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Flexible Description and Adaptive Processing of Earth Observation Data through the BigEarth Platform

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The Earth Observation data repositories extending periodically by several terabytes become a critical issue for organizations. The management of the storage capacity of such big datasets, accessing policy, data protection, searching, and complex processing require high costs that impose efficient solutions to balance the cost and value of data. Data can create value only when it is used, and the data protection has to be oriented toward allowing innovation that sometimes depends on creative people, which achieve unexpected valuable results through a flexible and adaptive manner.
The users need to describe and experiment themselves different complex algorithms through analytics in order to valorize data. The analytics uses descriptive and predictive models to gain valuable knowledge and information from data analysis. Possible solutions for advanced processing of big Earth Observation data are given by the HPC platforms such as cloud. With platforms becoming more complex and heterogeneous, the developing of applications is even harder and the efficient mapping of these applications to a suitable and optimum platform, working on huge distributed data repositories, is challenging and complex as well, even by using specialized software services.
From the user point of view, an optimum environment gives acceptable execution times, offers a high level of usability by hiding the complexity of computing infrastructure, and supports an open accessibility and control to application entities and functionality. The BigEarth platform [1] supports the entire flow of flexible description of processing by basic operators and adaptive execution over cloud infrastructure [2]. The basic modules of the pipeline such as the KEOPS [3] set of basic operators, the WorDeL language [4], the Planner for sequential and parallel processing, and the Executor through virtual machines, are detailed as the main components of the BigEarth platform [5]. The presentation exemplifies the development of some Earth Observation oriented applications based on flexible description of processing, and adaptive and portable execution over Cloud infrastructure.

Main references for further information:
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