DataFactZ Solution

How to Migrate Your Data to the Cloud

"With the advent of The Cloud, Data Ware-housing has never been so accessible, scalable, and user friendly"

From ice-cream stands to the world's biggest shopping centers, data and analytics are the keys to a successful business strategy. Depending on the size and type of the company/corporation, the data warehouse size changes, as does the complexity.

Building a data warehouse has always been a costly affair for companies. Keeping aside its complexity, it is also a time-intensive process that quickly becomes a major feat. Post-deployment, the major task of maintaining such complex architecture can make someone question the sanity of having one in the first place.

Even after setting the data warehouse up, those troubles never end. Companies then need a team of members to maintain those servers, and make sure everything runs smoothly to prevent any loss of data. Additionally, if a data warehouse ever falls short on memory or disk space, upgrading or scaling it becomes a big project in itself, from finding new software vendors, to making hardware purchases. Within the last five years however, a trend has been moving away from on-premise data warehouses to a much less complicated architecture called the "Cloud".

Companies, engineers, architects, developers, and users across the world are embracing data on the cloud, because of its cost-effectiveness and the performance boost it provides.
• Business owners are thrilled with the cloud, be-

cause of its economic benefits, and lack of hardware failures.

• Engineers, architects, and developers like the cloud because it's easy to work with, especially in scalability and speed.

• On-demand performance boost is one of the greatest wins for cloud service providers.

• IT Administrators are embracing the cloud because of its flexibility and ease by which new machines are added, and existing machines are scaled. Industry-class security standards are also maintained right from the beginning.

Throughout the migration of data from on-premises to the cloud, one can expect challenges, surprises, but also great rewards. An organization should strategize such moves and be prepared with a list of all actionable items before attempting to migrate any data. Working with an experienced cloud consultant can mean the difference between transformation or disaster.

Technology stack decisions are crucial, but the migration process can stall even the best strategy. Thousands of man hours and millions in cost can be achieved with automated solutions.

Why do Businesses Migrate?

Change is to be expected in the IT business, and that change ultimately occurs because of necessity and timing. There are many reasons why companies

migrate to the cloud. Here are some of the most popular ones:

- Mergers, acquisitions etc.
- Reduce the liability and single point of failure risks.
- Renewed company policies.
- Improve infrastructure and performance.
- Big Data projects.
- On-Demand pricing and cost benefits.

Keeping abreast with the latest IT technologies and changing courses at the right time, are what help companies reap the benefits of the growing economy.

First Steps

Before a business starts the process of migrating to the cloud, a business needs to answer a few important questions first.

- What are the benefits of migrating business to the cloud?
- What happens to current infrastructure?
- How fast does the business need this migration?
- What portions of the business process data need to be moved to cloud?
- What fault tolerance do you need the system to be prepared for?
- Replication factor and response zones.

If the answers to these questions point clearly to moving towards the cloud, then your next steps are to plan the move towards that.

Plan for a Proof of Concept and Data Model

Since migrating data is a long-term and costly move, running a proof of concept is always a good beginning point. It sets the right expectations, helps evaluate the upstream and downstream applications behavior, and to some extent evaluates performance changes in a realistic world.

Ever since databases have existed, the most stable, mature, and popular choice has been the RDBMS system. Irrespective of the vendor that provides it, in whatever flavors they provide it, RDBMS systems

have proven themselves to be successful and rewarding. Even today most companies rely on those systems to run their businesses successfully. In the last decade or so, the Internet has exploded massively, not ignoring surging web applications, social media applications, and e-commerce websites. There is one other dimension that complements the prior: "Connected Devices". Connected devices are smart phones, smart watches, smart appliances, and tablets etc. All these devices and applications generate data, data that has become very rewarding to businesses that can target their customers more efficiently than ever before. For some industry verticals it has become a vital source of existence in the strong competitive market. With the new sources, variety, and speed of data, there is a need to combine current models and architecture with new data models. This is something businesses must brainstorm and consider, while considering the cloud.

A company that has been using traditional RDBMS might improve performance and save costs while moving to columnar databases or NO-SQL databases. Proper planning with the development, architect, and business teams will mitigate any risks in moving from one traditional process to a newer, cutting-edge model. In some scenarios where moving to a different model becomes complicated and non-rewarding, sticking to existing RDBMS might just be the right thing to do.

Move Data to the Cloud

After completing the data model plants, and experimenting with Proof of Concepts, the next task is for an organization to start the data movement process to the cloud.

