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EARTHCARE PROCESSING FACILITY AND EARTHCARE L2 TESTBED - A SYNERGETIC SETUP TO SUPPORT SCIENTIFIC ALGORITHM DEVELOPMENT

Abstract

We report on the architecture and design choices of the EC processing facility and a parallel testbed facility for scientific processor development.

The EC mission is concerned with measuring factors relevant to the earths radiation balance. The satellite carries four scientific instruments. At the processing facility, the data streams of the instruments are processed into products up to level two by a number of tasks that include at, higher levels, also synergy processing that merge the results from several instruments and processing chains.

ESA has established an effective in house standard that is adhered to by a number of mission PDGS implementations with the introduction of a generic processing facility interface. The generic interface provides declarative elements to integrate a processor in a processing and resource management layer. For the EarthCARE processing facility a new configuration element has been introduced that amends the processor interface with a configuration language for the specification of complete workflows (DAGs). This workflow configuration language is domain specific and allows expressing PDGS processing workflows in a very concise way in terms of input output relations and processing resource needs.

In line with the principles of the Earth Explorer concept that is focussing on innovative missions, the EC mission infrastructure also includes a processor testbed to allow for early integration of algorithms under development into an infrastructure that is close to the operational one in terms of processor interfaces and data and downstream data treatment. The early integration facility profits from processing facility design choices like the use of a well-defined workflow definition language and the use of Docker containers for processor integration.

This paper present the main elements of the new processing language, the architecture of the facility and shows real-live results from actual system runs based on simulated data from the mission that is scheduled to be launched in 2019.