A Novel Architecture and Methodology for Migration of the Data Layer to the Cloud
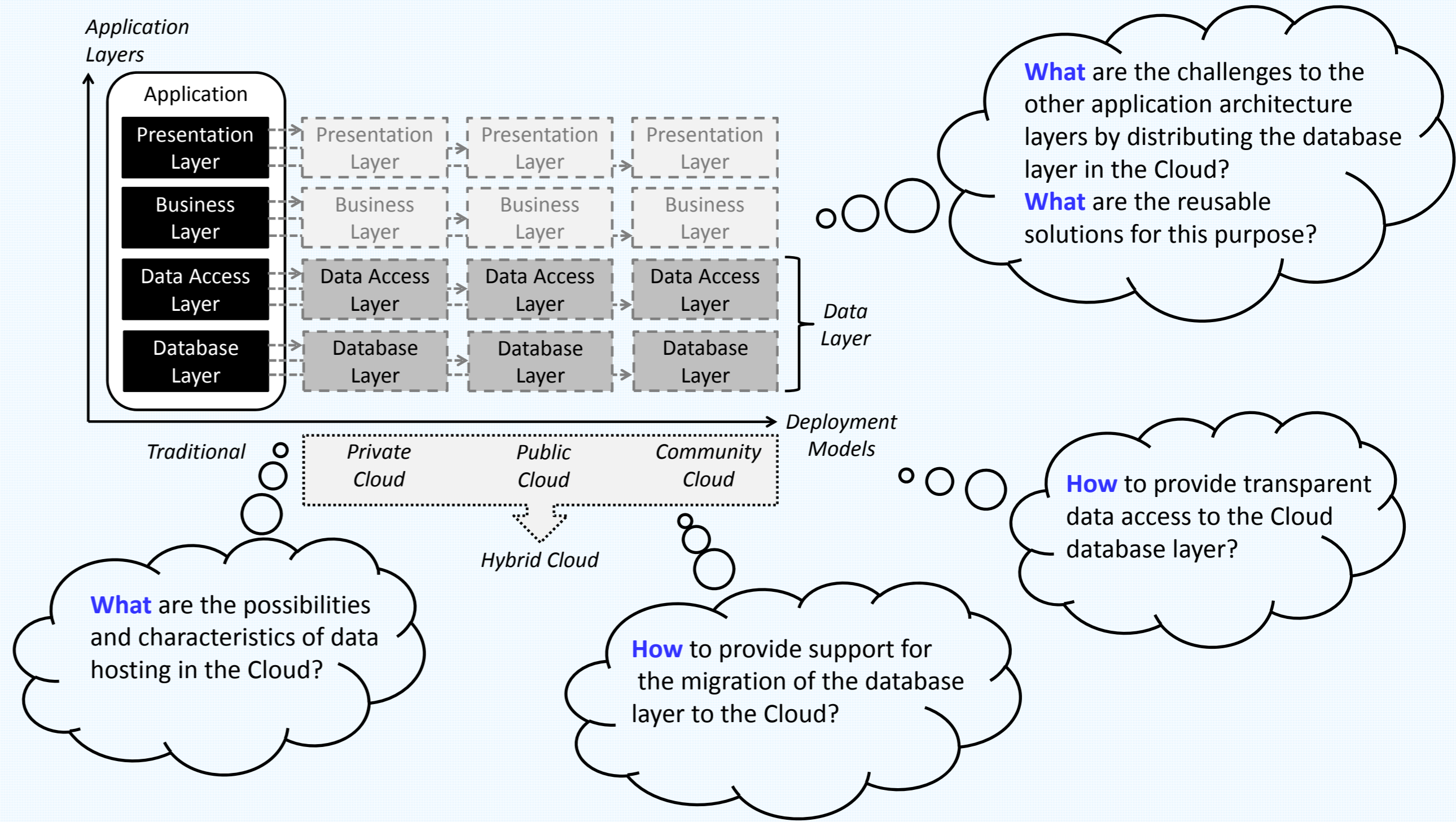
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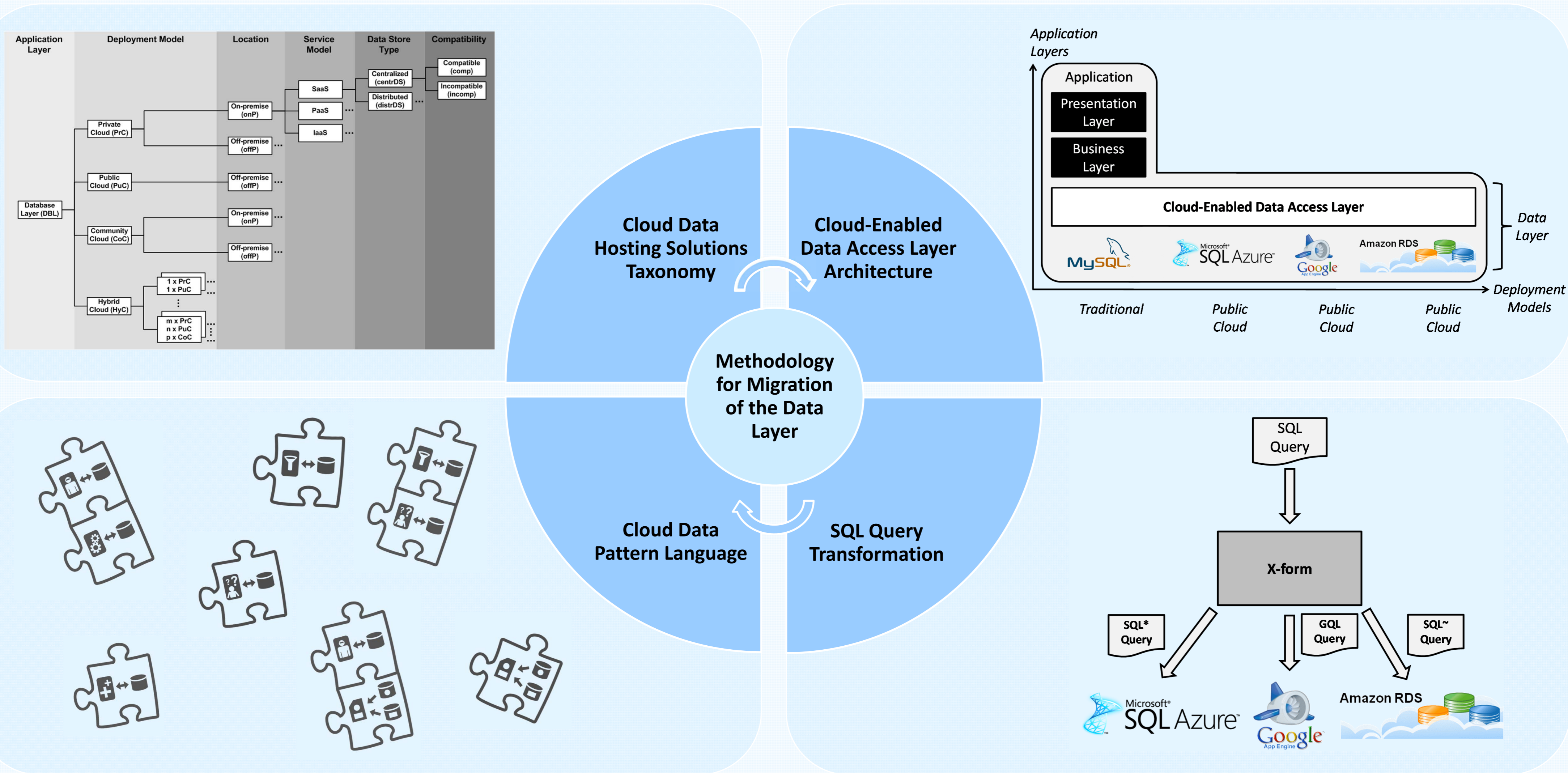
Problem Description and Research Questions

