



Phantom Links
Tutorial
March 2016

1.0 General

Please feel free to get in touch at contact@lentransolutions.com if you would like additional guidance.

2.0 Tutorial

2.1 Aim and audience

The aim of this tutorial is to illustrate a step-by-step solution to identifying and, if required, removing external links in received workbooks.

2.2 Tutorial conventions

References to menu items in Excel are shown in *Italics*. And anything to be typed and shortcuts / key strokes will be shown in **bold**.

2.3 Introduction

Here's the scenario – you receive an Excel file from a trusted source. No mention is made of links to other files. Upon opening you are warned there are links and asked whether you wish to update these links. Unclear what these links are, you inspect the links to get a sense of the problem you are dealing with.

Given the links were not expected, they are for all intents and purposes 'Phantom', serving no obvious purpose. Perspiring profusely, you opt not to update the links and take a few deep breaths.

These phantom links have likely eventuated from moving or copying worksheets and/or charts into this workbook. The party releasing the workbook has either saved and released it (without reopening) or deemed the links harmless or indeed they are aware of them, but are unsure how to unbundle them and just thought 'what the hell'. Being cautious, we take a less sanguine view.

Fear not for the most part phantom links are not as elusive as they can first appear. There is plenty of low hanging fruit that will most often remedy this nuisance without too much effort.

In the first instance, we recommend you take guidance from the party that provided you the workbook. Hopefully, they can provide insight that expedites your search.

2.4 Systematic approach

At Lentrans Modelling Solutions ("LMS") we believe, as a rule, that phantom links can be discovered efficiently if tackled in the following order:

- Formulae
- Defined names

- Conditional formatting
- Charts
- Objects
- Delete sheets sequentially (from left to right)

We hasten to add that the approach taken will be determined by the nature of the workbook. Before starting your search, form a view of the workbook:

- Structurally – is it formula or chart oriented; and/or
- Functionally – is it a transaction model or operational forecasting model that is frequently updated?

Okey-dokey, let's saddle up and get ready to go hunting. One last important thing before we commence in earnest:

- Check for hidden sheets¹; and,
- If you have not done so already please, save a copy of your workbook to protect file integrity.

Please note: throughout this process you can check whether you have resolved all your Links issues, by going to the *Data* tab and selecting *Edit Links* (**ALT + A, K**). If you are trying to rid yourself of all external links the *Edit Links* option will 'grey out' once all external links have been removed.

2.4.1 Formulae

Ensure all other workbooks are closed then:

- On the *Home* tab, select *Find & Select* and *Find* (**ALT + H, FD, F**).
- Type [in *Find what*. This will capture any file path references.
- In *Options*, select:
 - *Workbook* from the *Within* drop-down box; and
 - *Formulas* from the *Look-in* drop-down box.
 - Select *Find All*.
 - Interrogate the list entries. The solution may be as simple as changing the link to the current workbook (**ALT + A, K**).

¹ On the *Home* tab, select *Format* and *Visibility, Hide & Unhide* (**ALT + H, O**). If *Unhide Sheet* is not greyed-out, the workbook contains hidden sheets. Note, sheets with the visible property set to `xlVeryHidden` in VBA Editor (**ALT + F11**) will not be identified using this approach and must be unhidden manually.

2.4.2 Defined Names

With formulae discounted as the root cause, turn your attention to named cells and ranges:

- Select **CTRL + F3**. This will bring up the *Name Manager* which holds all named cells and ranges.
- Columns '*Refers To*' and '*Scope*' will quickly identify where there is an out-of-workbook link arising.

Alternately, if you want everything on one worksheet rather than in the Name Manager box you can also take the following steps:

- Insert a blank sheet.
- On the *Formulas* tab, select *Use in Formula* and *Paste names* (**ALT + M, S, P**).
- Paste list and review the defined names for external workbook references.

2.4.3 Conditional formatting

References to external workbooks can often lurk in conditional formatting formulae too. Taking each worksheet in turn:

- On the *Home* tab, select *Conditional Formatting* and *Manage Rules* (**ALT + H, L, R**).
- Select each sheet in *Show formatting rules* for drop-down box.
- Cycle through each worksheet in this list, at each scrolling through conditional formatting rules looking for external workbook references.
- Use *Edit Rule* or *Delete Rule* to manage any external links found.

2.4.4 Charts and Objects

Charts and Object can also harbour external references.

- Select the *Home* tab, select *Find & Select* and *Selection Pane* (**ALT + H, FD, P**).
- All visible charts and objects are listed. Select *Show All* to ensure no objects are hidden.
- Note that the items shown will only be for the active sheet and so please cycle through each worksheet while the *Selection Pane* is still open.

Charts may contain external references in the data range, x-axis and title. Taking each sheet in turn, select the chart and the *Chart Tools* tab appears:

- Select *Design* and then *Select Data* (**ALT + JC, E**).
- Review the *Chart* data range.

- Select the series within the *Legend Entries (Series)* section individually and select *Edit* and review.
- Select *Horizontal (Category) Axis Labels* individually and select *Edit* and review.
- Review the chart title.

The last port of call is objects, such as shapes and text boxes that can also harbour external references, such as hyperlinks to other parts of an external workbook. With the *Selection Pane* visible (**ALT + H, FD, P**), taking each sheet in turn:

- Save another copy of the workbook.
- Select first object and delete.
- Next go to *Data, Edit Links* to see if the external links have been removed.
- If the issue is not resolved, continue process deleting each object one at a time.

Fingers crossed the Phantom Link has disappeared. Revert back to the first copy, not the original workbook, and investigate each object on that sheet.

2.4.5 Delete sheets

At this point if you have not solved the riddle or only solved it partly then more drastic action must be taken.

- Open the workbook you saved to interrogate the objects at the section above 2.4.4 Charts and Objects.
- Delete sheets one at a time, starting from the left-hand sheet.
- Each time look to *Data, Edit Links* to see if this has resolved the issue.
- If this does not do the trick you may wish to repeat, but instead of checking *Edit Links* to actually save and shut the workbook and reopen (in the case of workbooks with a particularly bad case of the phantom links, a close can usually do the trick where an *Edit Links* will not).
- Repeat this process until the *Edit Links* becomes greyed out or alternatively until the 'update missing links' on open message disappears.
- Finally, once the 'bad sheet' has been identified, delete sections of the offending sheet, from top to bottom, checking *Edit Links* throughout or saving and closing the workbook and reopening until the links warning message is not displayed.

This final method is no doubt laborious, but ultimately it will systematically solve your problem. Cases where this process is needed are rare and so we hope in many ways you have not got this far!

Happy hunting.