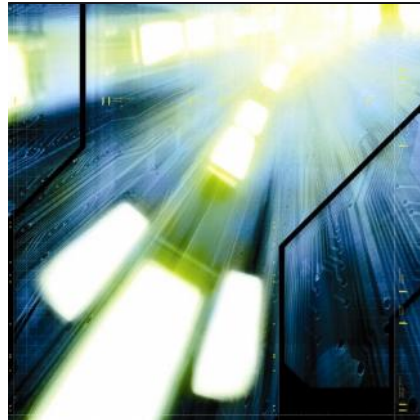


# OPC and Databases



# Overview

- Databases, SQL and ODBC
- OPC and ODBC
- Archiving OPC data in databases

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# Databases

- A database system (DBS) is a system for managing data digitally.
- The primary task of a DBS is to store large amounts of data efficiently, consistently and permanently.

# ODBC

- ODBC (Open Database Connectivity) is a standardized database interface which uses SQL as the database language.
- ODBC offers a programming interface (API) which enables programmers to develop applications relatively independently of the database management system being used if an ODBC driver exists for it.
- Examples of ODBC databases:
  - Microsoft SQL Server
  - Oracle
  - MySQL
  - IBM DB2

# SQL - Structured Query Language

- SQL (Structured Query Language) is a programming language for defining, querying and manipulating data for relational databases.
- SQL is an ANSI and ISO standard and is supported by nearly all commercial database systems.
- Simple syntax based on English colloquial language
- Provides commands for defining data structures, manipulating data (entering, editing and deleting datasets) and querying data

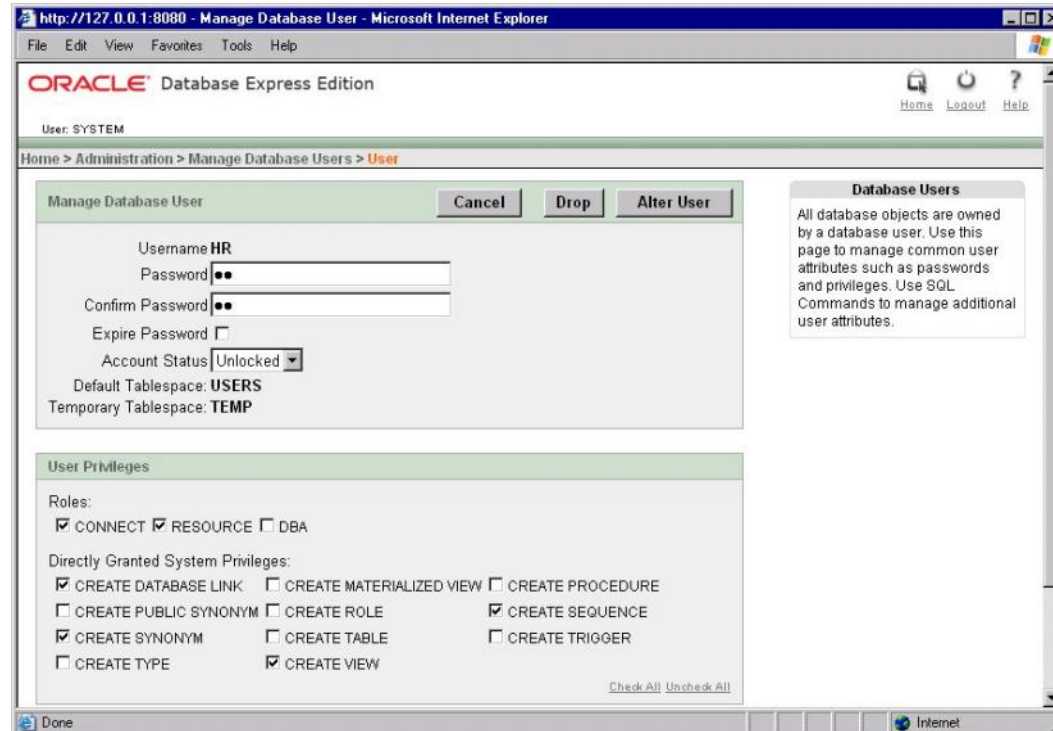
- Databases, SQL and ODBC
- OPC and ODBC
- Archiving OPC data in databases

## OPC and ODBC

- The OPC standard for capturing data and ODBC standard for archiving data are being combined more and more frequently
- Advantages:
  - Simple configuration via SQL statements
  - Conditional execution of SQL statements possible
  - No programming necessary

