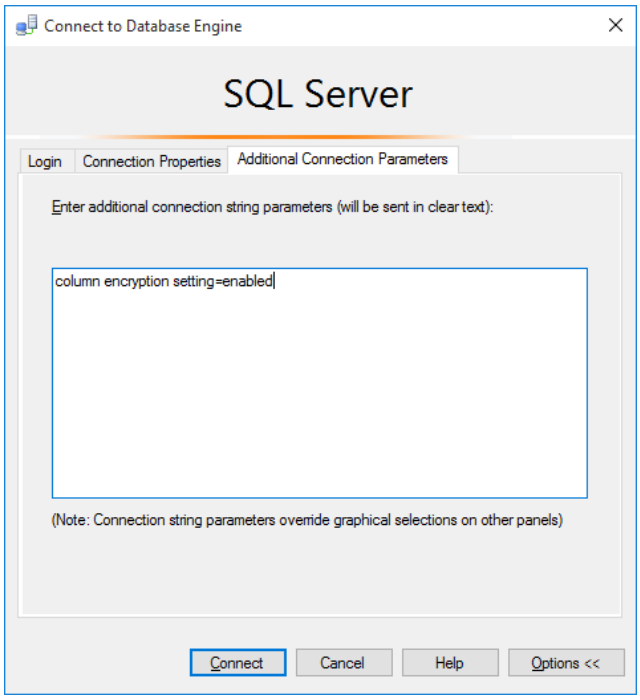
Always Encrypted README

The AdventureWorks database uses the Always Encrypted feature to protect sensitive information stored in the `SSN` and `CreditCardNumber` columns in the `Sales.CustomerPII` table. This file provides the steps to explore the capabilities of Always Encrypted and the encryption configuration in the database.

For information about Always Encrypted, please see:

- MSDN documentation: Always Encrypted (Database Engine)
- Always Encrypted articles on SQL Server Security Blog

