

**Pattern:** **Failing embedded COM Objects**

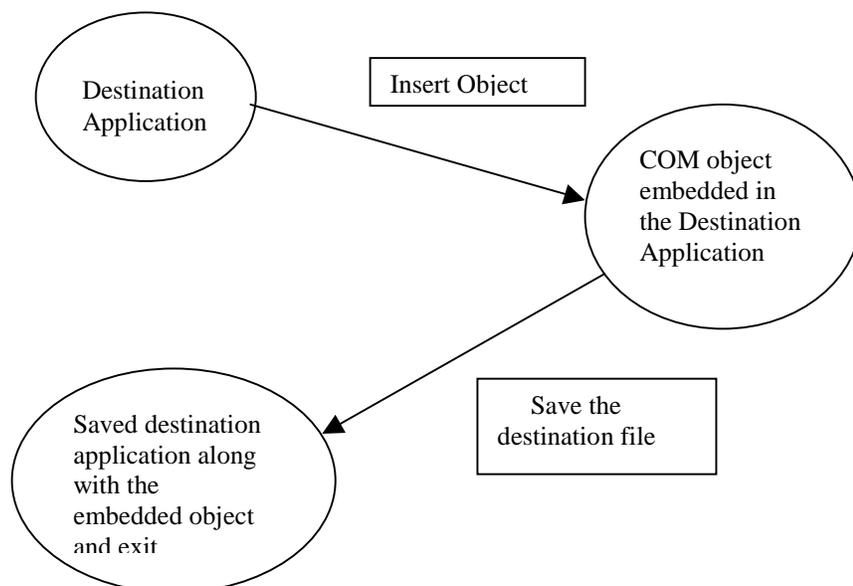
**Context:** Component Object Model (COM) allows software objects to talk to other software objects. Object controls may not be updated in system registry or may be improperly launched by a destination file, or fail while in use, raising exceptions. In this scenario, if the destination file application does not provide error-handling routines to catch the exceptions raised by the server objects, it might fail.

**Problem:** How do we show that windows based programs fail while inserting embedded OLE/COM objects?

**Forces:** Before the release of a software application, sets of common controls are identified and tested. But the real problem arises after the release of the product. Almost all applications provide their own set of COM components. As new applications with COM component objects are added to a system, it becomes difficult to test for each COM control individually. Individual exceptions arise and they can be tested only on a one-to-one basis.

A COM interface is a binary description of the layout of a block of memory containing an array of function pointers. The array has a fixed structure, and is known as a virtual method table (vtable). The pointers in the array point to the functions of a COM object that can be called by a consumer of the interface. When a client wants to use the services of a COM object, it obtains the vtable for the appropriate interface and looks up the method it wants to call. It then uses the function pointer to invoke to invoke the method. Each interface has its own vtable layout, and a COM object can expose any number of interfaces. The order of the functions in the vtable, the parameters for each function, the name of the interface, and the amount of memory needed physically to store the pointers is known as the interface signature. Once a COM interface has been published, this signature must not change. If the interface signature is altered, there is a very real risk of breaking all the applications that are using it.

**Solution:** **Test One:** Insert the COM object in the destination file and save the file. The following model explains the procedure.

