

Reading and Writing Data from Microsoft Excel/Word Using DDE

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Dynamic Data Exchange to Excel

Dynamic Data Exchange is a means of transferring data between different Windows applications such as the SAS System and Microsoft Excel or Microsoft Word. The technique uses what is known as a Client / Server type relationship, where the Client application makes the requests and the Server application responds accordingly. When using DDE with the SAS System, SAS is always the Client.

The DDE technique may be used within a Data Step, a Macro or from inside a SAS/AF application.

Using the DDE technique involves specifying the following three components in what is called a DDE Triplet:

1. The path and name of the executable file for the server application. For example, with Microsoft Excel the name of the executable is EXCEL.
2. The full path and file name of the document or spreadsheet with which you wish to share data. This is referred to in SAS documentation as the Topic.
3. The location of data to be read or modified. With a spreadsheet application, this is a range of cells. In applications such as Microsoft Word, the location of data is defined by what are known as bookmarks.

An example of a DDE Triplet for an Excel Spreadsheet is as follows:

```
EXCEL | C:\COURSES\DATA\CLIN.XLS !  
R4C17: R17C8
```

The DDE Triplet is then incorporated into a Filename statement of the following form:

```
FILENAME fileref DDE 'DDE-Triplet' |  
'CLIPBOARD' <DDE-Options>;
```

where:

fileref is a valid fileref

DDE is the keyword that primes the SAS System for Dynamic Data Exchange.

'**DDE-Triplet**' is the three part specification of the DDE external file and takes the following form: 'Executable-file-name|Topic!Data-range'. Note that the triplet is application dependent and may differ between different releases of the same application.

'**CLIPBOARD**' is an alternative to directly specifying the DDE triplet. To use this option, copy the required data from the Server application to the Clipboard and specify the 'CLIPBOARD' option in the Filename statement. SAS will then determine the Triplet for itself. You will be able to see the triplet definition by looking at the Log.

DDE-Options are as follows:

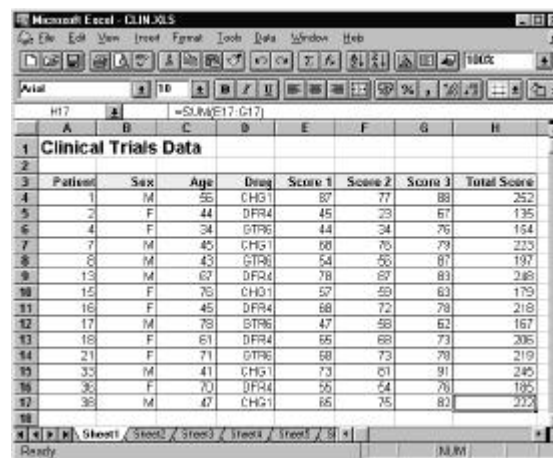
HOTLINK invokes the DDE HOTLINK facility, which causes the DDE link to be activated whenever data in the spreadsheet range is updated.

NOTAB makes the SAS System ignore tab characters between variables.

COMMAND allows remote commands to be sent to DDE server applications.

Example of using DDE to read data from Excel

Consider the following Excel Spreadsheet:



1	Clinical Trials Data							
2								
3	Patient	Sex	Age	Drug	Score 1	Score 2	Score 3	Total Score
4	1	M	55	CHG1	87	77	88	252
5	2	F	44	DPR4	45	29	67	141
6	4	F	34	BTR6	44	34	79	157
7	7	M	45	CHG1	88	76	79	243
8	8	M	43	BTR6	54	50	87	191
9	13	M	67	DPR4	78	57	83	218
10	15	F	75	CHG1	57	59	63	179
11	16	F	45	DPR4	68	72	78	218
12	17	M	79	BTR6	47	58	62	167
13	18	F	61	DPR4	65	68	73	206
14	21	F	71	BTR6	68	73	78	219
15	32	M	41	CHG1	73	61	91	245
16	35	F	73	DPR4	55	54	76	185
17	38	M	47	CHG1	65	75	82	222

With Excel running and the above spreadsheet open, a simple Data Step can be written to read the above data into a SAS Data Set.

