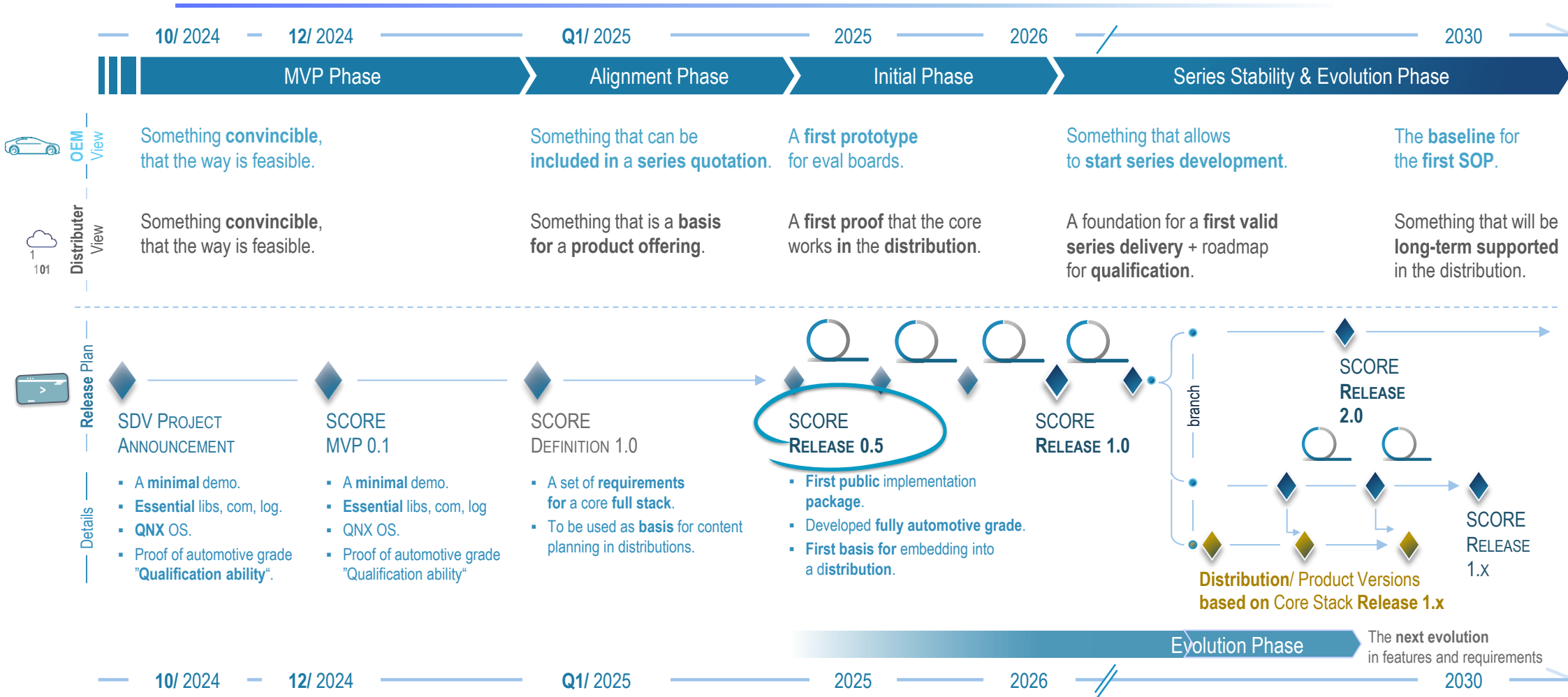
## S-CORE V.05 RELEASE PLAN



[Detailed planning overview](#)

