OHB EGS-CC Integrator Support Final Presentation

v01

CONTEST: Status of the OHB EGS-CC Integrator Support activities
08/12/2021

ESA 4000131922/20/NL/AS/vr

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Agenda

- Scope of the project & Team and contact persons & deliverables
- Schedule
- Overview Task 1
- Overview Task 2
- Overview Task 3
- General comments
- Conclusion

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Purpose and Scope (I/II)

- **European Ground Systems – Common Core (EGS-CC)**

  EGS-CC is a European Initiative (as a collaboration between ESA, European National Agencies and European Industry) with it's main goal to develop a common infrastructure to support space systems Monitoring and Control (M&C) in pre- and post launch phases for all mission types.

- **EGS-CC integration at OHB**

  EGS-CC is not a complete integrated and ready to use system, even if it covers the core functionalities expected for the M&C domain. In order to be able to use EGS-CC OHB needs to integrate EGS-CC into its own ground based test system setup and adapt its interfaces to elements available in the OHB infrastructure. Additional or modified EGS-CC components may be required due to the specific OHB environment.

The EGS-CC integrator support OHB activity aimed at OHB support for EGS-CC Engineering and Validation and to assess interoperability of OHB EGSE building blocks with EGS-CC.

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Purpose and Scope (II/II)

- **The OHB EGS-CC Integrator Support activity is comprised of three main tasks:**
  - Task 1: EGS-CC Engineering Support
    - Providing engineering contributions for the EGS-CC product definition, including Conceptual Data Model (CDM), engineering support and technical analysis of the EGS-CC functionality including evolutions.
  - Task 2: EGS-CC Validation Support
    - Support of two aspects of the EGS-CC validation:
      - review of EGS-CC system test artefacts prepared by the EGS-CC validation team and analyze results
      - Complement these test activities by dedicated tests within OHB context
  - Task 3: EGS-CC deployment assessment
    - Verify interoperability of OHB building blocks with EGS-CC deployment at OHB
    - Provide an “Integration and Deployment Report” describing the integration approach and supported interfaces, problems encountered and lessons learned etc.

  All three tasks include problem/issue reporting on the confluence and JIRA platforms.

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Team and contact persons

- ESA
  - Technical Manager: Peter van der Plas
  - Finance: Kieran Killard
- OHB
  - Project Manager: Pamela Froehner
  - Deputy Project Manager: Boris Penné
  - Responsible for Task 1/2/3: Michael Rohn
  - Finance: Simon Wittmann

Doc ID	Name / Title	Reference No.	issue	Description
D1	EGS-CC engineering support output (task 1)	N/A	N/A	Electronic provision in EGS-CC CSDE in JIRA/Confluence
D2	EGS-CC validation support output (task 2)	N/A	N/A	Electronic provision in EGS-CC CSDE in JIRA/Confluence
D3	EGS-CC deployment assessment output (task 3)	N/A	N/A	Electronic provision in EGS-CC CSDE in JIRA/Confluence
D4	EGS-CC implementation and deployment Report (task 3)	CONTEST-OHB-RP-SYS-0002	03	Technical description of the activities
FR	EGS-Common Core integrator Support OHB - Final Report	CONTEST-OHB-RP-SYS-0001	03	Summary of the activities
FP	EGS-Common Core integrator Support OHB - Final presentation	XXX		This presentation
CCD	Contract closure document	XXX		
-	EGS-CC Generic Description	OHBG-TN-0001	01	Technical description of EGS-CC approach at AOHB

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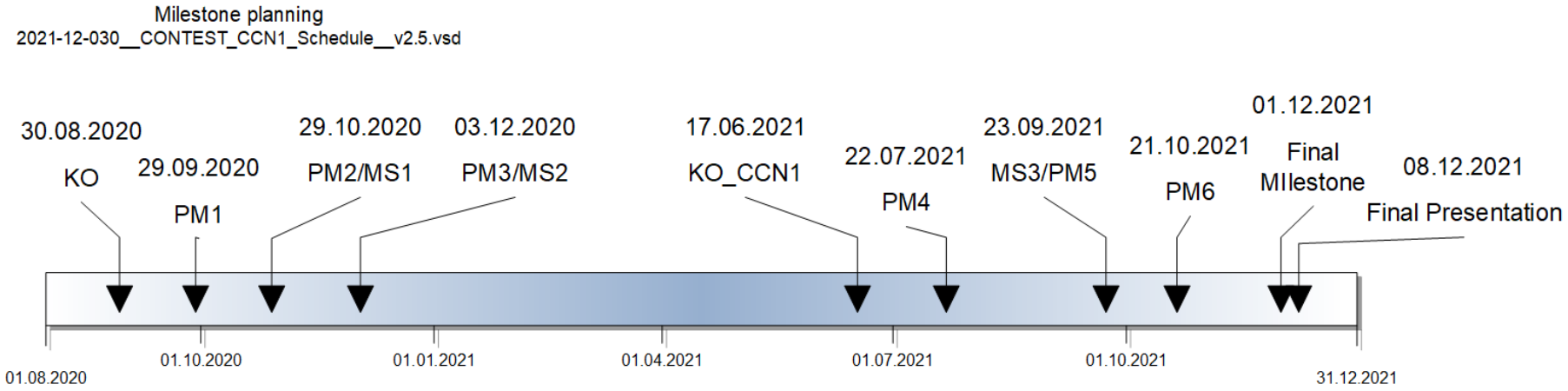
Schedule

Duration from initial Kick-Off to the final milestone is 15 month with 6 month intermission.