The DDE Triplet components for the above example are as follows:

Name of Executable File: EXCEL

Full Path and Name of spreadsheet file:
C:\COURSES\DATA\CLIN.XLS


```
T=SLEEP(5);
```

```
RUN;
```

NOXWAIT causes control to be returned to SAS as soon as the specified 'X' command has been executed. In the above example, as soon as Excel has been loaded, control will return to SAS.

NOXSYNC causes the application called from SAS to execute asynchronously so that it does not interfere with the SAS session.

Remember to reset the above options to XWAIT and XSYNC when the application is closed. The **X** statement contains the path and name of the executable file that calls the application. The **Sleep** statement inside the null data step simply gives the called application time to load. In the above example, 5 seconds has been allowed.

Issuing Commands from SAS

Having invoked an application like Excel using the above statements, you need to issue commands that carry out tasks such as opening the required spreadsheet file and selecting data. This is done through what is called the SYSTEM Topic:

Assign a Fileref that includes the DDE topic SYSTEM to enable Excel or Word commands to be issued from SAS.

```
FILENAME CMDS DDE 'Excel |SYSTEM';
```

Commands may now be sent to Excel by using 'Put' statements inside a null data step. Note that the syntax of the commands issued is application dependent.

```
DATA _NULL_;
```

```
FILE CMDS;
```

```
PUT
```

```
OPEN("C:\COURSES\DATA\CLIN.XLS")];
```

```
RUN;
```

Example of invoking and issuing commands to Excel

The example program does the following:

1. Invokes Excel.
2. Opens a Spreadsheet.
3. Reads spreadsheet data into a SAS data set.
4. Closes the Spreadsheet.
5. Closes Excel.



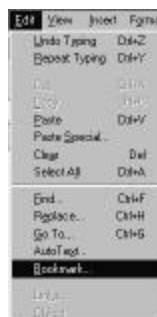
Dynamic Data Exchange to Word

Using DDE to access data stored in a Microsoft Word document is the almost the same procedure as used for Excel. The only difference is that the location of data in Word is specified by referencing Bookmarks rather than a cell range.

A bookmark is simply a named marker placed within the Word document. The following Word Document uses bookmarks to denote the position of Name and Address fields:



To create a bookmark within a Word document, highlight the text which you want to use as a bookmark, then select **Edit** and **Bookmark** from the pull down menu:



Enter a name for the book



The components of the DDE Triplet for the above example are as follows:

Name of Executable File: WINWORD

Full Path and Name of Word document:
C:\COURSES\DATA\ENQUIRY.DOC

Location of data (Name of Bookmark): Address1

Invoking Word from SAS

The procedure used to call Word from SAS is the same procedure used to call Excel or any other Windows application from SAS. Set the appropriate options, use an 'X' statement to call Word, and allow Word a few seconds to load.

OPTIONS NOXWAIT NOXSYNC;

X 'C:\WINWORD\WINWORD' ;

```
DATA _NULL_;
  T=SLEEP(5);
RUN;
```

Remember to reset the above Options to XWAIT and XSYNC when the application is closed.

Issuing Commands to Word from SAS

As with Excel, this is done by assigning a Fileref to the DDE topic SYSTEM:

```
FILENAME CMDS DDE 'WINWORD|SYSTEM';
```

Once the above Fileref is assigned, commands can be sent to Word by using 'Put' statements inside a null data step.

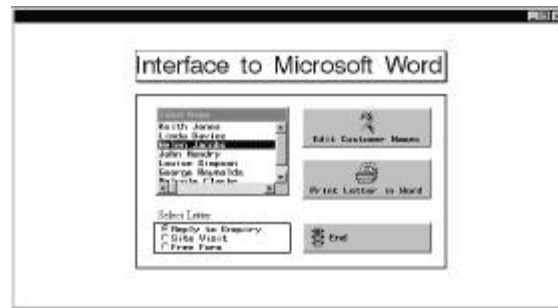
```
DATA _NULL_;

  FILE CMDS;
  PUT
  '[ FILEOPEN("C:\COURSES\DATA\ENQUIRY.DOC") ]';
```

```
RUN;
```

Example of using DDE to access a Word document

The following SAS/AF Application automatically inserts the name and address of a customer into the selected Word document and prints it:



The name and address information is stored in a SAS data set that may be accessed and updated by clicking on the 'Edit Customer Names' icon.

