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云中数据库的管理监控，应用部署与迁移

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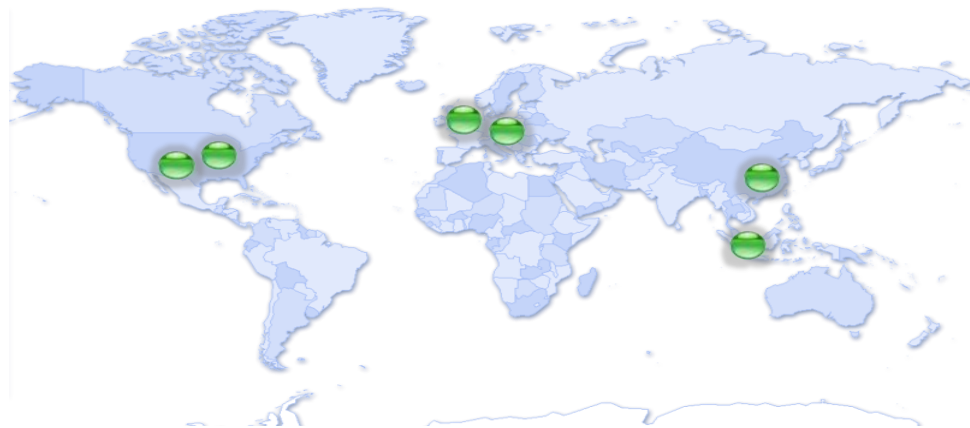
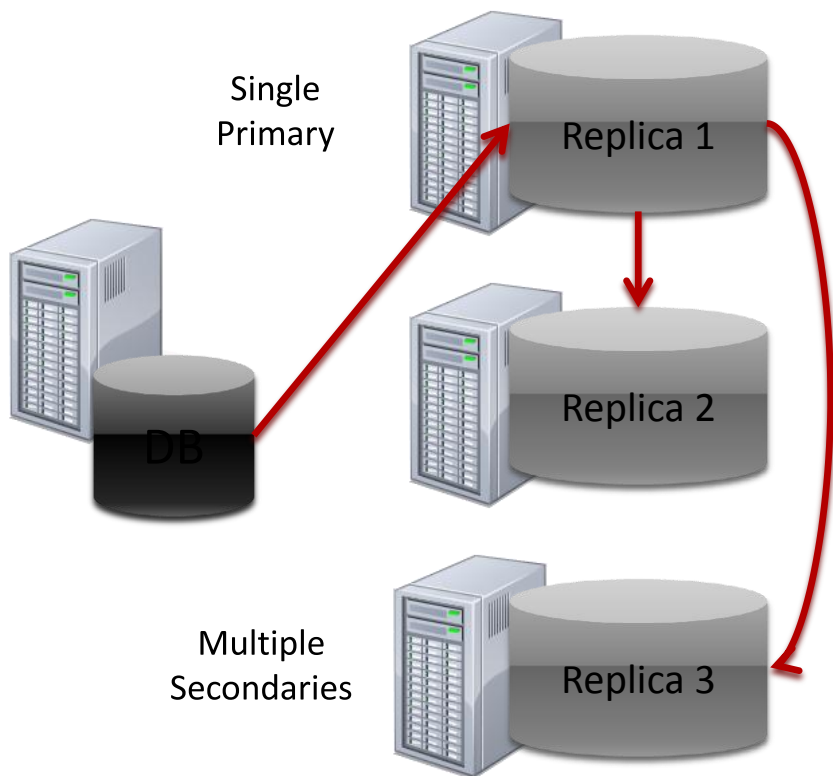
演讲内容

- 回顾 - 当前状态的SQL Azure
- 设置服务器和数据库
- 安装和迁移数据库
- 理解节流
- 数据库调试
- 即将推出的SQL Azure新功能

SQL Azure 的现状

Single Logical
Database

Multiple Physical
Replicas



- 基于 SQL Server 2008 R2 的引擎
- 使用相同的工具和数据访问方式
- 6个全球数据中心
- 高可用性和冗余性(Redundancy)
 - 在 Primary 进行读写
 - 写入复制到一群确定数目的 Secondaries 中

