

Emailing a SAS® Report to Excel

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ABSTRACT

Your database is on the mainframe. Your client is on the PC. You have the batch report developed, but the client wants a spreadsheet. To top it off, the client wants the spreadsheet emailed to multiple people. To be sure there are a number of ways to accomplish these requirements, but you want something clean and efficient—preferably one step. This paper shows how to create a report using ODS on the mainframe, write it to an HTML data set, and send it as a Excel attachment to an email in one step with SAS® software.

INTRODUCTION

Increasingly clients want more sophisticated output. It used to be a mainframe report was sufficient. The possibilities seemed endless: quick PROC PRINTs, customized reports using DATA _NULL_, frequencies, tabular reports. But now regardless of the output, clients do not just want a printout. Often they want the output sent to a server or delivered via email. So the client comes to you and says “All I want is this report with these columns for these companies showing these subtotals and totals in an Microsoft® Office Excel spreadsheet emailed to this list of people.” And you say “I’ll see what I can do.” And you think, “Is that *all*?” Going from the mainframe report to the PC is one thing, but emailing the report, too. How?

Okay, we can get there from here. It’s not as hard as it sounds. In fact, this is a real-life scenario that had me treading on new ground. The result proved extremely popular and is created monthly using a scheduled job.

DEVELOPING THE REPORT ON THE MAINFRAME

The first thing is to create the report. In this case, the information is in a DB2 database used by an Electronic Data Interchange (EDI) translator. The translator utility creates a report of the month’s data for the companies required. Using SAS® software, the automatic headings provided by the translator can easily be removed. That leaves the EDI information which is in ANSI X12, version 4010, transaction 810 or an invoice. Since I work with EDI data on a regular basis, that part is not intimidating. In order for one company to communicate with another and to send the data electronically using the fewest possible bytes, standards were developed. So the 810 transaction is made up of specific segments, each of which begins with a character segment name, like BIG or N1. That segment has a prescribed set of elements in order separated by delimiters. So the elements are positional. For the report, I only needed to select the elements that the report needed.

Example of EDI data—One 810 Transaction:

```
BIG.030801.23113011205001030731..UTILITY...PR.  
N1.BT.MOUNTAIN PENNIES.91.12503011205001.  
N1.MQ.RR MURRYS MUN BLDG.92.WP8300.1W.  
N3.SAILORS CREEK RD.  
N4.SLANESVILLE.NC.15118.  
N1.RE.SOUTHLAWN POWER.9.007009005.  
PER.CR..TE.8002553443.  
ITD.05.4....030818.  
IT1.BTC002.301.KH..11279..SV.ELECTRIC.  
MEA.AE.MU.1.KH.18704.19005.  
MEA.AE...K1.0.1.5.  
REF.MG.12401401.  
REF.RB.201.  
DTM.181.030701.  
DTM.187.030731.  
TDS.3395.  
ITA.C...01...4020.....PRIOR BILLING AMOUNT.PBA.  
ITA.A...04...4020.....CREDIT TO ACCOUNT.230.  
CTT.1.
```

Since a primary virtue of SAS software is parsing data, the EDI data is not a problem. Using SAS functions like SCAN, INPUT, INDEX, SUBSTR, and TRIM, the specific variables needed for the report are gleaned, written to a SAS file, and sorted for the report.

The report itself includes a number of variables which needed to be trimmed to the smallest size possible. In the end, PROC PRINT won over PROC REPORT, so the report code was simple.

The excerpt below should give you an idea of the look of the report.

ROCKPORTE EDI CHARGES - PREV. MONTH										14:16 FRIDAY, JULY 15, 2005 1	
MOU CO NO	MOU CO NO	MOUNTAIN NAME	VENDOR NO	ROCKPORTE COMPANY NAME	ACCOUNT	DATE	KH USED	AMOUNT BILLED	ADDRESS	CITY STATE	
1001	1001	MOUNTAIN WEST IOWA	199023483	MINNEHAHA	49119220084082	08/14/2003	0	11.90	421 S 7TH ST	COUNCIL, IA	
	1001	LAKELAND TRANSMISSION	199023483	MINNEHAHA	42420738081151	08/15/2003	112	17.21	143 FLORIDA ROK	BRITTANY, ND	

CREATING THE OUTPUT IN HTML

Now that the report is set, I know I need to use the Output Delivery System (ODS) to create a file. In this case, the file will be an HTML file. Creating the HTML file from a PROC PRINT is easy: just wrap the ODS around the PROC PRINT and reference that filename in the DD card in the Job Control Language (JCL) of the batch job.