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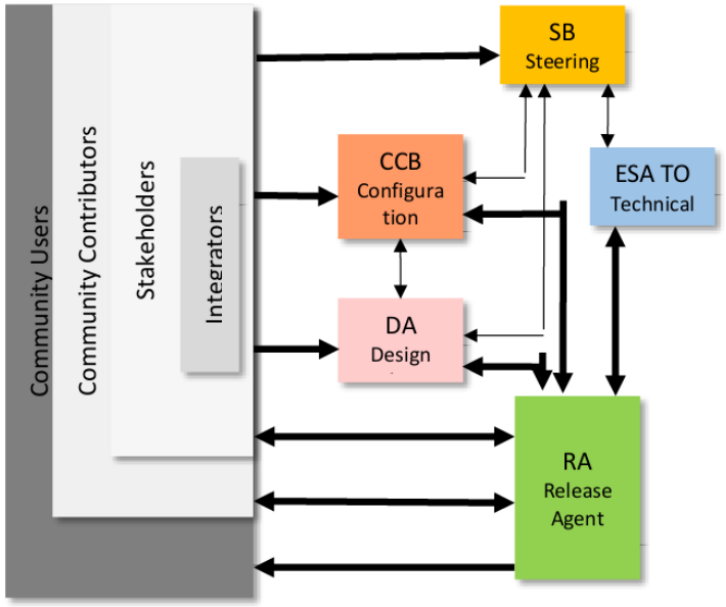
Task 1 covers technical engineering input for the EGS-CC System Engineering Team (SET) and EGS-CC Conceptual Data Model (CDM) Working Groups. OHB participates in following Working groups meeting:

- SET Meetings
- FAR Review
- Delta FAR Review
- CDM Workshop
- CDM Consolidation Review
- Consolidation Final Acceptance review
- SIT Meetings
- Performance Meetings
- Steering Board Meetings
- CCB Meetings
- Composition and Deployment Meetings (TigerTeam)



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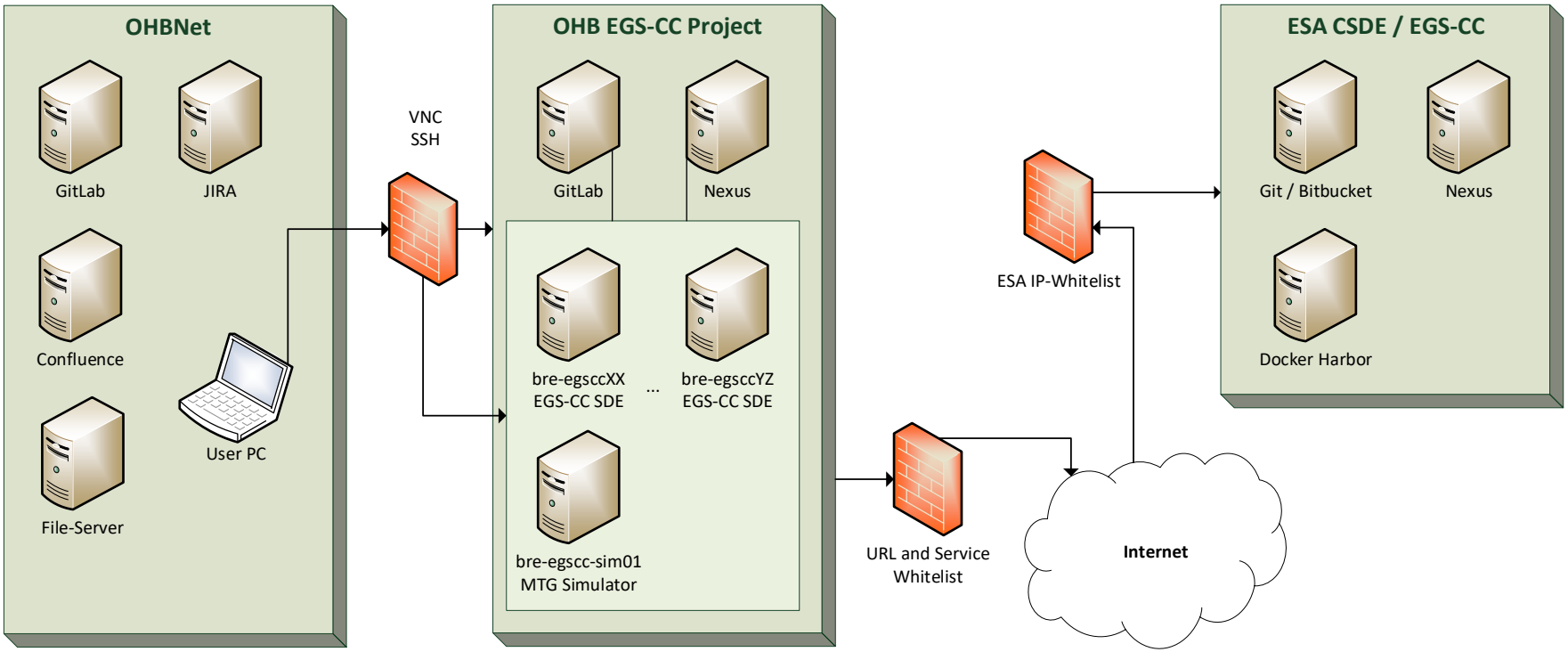
Task 2 covers the validation of the actual EGS-CC with the background of the operational scenarios. (I/III)