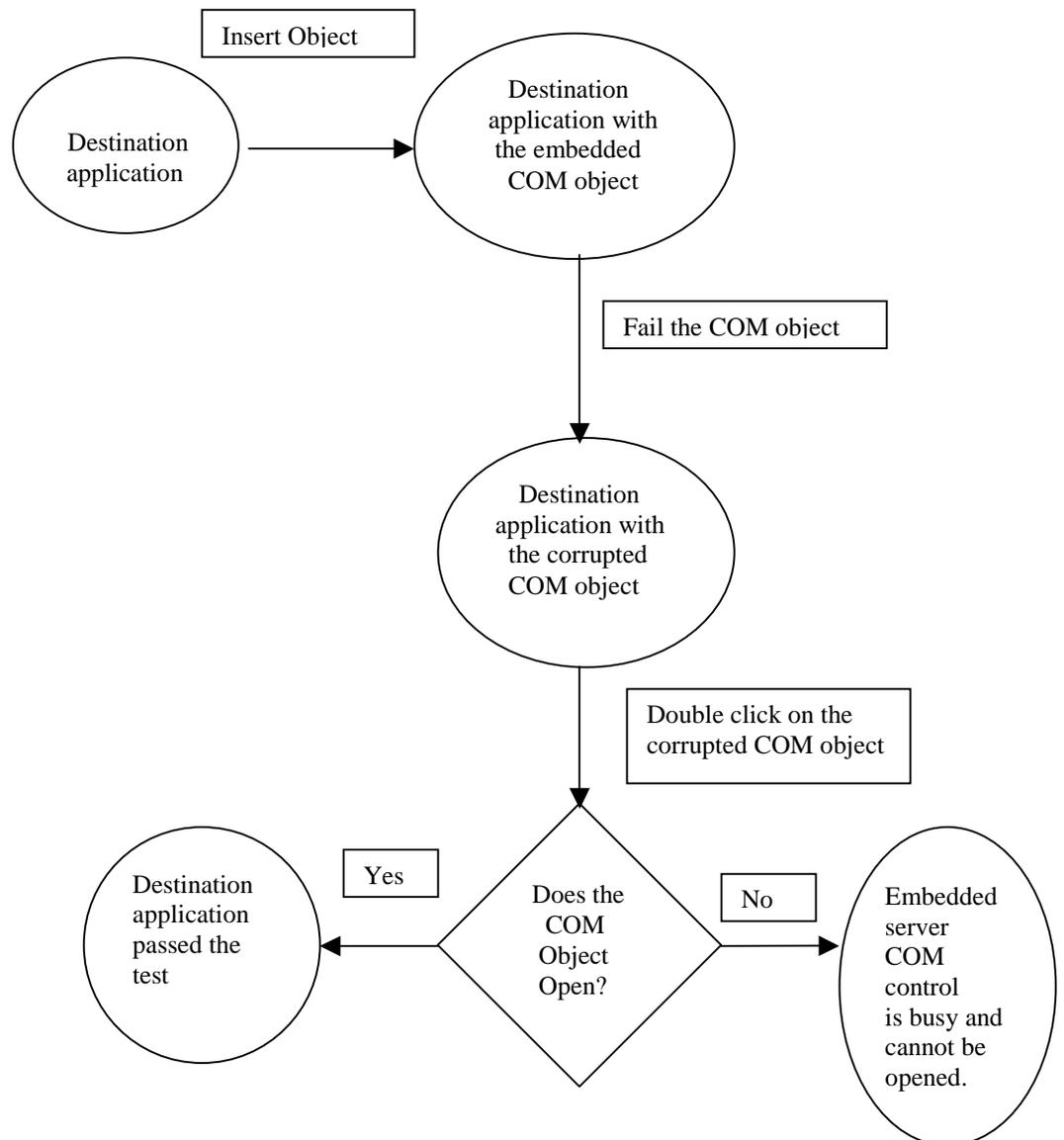


The destination file may fail either during

1. Inserting the object, or
2. Saving the file with the embedded object.

**Test Two:** Open a new destination file application and embed COM object. Forcefully, fail the COM object, and observe if the destination file fails or not. If the destination application does not fail, conduct all of the following tests one by one.

1. Double click on the corrupted embedded object to invoke it again.
2. Save the destination file and open the same file again
3. Some software applications have certain properties associated with the embedded COM objects. Modify these properties.



**Examples:****One:****Microsoft PowerPoint 2000 SR-1 (9.0.3821)**

1. Start Microsoft PowerPoint 2000 SR-1 (9.0.3821). Presentation 'PowerPoint' window opens.
2. In the 'Create a new presentation using' section, click on the 'Blank presentation' option button and click on the 'OK' button.
3. 'New Slide' window opens. Click on any one of the layout fashions from the 'Choose an AutoLayout:' section and click on the 'OK' button.
4. From the 'Insert' pull-down menu choose 'Object...'
5. 'Insert Object' task-window opens
6. By default the 'Create new' option button is selected
7. In the 'Object type:' list-box control click on 'TIPictures Control'.
8. Click on the 'OK' button.
9. The 'Open Picture File' window opens. Note that the 'Open Picture File' window is from TI InterActive
10. Click on the 'Cancel' button
11. Back in MSPowerPoint there is a dialog box, with no name and no message. All it has is a "Warning Exclamation mark"
12. Click on the 'OK' button.
13. Microsoft PowerPoint 2000 SR-1 (9.0.3821) fails.

**Two:****TI InterActive 1.0.5.0**

1. Start TI InterActive 1.0.5.0
2. From the 'Insert' pull-down menu choose 'Object...'
3. 'Insert Object' task-window opens
4. By default the 'Create new' option button is selected
5. In the 'Object type:' list-box control click on 'Microsoft Word Picture'.
6. Click on the 'OK' button.
7. 'Picture in Unnamed – Microsoft Word' window opens
8. In the 'Picture in Unnamed – Microsoft Word' window from the 'Edit' pull-down menu choose 'Replace...'
9. The 'Find and Replace' window opens
10. In the 'Find what:' edit box type in "a" and in the 'Replace with:' edit box type in 260 "a's".
11. Click on the 'Replace' button.
12. Microsoft Word 2000 SR-1 (9.0.3821) fails.
13. Back in TI InterActive, click on the just inserted Microsoft Word Picture.
14. Once the Microsoft Word Picture is highlighted, right click on it and click 'Floating with text around' or 'Floating with text top & bottom".
15. TI InterActive 1.0.5.0 fails.