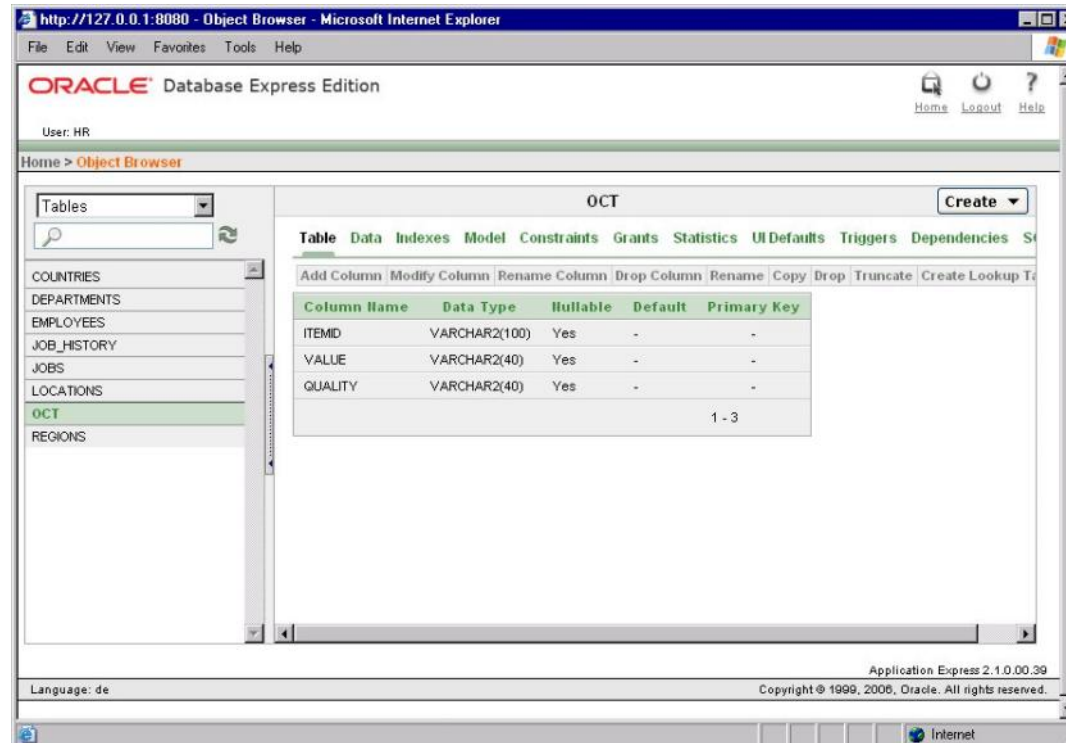
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# Archiving OPC in databases



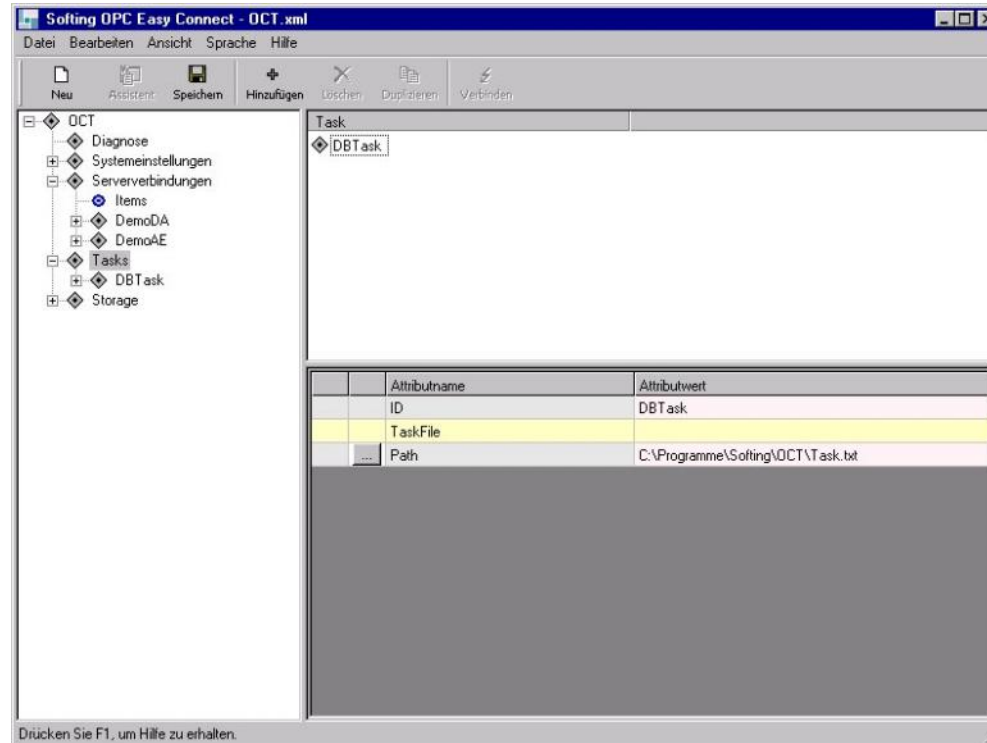
Launch database, such as Oracle, and log in