- To support these activities OHB setup the EGS-CC SDE in the OHB infrastructure



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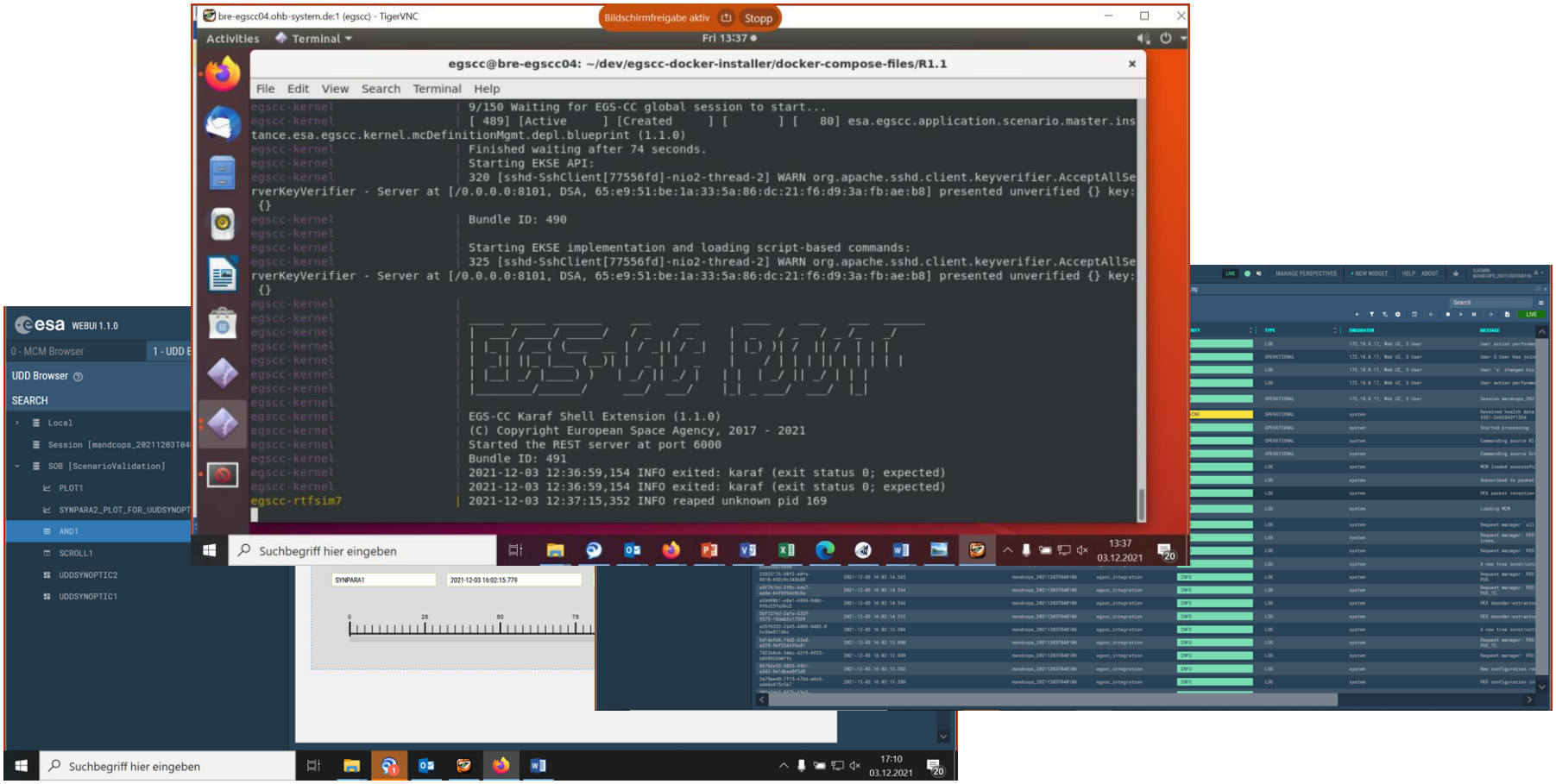
Screenshots of EGS-CC SDE running in OHB infrastructure



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Task 2 covers the validation of the actual EGS-CC with the background of the operational scenarios. (II/III)

- Execute a scenario to prove that the installed EGS-CC system incl. SDE is working in the OHB infrastructure.
- For a validation check of the OHB EGS-CC SDE based on the Weekly Build 2021W23, OHB generates an internal test script to prove that the setup is correct.
- Tests with Manual URs validation scenarios in the WebUI were made with EGS-CC R1.1 release.

WebUI user display export example of the user scenario 04 SC_UDD which tests basic functionality of User Defined Displays.

