

*Federal CIO Council*

# Federal Desktop Core Configuration

## Beating the Application Compatibility Challenge

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*FDCC*

# Optimizing Application Testing

*Basic  
Cost Center*

- ▶ Limited or ad-hoc application testing
- ▶ Limited or ad-hoc sharing of application issues and solutions

*Standardized  
More Efficient Cost Center*

- ▶ Defined set of test tools and approaches
- ▶ Issues/solutions reported on multiple central systems

*Rationalized  
Business Enabler*

- ▶ Scripted test plans and automated tests
- ▶ Issue/solution data captured from various sources with clear escalation paths

*Dynamic  
Business Asset*

- ▶ Automated application tests easily used and updated
- ▶ Issue/solution data captured - tied to tools and training plans

# AE SWAT Observations

Engage Business  
Owners / SMEs

Remember to  
Rationalize

Leverage  
Virtualization

Define and  
Track  
Success

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# Windows Application Compatibility Infrastructure



Windows  
components  
change

New technology  
Bug fixes  
Strategy changes



Changing  
Windows itself  
has issues

May fix one application,  
but break another  
Code branches  
affect servicing and  
performance

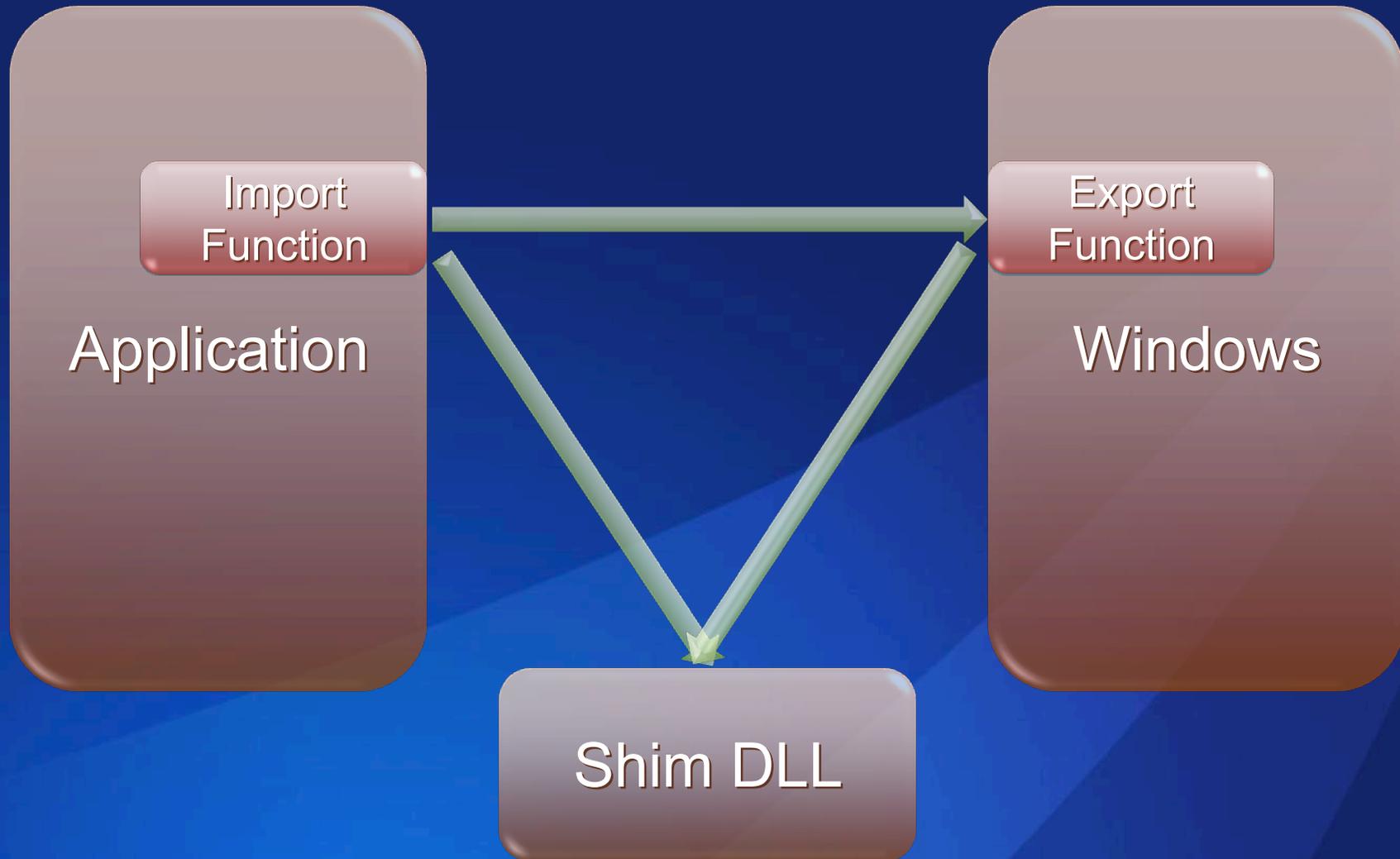


We need a way to  
simulate the  
behavior of  
previous versions  
of Windows, but  
only for a  
particular  
application

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# How Shims Work



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# Standard User Analyzer

- A tool to help IT Professionals and Developers understand issues preventing an application from running with Standard User privileges
- Based on Application Verifier



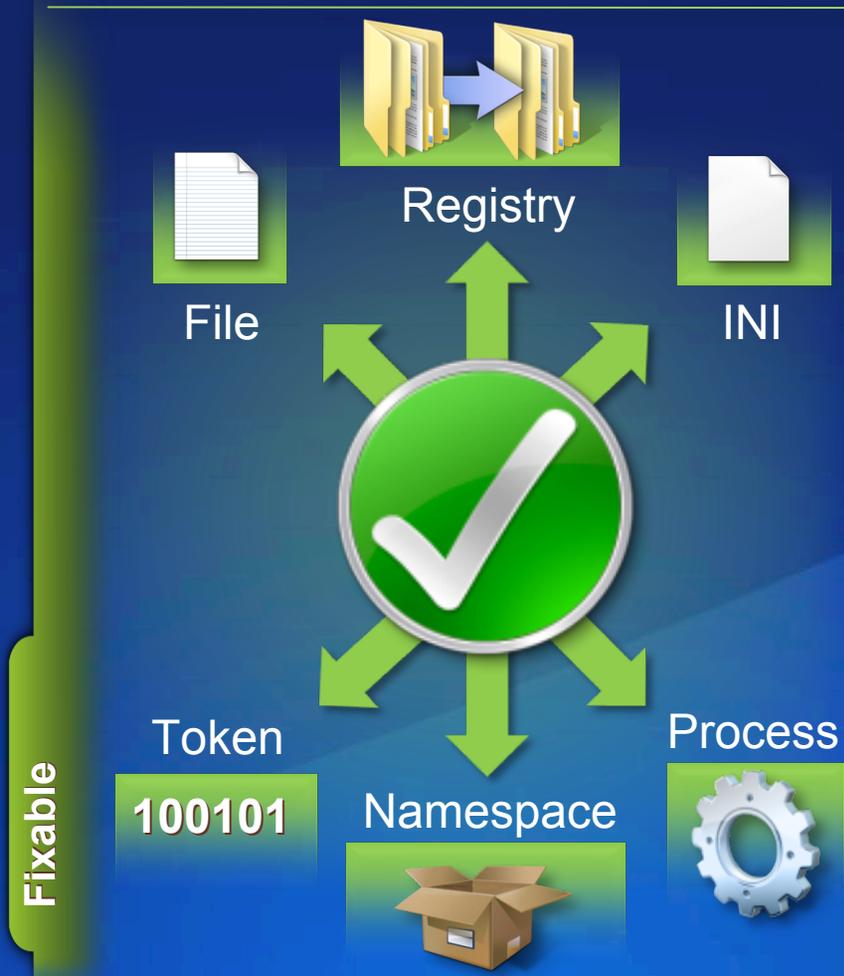
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# What Can You Fix?