# Archiving OPC in databases



Using the object browser, create OCT table as shown in screenshot

# Archiving OPC in databases



Open the OPC Easy Connect configurator and create a new task, “DBTask”. The “Task.txt” file shows the type of database selected, e.g., Oracle.

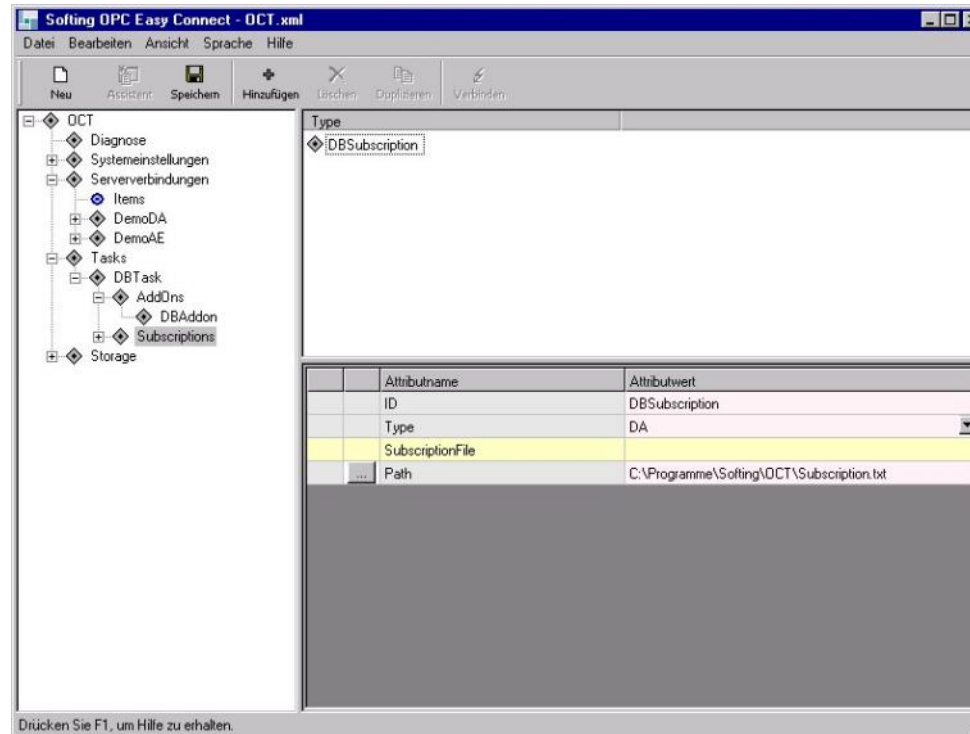
# Archiving OPC in databases

The screenshot shows a Microsoft Excel window titled "Microsoft Excel - Task.xls". The spreadsheet contains a table with columns A through G. The table lists various ODBC database configurations, including Oracle, IBM DB2, and MySQL. The first row (line 1) is highlighted in orange and serves as a header for the table. The second row (line 2) is also highlighted in orange and contains the column headers. The third row (line 3) is highlighted in green and contains a '#' symbol. The fourth row (line 4) is highlighted in blue and contains the configuration for an Oracle database. The fifth row (line 5) is highlighted in blue and contains the initialization statement for the Oracle database. The sixth row (line 6) is highlighted in green and contains a '#' symbol. The seventh row (line 7) is highlighted in blue and contains the configuration for an IBM DB2 database. The eighth row (line 8) is highlighted in blue and contains the initialization statement for the IBM DB2 database. The ninth row (line 9) is highlighted in green and contains a '#' symbol. The tenth row (line 10) is highlighted in blue and contains the configuration for a SQL Server database. The eleventh row (line 11) is highlighted in blue and contains the initialization statement for the SQL Server database. The twelfth row (line 12) is highlighted in green and contains a '#' symbol. The thirteenth row (line 13) is highlighted in blue and contains the configuration for a MySQL database. The fourteenth row (line 14) is highlighted in blue and contains the initialization statement for the MySQL database. The fifteenth row (line 15) is highlighted in green and contains a '#' symbol. The sixteenth row (line 16) is highlighted in green and contains a '#' symbol. The status bar at the bottom of the window shows "Bereit".