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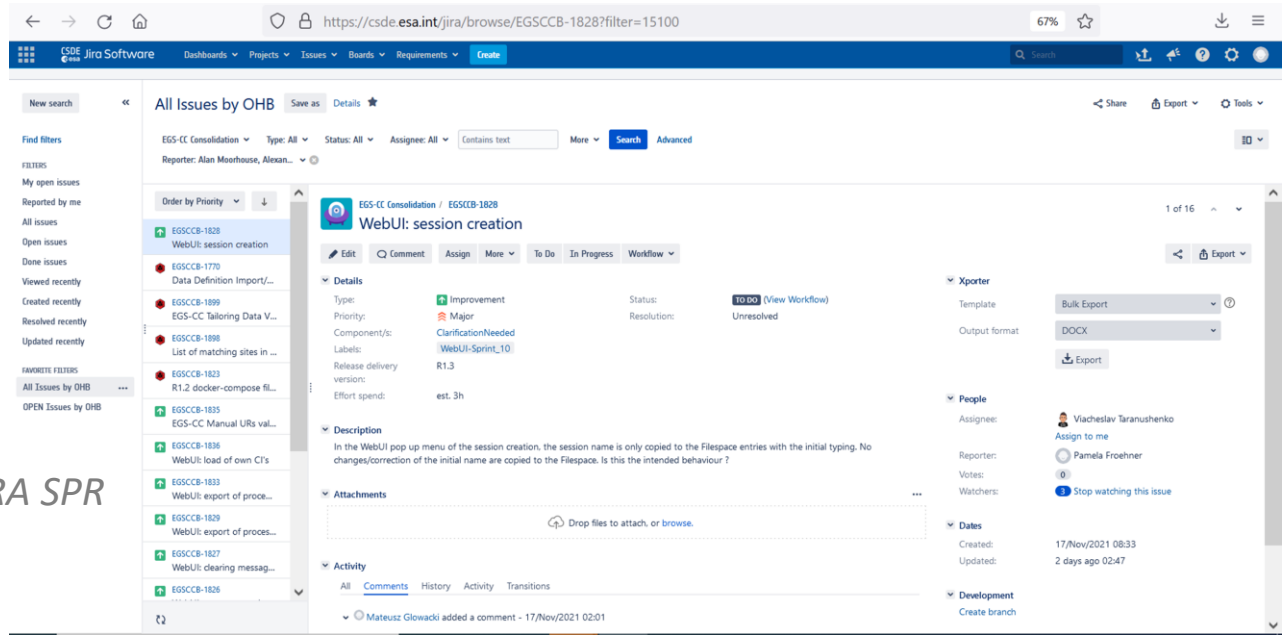
Task 2 covers the validation of the actual EGS-CC with the background of the operational scenarios. (III/III)

- With the participation of official EGS-CC reviews, OHB reviews documents/information and results, creates RIDs or comments and support the overall EGS-CC activities.
- Comments, problems and questions were raised in the collaboration environment CSDE (Jira, Confluence).



Example of a JIRA SPR in CSDE

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Task 3 covers the objective that OHB is able to support missions based on EGS-CC. (I/V)

- Participation in the System Engineering Team (SET) Meetings. In these meetings, the technology exchange is ensured that EGS-CC can be integrated in the future OHB tool chain.
- With ending of the consolidation phase, the SIT meetings were re-started and additional performance meetings were setup. Here the actual SPR are discussed and possible sent to CCB or SET meetings for further decisions.
- The performance meetings which were started to ensure the correct performance of the overall EGS-CC system according to the user needs. Here special scenarios are setup which will be integrated in the automatic scenario validation of EGS-CC.

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Task 3 covers the objective that OHB is able to support missions based on EGS-CC. (II/V)

Preparation on OHB side to get the knowledge to support OHB Project teams with the knowledge how to setup an EGS-CC runtime environment. This task extend the setup of the SDE to be able to execute scripts and use project information in EGS-CC format. Here the first step is to use an EGS-CC runtime environment with OHB SRDB Data in Tailoring Data format to command an OHB Simulator.

- R1.1 docker container installation used for test with OHB Tailoring Data
  - OHB SRDB export function implemented to generate OHB Tailoring Data File with API
  - Export loadable in EGS-CC Tools MME and Tailoring Data Viewer
  - Trying to load in WebUI, partially successful

  →SPR 1836 will be updated to ask for help

The SOB OHB_bin with version 1 […] has been successfully committed.
SOB OHB_bin […] validation started
User action performed by s: Trying to Commit SOB SystemOperationsBaselineId [UUID, sobName=OHB_bin]
SOB OHB_bin with version 1 […] validation performed with 28 errors. Check the SOB file /home/egscc/src/tsi/esa.egscc.master/target/temp/MCD_SOB/…. for additional information.
SOB OHB_bin [….] validation started
User action performed by s: Trying to Validate SOB SystemOperationsBaselineId [UUID=…, sobName=OHB_bin]
The CIs from /home/egscc/OHB_CIs/OHB_bin have been successfully imported into the SOB OHB_bin with version 1 [….]
Import of the CIs from /home/egscc/OHB_CIs/OHB_bin for the SOB OHB_bin […] have been started
User action performed by s: Trying to Import CIs from path /home/egscc/OHB_CIs/OHB_bin
SOB OHB_bin [……] created
User action performed by s: Trying to Create SOB OHB_bin

