Non-Functional Data Layer Patterns for Cloud Applications

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Problem Description and Research Questions

Cloud computing has become increasingly popular with the industry due to the clear advantage of reducing capital expenditure and transforming it into operational costs. To take advantage of Cloud computing, an existing application may be moved to the Cloud or designed from the beginning to use Cloud technologies. Until today the migration of applications has been limited to the migration of the whole application, i.e., by using virtualization technology. The advent of various Cloud services enabled the migration of applications on the granularity of application layers.

This work focuses on the migration of the data layer to the Cloud. Using Cloud technology leads to challenges such as incompatibilities with the database layer previously used or the accidental disclosing of critical data by e.g., moving them to a Public Cloud. An application relying on such functionalities cannot therefore have its data moved to the Cloud without deep changes to its implementation. We identify such challenges focusing on enabling data store scalability and ensuring data confidentiality and provide a set of Cloud Data Patterns as the best practices to deal with them.

Overview

Definition of Cloud Data Pattern

“A Cloud Data Pattern describes a reusable and implementation technology-independent solution for a challenge related to the data layer of an application in the Cloud for a specific context.”

Patterns of a pattern language are related to each other, they have to be considered as a whole and to be composable (Hohpe and Woolf, 2003). Thus, we have chosen the form of a piece of a puzzle for the pattern icons.

Further Information

Selected Publications


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