	A	B	C	D	E	F	G
1	#DB	Database ID	Driver	Host	Database Name	User Name	Password
2	#INIT	Database ID	Statement				
3	#						
4	DB	MyDB	Oracle in XEclient	127.0.0.1/XE	hr	hr	hr
5	INIT	MyDB	ALTER SESSION SET NLS_TIMESTAMP_FORMAT='YYYY-MM-DD HH24:MI:SS.FF'				
6	#						
7	#DB	MyDB	IBM DB2 DRIVER for ODBC - MyPathToClidriver	127.0.0.1	MyDBName	MyUser	MyPassword
8	#INIT	MyDB	SET SCHEMA MySchemaName				
9	#						
10	#DB	MyDB	SQL Server	MyMachine\SQLEXPRESS	MyDBName	MyUser	MyPassword
11	#INIT	MyDB	SET DATEFORMAT ymd				
12	#						
13	#DB	MyDB	MySQL ODBC 3.51 Driver	127.0.0.1	MyDBName	MyUser	MyPassword
14	#INIT	MyDB	USE MyDB				
15	#						
16	#						

Selecting the ODBC database: The “Task.xls” Excel file lists the four types of ODBC database with their respective settings. For the Oracle database in our example, lines 4 and 5 must be active.

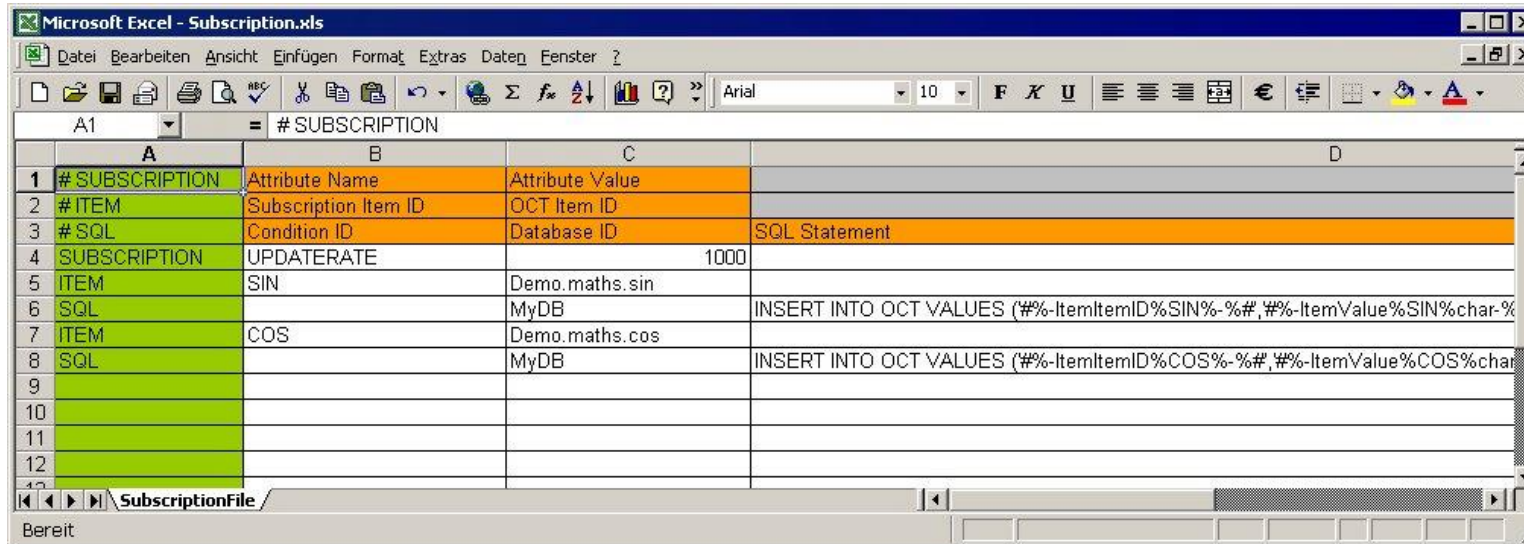
# Archiving OPC in databases



Configuring a subscription for acquiring data from OPC Data Access or XML-DA servers, including update rate

