Serverteknologi Database Cheat Sheet

by Nicholade via cheatography.com/62330/cs/16133/

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Serverteknologi Database

Relation Database

A relational database is a set of formally described tables from which data can be accessed or reassembled in many different ways without having to reorganize the database tables. The standard user and application programming interface (API) of a relational database is the Structured Query Language (SQL). SQL statements are used both for interactive queries for information from a relational database and for gathering data for reports.

Reference: https://en.wikipedia.org/wiki/Microsoft_SQL_Server

MS SQL Architecture

External Protocols	Shared memory - Named pipes - TCP/IP - Virtual Interface Adapter (VIA)
Database Engine	Database Tables/Indexes - Type System Transactions - Events/Exception Triggers - TSQL - Stored Procedure - SQLCLR
Storage Engine	Transaction Services & File Manager (Utilities) – Buffer Manager & Lock Manager (Access Methods)
Query Processor	Parser - Optimizer - SQL Manager - Database Manager - Query Executer
SQL OS API	Lock Manager – Synchronization Services – Thread Scheduler – Buffer Pool – Memory Manger – I/O Manager

Reference: http://udayarumilli.com/sql-server-architecture-qa-3/

Database Design and Resource use

Database planning	Planning the database is very important in terms of creating a resourceful and working database. Even though it seems obvious – It can be one of the most demanding tasks, when creating a relational database.
Documentation	The importance of documentation of a database, will make it easier for maintaining and altering changes further ahead in the database.
Naming conventions	Even if you consider naming your tables, columns etc. to be easy – It is very important to use clear and understandable name giving for your database – So it can be understood by everyone who need to work on the database.
Normalize	It very important to know the rules of normalization in terms of relational database structure. If the principles of normalization are done right. Your database will be efficient and logical to everyone. It is very important that your normalization is done right up to the Third Normalization.
Data types	Giving your design the right data types is crucial for a working database. Therefore is very important to give your columns in your database the most appropriate data type for each and give you better understanding of the data.

Database Design and Resource use (cont)

Primary keys	It is very important in terms of relational database, that your primary and natural key is set correctly. Be sure that you define a primary key and natural key for your tables – It can be very important when you start to break up your tables when you start to normalize.
Data Integrity	Data integrity is very important when you work with RDBMS and it is one of the core functions to uphold the data integrity in your database.
Indexing	A proper indexing is a key to a successful database. It can be very complexed to index your database and deserves quite focus when creating your database.
Testing	Testing your relational database is very important and can be crucial to avoid system failures. Quality assurance is there for key in database creating.

Reference: https://www.quora.com/What--are-good-resources-to-learn-Database-design-best-practices

Install SQL Server

Hardware Minimum Requirements

SQL Server requires a minimum of 6 GB of available hard-disk space.

SQL Server requires Super-VGA (800x600) or higher resolution monitor.

Memory: Express Edition 512 MB, All other Editions 1 GB

Processor Speed: x64 Processor: 1.4 GHz

Install SQL Server (cont)

Processor Type: x64 Processor: AMD Opteron, AMD Athlon 64, Intel Xeon with Intel EM64T support, Intel Pentium IV with EM64T support

Install SQL Server

`Run setup.exe from your media -> Instal lation -> Choose "New SQL Server stand- alone instal lation or add f`

Advance to Install Setup Files and check for updates, if not move on and check your installation is correct. Click Next.

`On Instal lation type choose new or add features to existing and click Next -> Advanced -> Named Instance`

https://docs.microsoft.com/en-us/sql/sql-server/install/hardware-and-software-requirements-for-installing-sql-server?view=sql-server-2017

Configure Windows Firewall

Open TCP port 1433

Run netsh.exe with admin permissions

`firewall set portop ening protocol = TCP port = 1433 name = SQLPort mode = ENABLE scope = SUBNET profile = C`

Tabeller

MASTER	The master database records all the system-level information for a SQL Server system.
MODEL	The model database is used as the template for all databases created on an instance of SQL Server.
MSDB	The msdb database is used by SQL Server Agent for scheduling alerts and jobs and by other features such as SQL Server Management Studio, Service Broker and Database Mail