SQL Server and SQL Azure 之比较

- **对称是基本要求 (Goal is symmetry):**
 - T-SQL, features
 - 工具 (Tools)
 - 联接方式 (Connectivity)
 - Frameworks
- **存在一些不同 (Some variations exist):**
 - Table design (e.g. need clustered index)
 - T-SQL (e.g. CREATE DATABASE)
 - 某些功能的不同 (e.g. No FILE STREAM yet)
 - 如何实现扩展性 (向外扩展 scale out)
 - 概述: <http://msdn.microsoft.com/en-us/library/ff394102.aspx>
- **随着时间的推移差异正在减少**
 - Roadmap at end

与SQL Server 的不同

- **基于数据库的版本**

- SQL Azure 基于 SQL Server Denali

- **Table design:**

- 需要Clustered index
- 没有物理/服务器配置

- **Features:**

- 某些功能尚未公布
- E.g. Agent, Full-text, encryption, service broker, SQL CLR

- **连接处理**

- 延迟 (Latency)
- 负载均衡 (load balance)
- 节流 (Throttling)
- Continually improving

- **扩展**

- 数据库大小
- 向上扩展
- 向外扩展
- 弹性 (Elasticity)

- **进一步的信息:**

- Porting TFS:

<http://blogs.msdn.com/b/bharry/archive/2010/10/28/tfs-on-windows-azure-at-the-pdc.aspx>

2010 新增功能

	2010 Q1	2010 Q2	2010 Q3	2010 Q4
SQL Azure Database Services	<ul style="list-style-type: none"> • TSQL support • Tooling Support (SSMS, VS) • High Availability • Self-Management • Elastic Scale-out 	<ul style="list-style-type: none"> • Increased DB size to 50GB • Spatial data • MARS Support • Developer & management experience improvements (Support life-cycle of DB deployment) 	<ul style="list-style-type: none"> • Database copy • QoS Enhancements 	<ul style="list-style-type: none"> • New Integrated developer portal integrated with Windows Azure • Project “Houston” (Web-based management tool)
		Data Sync Service (CTP1) <ul style="list-style-type: none"> • Cloud-to-cloud sync 		Data Sync Service (CTP2) <ul style="list-style-type: none"> • On premises/cloud spanning
				Reporting CTP
Data Market	DataMarket CTP		Data Market GA <ul style="list-style-type: none"> • New partners, new content • OData and VS support 	<ul style="list-style-type: none"> • Billing, Payouts • Enhanced marketplace • Publication Experience

提供Server and Database的方法

- **Windows Azure Platform Portal (平台的门户)**
 - 界面简洁和明了 – no programmatic support
- **SQL Azure Server API**
 - 通过相互的客户端身份验证 (Secured via Mutual Client Authentication)
 - 使用和Windows Azure API相同的认证方法
 - 为DBA和操作人员提供最大的灵活性

演示

Using SQL Azure Portal and SSMS

安装和迁移数据库

- 若干可用的选项
- Script out work but not effective with any significant amount of data
 - Remember 'Script For Engine Type = SQL Azure'
- DACPACs are great
 - 支持所有的SQL Azure的数据类型和对象
 - 支持版本升级
 - 不包括数据
- BACPACs are even better
 - DACPAC 加上数据
 - Command line, Windows Azure Platform Portal(future) or PowerShell

演示

利用DAC Import and Export进行数据库迁移 (video)

如何理解和应对节流 (Throttling)

- **节流为在一个节点上的所有数据库程序提供了一个较好的环境** (Throttling provides a good experience to all databases on a single node)
- **SQL Azure是能够监测和自动平衡数据库** (SQL Azure is able to monitor and rebalance databases automatically)
- **重新调整使用一个交换/移动副本程序** (Rebalancing uses a swap / move replica procedure)
- **资源预留是更可预见的经验** (Resource reservation is coming for a more predictable experience)

