



WHITE PAPER

TIME MACHINE VS. RESETTING THE SYSTEM CLOCK

INTRODUCTION

Many industries have business processes triggered by time-based events. Whether you're testing settlement dates, billing cycles, or payment schedules; time-based testing is an integral part of a tester's toolkit when it comes to ensuring optimal test coverage.

Rigorous & moreover reproducible application testing is a cornerstone for any test strategy in order to verify and validate that the system will operate the way it has been designed and – ultimately – requested by the business. Many companies struggle with enabling their applications and test environments to allow test engineers to easily update the testing date and therefore they cannot be certain if their test coverage truly encompasses all critical scenarios.

So, the test engineers frequently lack sufficient resources to complete comprehensive testing – from a test environment and a test data point of view. The commonly used method of waiting for a time trigger to occur (e.g. month-end cycle, end-of-day processing, etc.) is often not a practical way to test given the ever increasing demands of time-to-market conflicting with the desired full scope of time/date related test processes. A thorough software test process needs to involve running the applications with actual data in their target environment, executing the applications through an extensive range of past, present and future dates, and letting the test engineer and business users scrutinize the results for any functional inconsistencies. All of your existing programs and system functions should be tested in a current date/time environment while you test the future viability of the new program, in the same environment, interacting with all interfaces in an end-to-end test scenario.

So, why use Time Machine rather than resetting the system clock?

TIME MACHINE ALLOWS FOR THE TESTING OF 200 VIRTUAL CLOCKS SIMULTANEOUSLY ON ONE COMPUTER

Time Machine saves resources of time and money by eliminating down time and the need to purchase duplicate systems for testing. Productivity is boosted since you are not limited to one clock at a time and you are able to expedite testing by running multiple clocks concurrently. In addition, with Time Machine, you can automate test suites, instead of manually resetting the system clock every time.

NO VIRTUAL DATE TIME STAMPS ON FILES

Files manipulated by a user on Time Machine are not time stamped with the test/virtual date. In contrast, when the system clock is reset for testing, any files manipulated will be time stamped with the test clock. These time stamps can cause potential problems such as back up archive issues, file issues, or data corruption. Thus, it is extremely advantageous to not have the files' time stamps altered.

ONLY SPECIFIED USERS WILL SEE THE VIRTUAL CLOCKS ON TIME MACHINE

Users are assigned to a specific virtual clock on Time Machine. Users that are not on Time Machine will continue to see the system clock.

RENTAL, DEMO AND LICENSED SOFTWARE CAN BE EXCLUDED FROM THE VIRTUAL CLOCK WITH TIME MACHINE

If you have software with an expiration date, you may not be able to use it after resetting the system clock. Worse yet, this software can cause problems if it is run and has expired. With Time Machine, these applications can be excluded from the virtual clock, by placing them on an exclusion list. Thus, the user is still able run the application, but the application will see the system clock.

Time Machine has six log levels. It records date and time related system calls, identifies the application making the call, which system call was utilized, and the date/time that was returned. Thus, Time Machine will aid projects by identifying the date intrinsic and date commands referenced. Resetting the system clock will only test the behavior of your applications running on the future clock. Time Machine will not only do this, but it will also aid you in finding where and how the application failed or had problems.

TIME MACHINE LOGS DATE AND TIME SENSITIVE REQUESTS

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"FROZEN" VIRTUAL TIMES CAN BE TESTED BY TIME MACHINE

The virtual clock can be fixed in time to allow normally impossible testing scenarios.

VIRTUAL DATES AND TIMES CAN BE AUTOMATICALLY UPON SESSION AND JOB LOG IN

Users can be assigned to a clock once and will start traveling as soon as they log in without further assistance or manual operations.

NON-ROOT USERS CAN SET VIRTUAL CLOCKS

On most systems, only root can reset the system clock. Since Time Machine isn't actually resetting the system clock, non-root users can be given the ability to set virtual times.

REAL PRODUCTION DATA CAN BE RUN CONCURRENTLY

Since only assigned users are on Time Machine, users not traveling on Time Machine are unaffected, allowing production and development to continue normally and safely.

In addition, backups are likely to miss certain files.



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