Parts of the WebUI log file for test with OHB Tailoring Data

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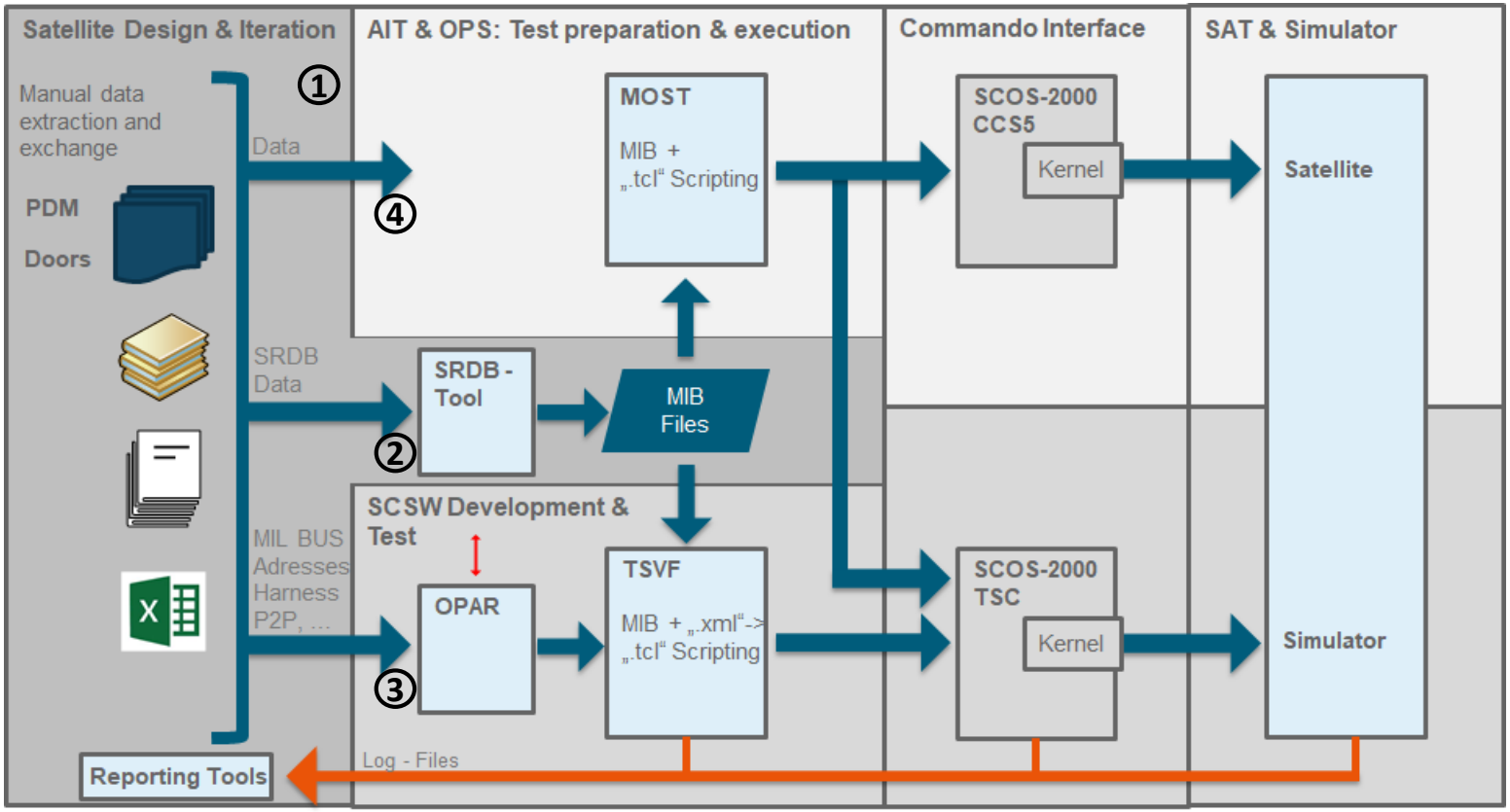
Task 3 covers the objective that OHB is able to support missions based on EGS-CC. (III/V)

- Another step of this preparation is to identify the impact on the current OHB tool chain.



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Task 3 covers the objective that OHB is able to support missions based on EGS-CC. (IV/V)

The Current OHB Tool chain consists of four main groups

1. Satellite design & iteration: definition of engineering data in form of documents, Excel, …
2. Satellite Reference Data Base: OHB Tool generates current used SCOS2000 MIB files
3. Software Development and Test Team: OHB tools (OPAR, TSVF) are used to create from the input-files relevant source code header files, and to perform software test.
4. AIT, Operations and Engineering teams: OHB tool (MOST) for script generation to verify expected satellite behavior.

With change of the configuration files and the scripting language necessary for using EGS-CC, all OHB tools currently using SCOS2000 artefacts needs to be updated.

