

## The World Wide Web and SAS®

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## INTRODUCTION

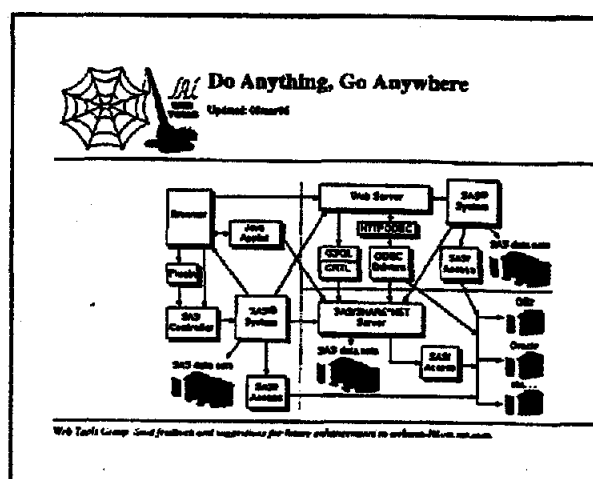
Advances in Internet technology, specifically initiatives in HTTP and HTML and proprietary extensions, provide new opportunities for delivering and exploiting information. These opportunities obviously complement and occasionally overlap the competencies at which SAS traditionally excels.

Not surprisingly, therefore, the Institute promoted new Internet connectivity features in release 6.11, components that are in some various stage of development including production, beta and experimental. One chart that was widely circulated, entitled *Do Anything, Go Anywhere* (produced by the Web Tools Group), shows their initial understanding of the Institute's place within the Web (Figure 1).

The purpose of this paper is to update you with the progress and additional features and demonstrate a few techniques for deploying them.

There are two sections to this paper: hooking your browser to basic SAS components, and hooking basic SAS components to the Web. While most of this information

should work in either Microsoft's IE browser or Netscape's browser, the examples are somewhat Netscape-centric.



**Figure 1 SI Poster Showing SAS/W3**

## I. HOOKING THE BROWSER TO SAS

### EXAMPLE 1.

Let's look at simple HTML source for SAS under Windows or an OS/2 platform. First, create a simple SAS program called hello.SAS:

```
filename msg disk 'c:\paper\results.htm';
data temp;
length string $25.;
input string;
cards;
Hello_WWW!
```

```
data _null_;
set temp;
file msg;
put '<H1>' string '</H1>' ;run;
```

Next, create some simple html:

```
<A HREF="hello.SAS">Hello</A>
```

Name this little file `howdy.htm`, then point to it in your browser. At the URL window, enter: `file:///c:/howdy.htm`

Please note the use of the vertical bar rather than a colon after the drive specification.

If your windows registry already knows how to behave when it sees the .SAS extension, you're done. When your browser says something like "unrecognized application," you'll know you need to perform one more step: configure the browser to recognize the service request and take the correct action by invoking SAS when it encounters the .SAS extension. In Netscape, this can be done by telling it how to start a batch SAS session.

For Netscape, you create a batch file that points to the SAS core directory. Create a batch file (WWWSAS.BAT) with this info

```
in it, replacing COREDIR? with the location
of your SAS system (e.g., F:\SAS611):
\COREDIR?\sasexe\sasoact.exe
action=Open datatype=sasfile
filename ="%1"
```

Next, define a new MIME type that references the batch file (WWWSAS.BAT). This can be done in Netscape under General Options, Helper Apps (see Figure 2.)

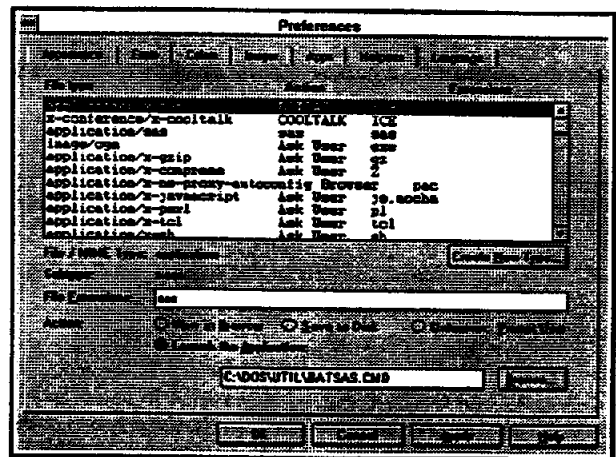


Figure 2 Example of Netscape Config

#### EXAMPLE 2:

Another simple technique for interfacing SAS and the Web is available in Netscape by using the embed method.

With this technique, SAS programs and datasets can be embedded into the html page with the following source:

```
<EMBED SRC=hello.sas">
```

The browser downloads the code and executes it via the registration actions you accomplished in the previous example.