Note: Since the Output Delivery System (ODS) makes this process possible, SAS® Version 8 or higher is recommended.

Because this ODS output is coming from the mainframe, the RS option is needed. By default, mainframe ODS will create a binary file with embedded characters to separate records. If the output is viewed in an editor, lines will run together. Specifying RS=NONE will generate EBCEDIC and do a Text (ASCII) transfer.

ODS HTML FILE=HTMOUT RS=none;

```
PROC PRINT SPLIT='_' NOBS WIDTH=min DATA=info.sorted;
VAR    mountain_company_no
      mountain_name
      vendor_no
      rockporite_company_name
      account
      kh_used
      amount_billed
      address
      city_state;
ID mountain_company_no;
SUM kh_used amount_billed ;
BY mountain_company_no;
TITLE1 'ROCKPORTE EDI CHARGES - PREV. MONTH';
RUN;
```

ODS HTML CLOSE:

Creating the HTML file results in a new file name being set up. In this case with a batch job, a new DD card is added to the Job Control Language (JCL).

In JCL: HTMLOUT DD DSN=SHRRCLA.SESUG4.HTML,DISP=OLD

If you would rather place the file name in the SAS® part of the job, the code would be similar to that below:

In SAS® Code: FILENAME htmlout 'SHRRCLA.SESUG4.HTML' DISP=(old)
RECFM=VB LRECL=20004 BLKSIZE=27998 UNIT=3390 SPACE=(Cyl,(1,2)) ;

REDUCING THE SIZE OF THE HTML FILE

By virtue of using an HTML file, there are many tags controlling the fonts, the alignment, spacing, and the like. The file can become quite large. For the purpose here, much of that information is unnecessary. There is a very helpful option that we can put on the ODS statement to minimize the size of the HTML file. A style called Minimal is a default

style that comes with SAS software. Because it uses very few formatting instructions, the file size is reduced significantly.

For this report which uses a SAS® data set with 170 observations and 14 variables, the HTML file originally had 2329 lines. Using STYLE=MINIMAL reduces the number of lines to 179! The modified ODS statement is below:

```
ODS HTML FILE=htmlout STYLE=MINIMAL ;
```

SENDING THE FILE

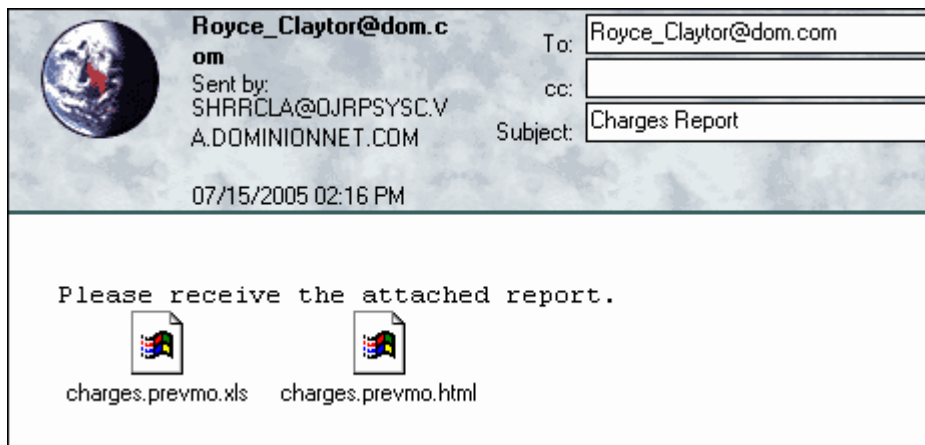
If you can get access to your company's Simple Mail Transfer Protocol (SMTP) server, then the process is simple. On the EXEC card for SAS®, add an options parameter to identify the email SMTP server. After EMAILHOST=, you can specify the SMTP server by name as below, by nickname, or by IP address.

```
// EXEC SAS,OPTIONS='EMAILHOST=SMTP.SERVER.WHATEVER.COM'
```