→High impact on the existing tool chain and infrastructure budget

- update to EGS-CC
- both setups will need to be maintained in parallel
- stepwise approach necessary (impact on schedule)

→Next slide show all OHB tool in green which needs to be updated

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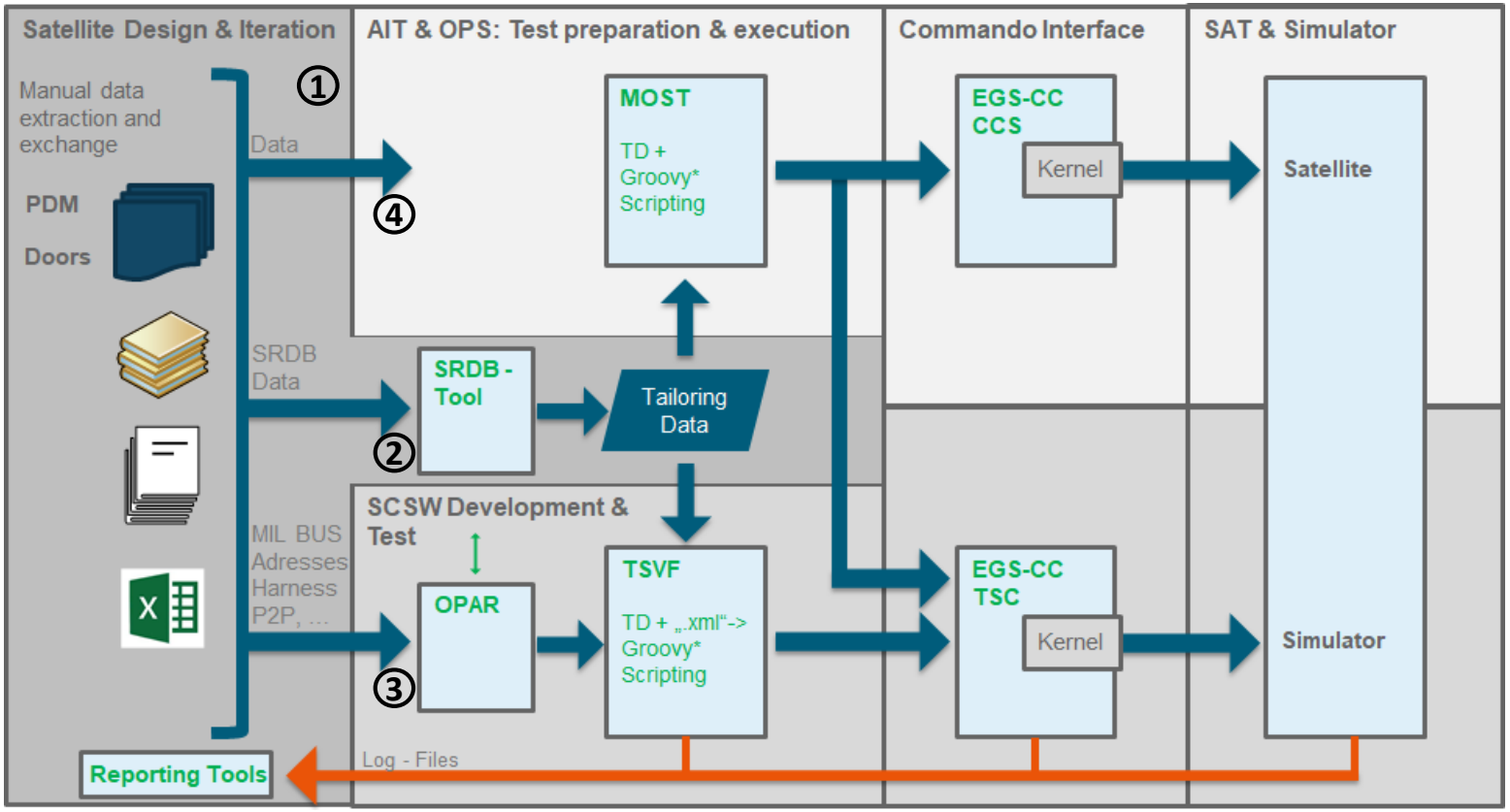
Task 3 covers the objective that OHB is able to support missions based on EGS-CC (V/V).

- Another step of this preparation is to identify the impact on the current OHB tool chain.



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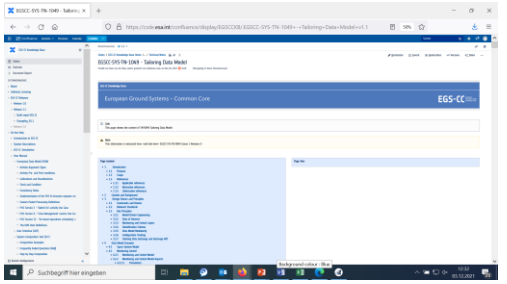
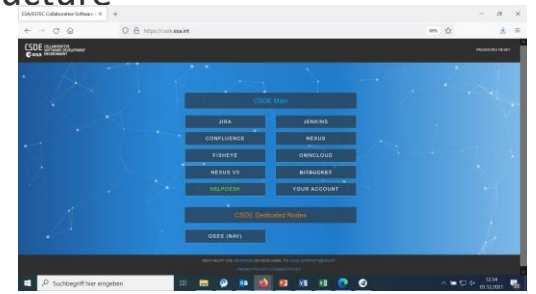
Achievements



- Participation in the EGS-CC Community
  - In multiple boards for user needs and technical questions
  - In the collaboration environment to support community concept
  - Improvement proposal during EGS-CC milestone reviews
  - Identification of interface problems for new users (generation of Tailoring Data Files)
- EGS-CC SDE is setup on the docker container concept in the OHB infrastructure
- EGS-CC SDE usable inside OHB to give OHB users first hands-on EGS-CC



