



FUTURE REPAIR AND MAINTENANCE FOR AEROSPACE INDUSTRY

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**Report on the Integration of the bridges
and communications of the subsystems
with the RepAIR IT System**

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Executive summary

This document describes the approach how the communications between the Central Node and other components or subsystems are implemented using the RepAIR Bridge System.

This allows exchanging information between subsystems and the Central Node using a set of interfaces. The subsystems must communicate with the Central Node for informing about job and supply chain status in order the Central Node can coordinate the efforts of end-users and give coherence to their actions.

All the interfaces have been developed in accordance with the functionality designed for the end-users and stakeholders. Also, it has been integrated and connected to production equipment under the requirements defined in the project and according to the previous results.

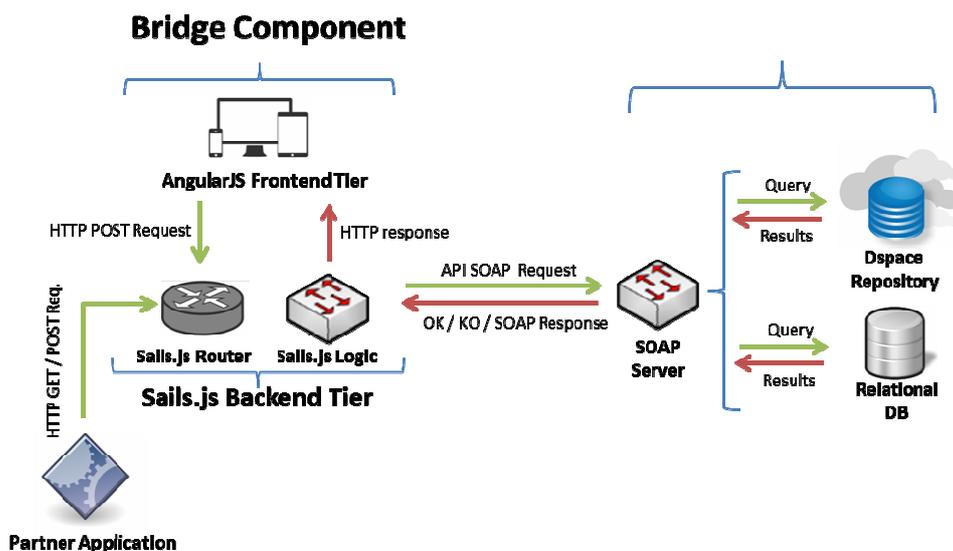
The implementation of the RepAIR Bridge System as a communication system between Central Node and Subsystems aims, from a technical point of view, to

- to provide infrastructure services to achieve connectivity between different components in the RepAIR project,
- define a set of services that support the needs of integration of the different components of the RepAIR project and
- deploy services with the operations required for complete interoperability of components RepAIR project.

Also, the implementation of the RepAIR Bridge System contributes to incorporating all functions into the platform in order to calculate an efficient cost and lean management for Maintenance, Repair and Overhaul (MRO) processes.

The introduction section gives a general introduction to the document including information about purpose and validity of this document, relation to other RepAIR documents and to its main audience.

In *Bridges in Repair: Overview section*, the technologies used in the implementation of the bridges are described. It was decided to use JavaScript Technologies for the sake of speed, scalability, heritage between developers, modernity and support from the community. Also, in this section, it is described the Communication system. The following figure shows the final communication system. All components behave identically:



The section 3 is dedicated to describe the global bridge for Authorization. In order a user to use the system, he must begin authenticating through the Bridge App against Central Node. To do this, once introduced the credentials, a request is made to the Central Node, obtaining a web-token that will act as the identity of the single session and exclusive of the user just in case these credentials have passed. It's described the exposed services and the Web Application that can be used to authenticate users.

The next four sections have a similar structure. They describe the different bridges created for each of the Subsystems developed in RepAIR: Predictive Maintenance, Decision Component, Production Component and Quality Component. Each section describes the functionality of the Bridge Component to enable communication between these components with the Central Node. Services and the information exchanged is detailed. Additionally, an application website is presented which has been developed so that the user, if desired, can exchange information through it instead of implementing the bridge autonomously (for instance, for demonstration purposes). Finally, in each section it will be evaluated whether design prerequisites have been met.

No specific bridges have been developed for this component since the communication capabilities to integrate and obtain data from it are covered by other implemented bridges. This is explained in Section 8.

In section 9, the document deals with communication with external components. The external components are programs used in a common way into the airworthiness control and repairing world. The IT Management Platform has to communicate with all that components to ensure the availability of the whole Repair/Manufacturing process and integration with the existing structure.

The last section, conclusion, makes a brief summary of the performed work and the main results obtained.