After the ODS and PROC PRINT portion of the job, there is code to do the send in a SAS® job. In this case, the same HTML file is being sent as an attachment as an Excel spreadsheet (.xls) and as an HTML file (.html).

```
FileName Send Email
From   = 'Royce_Claytor@dom.com'
To     = 'Royce_Claytor@dom.com'
Subject = 'Charges Report'
Attach = ('SHRRCLA.CHARGES.PREVMO' Ext='xls'
          'SHRRCLA.CHARGES.PREVMO' Ext='html');
Data _Null_;
File Send;
Put 'Please receive the attached report.';
Run;
```

See the email created by SAS below:



AN ALTERNATIVE

If you cannot get access to your company's SMTP server, then there may be another product that your company uses to send information from batch jobs to email. In our case, there was a product designated to do that. The product is called HP Output Server (formerly Dazel).

In order to send the report through HP Output Server, the job will take two steps. In the first step, the SAS code produces the report and writes the report to the HTML file. The second step, there is a file which holds the code to provide setup information, such as to what address to send the file and how to send the file—by email, page, fax. The setup file and the file holding the SAS® report must have the same Data Control Block (DCB) information.

For the HP Output Server:

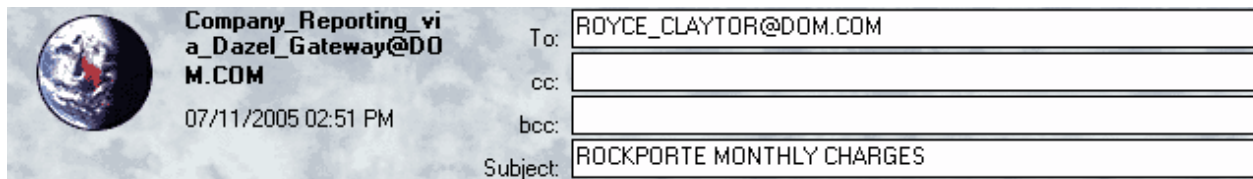
JCL for Step 2 :

```
/*
//*****
//**SEND EMAIL!
//*****
//EMAIL EXEC PGM=IEBGENER
//SYSPRINT DD SYSOUT=*
//SYSIN DD DUMMY
//SYSUT2 DD SYSOUT=Y,DEST=U8404,FREE=CLOSE
//SYSUT1 DD DSN=SHRRCLA.DAZELCD.DATA,DISP=SHR
// DD DSN=SHRRCLA.SESUG4.HTML,DISP=SHR
//
```

In the data set:

```
#!DAZEL
-DESTINATION EMAIL
-MAIL-RECIPIENT ROYCE_CLAYTOR@DOM.COM
-!ATTACHMENT
-MAIL-SENDER Company Reporting
-MAIL-SUBJECT ROCKPORTE MONTHLY CHARGES
-MAIL-MESSAGE Attached is last month's report of Rockporte EDI charges.
-MAIL-MESSAGE These amounts have been automatically recorded in the syst
-MAIL-MESSAGE and paid to Rockporte, Inc. Please review and verify that
-MAIL-MESSAGE the amounts billed are reasonable and correctly charged.
-MAIL-MESSAGE If there are any questions about these charges, contact
-MAIL-MESSAGE Silas Marner at 222-4567.
-DOCUMENT-FILENAME PREVMOCHG.XLS
#!EOR_DAZEL
#!EOF_DAZEL
```

See the email produced by HP Output Server below:



Attached is last month's report of Rockporte EDI charges. These amounts have been automatically recorded in the system and paid to Rockporte, Inc. Please review and verify that the amounts billed are reasonable and correctly charged. If there are any questions about these charges, contact Silas Marner at 222-4567.



PREVMOCHG.XLS

If you do not have SMTP on the mainframe, there is still hope. You may be able to send the output to a server that can send mail.

THE NEAT TRICK

So far we have an HTML file that houses a SAS report. That file will be the attachment to the email. The trick is to call the attached file with an xls extension. Since .xls is used on the attachment, when the receiver clicks on the attachment, Microsoft Excel is launched. The report appears as an Excel spreadsheet, and it looks great. Great, except for the scientific notation in the Account Number column. Also notice in the Amount Billed column, a zero has been dropped from 11.90.