- Feedback for re-producing manual user scenarios
- Feedback for SDE setup procedure
- On-Boarding of OHB engineering departments started
- Identification of needed updates in OHB tools to support future satellite projects using EGS-CC
- Lessons Learned with identification of possible improvements that future EGS-CC users can have a smoother start with EGS-CC

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General comments related to setup the Infrastructure

- Working with EGS-CC, OHB needs to ensure that the needed infrastructure is setup. On one side the interfaces with external servers, on which the needed EGS-CC information can be found, needs to be accessible. On the other side the internal OHB network which is the baseline for the projects infrastructure, needs to interface with EGS-CC sources.
- Due to the security concept of OHB, there is no direct link from the project infrastructure to external servers possible. So a concept needs to be setup that the EGS-CC sources can be copied to OHB servers, were the SDE can be setup and afterwards distributed to the project infrastructure.

→Depending on the security aspects of the company infrastructure, possible external network access needs to be whitelisted. For such an activity an overview of all needed accesses for EGS-CC would be helpful.

→Securing the sources against malicious code on all whitelisted servers needs to be ensured perpetually.

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General comments related to an activity to integrate EGS-CC in an infrastructure

- The information provided by the EGS-CC Knowledge Base is not in all parts up to date and some information is missing or not yet included. Also information can be found in the Knowledge Base or on the Consolidation Phase confluence. It is not easy to know what is where in order to search and find the right information.

→An update of the Confluence area from newbie point of view is recommended, so that new participants can access the information

- Useful Tools and extension (e.g. WebUI Tailoring Data API) are not always well documented or easy to find. Also the life cycle of these tools is not always clear. Potential users need to know about the formal relation to EGS-CC.

→ A clarification of available tools/libraries and their lifecycle/maintenance concept is recommended.

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General comments related to upgrading the tool chain with EGS-CC

- Maintainability of existing development and test processes is needed to limit the impact and lower the risk of failures
- Maintainability of existing man/machine interfaces to minimize familiarization overheads by the users (as much as possible)
- Currently used internal data formats need to be maintained to limit further tool chain impact of other engineering disciplines.
- Adaption to new scripting languages should be handled in low-level parts of tools to limit the change impact.
- Major uncertainty currently needs to be handled: some of the additional tools or artifacts are a possible candidate for a future tool chain based on EGS-CC e.g. ESA WebUI tool. However, the currently available documentation does not support an effective implementation.
- The transition from the current tool chain setup to the EGS-CC based tool chain entails significant development efforts, which are also impacted by availability and stability of candidate tools and artifacts.

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General comments related to EGS-CC

- A “working” community for which the spirit of the EGS-CC Collaboration Agreement is mandatory, needs to be established to the benefit for each partner versus the costs.
- Start interacting with the community (writing SPRs) is not easy due to the amount of already existing information. A guideline or netiquette would be recommended.
- Independent developments of EGS-CC and CDM or OPEN appear to increase the risk of prolonging problem solving in case of mismatches between these development branches.
- Valid and maintained references to sources, tools and respective documentation should be easy to find in singular overview pages. Also a configuration approach for items only available in confluence needs to be setup. Otherwise satellite projects will run into problems in referring to specific versions.
- A newbie introduction and tutorials that go with it would greatly help to introduce EGS-CC to new team members.

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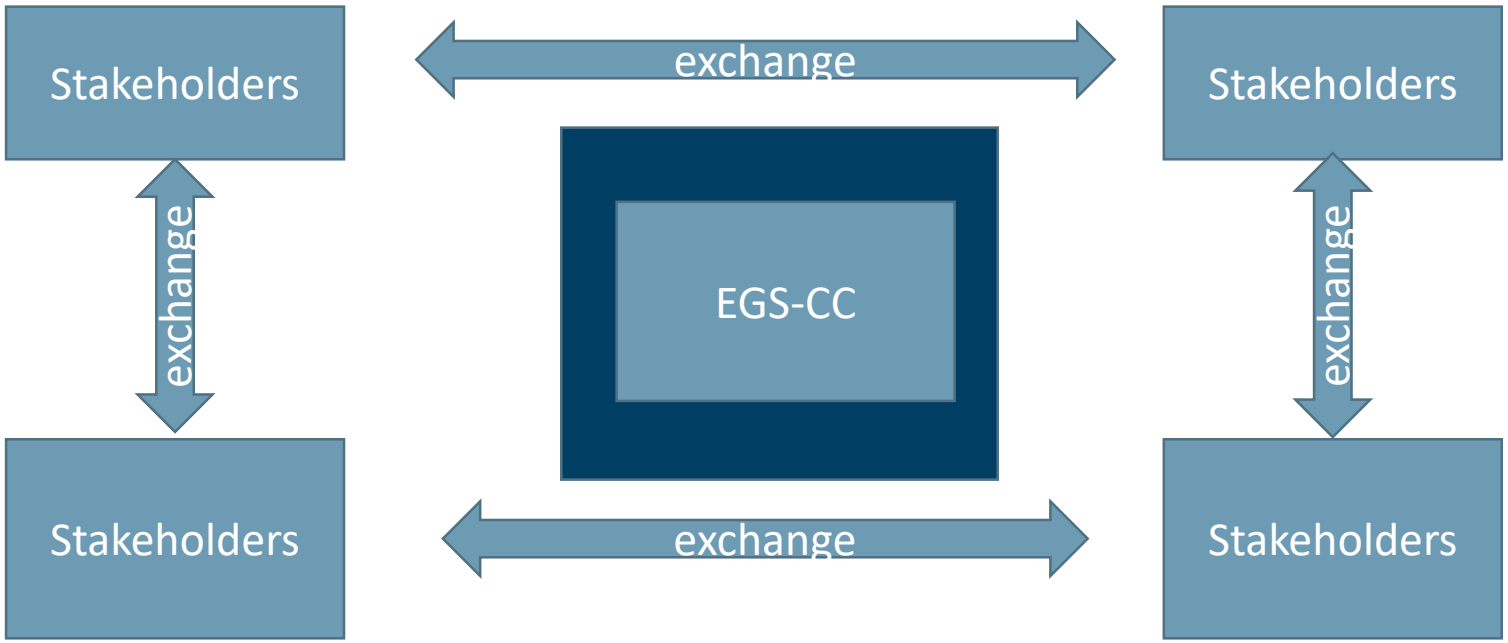
Conclusion I/III

