MAKING THE CLOUD WORK FOR YOU

OblakSoft ClouSE

Barriers to cloud adoption

cloud-or-nothing, limited adoption modes

new programming model, new API

data confidentiality, data lock-in concerns

caching, encryption, compression, strict consistency enforcement …

ClouSE

Cloud promise – delivered

tried and true SQL RDBMS, weblobs

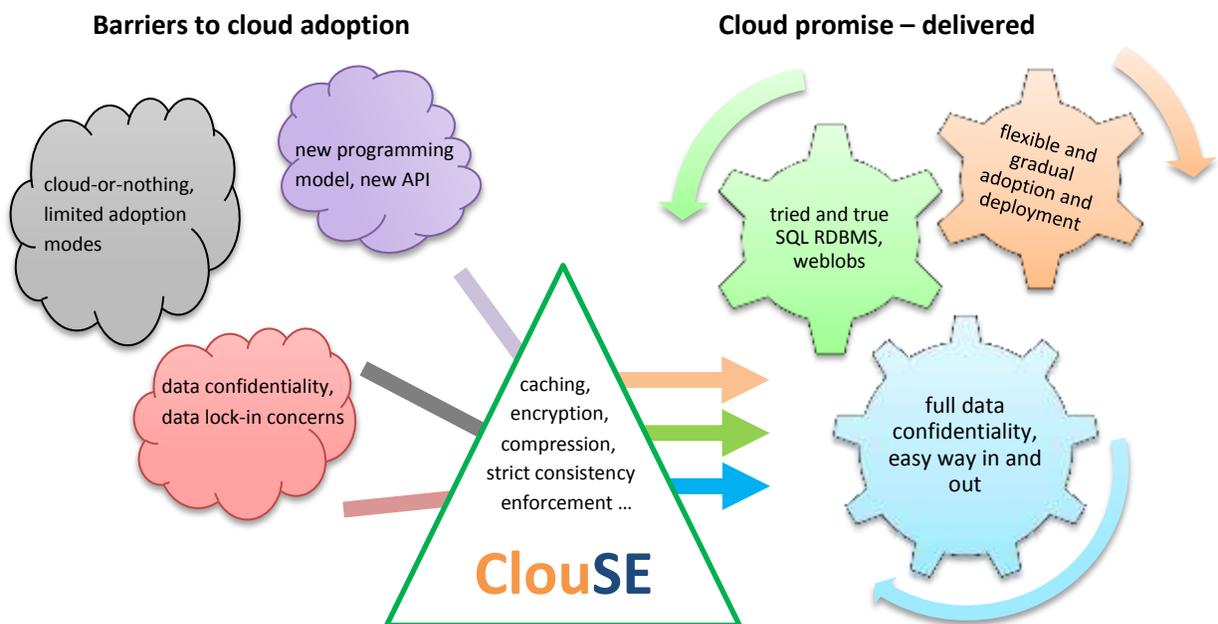flexible and gradual adoption and deployment

full data confidentiality, easy way in and out

Cloud computing promises a lot of benefits but its adoption is still clouded by many barriers, such as data confidentiality concerns, the necessity to use new programming paradigms and platforms (often tied to a specific cloud computing vendor) and inflexible deployment options. While individual cloud services are doing quite well on the cloud computing promises such as *no upfront commitment* and *elasticity*, the overall cloud adoption roadmap often falls short: sizeable and risky investment into re-training the developers and re-writing applications is still required in order to embrace and take further advantage of new cloud computing paradigms. And the final solution deployment options are far from elastic: the solution is often tied to one cloud computing vendor and it's a ***cloud-or-nothing*** kind of deal.

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ClouSE technology was created to bring elasticity into cloud computing adoption and help you to find your way to the cloud while making sure it happens your way. ClouSE is the Cloud Storage Engine for MySQL that can utilize cloud storage such as Amazon S3 to store relational and blob (a.k.a. structured and non-structured) data. ClouSE provides fully functional, transactional and ACID-compliant relational data management on top of cloud storage.

Designed and optimized for cloud storage from ground up ClouSE implements strict consistency enforcement, user data encryption, compression and caching (both read and write) techniques to smooth out cloud storage adoption bumps such as non-strict data consistency, lack of data confidentiality, high-latency storage access, and higher storage access failure rate due to network failures. As a transactional storage engine for MySQL ClouSE opens cloud storage to SQL developers and SQL-based applications and reduces the need to retrain developers and rewrite applications to use new data management paradigms, thus lowering the barrier for cloud storage adoption.

