

Research Paper on Incremental Data Load on Premises to Azure

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Abstract: *This project explains to overcome with the disadvantages of legacy process to move data from SQL server to SQL azure database. On legacy system Cloud based internet application need to be offline while loading data into Azure cloud database; which causes application unavailability and low customer satisfaction. This project helps in understanding the way of getting the advantages of the Cloud without having to migrate the entire database by just maintaining a copy of the data that needs to be accessible to internet-based users in Windows Azure SQL Database. The project allows SQL Server Management Studio (SSMS) to interface with the database engine and use Business Intelligence Development Studio (BIDS) to create a SQL Server Integration Services (SSIS) Package. SSIS will provide the mechanism necessary to upload the data from the SQL Server instance to SQL Azure and synchronize the uploaded data with existing data.*

Keywords: Azure cloud SSIS package, SSMS, SQL

1. Introduction

Existing System

At present during the monthly deployments/releases, all the required SQL code which includes bug fixes and other additions to be manually executed and then bring the application offline or down for the required data to be pushed through jobs to Azure SQL database and then once all the new data is pushed to Azure, perform a manual data check and bring the application online.

Drawbacks of Existing System

In existing system once the application is offline; users are impacted and will be able to access the application till the jobs and the required data is pushed to Azure; so due to these drawbacks user are very dissatisfied and the interest towards using the application goes down.

New System and Enhancements

The goal of our solution is to use SSIS to copy data from on-premises SQL Server Database to a SQL Azure Database and to keep the data synchronized. In our SSIS package, we'll issue T-SQL MERGE statements against the SQL Azure Database to synchronize the data between the staging tables and target tables. We could use SSIS to stage the data in memory and then synchronize it with the data in the SQL Azure Database.

2. Methodology

1.0 Requirement Analysis

Introduction:

Requirement analysis is a software engineering task that bridges the gap between system software allocation and software design. It provides system engineer to specify

software function and performance indicate software's interface with other system elements and establish constraints that software must need. The basic is to obtain a clear picture of the needs and requirements of the end user and also the organization.

Functional Requirements

1. Truncate the staging table of SQL Azure.
2. Load the existing data from Azure main tables to on premises staging tables.
3. Apply the bug fixes or requirements code on the data available in on premise main tables.
4. Compare the data present in on premise staging tables and the main tables.
5. Push the incremented data, post comparison to Azure staging tables.
6. Compare the data present in the Azure staging tables and the main tables.
7. Push the incremented data, post comparison to Azure main tables.
8. Validate the changes made in backend are reflecting as per expectation in the application.

Hardware Requirements:

On Premise SQL Server:

HDD: 1860GB
RAM: 16GB
Processor: Intel® Xeon® CPU L5640 @ 2.27 GHz 2.27 GHz

SQL Azure:

HDD: 150GB
DTUS: 2000
Service Tiers: Basic/Standard/Premium

Software Requirements:

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Server:

Operating System: Windows 2012 R2
 Database Server: SQL Server Management Studio
 Application Server: Windows Server 2012

Client:

Database Server: SQL Azure Database
 Application Server: Windows Azure

2.0 Database and server

SQL Server Management Studio:

SQL Server Management Studio (SSMS) is a software application first launched with the Microsoft SQL Server 2005 that is used for configuring, managing, and administering all components within Microsoft SQL Server. The tool includes both script editors and graphical tools which work with objects and features of the server.

A central feature of SSMS is the Object Explorer, which allows the user to browse, select, and act upon any of the objects within the server.

Windows Azure

Microsoft Azure is cloud computing platform and infrastructure, created by Microsoft, for building, deploying and managing applications and services through a global network of Microsoft-managed and Microsoft partner hosted data centres. It provides both PaaS and IaaS services and supports many different programming languages, tools and frameworks, including both Microsoft-specific and third-party software and systems. Azure was announced in October 2008 and released on 1 February 2010 as Windows Azure, before being renamed to Microsoft Azure on 25 March 2014.

SQL Azure

Microsoft Azure SQL Database (formerly SQL Azure, SQL Server Data Services, SQL Services, and Windows Azure SQL Database) is a cloud-based service from Microsoft offering data-storage capabilities (similar to Amazon Relational Database Service) as a part of the Azure Services Platform. Unlike similar cloud-based databases, SQL Database allows users to make relational queries against stored data, which can either be structured or semi-structured, or even unstructured documents. SQL Database features querying data, search and data analysis and data synchronization.