## Fixable

## Not Fixable



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# SUA Mitigations

- SUA can recommend:
  - ElevateCreateProcess
  - ForceAdminAccess
  - LocalMappedObject
  - VirtualizeDeleteFile
  - VirtualizeHKCRLite

# ElevateCreateProcess

## ○ Symptom

- Host process calls CreateProcess, and it returns `ERROR_ELEVATION_REQUIRED` (740L)
- This error code is new in Windows Vista – legacy applications will not be aware of it

## ○ Fix Description

- Handles the error code and attempts to CreateProcess a second time, this time requesting elevation
- No effect if the shimmed application has a UAC manifest – error code is returned unchanged

# ForceAdminAccess

- Symptom
  - Application fails explicit administrator check
- Fix description
  - Pretends the user is a member of the administrators group, even when they aren't, by:
    - Returning TRUE for various queries of the token
    - Returning success for various permission checks

# LocalMappedObject

- Symptom
  - Application is trying to create an object in the Global namespace
- Fix Description
  - Intercepts the call to create the object, replacing the word Global with Local

# VirtualizeDeleteFile

- Symptom
  - Application is unable to delete files because of permissions issues
- Fix description
  - Returns success from calls to delete files that are in protected locations
    - If the file was successfully deleted, but it was a virtualized copy, pretends that the real one was deleted as well
    - Subsequent calls to check for the existence of the file will return that the file was not found

# VirtualizeHKCRLite

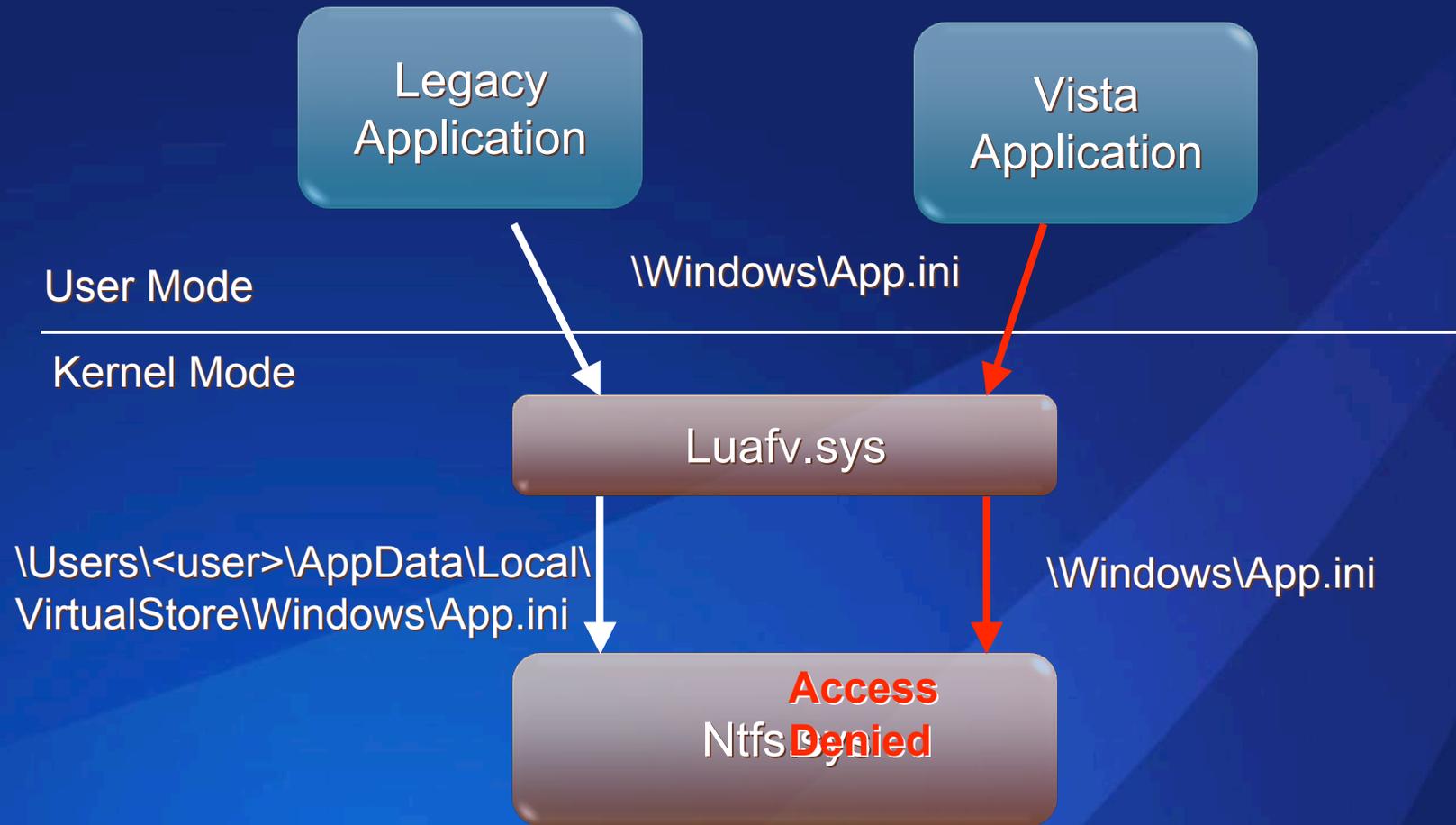
- Symptom
  - Application failing to register COM components at run-time
- Fix Description
  - Redirects HKCR writes (HKLM) to HKCU for a per-user COM registration
  - Lighter weight and better performance than VirtualRegistry with VIRTUALIZEHKCR parameter
  - Typically, you will use in combination with VirtualizeRegisterTypeLib

