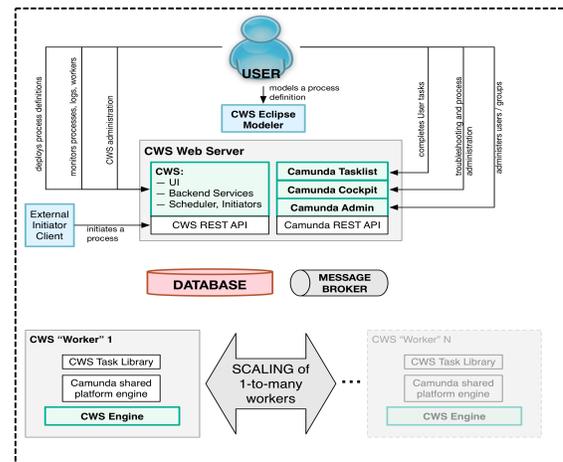


COMMON WORKFLOW SERVICE: Standards Based Solution for Managing Operational Processes. A. W. Tinio¹ and G. A. Hollins², ¹NASA Jet Propulsion Laboratory (4800 Oak Grove Drive, Pasadena CA 91109, Adri-an.W.Tinio@jpl.nasa.gov), ²NASA Jet Propulsion Laboratory (4800 Oak Grove Dirve, Pasadean CA 91109, Galen.A.Hollins@jpl.nasa.gov).

Introduction: The NASA Advanced Multi-Mission Operation System (AMMOS) provides many of the ground data system functions needed to design, implement, and operate a Mission Operations System (MOS). As the need for automation and orchestration becomes more prevalent across the AMMOS functions, an effort was set underway to assess the use of workflow technologies. This assessment has culminated in the formulation of the Common Workflow Service (CWS). The CWS is a collaborative and standards-based solution for managing mission operations processes using techniques from the Business Process Management (BPM) discipline [1]. Its goal is to provide a common process management solution that can be used across multiple functional elements within the AMMOS and therefore avoiding disparate workflow implementations. To achieve this goal, the CWS leverages CamundaBPM [2], an open-source BPM solutions software, to design and implement a common framework for defining, executing, managing, and monitoring operational processes.

Common Workflow Service: CWS is a platform that leverages existing Business Process Management (BPM) technologies and software to design and implement a common framework for defining, executing, managing, and monitoring processes. At the center of CWS lies the BPMN v2.0 standard [3]; a leading industry standard that defines the language for graphical modeling processes with semantics that can be executable.

CWS Platform Architecture. The CWS Platform provides the core functionality of managing and executing BPMN 2.0 processes. The platform software consists of the *CWS Core*, one or more *CWS Workers*, a *centralized database*, and a *message broker*. The platform architecture allows for a distributed system where the *CWS Workers* can be spread across different remote host machines. This distributed architecture allows for different deployment topologies for different uses.



Benefits. Leveraging CWS and BPMN 2.0 to model, deploy, execute and monitor processes has the following advantages:

- Processes can be represented graphically (i.e. BPMN 2.0), and are easily understood / presentable to all stakeholders (from developers to managers).
- Processes can be easily modified / maintained
- Development process is streamlined as many out-of-the-box task types can be utilized.
- In-depth monitoring of the processes and logs
- Distribution of tasks and processes
- Provides support for User tasks in processes
- Web-based access, means end Users and operators can access CWS from anywhere, without installing additional software

References:

- [1] Tinio A. W. et al. (2016) *NASA Tech Briefs*, November 2016, 64. [2] Camunda BPM. (2016). Retrieved from <https://camunda.org>. [3] Object Management Group: Business Process Model and Notation (2016). Retrieved from <http://www.bpmn.org>.

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