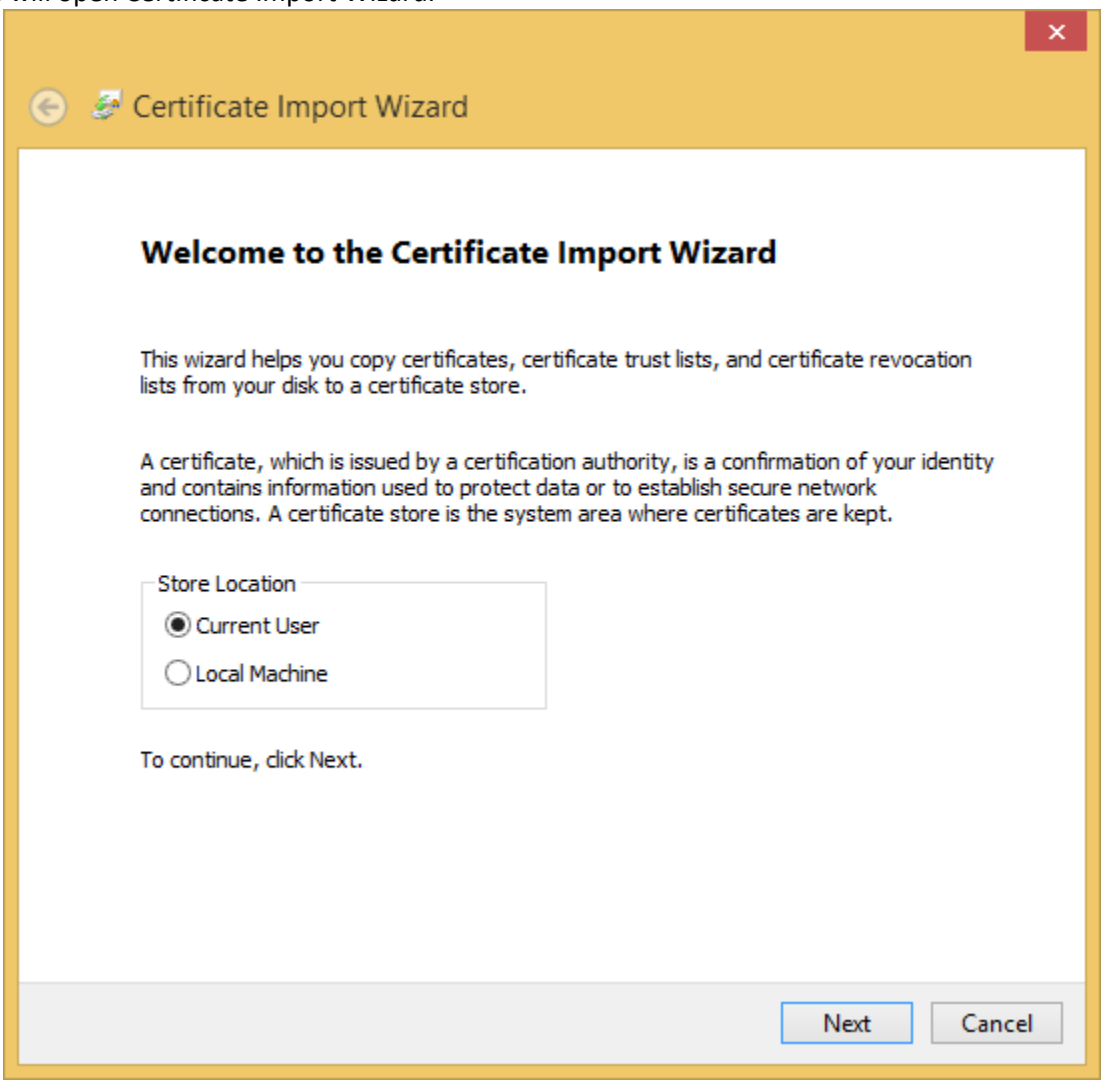
1) Query encrypted columns without decrypting sensitive data:
   a) Using SSMS, connect to the database.
   b) Using Object Explorer, navigate to the `Sales.CustomerPII` table.
   c) Right-click on the table and choose **Select Top 1000 Rows**.
      i) The query should return binary values, e.g.: `0x01F7753C73CA15965E314…`, in both the `SSN` and `CreditCardNumber` columns.
2) Query encrypted columns, attempting to decrypt sensitive data without having the valid column master key configured in your environment.
   a) Close the database connection from step 1 and reconnect by adding the following connection string keyword/value in the **Additional Connection Parameters** of the **Connect to Database Engine** dialog: **column encryption setting=enabled**.