# SUA Mitigations

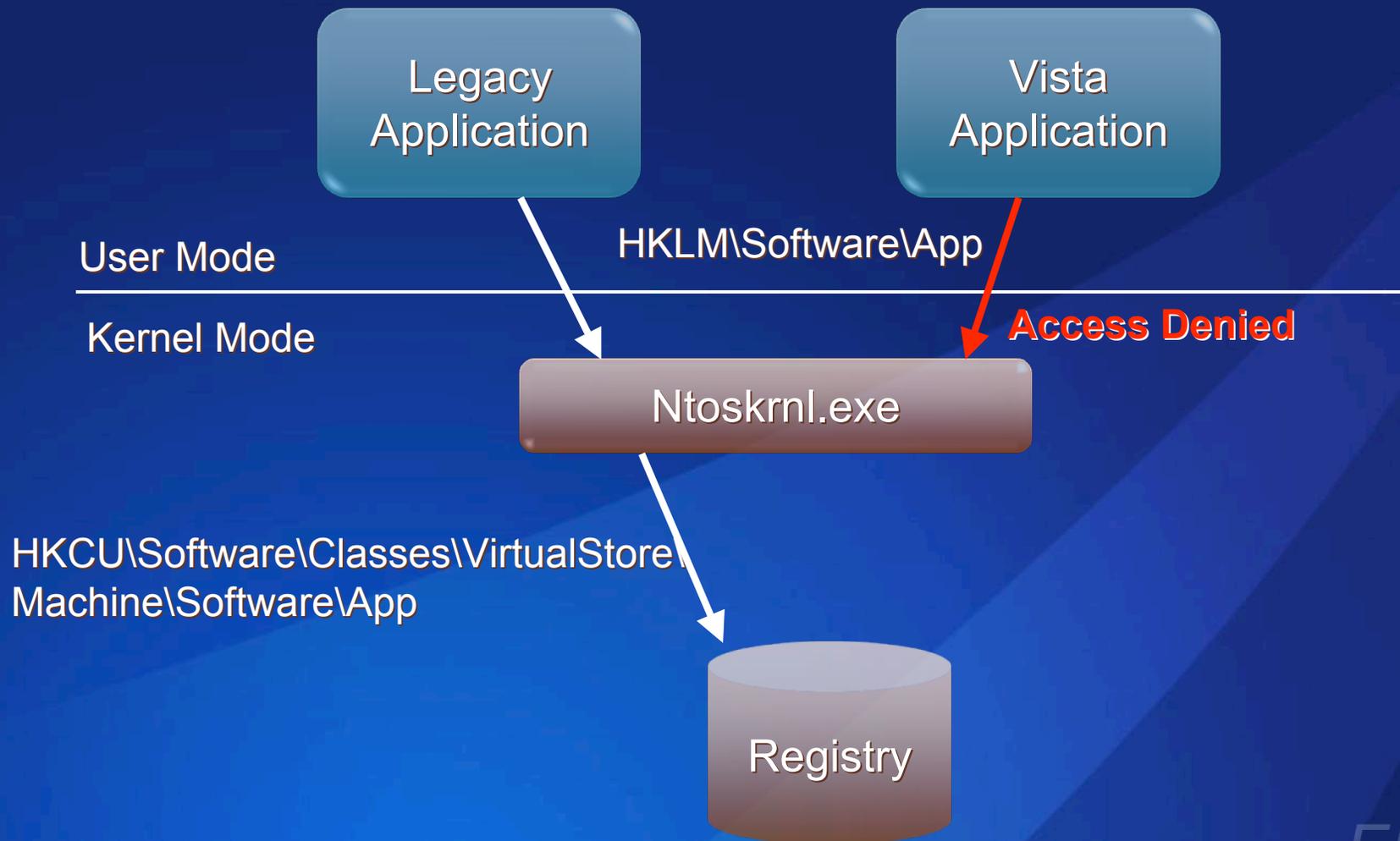
*demo*

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# File Virtualization



# Registry Virtualization



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# VirtualRegistry

- Symptoms
  - Application is checking the registry for keys that:
    - Return a more current value than they are looking for
    - Have been deprecated
    - Deny access to standard users
- Fix description
  - Enables registry functions to allow virtual keys, redirection, and expansion values
- Command line parameters...

# VirtualRegistry Version Lies

- DISABLEWIN9XMODE
- DX7A
- DX8
- IE401
- IE60
- NT4SP5
- NT50
- NT51
- WIN2K
- WIN9X
- WINNT
- WinNTCurrentVersion
- WINXP
- X86ARCHLIE
- XPSP1LIE
- XPSP2LIE

# VirtualRegistry Generic Fixes

- AddRedirect(HKLM\Key^HKCU\Key^HKLM\Key2^HKCU\Key2)

# VirtualRegistry

# *demo*

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# CorrectFilePaths

## ○ Symptoms

- Application receives access denied errors when trying to write to files
- Application received file not found or path not found errors when trying to write to files

## ○ Fix description

- Modifies path names to point to a new location on the drive

# CorrectFilePaths Processing

Default Corrections Applied

NEW\_PATH converted to short file name

OLD\_PATH converted to short file name

Command line paths corrected

# CorrectFilePaths Variables

Variable	Typical Value
%windir%	C:\windows
%systemroot%	C:\windows
%systemdrive%	C:\
%systemdir%	C:\windows\system32
%username%	billg
%programfiles%	C:\program files