	A	B	C	D	E	F	G	H	I	J	K
1											
2			ROCKPORTE EDI CHARGES - PREV. MONTH								
3	Mou	Mou	MOUNTAIN	VENDOR	ROCKPORTE			KH	AMOUNT		City
4	Co	Co	NAME	NO	COMPANY			Used	BILLED		State
5	No	No			NAME	ACCOUNT	DATE			ADDRESS	
6	1001	1001	MOUNTAIN WEST IOWA	199023483	MINNEHAHAHA	4.91192E+13	08/14/2003	0	11.9	421 S 7TH ST	COUNCIL, IA
7		1001	LAKELAND TRANSMISSION	199023483	MINNEHAHAHA	4.24207E+13	08/15/2003	112	17.21	143 FLORIDA ROA	BRITTANY, ND

THE NEXT RUB: TWEAKING EXCEL

In transit between SAS and Excel, not everything carries over the way you want it. Numeric fields may not carry the values to the right of a decimal consistently, so corrections may be needed for those fields. If the fields are imported to Excel as Text, then no interpretation changes the original SAS® values.

To import these values as Text, we need to employ specific Microsoft Office CSS style sheet properties. Based on the version of Excel needed, the code is different.

For Excel 97, the CSS style property is **vnd.ms-excel.numberformat**.

For Excel 2000 or higher, the style property is **mso-number-format:"\l@**

Since my report will use Excel 97, I am showing the style property for that. See below the SAS® code with the style being applied to the Account variable. It is also needed on the totals created by PROC PRINT. Notice that in order to override the style on a column, you simply end the VAR statement with a semi-colon and then begin another VAR statement for the next variable to be printed.

```
PROC PRINT SPLIT=' ' NOOBS WIDTH=min DATA=info.sorted;
VAR mountain_company_no mountain_name
    vendor_no
    rockporite_company_name
    account / style(column)={htmlstyle="vnd.ms-excel.numberformat:@"};
VAR date
    kh_used
    amount_billed /
        style(column)={htmlstyle="vnd.ms-excel.numberformat:@"};
VAR
    address
    city_state ;
ID MOUNTAIN_COMPANY_No;
SUM kh_used amount_billed /
    style={htmlstyle="vnd.ms-excel.numberformat:@"};
BY MOUNTAIN_COMPANY_No;
```

The resulting Excel spreadsheet is shown below:

	A	B	C	D	E	F	G	H	I	J	K
1											
2	ROCKPORTE EDI CHARGES - PREV. MONTH										
3	Mou	Mou	MOUNTAIN	VENDOR	ROCKPORTE			KH	AMOUNT		City
4	Co	Co	NAME	NO	COMPANY			Used	BILLED		State
5	No	No			NAME	ACCOUNT	DATE			ADDRESS	
6	1001	1001	MOUNTAIN WEST IOWA	199023483	MINNEHAHAHA	49119220084082	08/14/2003	0	11.90	421 S 7TH ST	COUNCIL, IA
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Another area that often requires an adjustment is that of Titles and Footnotes. When ODS HTML produces the .xls file, the result is that the title is put in the first cell. To correct strange titles and to allow them to span more than one cell, it may be necessary to add a little HTML code. For this report, the title needed to span 6 columns and alignment to the left was fine. See the code for the title correction below:

TITLE1 "<td align=left colspan=6><font size=4ROCKPORTE EDI CHARGES – PREV. MONTH</td>";

The best sources for this and many other ways to customize or fix discrepancies in moving to an Excel spreadsheet are two papers by the expert: Chevell Parker of SAS Institute. See the references at the end of this paper.

CONCLUSION

This paper has covered a number of specific areas to modify in order to get the desired results, but the fact is that there is very little code required to creating an HTML file from ODS and emailing it as an attachment that is automatically opened as an Excel spreadsheet. Actually it's pretty slick!

REFERENCES

Parker, Chevell. "Using ODS to Generate Excel Files"

WEB REFERENCES

Parker, Chevell. "Generating Custom Excel Spreadsheets Using ODS" *Proceedings of the Twenty-Eighth Annual SAS® Users Group International Conference*, March 2003. <http://www2.sas.com/proceedings/sugi28/012-28.pdf> (March 27, 2003).

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