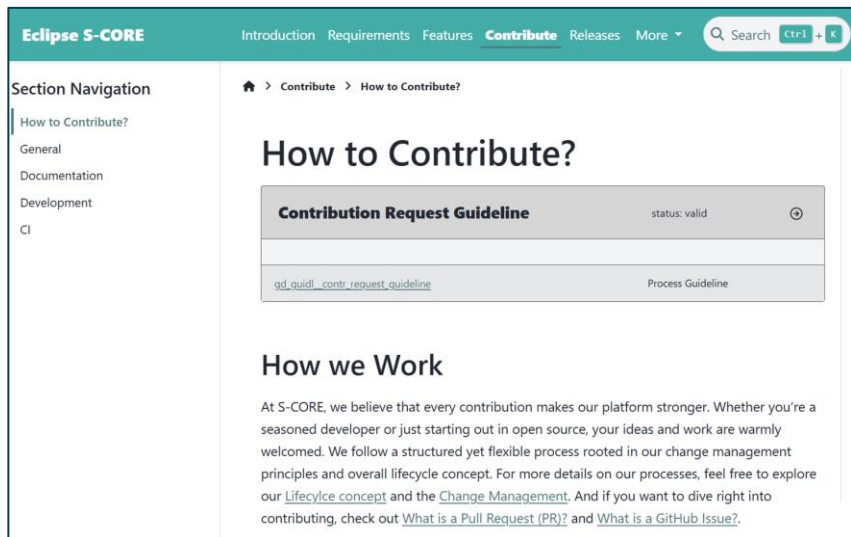
# ROADMAP TO ECLIPSE S-CORE V1.0

# ECLIPSE S-CORE MILESTONE PLAN 2026 AND FOLLOWING



# S-CORE SW-PLATFORM |

## Let's collaborate!

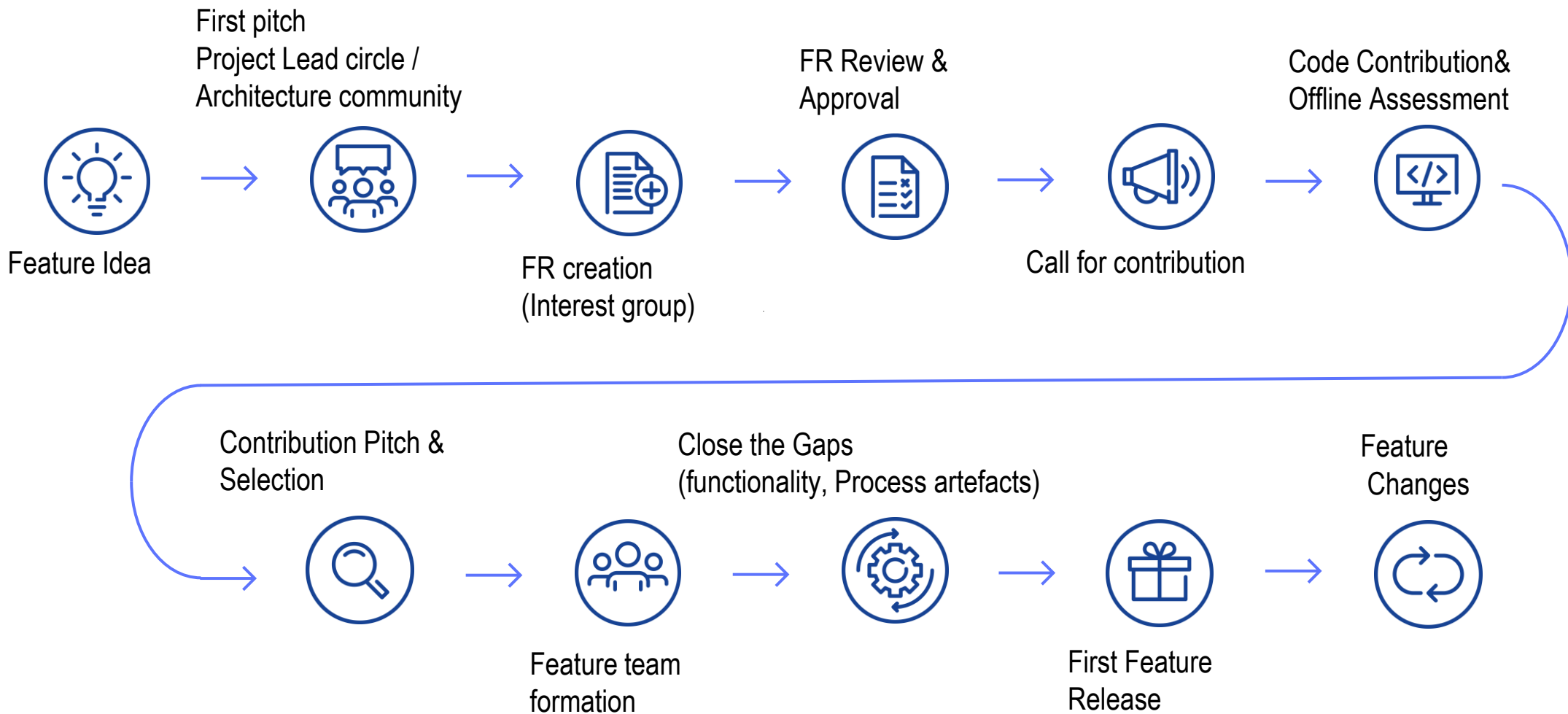


The screenshot shows the Eclipse S-CORE website's 'How to Contribute' page. The page has a teal header with the 'Eclipse S-CORE' logo and navigation links for 'Introduction', 'Requirements', 'Features', 'Contribute', 'Releases', and 'More'. A search bar is located in the top right. On the left, there 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 'Process Guideline' link. Below this, there is a section titled 'How we Work' with a paragraph explaining the platform's contribution philosophy and linking 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.