Types: DA or XMLDA

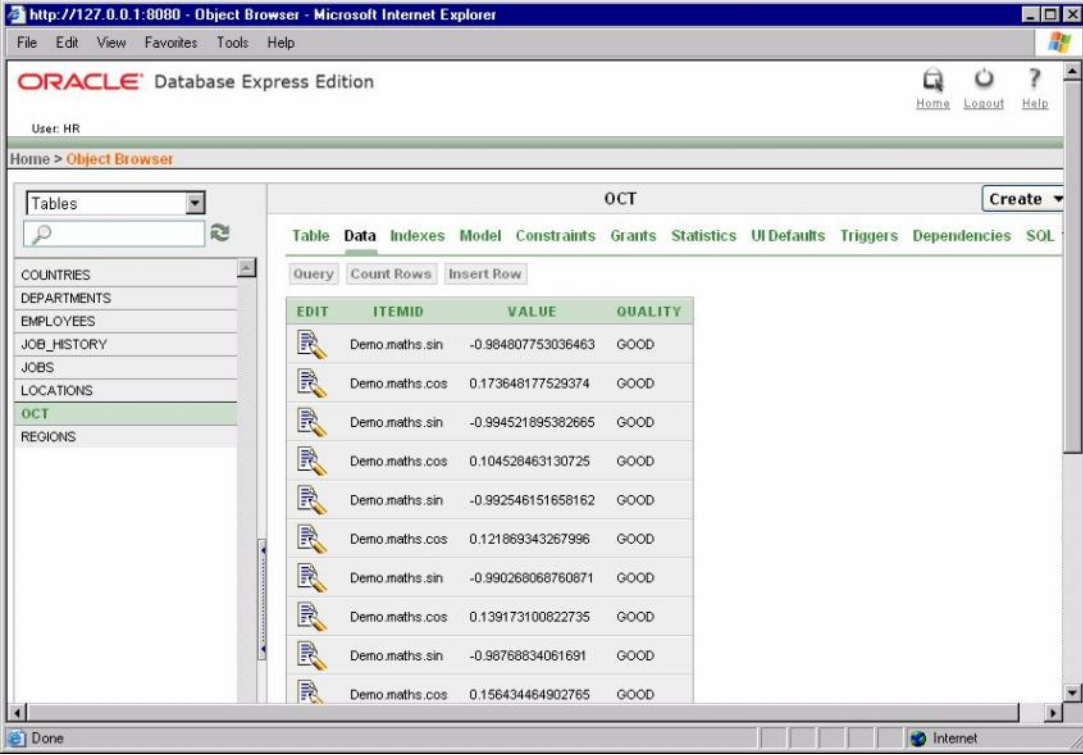
# Archiving OPC in databases



	A	B	C	D
1	#SUBSCRIPTION	Attribute Name	Attribute Value	
2	#ITEM	Subscription Item ID	OCT Item ID	
3	#SQL	Condition ID	Database ID	SQL Statement
4	SUBSCRIPTION	UPDATERATE	1000	
5	ITEM	SIN	Demo.maths.sin	
6	SQL		MyDB	INSERT INTO OCT VALUES (##-ItemItemID%SIN%-##,##-ItemValue%SIN%char-%
7	ITEM	COS	Demo.maths.cos	
8	SQL		MyDB	INSERT INTO OCT VALUES (##-ItemItemID%COS%-##,##-ItemValue%COS%char-%
9				
10				
11				
12				

The “Subscription.xls” Excel file defines which OPC data points will be written to which database cells and the rate at which the data should be updated - in this example, it is 1000 milliseconds.

# Archiving OPC in databases



The screenshot shows the Oracle Database Express Edition Object Browser interface. The browser is displaying the 'OCT' table. The table has four columns: 'EDIT', 'ITEMID', 'VALUE', and 'QUALITY'. The data is as follows:

EDIT	ITEMID	VALUE	QUALITY
	Demo.maths.sin	-0.984807753036463	GOOD
	Demo.maths.cos	0.173648177529374	GOOD
	Demo.maths.sin	-0.994521895382665	GOOD
	Demo.maths.cos	0.104528463130725	GOOD
	Demo.maths.sin	-0.992546151658162	GOOD
	Demo.maths.cos	0.121869343267996	GOOD
	Demo.maths.sin	-0.990268068760871	GOOD
	Demo.maths.cos	0.139173100822735	GOOD
	Demo.maths.sin	-0.98768834061691	GOOD
	Demo.maths.cos	0.156434464902765	GOOD

When OPC Easy Connect is launched, two entries are written to the database table every second.