The OHB EGS-CC Integrator Support project is one step of the introduction of EGS-CC in the satellite development. The exchange with other stakeholders to use a common kernel (EGS-CC) in the stakeholder's tool chains with defined exchange formats promises to be a major step to improve the overall development with different involved companies and institutions, once the tool chains are established and work reliably.



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Conclusion II/III

With finalization of the OHB EGS-CC integrator support project a major step for defining a baseline has been taken, which is the starting point for further developments and improvements in establishing an EGS-CC based setup required for using the EGS-CC kernel.

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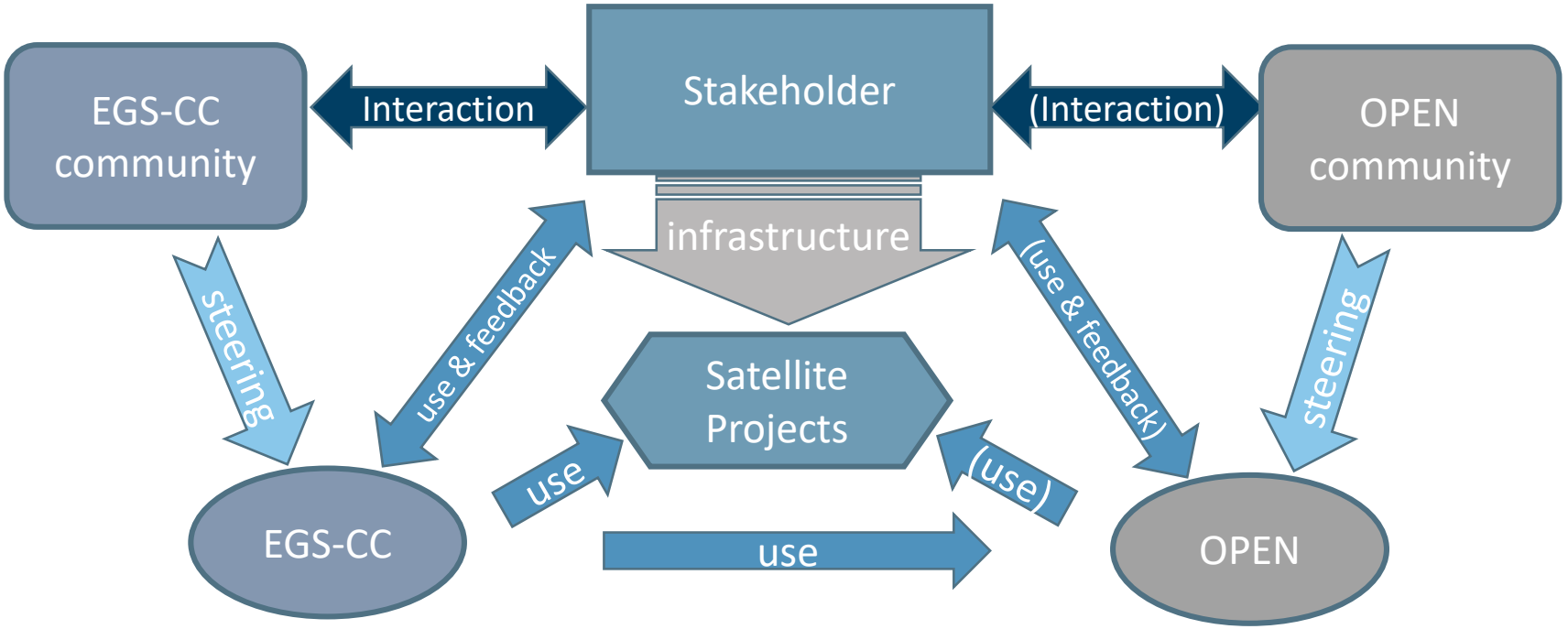
Conclusion III/III

With the upcoming EGS-CC Maintenance phase, the EGS-CC Community concept needs now to be established in a way that satellite projects which shall use EGS-CC have still a predictable schedule to fulfill satellite project needs. Also dependencies like EGS-CC CDM/Tailoring Data or re-used parts of OPEN which have independent life cycles need to be reflected in the community approach.



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Thank You