VPE Software: SoloVPE Software Zero Kilobyte File Behavior

Abstract: This document provides detailed information about the SoloVPE Software, specifically a security related behavior that results in the creation of 0 kilobyte files during routine use.

Applicability: This article applies to Versions 1.X, 2.X and 3.0 (Pre Build 163) of the SoloVPE software

Symptom: Normal use of the File Save As Dialogs (Non-Cary WinUV Menu), as is done for Autosave actions, to specify target folders and files, creates a 0 KB file in the target path and displays and permission warning message to the user when the target folder has NTFS permissions configured to prevent deletion. Acknowledging the message still will allows data acquisition to proceed and the Batch file record to be created.

Cause: The behavior occurs because the Microsoft Windows API functionality on which the File Save As dialog relies includes a simple permissions verification event that tries to create and delete a null file in order to confirm that the current user has access rights to the target folder.

Detailed Info:

The SoloVPE hardware and software suite was developed by leveraging core spectrophotometer capabilities of Varian Inc. (now Agilent Technologies). The software that is provided with the SoloVPE technology is directly dependent on the Cary WinUV software platform that Agilent provides with their Cary line of instruments. The Cary WinUV technology is a mature technology that is very self-contained relative to the Windows operating system. It also contains its own scripting language to allow for customization and creation of new functionality. It was this flexibility that made it adaptable to the variable pathlength technology created by C Technologies.

In order to develop a software package that met the needs of SoloVPE customers, C Technologies had to leverage a variety of technologies including features and capabilities from Cary WinUV, the Windows environment and several other software components. A critical piece of functionality that was required in the software was the ability to browse for files to open or to browse to folders to specify save path and file names. This functionality was integrated using the mature common dialog control functionality that is integral to the Windows operating system API (Application Program Interface). API functionality is built into the software package in such as way that it can support and facilitate development of products just as was done in this case.

The common dialog control has been around for many versions of Windows and is considered a mature technology. There are many ways to achieve this functionality however, given the age and technology employed in Cary WinUV and the ADL development scripting language, the Common Dialog was the most accessible tool for the job. This functionality has existed in the SoloVPE Software since Version 1.X which was released in July of 2008 with the introduction of the variable pathlength technology. At the time, security features were not a consideration for the system and the enhancements, which would ultimately include SecureVPE, were not even in development.

As customers began to discover and use the variable pathlength tool and applications were found, the SoloVPE software was embraced by regulated industries such as the Biotech and Pharmaceutical industry where security is important. The requirements for the software have continued to evolve both from a scientific and a security

perspective. The reliance on Agilent's technology for the spectrophotometric engine, including the Cary 50/60 and Cary WinUV, has remained and as such some of the limitations persist. The use of the Common Dialog from the Windows API has remained a component in the software. However, as the system moved into more secured implementation an issue with the Common Dialog became apparent.

When the Common Dialog is used to specify save targets in folders with limited NTFS permissions, a 0 kilobyte files can be produced. After some research, the reason for this behavior was identified and it has to do with the NTFS permissions on the specified target folder and a security verification that Microsoft incorporated into the Windows API Common Dialog control.

- The Common Dialog performs a simple security verification to ensure that the currently logged in user has permissions to save a file to the specified target path. Microsoft integrated this features to prevent issues while using the Common Dialog. The Common Dialog creates a null file in the path, confirms it was created and then attempts to delete the null file after the verification is complete. If the null file is not found or it cannot be deleted the Common Dialog will present the user with a message box indicating that the user does not have necessary permissions to save a file in that location.
- When this behavior is combined with restrictive NTFS permissions, specifically permissions which allow the writing or creating of new files but not the deletion of files, the null (0 kilobyte) file remains in the target folder and the message box will be presented to the user.

The behavior does not actually preclude a successful save of the desired data so long as write permissions exist, however the null or 0 kilobyte file persists as an artifact of the Common Dialog's attempt to verify user rights prior to the save event. Users have dealt with the issue through a work around that acknowledges the Common Dialog warning message and then allows the data acquisition to complete based upon their understanding of this behavior.

This issue was resolved in version 3.0.163 of the SoloVPE Software with changes to the underlying implementation of the Browse for File Dialog functionality and Save As Dialog functionality.

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