There are several ways to move data into the cloud, but using the right methodology reaps the benefits. If the company currently owns petabytes of data, the time to transfer the data over Internet is not only a pricy affair but also a long process. It can take anywhere from several days to several months to just move petabytes of data to the cloud.

Partnering with a cloud provider or cloud imple-

mentation partner to figure out the right method of data transfer will help such situations. Some of the recommended approaches are listed below:

- For petabytes of data: it might be more practical to ship   the data hardware directly to the cloud provider, rather than transfer it over Internet channels.

- For terabytes of data: this can be done over high-speed Internet channels, if it looks feasible and cheaper.
Partnering with cloud provider to discuss about dedicated communication channel between sites to improve transvfer speeds.

Data Modelling

After the data is moved into cloud, the next task would be preliminary data validation where the company can use tools that do row to row testing or any other testing standards the company has set forth, and that the cloud implementation partner suggests. After the initial validation the data model can be built as decided. If the same database and model are being moved to the cloud then it's a fairly simple task. However, things get complicated if there are any changes in the database or in the architecture itself.

Data Validation Post Migration

One of the important tasks post data migration is data validation. A company can take various directions depending on the data governance policies laid down to validate the data migrated to cloud or any other environment. However the most commonly used methodology is parallel testing. In general, the data is usually consumed by a downstream application like a BI tool. A parallel comparison of data reported on a similar report using all possible scenarios can be a great validation use case.

Fine Tuning

After the data validation is complete, a final tuning and review will help smooth the process before

rolling it out to production. The process of fine tuning includes things like security check ups, network setup for easy access, removing any bottle necks observed during testing, and making sure that disaster recovery and high availability are tested and working per SLA requirements.

DataFactZ's offering for Cloud Migration

DataFactZ has vast cloud handling and deployment experience. We have successfully helped clients migrate to the cloud effortlessly—and most importantly—securely.

DataFactZ follows four leap-reap approaches, where teams of experts walk in to assess, plan, migrate, and deploy the cloud data warehouse.

The first of the four phases of data migration that DataFactZ suggests is to assess. A team of solution architects meets with business, IT and security teams to assess the current data warehouse and models. This assessment showcases the clients' readiness to move to the cloud. Depending on assessment results, the solution architects provide individual reports on their findings and then consolidate their findings to carve out a plan. Depending on the complexity of the existing architecture, data migration can last anywhere from 2 – 24 months or beyond.

In the second phase the solution architects build a proof of concept showcasing the benefits that cloud migration can bring into the organization, and also showcasing the compatibility of their existing systems to connect to the new data warehouse and applications.

In the third phase the team prepares the cloud environment for incoming data in terms of networking and security and moves the data to cloud and performs data testing.

The fourth and final stage involves setting up the data model and connecting any existing applications to the new enviroment, testing the new connections, performance and a final report to report or row to row testing of data between the old and new systems.

Migration Automation Solutions

Hundreds of hours can be saved in the migration process with fully-automated migration solutions. Table definitions can be converted to ensure that the Data Definition Language (DDL) script is compatible with the cloud platform DDL. A schema converter takes care of this and validates it to ensure it functions properly in the new DDL. Once the tables are ready to load data, extracting and loading can be optimized by automating the splitting of large tables

and loading them in parallel to shorten load time. Load restarting and data recovery is available during this automated data load process. Customization of these solutions should possible in order to configure parameters for data loading or preventing duplication.

Maintenance and Scaling Automation

Even though the premise of cloud is the scaling capability, some platforms like Azure don't make it as simple as a basic configuration. UNderstanding the particularities of certain technologies means you can plan on required solutions such as scaling Azure

instances based on usage. Same is true for regular database maintenance tasks like indexes, statistics, etc, hundreds of hours can be saved through automation.

Monitoring and Cost Control

With great power comes great responsibility, yet cloud platforms don't offer detailed monitoring solutions out of the box. DataFactZ offers fully customizable cloud and usage monitoring dashboards in multiple BI platforms to avoid the cost surprises 70% of surveyed large enterprises say they do, and to better leverage their platforms from usage analytics.

Conclusion

Data migration to the cloud is not an easy exercise, but it is ultimately rewarding. A planned approach to the cloud makes the process simpler and less uncertain. Planning data model changes and application reconsiderations will help companies that are planning to revamp their older setups. Cloud implementations can be used as an alternative to on premise data centers to save time, money, effort, single point failures, upgrade flexibilities, and limit liabilities.

The Next Step

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