

Database Health Monitoring

As a database administrator, monitoring the health and performance the database should be one of their most important tasks. Often, an administrator will use the system catalog (known as the Catalog Views in SQL Server) to monitor the health of the database.

Catalog Views and System Dynamic Management Views:

Object Catalog:

<https://docs.microsoft.com/en-us/sql/relational-databases/system-catalog-views/object-catalog-views-transact-sql>

Dynamic Management Views:

<https://docs.microsoft.com/en-us/sql/relational-databases/system-dynamic-management-views/system-dynamic-management-views>

Some of the aspects of a database that we must monitor are:

- Disk space usage of the database files.
- Number of connections.
- Query execution duration.
- Processor utilization.

The following System Views help an administrator monitor the database and make inquiries on what is occurring.

Sys.objects

Contains all the objects in the database. An object in SQL Server can be considered one of the following items:

AF = Aggregate function (CLR)
C = CHECK constraint
D = DEFAULT (constraint or stand-alone)
F = FOREIGN KEY constraint
FN = SQL scalar function
IT = Internal table
P = SQL Stored Procedure
PK = PRIMARY KEY constraint
S = System base table
TR = SQL DML trigger
U = Table (user-defined)
UQ = UNIQUE constraint
V = View

<https://docs.microsoft.com/en-us/sql/relational-databases/system-catalog-views/sys-objects-transact-sql>

Example:

Return the ObjectId, name and create date of all user tables

```
select object_id, name, create_date from sys.objects
where type = 'U'
```

Sys.dm_exec_query_stats

Contains the aggregate performance statistics for cached query plans. A query plan is an in-memory data structure which is the output of the of the SQL optimizer and a defines what is the most efficient way to execute a query.

<https://docs.microsoft.com/en-us/sql/relational-databases/system-dynamic-management-views/sys-dm-exec-query-stats-transact-sql>

NOTE: If interested in how SQL processes select statements, review the following:

[https://technet.microsoft.com/en-us/library/ms190623\(v=sql.105\).aspx](https://technet.microsoft.com/en-us/library/ms190623(v=sql.105).aspx)

Example:

Return the top 5 worst queries based on cpu execution time

```
SELECT TOP 5
    total_worker_time, execution_count, sql_handle
FROM sys.dm_exec_query_stats
```

```
ORDER BY total_worker_time/execution_count DESC
```

Sys.indexes

Contains all the indexes that have been created in the database along with the object (table) that it belongs to.

<https://docs.microsoft.com/en-us/sql/relational-databases/system-catalog-views/sys-indexes-transact-sql>:

Example:

Return the name of all the indexes and the table to which they belong.

```
select name, object_name(object_id) as tablename from sys.indexes
```

Sys.databases

Contains one row per database instance in SQL Server

<https://docs.microsoft.com/en-us/sql/relational-databases/system-catalog-views/sys-databases-transact-sql>

Example:

Return the name, database id and create date for all data bases created in the last 30 days.

```
select name, database_id, create_Date from sys.databases
where create_Date > dateadd(dd, -30, getdate())
```

Sys.sysprocesses

Contains info about the processes running in SQL Server on an instance of SQL Server.

<https://docs.microsoft.com/en-us/sql/relational-databases/system-compatibility-views/sys-sysprocesses-transact-sql>

Example:

Return the hostname, program, command and usernames running in the SQL Server which are not background processes or sleeping.

```
select hostname, program_name, cmd, nt_username from sys.sysprocesses
where status not in ('background', 'sleeping')
```

Sys.master_files

Contains info about the files used in a database instance

<https://docs.microsoft.com/en-us/sql/relational-databases/system-catalog-views/sys-master-files-transact-sql>

Example:

Return the physical drive path with filename and name of the files used with database name 'COP4703'

```
select physical_name, name from sys.master_files
where db_name(database_id) = 'cop4703'
```

There are many tools available at your disposal to monitor the health of your database. Understanding the Catalog Views and Dynamic Managements Views is a great way to retrieve that information.