为什么Throttling

- **过度的锁的消费 (Lock Consumption)**
 - Sessions 使用一百万以上的锁
- **过度的日志的消费 (Excessive Log Usage)**
 - 单笔交易消费 1GB 以上
- **未完成交易**
 - 单一交易消费 20% 以上的日志
- **过度的TempDB的消费 (Excessive TempDB usage)**
 - Session使用 5GB 以上的TempDB
- **过度的内存的消费(Excessive Memory Usage)**
 - 当节点出现内存竞争...
 - 使用16MB以上并超过 20 秒的对话(Sessions)将按序(descending)被中断
- **空闲连接超过30分钟 Idle Connections**

数据库调试

- 它的核心实际上是SQL Server
- 在云中，数据库管理员更重要
- 大多数动态管理视图(DMV)是供您使用
- 还提供了SQL Azure有关的动态管理视图 (DMV)

计算你的数据库的大小

```
SELECT  
SUM(reserved_page_count)*8.0/1024  
  
FROM sys.dm_db_partition_stats;
```

观察连接进程

```
SELECT e.connection_id, s.session_id,  
s.login_name, s.last_request_end_time,  
s.cpu_time  
FROM sys.dm_exec_sessions s  
INNER JOIN sys.dm_exec_connections e ON  
s.session_id = e.session_id
```

找出最耗费的查询

```
SELECT TOP 5 query_stats.query_hash AS "Query Hash",  
SUM(query_stats.total_worker_time) /  
SUM(query_stats.execution_count) AS "Avg CPU Time",  
MIN(query_stats.statement_text) AS "Statement Text" FROM  
(SELECT QS.*, SUBSTRING(ST.text, (QS.statement_start_offset/2)  
+ 1, ((CASE statement_end_offset WHEN -1 THEN  
DATALENGTH(st.text) ELSE QS.statement_end_offset END -  
QS.statement_start_offset)/2) + 1) AS statement_text FROM  
sys.dm_exec_query_stats AS QS CROSS APPLY  
sys.dm_exec_sql_text(QS.sql_handle) as ST) as query_stats  
GROUP  
BY query_stats.query_hash ORDER BY 2 DESC;
```

2011年的发展方向

数据保护/恢复

- Local Backup/PIT Restore: to recover from users/app errors
- Geo Backup/Disaster Recovery from data center/geographical disasters

新的数据移动功能

- DB Import/Export of data and schema between SQL Azure and SQL Server
- Migration support to SQL Azure from Sybase, in addition to existing support for Access, MySQL, Oracle

更强的管理体验

- Enhanced portal-based management
- Multiple DB administrators per subscription to support enterprise scenarios

用Federation向外扩展

- 为大型数据库提供在多台服务器主机进行无限扩展的可能
- Better support for multi-tenant applications with numerous tenants

向上扩展(Scale-up)和向外扩展 (Scale-down)

- Scale beyond 50GB, less than 1GB

提供可预测的性能

- Reserve compute capacity with Resource SLA

加强多租户(multi-tenancy)的支持

- API level support for multiple DB server per subscription, provisioning & de-provisioning

报表服务(RS as Service)提供丰富的洞解

- Ability to author rich reports, host in Azure and view in on-premises or cloud apps

应用程序之间的同步服务

- Synchronize data between SQL Azure DBs and between SQL Azure & SQL Server DBs

丰富的开发体验

- **Professional Devs:** VS “Juneau”
- **Departmental Devs:** VS LightSwitch
- **Java Devs:** supported JDBC driver
- **International Devs:** Localized Azure Portal

进一步加强的 DataMarket

- International Rollout
- Enhanced Content Management
- Integration with Denali, Office, CRM

演示

New SQL Azure Management Portal

内容回顾

- **设置服务器和数据库**
 - 通过GUI或编程
- **安装和迁移数据库**
 - BACPAC提供最好的体验
- **如何理解节流**
- **数据库调试**
- **即将推出的SQL Azure新功能**

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