SQL Database uses a special version of Microsoft SQL Server as its backend. It provides high availability by storing multiple copies of databases, elastic scale and rapid provisioning. It exposes a subset of the full SQL Server functionality, including only a subset of the data types-including string, numeric, date and Boolean. It uses an XML- based format for data transfer. Like Microsoft SQL Server, SQL Database uses T-SQL as the query language

and Tabular Data Stream (TDS) as the protocol to access the service over the internet.(The product does not provide a RSET- based API to access the service over HTTP- Microsoft recommends using ADO.NET Data Services for this purpose)

Windows Server 2012

Windows Server 2012, codenamed “Windows Login Serve 8th, is the sixth release of Windows Server. It is the server version of Windows 8 and succeeds Windows 2008 R2. Two pre-release versions, a developer preview and a beta version, were released during development.

Unlike, its predecessor, Windows Server 2012 has no support for Itanium-based computers, and has four editions.

The successor to Windows Server 2012, called Windows Server 2012 R2, was released along with Windows 8.1 in October 2013. A service pack, formally designated Windows Server 2012 R2 Update, was released in April 2014.

3.0 Architectural Diagram

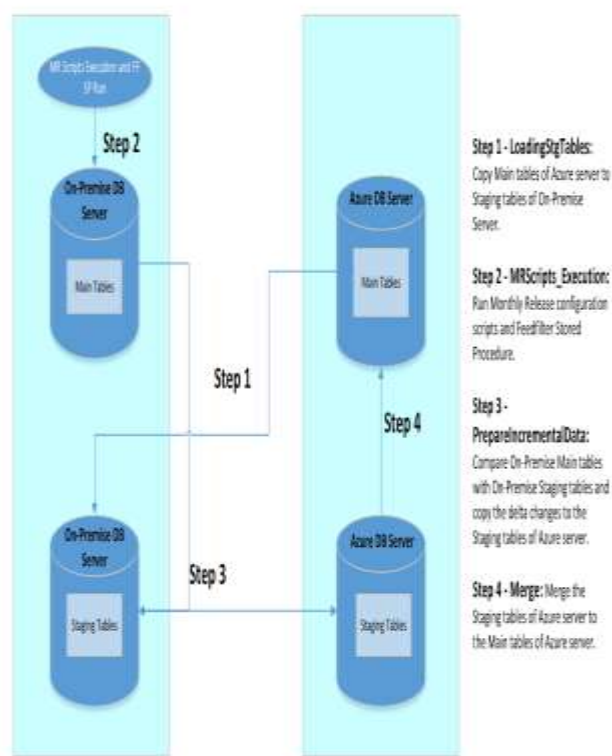


Figure1: Architectural Diagram of Incremental Data Load on premises to Azure

Flow chart:



3. Test Plan

Test Case 1:- After executing the Scripts and running required jobs the now counts at On Premise for all required tables and the row counts for all tables on azure server should be same.

Test Case 2:- Data Validations done for Random data as well as for specific changes by following below approaches:-

For Insertion

If inserting new record at On Premise in specific -> Running Job -> validating same record should be INSERTED on Azure.

If deleting record from Azure specific table -> Running Job -> validating same record should be DELETED on Azure.

For Deletion

If deleting record from On Premise from specific table -> Running Job -> validating same record should be DELETED on Azure.

If inserting new record on Azure in specific table -> Running Job -> validating same record should be DELETED on Azure.

For Updating

If Updating record at On Premise in specific table -> Running Job -> validating same record should be UPDATED on Azure.

If Updating record on Azure in specific table -> Running Job -> validating same record should be ROLLBACK.

Test Case 3:- Accessing application and checking breaking of application while job is running.

Test Case 4:- If user has selected the product and Program as well and moving to next page meanwhile deletion container executed through job than below warning message will be displayed:

Warning:-“Warning! Sorry but your report does not meet the minimum requirements for the selected program”

4. Result

We do not need to bring the application offline while loading data on cloud and there is no need to truncate and load unnecessary data again and again.

5. Conclusion

After completion of data load from on-premises to azure application; to load monthly data on SQL azure database we no need to bring internet based application offline.

Following are the outcome of this application:

1.Application availability: Cloud based application will be available to user

2.Minimum load time: During monthly data load; only new data will be loaded in SQL azure database, which will decrease the load time.

6. Future Scope

During data load if an existing records is accessed by business to generate the reports and the same records are modified in the backend and if that time customer accesses those data then below popup message will display to customer-“Value has been updated kindly refresh to get the updated and accurate report.”

Benefits:

In proposed system we do not need to bring the application offline while loading data on cloud. Customer satisfaction increases.

Limitation:

In existing system we need to bring the application offline while loading data on cloud.

References

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