> "… MySQL-based applications wouldn't require changing code; the decision to leverage cloud storage could be made by the DBA as part of application deployment …"

As a matter of fact, with ClouSE many MySQL-based applications wouldn't require changing any application code; the decision to leverage cloud storage for the application data could be made by the DBA as part of application database deployment, much like tablespace management decisions. Moreover, unlike Database-as-a-Service technologies, ClouSE does not require database access to happen over high-latency and less reliable network, so the applications can enjoy the standard topology where an application server and a database are deployed on the same machine or over fast reliable LAN.

ClouSE can run on the company premises or in the cloud, both public and private. The variety of configurations enabled by ClouSE and its non-disruptive programming model provide a full spectrum of smooth and natural cloud computing adoption paths: the adoption can be both gradual and partial.
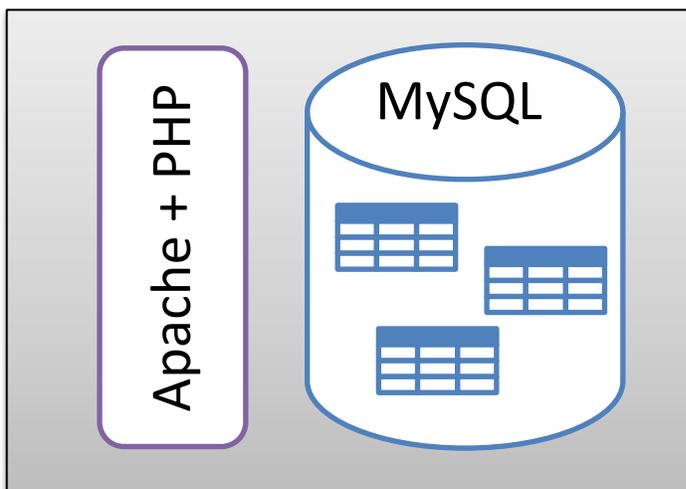

For example, let's consider a typical Webserver that is built on top of the de-facto standard LAMP software stack: Linux, Apache, PHP and MySQL. The Webserver uses a MySQL database and it stores its

data in multiple tables. The tables are stored on the local disk and need to be protected by backups and / or replication.

So far there is no cloud in sight, but with ClouSE cloud adoption can gradually begin. Once the ClouSE plugin is installed and configured a table can be moved to the cloud storage using a simple statement:

mysql> ALTER TABLE *table_name* ENGINE=CLOUSE;

which makes the picture look like this:
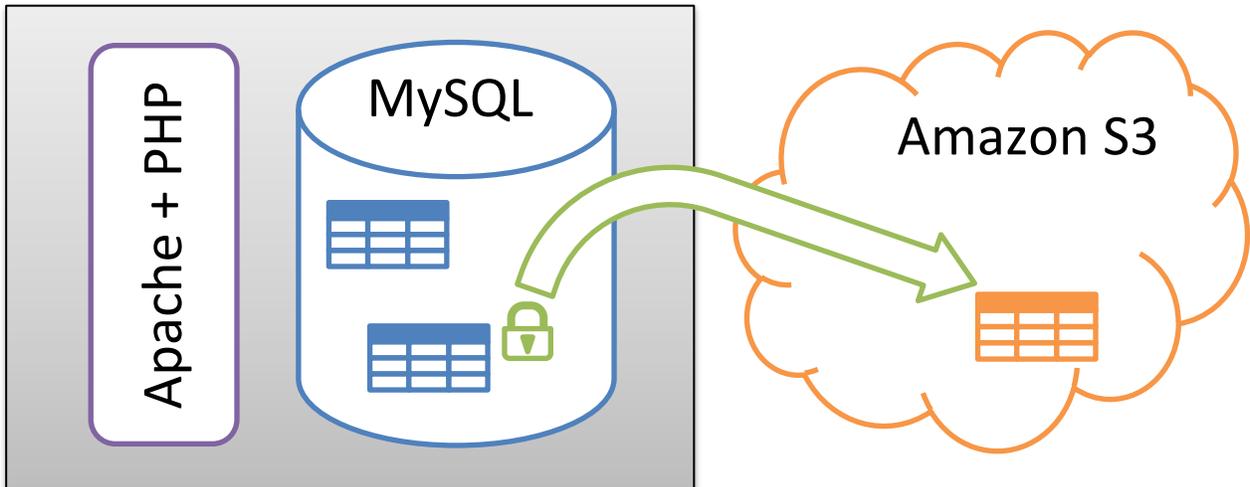
The Webserver still runs on the LAMP stack, but one table is stored in Amazon S3 and does not use any storage on the local disk nor does it need data protection: it's stored in highly available and highly reliable cloud storage. Amazon S3 provides storage for the data, but the cloud provider has no access to the customer's data that is encrypted with strong AES-256 algorithm, the keys to which only a customer has. This enables full data confidentiality in the cloud that is fully under the customer's control.

