

Consider the scenario of you have a new software application that needs to be promoted. You as a software developer is asked to allow your application to be installed/run in potential customers' computer system for a trial period. After the trial period your software application should cease to work.

Now you are tasked to design and implement a simple time expiry library that fulfill that purpose.

Requirement

The library API should provide functions for:

1. A function to create a start timestamp when the software product is installed.
 - The timestamp is encrypted before written into a file to avoid the timestamp be tampered.
 - The timestamp will be used as reference when the function of check for expiry.
 - The library should not create a new timestamp file if a timestamp file already exists. If that happens, the function should return a failure condition.
2. A function to check the expiry. This function returns a boolean to indicate the check result. It returns success condition except:
 - the timestamp file does not exist
 - the timestamp cannot be decrypted back to its original form (tampered).
 - the duration between current time and the decrypted timestamp is longer than the trial period (expired).
3. A function to inspect the timestamp

The library should be implemented as a dynamic link library (DLL), and its API should be designed and implemented in C++ (object-oriented). Microsoft Visual C++ is the suggested tool to provide the solution.

The software developer is suggested to use standard and third-party C++ libraries wherever he/she see fit to accomplish the task.

All unspecified details are to be decided by the software developer who design and implement this library.

All non-requirement decisions made by the developer should be well documented.

The software developer should also provide a test plan for this library.

A simple console application should be provided to prove the function of the library.

The library and the console application should be compiled without any warning and error.