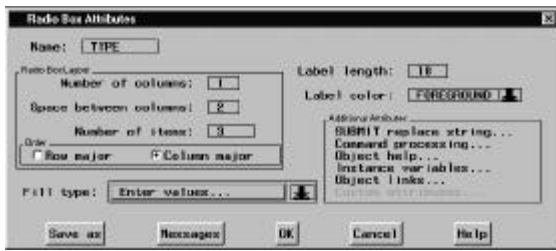
The name and address information of the selected customer is inserted into the Word document as follows:



Note how the name and address details have been written to their respective bookmarks. The square brackets, which denote the boundary of a bookmark, do not appear in the printed document.

Note the following about the SCL Program that controls the Frame:

1. The physical paths for the Word executable file and Word documents, are assigned to Macro variables in the Autoexec file which runs before the application is called. Call Symget routines are used in the INIT section to assign the values of these Macro variables to SCL variables. This approach avoids having to hard code path names in the application.
2. The name of the Word document to open is derived by concatenating the document path, letter type, and the suffix '.DOC'.
3. The letter type is obtained by sending the _GET_TEXT_ method to the Radio Box, which returns the Character value assigned to the selected item. Each Radio Box item has a Character return value specified in the attributes window:



Click on **Enter values..** to access Return values for items on



Clicking on a Radio Box Item displays its Return value.

4. A Submit Block contains all of the SAS code used to load Word, access the selected document and print it. Recall that an ampersand within a Submit Block references an SCL variable.
5. Five different Filrefs are assigned to point at the various name and address bookmarks in the Word document.

The SCL Program is as follows (see next column):

```

00028 /* Refresh the contents of the List Box */
00029 call setfil('Name', '_response_');
00030 return;
00031
00032
00033
00034 PRINT;
00035
00036 /* If a name has been selected then generate and print the Word document */
00037 if selected ne '' then do;
00038
00039 /* Get the Type of Letter selected from the Radio Box */
00040 call setfil('type', '_get_item_' || selected);
00041
00042 /* Concatenate the Path and Letter Type to generate the name of the
00043 document to be opened in Word */
00044 wordfil=length('_')||selected||'.doc';
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00052 /* Set system options */
00053 %PUT MSG RESPONSE;
00054
00055 /* Invoke Word */
00056 %INCLUDE 'word';
00057
00058 /* Wait 5 seconds for Word to load */
00059 %WAIT 5;
00060 %YIELD;
00061
00062
00063 /* Display a Fileref for the Word topic STARTER to enable commands
00064 to be sent to Word */
00065 FILENAME WORD SRC 'STARTER(STATER)';
00066
00067
00068
00069 /* Open the required Word Document */
00070 SET FILEDSM1 'wordfil';
00071
00072
00073 /* Assign Filerefs to the named bookmarks in the Word Document */
00074 FILENAME name SRC 'namefil1';
00075 FILENAME addr SRC 'addressfil1';
00076 FILENAME work SRC 'workfil1';
00077 FILENAME stand SRC 'standfil1';
00078
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00082 /* Open the Data Set called name and read the observation that
00083 corresponds to the selected row in the List Box, use File and Fil
00084 statements to write out the values of variables to the appropriate
00085 position in the Word Document */
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Hints:

Use a separate Fileref to define the range of cells into which people's names are written and include the NOTAB option i.e.:

```
FILENAME XLF1 DDE
' EXCEL | C: \COURSES\DATA\DEMOG. XLS! r3c1:
r52c1' NOTAB;
```

The NOTAB option makes SAS ignore Tab Characters between variables. In this example, the space between the first name and surname is taken as a Tab Character, which results in the two parts of the name being put into different columns in Excel unless NOTAB is specified. Use a second Fileref to define the range of cells for the remaining variables but do not include the NOTAB option as non of the variables include space characters:

```
FILENAME XLF2 DDE
' EXCEL | C: \COURSES\DATA\DEMOG. XLS! r3c1: r52c1' ;
```

Within a null Data Step, use separate File and Put statements of the following form to output the data:

```
DATA _NULL_ ;
FILE XLF1;
PUT NAME;
FILE XLF2;
PUT AGE GENDER etc;
RUN;
```

Remember to reset options NOXWAIT and NOXSYNC to XWAIT and XSYNC respectively.

Prepared by:

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