> "…That's one small step for a Webserver, a giant leap for cloud adoption: ClouSE creates a *continuity of working configurations* …"

That's one small step for a Webserver, a giant leap for cloud adoption. The simplicity of the action might obscure the significance of the result: ClouSE creates a **continuity of working configurations** such that an application is operational during all stages of the cloud adoption. This means that:

- Applications can stay operational over the course of adoption
- Applications can be gradually tuned to work with the cloud, there is no sink-or-swim situation
- Viability of cloud-based solutions can be evaluated with no upfront investment
- Way out is as easy as way in, there is no cloud-or-nothing situation

> "…Way out is as easy as way in, there is no cloud-or-nothing situation …"

Moreover, easy adoption also implies easy evolution: the application deployment configuration can easily evolve as the company needs advance – move between the public cloud, private cloud and the on-

premise. This is true elasticity of the cloud adoption: it can scale both up and down to fit the company needs.

Getting back to our example, moving all tables to the cloud storage leads to this important deployment configuration:
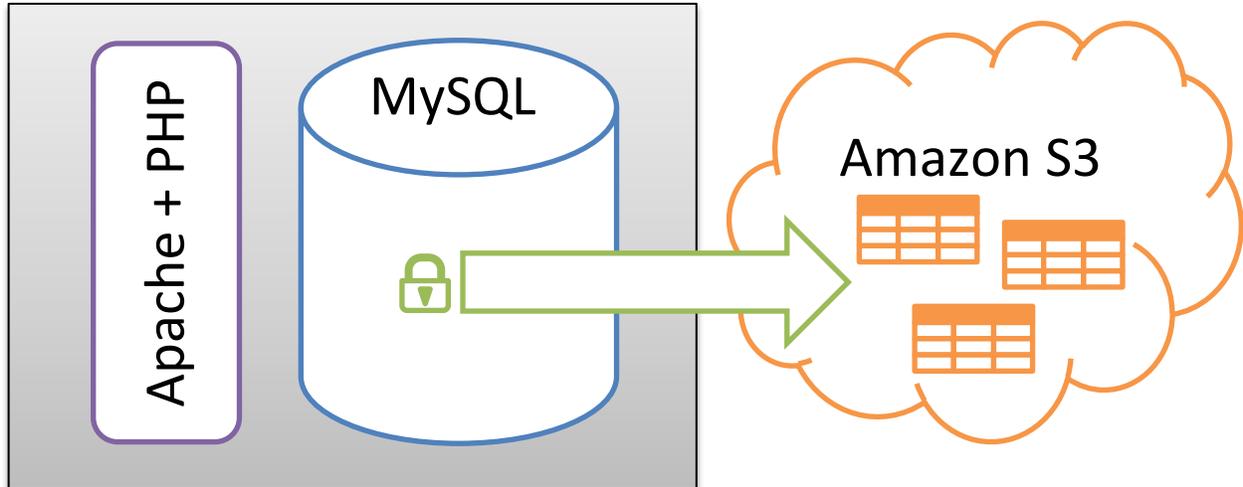

The Webserver still runs on the LAMP stack, but all tables are stored in Amazon S3. In fact, this is not just a LAMP, but the modern cloud-based version if it – LAMPS3. The database does not use any storage on the local disk; it's stored in highly available and highly reliable cloud storage. The Webserver is now fully protected by the cloud: should it fail, a new one can be provisioned and recovered from the cloud in the matter of minutes. Amazon S3 provides storage for the data, but the cloud provider has no access to the customer's data: ClouSE uses strong AES-256 encryption to provide full data confidentiality in the cloud.