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. In particular, we investigate how to **move the database layer to the Cloud** and we introduce a **novel architecture for the data access layer**, which enables transparent Cloud data access. The migration of the database layer imposes challenges and impacts the above application layers. We identify these challenges and provide reusable and technology-independent solutions in the form of a **Cloud Data Pattern Language**.

What are the challenges to the other application architecture layers by distributing the database layer in the Cloud? **What** are the reusable solutions for this purpose?

What are the possibilities and characteristics of data hosting in the Cloud?

How to provide support for the migration of the database layer to the Cloud?

How to provide transparent data access to the Cloud database layer?

Contributions

- Cloud Data Hosting Solutions Taxonomy
- Cloud-Enabled Data Access Layer Architecture
- Methodology for Migration of the Data Layer
- Cloud Data Pattern Language
- SQL Query Transformation

Further Information

Acknowledgments

Selected Publications

Strauch, S., Kopp, O., Leymann, F., Unger, T.:
A Taxonomy for Cloud Data Hosting Solutions.
In: Proceedings of CGC '11. IEEE Computer Society
(Dezember 2011)

Strauch, S., Breitenbuecher, U., Kopp, O., Leymann, F.,
Unger, T.: Cloud Data Patterns for Confidentiality.
In: Proceedings of CLOSER '12. SciTePress
(April 2012)

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