Tabeller (cont)

TEMPDB	The tempdb system database is a global resource that is available to all users connected to the instance of SQL Server or connected to SQL Database. Tempdb is used to hold: *Temporary user objects that are explicitly created. Internal objects that are created by the database engine. tempdb is re-created every time SQL Server is started*

Add users (RDMS)

Powershell

`$newUser = New-RD MUser -Name " Log inN ame " -Creat eSQ LSe rve rLogin edS ecurity`

GUI

SSMS > "SQL-Server" > Right click on Security > New - Login

Creating an user in Query

```
CREATE LOGIN " USE RNA ME"
WITH PASSWORD = 'Pa$$w0rd'
```

The Password need to follow the Windows policy requirement

```
GO
CREATE USER " USE RNA ME" FOR LO GIN " USE RNA ME"
GO
```

User Permissions (RDMS)

Powershell

```
Set-RD MUs erP roperty -User $newUser -Property " Add " -Value $TR UE
Set-RD MUs erP roperty -User $newUser -Property " Edi t" -Value $T RUE
Set-RD MUs erP roperty -User $newUser -Property " Delete " -Value $TRUE
```

GUI

SSMS > "SQL-Server" > Databases > "Database" > Security > Users > Right Click on an user > Permissions > Owned Schemas

Alter User with Query

`EXEC sp_add rol emember ' " SCH EMA S" ', ' " USE RNA ME" '`

Backup of Database

Create a Full Backup

Go to your Database in Object Explorer

`Right click NORTHWIND -> Tasks ->`

It creates our backup and sets it to default loca

Create a Full Backup to non-default location

Go to your Database in Object Explorer

`Right click NORTHWIND -> Tasks ->`

`From here go to Destin ation -> Ge u`

Click Remove until all existing backup files hav

Click Add and enter your desired Path.

It creates our backup and sets it to your chang

Recovery of Database

Recovery of Full Database Backup

Right click NORTHWIND -> Restore Database... -> From Device -> Add -> Browse your file -> OK -> Select point to restore

Optimize Database Operations

In SSMS open SQL Activity Monitor by pressing

CTRL + ALT + A

View Log Files gathered from SQL

%ProgramFiles%\Microsoft SQL Server\13-0\Setup Bootstrap\LOG\

Import & Export Database MS Tool

Import and Export Wizard

Run the SQL server 2016 Import and Export Data Wizard

Click Next -> Pick Excel as Data source -> Choose Destination SQL server and modify the settings -> Choose Copy Data -> Next -> Pick your Table to copy -> OK -> Check Run Immediately -> Finish

Setup Replication

1. Configure Distributor and publisher

SSMS > "SQL-Server" > Right click Replication > Configure Distribution > Act as own Distributor > When asked for publisher add second server

2. Creating Snapshot Publication

Setup Replication (cont)

SSMS > "Publisher Server" > Replication > Right click Local Publications > New publications > Use following server > Add > Select Distributor > Select Database > Snapshot Publication > Choose Tables > Create Snapshot Immediately

3. Create Subscription

SSMS > "Publisher server" > Replication > Local Publications > Right click the new replication > New Subscription > Add Subscription > Run all Agents at Distribution > Add SQL Server Subscription > Choose a Path > Add New Database > Agent Schedule > Run Continuously > Initialize > Immediately

Snapshot Agent

The Snapshot agent stores an executable file which stores schema and data of published tables and db objects. It's updated when synchronization jobs are recorded.

Distribution Agent

Works with Snaphot to distribute to subscribers. Moves transactions held at the distribution db out to the subscribers.

Merge Agent

It applies the initial snapshot to the Subscriber and moves incremental data changes that occur.

Queue Reader Agent

It runs at the Distributor and moves changes made at the Subscriber back to the Publisher.

https://www.codeproject.com/Articles/71-5550/SQL-Server-Replication-Step-by-Step

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