"…ClouSE makes cloud storage an IaaS: cloud storage can be "plugged into" the IT infrastructure …"

In a sense, ClouSE makes cloud storage itself to be an Infrastructure-as-a-Service (IaaS) offering for relational database workloads: with ClouSE cloud storage can be "plugged into" the IT infrastructure in a seamless manner.

When all the tables are in Amazon S3, the Webserver itself can be easily moved to the cloud as well, so the whole solution can run completely in the cloud, like this:

Amazon EC2

Apache + PHP

MySQL

Amazon S3
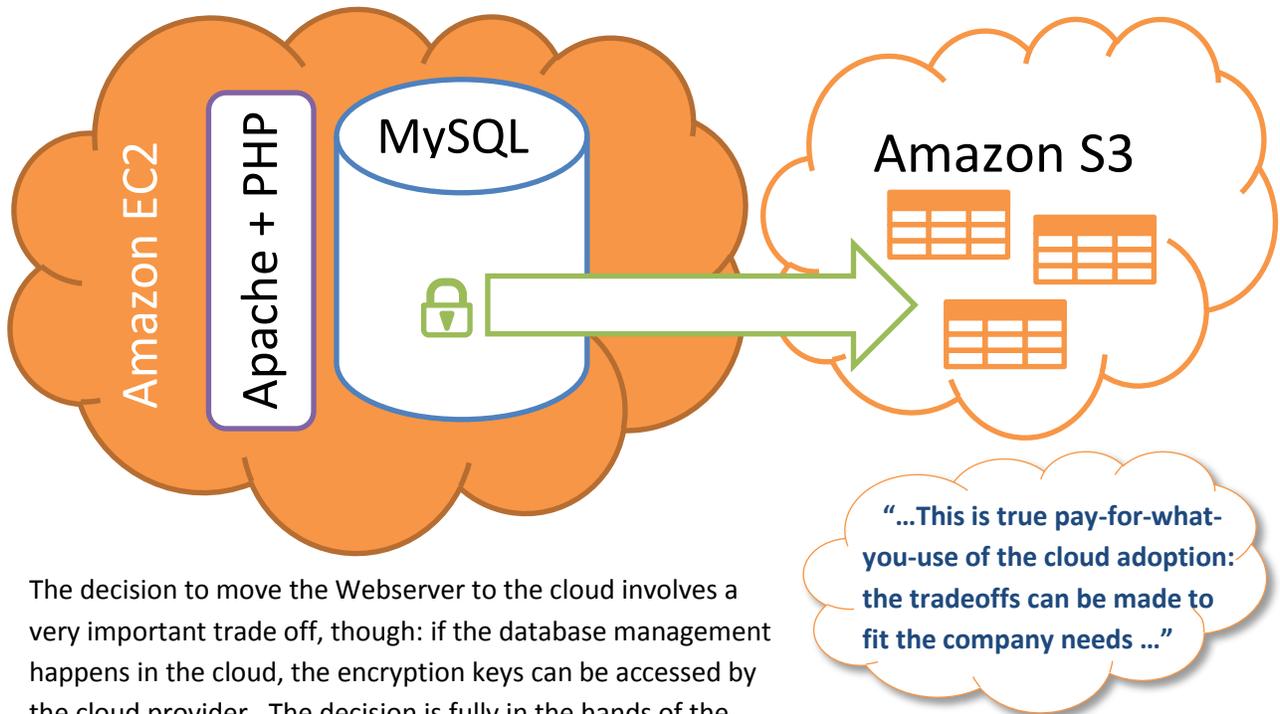
The decision to move the Webserver to the cloud involves a very important trade off, though: if the database management happens in the cloud, the encryption keys can be accessed by the cloud provider. The decision is fully in the hands of the customer and can be made on a case by case basis to fit your unique requirements to enforce data confidentiality, optimize for latency between the application and the database, minimize cost, address regulatory requirements, etc. This is true pay-for-what-you-use of the cloud adoption: the tradeoffs can be made to fit the company needs.

"…This is true pay-for-what-you-use of the cloud adoption: the tradeoffs can be made to fit the company needs …"

ClouSE works well with a variety of topologies, for example the Webserver could run in the private cloud that would be an intermediate solution between allowing a public cloud provider to access your data and running the Webserver on-premise.

The choice is yours. ClouSE is just there to help you to find your way to the cloud – _your_ way.

Start adopting cloud today: download ClouSE now.