One Click Build Environment and Tool Chain for Real Time Safety Critical Aerospace Embedded System

Tejas Chhaya, Dan Evans, David Dempsey, and Jason Powers
MAHLE Powertrain LLC

ABSTRACT

"Embedded Software Build" is the process of taking all source code files that are part of the embedded system and compiling them into build artifacts, such as executables or binaries for the target embedded hardware. In the case of embedded systems, it includes low level software for a specific embedded hardware device, the application software and the associated application data. To further complicate this, low level software also known as firmware or middleware layers are often hand-coded while the application layer is auto-coded. To ensure build reproducibility, accurately predict build results and achieve error-free embedded software builds both in a lab environment and in the field, embedded software builds are required to be automated. At the very initial stage of the project, we realized that the automation of the Embedded Software Build is highly imperative and extremely crucial, as we're dealing with a Real Time - Safety Critical - Aerospace Embedded System. In this paper, we will discuss the different types of software products that need to be integrated together prior to the build, and the cost-effective solution that MAHLE Powertrain has devised to automate the software build process to create a "One Click Build Environment and Tool Chain".