**Three:****Microsoft PowerPoint 2000 SR-1 (9.0.3821)**

1. Start Microsoft PowerPoint 2000 SR-1 (9.0.3821).
2. The 'PowerPoint' presentation window opens.
3. In the 'Create a new presentation using' section, click on the 'Blank presentation' option button and click on the 'OK' button.
4. 'New Slide' window opens. Click on any one of the layout fashions from the 'Choose an AutoLayout:' section and click on the 'OK' button.
5. From the 'Insert' pull-down menu choose 'Object...'
6. 'Insert Object' task-window opens

7. By default the 'Create new' option button is selected
8. In the 'Object type:' list-box control click on 'Microsoft Word Document'.
9. Click on the 'OK' button.
10. From the 'Edit' pull-down menu choose 'Replace...'
11. The 'Find and Replace' window opens
12. In the 'Find what:' edit box type in "a" and in the 'Replace with:' edit box type in 260 "a's".
13. Click on the 'Replace' button.
14. Microsoft Word 2000 SR-1 (9.0.3821) fails. Notice the 'Winword.exe – Application error' dialog window. Click on the 'OK' button
15. Back in the MS PowerPoint presentation, it does not allow the user to access the application with ease. The menus cannot be accessed any more. Keyboard shortcuts work (This allows the user to at least save the application).
16. Close the whole MS PowerPoint presentation by clicking on the 'Close' button at the top right corner of the application.
17. A 'Microsoft PowerPoint' warning dialog appears stating, "The presentation contains open inserted objects that can't be closed automatically. Close the objects and try again".
18. Click on the 'OK' button.
19. MS PowerPoint does not close at any cost.

**Four:**

**Microsoft Excel 2000 SR-1 (9.0.3821)**

1. Start a new, unsaved Microsoft Excel 2000 SR-1 (9.0.3821).
2. From the 'Insert' pull-down menu choose 'Object...'
3. 'Insert Object' task-window opens
4. By default the 'Create new' option button is selected
5. In the 'Object type:' list-box control click on 'Microsoft Word Document'.
6. Click on the 'OK' button.
7. From the 'Edit' pull-down menu choose 'Replace...'
8. The 'Find and Replace' window opens
9. In the 'Find what:' edit box type in "a" and in the 'Replace with:' edit box type in 260 "a's".
10. Click on the 'Replace' button.
11. Microsoft Word 2000 SR-1 (9.0.3821) fails. Notice the 'Winword.exe – Application error' dialog window. Click on the 'OK' button
12. Back in MS Excel, the menus disappear. Close MS Excel by clicking on the on the 'Close' button at the top right corner of the application.
13. 'Microsoft Excel' dialog opens stating "Do you want to save the changes you made to Book1?"
14. Click on the 'Yes' button.
15. The 'Save As' window appears. Provide a file name in the 'File name:' edit box. Keep the default file type to be 'Microsoft Excel Workbook'
16. Click on the 'Save' button.
17. A new 'Microsoft Excel' dialog appears stating "Document not saved".
18. Click on the 'OK' button.
19. Back in MS Excel main window close it by clicking on the on the 'Close' button at the top right corner of the application.
20. MS Excel closes, but the file does not get saved.

**Five: Microsoft Word 2000 SR-1 (9.0.3821)**

1. Start a new, unsaved Microsoft Word 2000 SR-1 (9.0.3821
2. From the 'Insert' pull-down menu choose 'Object...'
3. 'Insert Object' task-window opens
4. By default the 'Create new' tab button is selected
5. In the 'Object type:' list-box control click on 'Foxtlib Control'.
6. Click on the 'OK' button.
7. A message dialog appears with no window name stating, "This OCX can only be hosted by Visual FoxPro".
8. This message dialog is non-modal. So leaving this dialog aside, return back to the MS Word main window and click on the 'Close' button at the top right corner of the application.
9. A Microsoft Word' dialog appears stating, "Do you want to save the changes you made to Document1?"
10. Click on the 'Yes' button
11. The 'Save As' window appears. Provide a file name in the 'File name:' edit box.
12. Click on the 'Save' button.
13. Microsoft Word 2000 SR-1 (9.0.3821) fails

**Six: Corel WordPerfect 8.0.0.611**

1. Start a new, unsaved Corel WordPerfect 8.0.0.611
2. From the 'Insert' pull-down menu choose 'Object...'
3. 'Insert Object' task-window opens
4. By default the 'Create new' radio button is selected
5. In the 'Object type:' list-box control click on the MSVSAButton Class and click on the 'OK' button.
6. Corel WordPerfect 8.0.0.611 fails

**Seven: Corel Quattro Pro 8.0.0.611**

1. Open an existing file of Microsoft Word 2000 SR-1 (9.0.3821).Name it file1.
2. Start Corel Quattro Pro 8.0.0.611
3. From the 'Insert' pull-down menu choose 'Object...'
4. 'Insert Object' task-window opens
5. By default the 'Create new' option button is selected
6. In the 'Object type:' list-box control click on 'Microsoft Word Document'.
7. Click on the 'OK' button.
8. From the 'Edit' pull-down menu choose 'Replace...'
9. The 'Find and Replace' window opens
10. In the 'Find what:' edit box type in "a" and in the 'Replace with:' edit box type in 260 "a's".
11. Click on the 'Replace' button.
12. Microsoft Word 2000 SR-1 (9.0.3821) fails. Notice the 'Winword.exe - Application error' dialog window. Click on the 'OK' button
13. Notice that the file1 also closes
14. Save and close Corel Quattro Pro 8.0.0.611
15. Open file1 again. 'File in Use' dialog appears stating, "file1 is locked for editing" and it is read-only