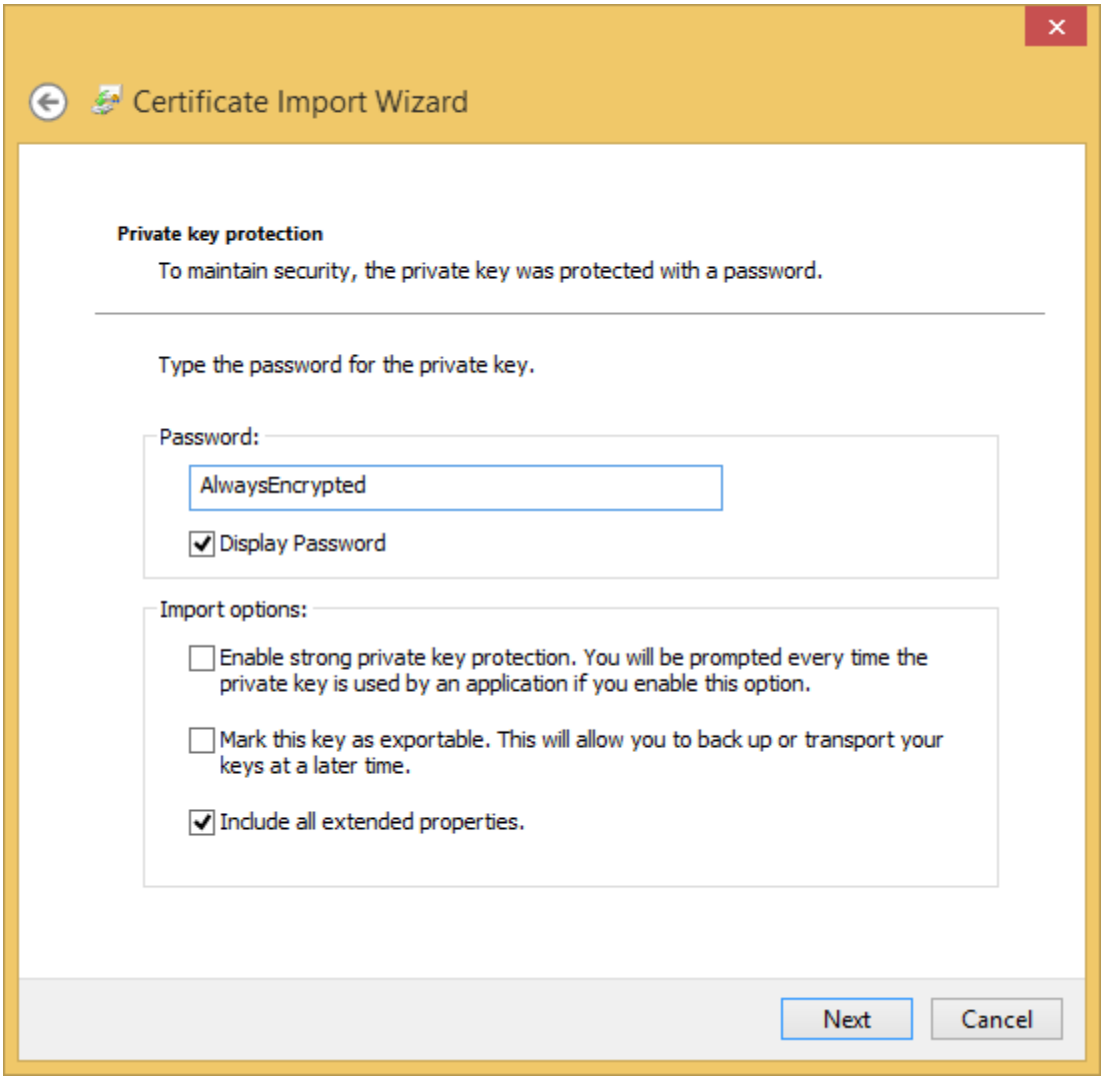
   b) Using Object Explorer, navigate to the `Sales.CustomerPII` table.
   c) Right-click on the table and choose **Select Top 1000 Rows**.

The query is expected to fail, as you try to decrypt sensitive data stored in the `SSN` and `CreditCardNumber` columns, but you do not have the column master key, protecting those columns.

3) Query sensitive data columns, decrypting the results using a valid column master key configured in your environment.
   a) Import the certificate that is configured as a column master key in the database.
      i) Using Windows explorer, navigate and double click on the AlwaysEncryptedCMK.pfx file. This will open Certificate Import Wizard.



      ii) Click **Next** (leave **Current User** selected for **Store Location**) and then **Next** again.
      iii) Enter the password for the certificate: **AlwaysEncrypted**.



iv) Click **Next** and then click **Finish**.

b) Make sure, you are connected to the database with **column encryption setting=enabled**. (please, see step 2a).

c) Using Object Explorer, navigate to the `Sales.CustomerPII` table.

d) Right-click on the table and choose **Select Top 1000 Rows**.
Since you can now access the certificate, used as a column master key in the database, the query should succeed and return plain text values stored in the `SSN` and `CreditCardNumber` columns.