%userstartmenu%	C:\Users\billg\AppData\Roaming\Microsoft\Windows\Start Menu
%allstartmenu%	C:\ProgramData\Microsoft\Windows\Start Menu
%userdesktop%	C:\Users\billg\Desktop
%alldesktop%	C:\Users\public\desktop
%userfavorites%	C:\Users\billg\Favorites
%allfavorites%	C:\Users\Public\Favorites
%allprofile%	C:\Users\Public

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# CorrectFilePaths Switches

Switch	Meaning
-c	Do not shim CreateProcess routines
-f	Do not shim file routines
-p	Do not shim GetPrivateProfile routines
-s	Do not shim IShellLink routines
-b	Bare: No built-in path changes
-u	User: Do not force Start Menu links from <username> to All Users
+GetCommandLine	Shim GetCommandLine APIs
+RegSetValue	Shim Registry APIs
+Win9xPath	Apply Win9x path specific fixes
-Profiles	Disable user profiles (same as -u

# CorrectFilePaths Parameters

- -switch1 -switch2 OLD\_PATH;NEW\_PATH  
OLD\_PATH2;NEW\_PATH2
- Examples:
  - -b setup.exe;setupapp.exe
  - -f -p -s -b setup.exe;setupapp.exe
  - setup.exe;setupapp.exe “Bad Place;Correct Location”
  - wordpad.exe;%SystemDir%\wordpad.exe  
.\\%SystemDir%;%SystemDir%

# CorrectFilePathsUninstall

- When applying CorrectFilePaths to an installer, you should apply CorrectFilePathsUninstall as well
- Symptoms
  - Files, directories, and links are left behind during uninstall
- Fix description
  - Corrects file paths for uninstallation of the application
  - Installers that do not remember whether they installed to user or common directories
  - Installers shimmed using CorrectFilePaths

# CorrectFilePaths

*demo*