**Example 12.1**

USE master;

CREATE MASTER KEY

ENCRYPTION BY PASSWORD = 'p1s4w9d16!';

GO

CREATE CERTIFICATE cert01

WITH SUBJECT = 'Certificate for dbo';

**Example 12.2**

SELECT p.name, c.name, certificate\_id

FROM sys.database\_principals p, sys.certificates c

WHERE p.principal\_id = p.principal\_id;

**Example 12.3**

USE sample;

GO

-- Associate the certificate to the sample database

USE sample;

CREATE DATABASE ENCRYPTION KEY

WITH ALGORITHM = AES\_128

ENCRYPTION BY SERVER CERTIFICATE cert01;

**Example 12.4**

USE master;

ALTER DATABASE sample SET ENCRYPTION ON;

Example 12.5

USE master;

SELECT \* FROM sys.dm\_database\_encryption\_keys

WHERE encryption\_state = 3;

Example 12.6

USE sample;

CREATE TABLE employee\_encr(

emp\_no INT NOT NULL,

emp\_lname nvarchar (11) COLLATE Latin1\_General\_BIN2

ENCRYPTED WITH (ENCRYPTION\_TYPE = DETERMINISTIC,

ALGORITHM = 'AEAD\_AES\_256\_CBC\_HMAC\_SHA\_256',

COLUMN\_ENCRYPTION\_KEY = MyCEK) NOT NULL,   
salary MONEY

ENCRYPTED WITH (ENCRYPTION\_TYPE = RANDOMIZED,

ALGORITHM = 'AEAD\_AES\_256\_CBC\_HMAC\_SHA\_256',

COLUMN\_ENCRYPTION\_KEY = MyCEK) NOT NULL);

**Example 12.7**

USE sample;

SELECT t.name AS table\_name, c.name AS column\_name,

c.encryption\_type\_desc AS encr, k.name

FROM sys.columns c JOIN sys.column\_encryption\_keys k

ON (c.column\_encryption\_key\_id= k.column\_encryption\_key\_id)

JOIN sys.tables t ON (c.object\_id = t.object\_id);

**Example 12.8**

USE sample;

CREATE LOGIN mary WITH PASSWORD = 'you1know4it9!';

**Example 12.9**

USE sample;

CREATE LOGIN [NTB11901\pete] FROM WINDOWS;

**Example 12.10**

USE sample;

GO

CREATE SCHEMA my\_schema AUTHORIZATION peter;

GO

CREATE TABLE product

(product\_no CHAR(10) NOT NULL UNIQUE,

product\_name CHAR(20) NULL,

price MONEY NULL);

GO

CREATE VIEW product\_info

AS SELECT product\_no, product\_name

FROM product;

GO

GRANT SELECT TO mary;

DENY UPDATE TO mary;

**Example 12.11**

USE AdventureWorks;

ALTER SCHEMA HumanResources TRANSFER Person.ContactType;

**Example 12.12**

USE sample;

CREATE USER peter FOR LOGIN [NTB11901\pete];

CREATE USER mary FOR LOGIN mary WITH DEFAULT\_SCHEMA = my\_schema;

**Example 12.13**

USE sample;

CREATE APPLICATION ROLE weekly\_reports

WITH PASSWORD ='x1y2z3w4!',

DEFAULT\_SCHEMA =my\_schema;

**Example 12.14**

USE master;

GO

CREATE SERVER ROLE programadmin;

ALTER SERVER ROLE programadmin ADD MEMBER mary;

**Example 12.15**

USE sample;

CREATE ROLE marketing AUTHORIZATION peter;

GO

ALTER ROLE marketing ADD MEMBER peter;

ALTER ROLE marketing ADD MEMBER mary;

**Example 12.16**

USE sample;

GRANT CREATE TABLE, CREATE PROCEDURE

TO peter, mary;

**Example 12.17**

USE sample;

GRANT CREATE FUNCTION TO mary;

**Example 12.18**

USE sample;

GRANT SELECT ON employee

  TO peter, mary;

**Example 12.19**

USE sample;

GRANT UPDATE ON works\_on (emp\_no, enter\_date) TO peter;

Example 12.20

USE sample;

GRANT VIEW DEFINITION ON OBJECT::employee TO peter;

GRANT VIEW DEFINITION ON SCHEMA::dbo TO peter;

Example 12.21

USE sample;

GRANT CONTROL ON DATABASE::sample TO peter;

Example 12.22

USE sample;

GRANT SELECT ON works\_on TO mary

  WITH GRANT OPTION;

**Example 12.23**

USE sample;

DENY CREATE TABLE, CREATE PROCEDURE

  TO peter;

**Example 12.24**

USE sample;

GRANT SELECT ON project

  TO PUBLIC;

DENY SELECT ON project

        TO peter, mary;

**Example 12.25**

USE sample;

REVOKE SELECT ON project

  FROM PUBLIC;

**Example 12.26**

USE my\_sample;

CREATE USER my\_login WITH PASSWORD = 'x1y2z3w4?';

**Example 12.27**

USE sample;

EXECUTE sys.sp\_cdc\_enable\_db;

**Example 12.28**

USE sample;

EXECUTE sys.sp\_cdc\_enable\_table

@source\_schema = N'dbo', @source\_name = N'works\_on',

@role\_name = N'cdc\_admin';

**Example 12.29**

USE sample;

INSERT INTO works\_on VALUES (10102, 'p2', 'Analyst', NULL);

INSERT INTO works\_on VALUES (9031, 'p2', 'Analyst', NULL);

INSERT INTO works\_on VALUES (29346, 'p3', 'Clerk', NULL);

**Example 12.30**

USE sample;

SELECT \*

FROM cdc.fn\_cdc\_get\_all\_changes\_dbo\_works\_on

(sys.fn\_cdc\_get\_min\_lsn('dbo\_works\_on'), sys.fn\_cdc\_get\_max\_lsn(), 'all');

**Example 12.31**

USE sample;

DECLARE @from\_lsn binary(10), @to\_lsn binary(10);

SELECT @from\_lsn =

sys.fn\_cdc\_map\_time\_to\_lsn('smallest greater than', GETDATE() - 1);

SELECT @to\_lsn =

sys.fn\_cdc\_map\_time\_to\_lsn('largest less than or equal', GETDATE());

SELECT \* FROM

cdc.fn\_cdc\_get\_all\_changes\_dbo\_works\_on (@from\_lsn, @to\_lsn, 'all');

**Example 12.32**

USE sample;

GO

CREATE VIEW v\_without\_budget

  AS SELECT project\_no, project\_name

              FROM project;

**Example 12.33**

USE sample;

GO

ALTER TABLE employee

  ADD user\_name CHAR(60) DEFAULT SYSTEM\_USER;

GO

CREATE VIEW v\_my\_rows

        AS SELECT emp\_no, emp\_fname, emp\_lname, dept\_no

             FROM employee

             WHERE user\_name = SYSTEM\_USER;

**Example 12.34**

USE sample;

GO

CREATE VIEW v\_analyst

  AS SELECT employee.emp\_no, emp\_fname, emp\_lname

             FROM employee, works\_on

             WHERE employee.emp\_no = works\_on.emp\_no

             AND job = 'Analyst';