## ECLIPSE S-CORE: HOW TO PARTICIPATE? |

### A STEP-BY-STEP JOURNEY FROM A FEATURE IDEA TO ITS RELEASE



# S-CORE SW-PLATFORM | THE MIDDLEWARE IS IN FOCUS OF THE RELEASE 0.5.

## RELEASE 1.0 WILL HAVE A BIGGER SCOPE & COVER MOST PARTS OF THE SW-PLATFORM

**Common**

- Concurrency
- Memory
- Hash
- Serialization
- JSON/YAML/...
- Math

**Development**

- Compiler (gcc, clang, rustc)
- Debug & Trace (gdb, lldb, lttng...)
- Testing (Unit, Integration, Security...)
- Analysis (Perf, SCAS...)
- Tools (IDE, Networking...)
- Collaboration (GitHub...)
- Simulation (OpenDUT, scenario, xIL...)
- Automation (GitHub...)

S-CORE 0.5		
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

S-CORE 1.0		
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

S-CORE v0.5 module

S-CORE v1.0 module

for not yet fixed

for fixed.

APP FRAMEWORK

MIDDLEWARE

PROGRAMMIN

CONTAINER

OPERATING SYSTEM

supporte

Joint

# Eclipse S-CORE Project | Get in Contact!

## 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 contributi uServices and share where we got to.

image.png

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

**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 th transport protocols like MQTT, Zenoh, SOME/IP etc and supports a

Nachricht an #score-project-channel-public

## Meetings ([link](#))

November 2025		
MO	DI	MI
27	28	29
<ul style="list-style-type: none"> <li>09:00 [sdv-wg-S-CORE] Technical Le</li> <li>10:00 [sdv-wg-S-CORE] Alignment Te</li> </ul> 6 weitere	<ul style="list-style-type: none"> <li>09:00 [sdv-wg] Eclipse S-CORE Proc</li> <li>11:00 [sdv-wg] Eclipse S-Core Loggir</li> </ul> 4 weitere	<ul style="list-style-type: none"> <li>10:00 [sdv-wg] Eclipse S-CORE Life</li> <li>11:00 OpenBSW Monthly Call</li> </ul> 5 weitere
3	4	5
<ul style="list-style-type: none"> <li>09:00 [sdv-wg-S-CORE] Technical Le</li> <li>10:00 [sdv-wg-S-CORE] Alignment Te</li> </ul> 6 weitere	<ul style="list-style-type: none"> <li>[sdv-wg-S-CORE] Eclipse S-CORE Architecture Community F2F Workshop</li> <li>09:00 [sdv-wg] Eclipse S-CORE Proc</li> </ul> 6 weitere	<ul style="list-style-type: none"> <li>10:00 [sdv-wg] Eclipse S-CORE Life</li> </ul> 4 weitere
10	11	12
<ul style="list-style-type: none"> <li>09:00 [sdv-wg-S-CORE] Technical Le</li> <li>10:00 [sdv-wg-S-CORE] Alignment Te</li> </ul> 6 weitere	<ul style="list-style-type: none"> <li>09:00 [sdv-wg] Eclipse S-CORE Proc</li> <li>11:00 [sdv-wg] Eclipse S-Core Loggir</li> </ul> 4 weitere	<ul style="list-style-type: none"> <li>10:00 [sdv-wg] Eclipse S-CORE Life</li> <li>13:00 [sdv-wg] Eclipse API Framew</li> </ul> 5 weitere
17	18	19
<ul style="list-style-type: none"> <li>09:00 [sdv-wg-S-CORE] Technical Le</li> <li>10:00 [sdv-wg-S-CORE] Alignment Te</li> </ul> 6 weitere	<ul style="list-style-type: none"> <li>09:00 [sdv-wg] Eclipse S-CORE Proc</li> <li>11:00 [sdv-wg] Eclipse S-Core Loggir</li> </ul> 4 weitere	<ul style="list-style-type: none"> <li>10:00 [sdv-wg-S-CORE] Eclipse S-C</li> <li>13:00 [sdv-wg-S-CORE] Eclipse S-C</li> </ul> 3 weitere
24	25	26
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1. Dez.	2	3
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THANK YOU