### EXAMPLE 3

A slightly more involved process involves using plugins. Plugins are more tightly integrated hooks between the browser and the application software. The Institute has an experimental plugin for Netscape and SAS for Windows.

```
<EMBED SRC="hello.sas"
ACTION=Submit
DATATYPE=SASfile>
```

When this page addressed, the browser begins downloading a temporary copy of the object. The difference between this technique and the first example is that user action is not required. In other words, the user does not select an icon to invoke the system. The browser already knows what to do and how to handle it, via the plugin. More importantly, the plugin configuration is simpler, too. Once its been downloaded and copied into the plugin directory, its available for use. Netscape must be restarted after a new plugin is added. the Institute continues to update their plugin, so check and re-check their WWW site for the latest version. It can be downloaded from [www.sas.com](http://www.sas.com) at URL

<http://www.sas.com/rnd/web/intro.html>

## II. HOOKING SAS TO THE WEB

### EXAMPLE 4:

SAS applications can also access Web pages. Given a file with the following info exists on your Web server in /example/filein.txt:

|                 |    |
|-----------------|----|
| stop            | 3  |
| exit            | 8  |
| halt            | 2  |
| quit            | 5  |
| clear           | 10 |
| off             | 6  |
| So long         | 2  |
| Farewell        | 2  |
| auf wiedersehen | 2  |
| good-bye        | 3  |
| bye             | 1  |

```
filename adios url
"http://www.host.com/sas/filein.txt";
```

```
title 'Initial experiences stopping DMS';
data example;
infile adios pad hrec1=30;
input
@1 say $14. @15 times 8.
;
run;
proc sort; by times;run;
proc gchart data=example;
    hbar say / sumvar=times discrete;
run;
```

To change to an ftp server, simply change the filename access to FTP instead of URL.

**EXAMPLE 5:**

Thanks to the work of Michael Friendly, it is relatively easy to convert a SAS table into an HTML table via a macro. The SAS2HTML macro's invocation includes the SAS dataset name, selection of variables, and the target HTML version. This macro is available from [www.sas.com](http://www.sas.com). Downloading the code, tailoring it slightly for site specific information, and installing it took about 30 minutes and was immediately productive. A slightly different approach to HTML table generation is available from John Smith of Boulder, CO.

**EXAMPLE 6:**

It is also possible to control the behavior of browsers from within SAS. For instance, through the use of DDE, SAS can communicate with Netscape. In the example below, instructions are sent to start the browser and open it to the SAS Web site.

```
/* Next line will start Netscape in an OS/2
platform: */
x c:\netscape\netscape.exe ;
```

```
filename browser dde
'NETSCAPE|WWW_OpenURL!'http:
//www.sas.com/'",-1';
  data _null_;
    infile browser;
    input @;
    put _infile_;
  run;
```

```
filename browser dde
'NETSCAPE|WWW_Activate!-1,0';
  data _null_;
    infile browser;
    input @;
    put _infile_;
  run;
```

**PROBLEMS AND ISSUES:****SECURITY**

Security should be the concern of every computer user, and generally is shortly after there has been a security breakdown that results in problems for the user.

Recommendation: It is important that users not disable or ignore the Netscape warning that alerts you to unsecured transactions and applications. For instance, a malevolent programmer could relatively easily code a SAS program that would be destructive to user files. For that matter, an inexperienced user could accomplish the same results accidentally.

**PROBLEMS**

Many of these features are new to SAS, whether they're classified as experimental, beta, or production. Check the support database before starting. Scan for tcp, ftp, socket and read the hits.

In the OS/2 arena, for instance, the Institute does support IBM Warp Connect's tcp/ip

stack, but does not support FTP Software for OS/2 for FILENAME.

This is mentioned because it is not currently documented, nor is it consistent with other SAS support for FTP Software's stack.

## OUTLOOK:

Through the use of SAS add-on products, and in conjunction with these programming techniques, the interface between the Web and SAS can appear almost seamless. For instance, SAS/SHARE can act as a processor to data requests from a Web interface. Moreover, with the advances in scripting languages (e.g., JAVA) and connectivity standards such as ODBC, SAS can tightly integrate with the World Wide Web.

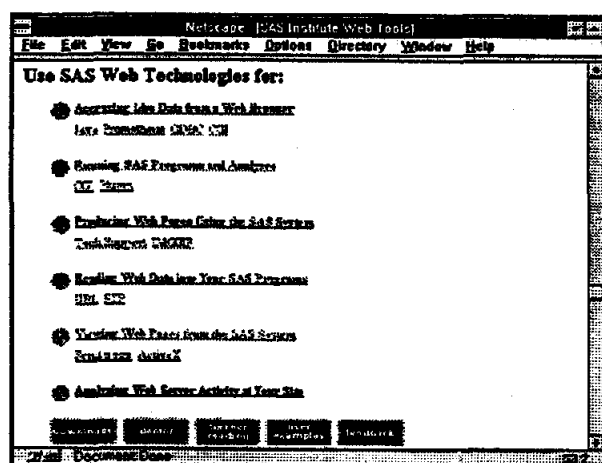


Figure 3 Institute's List of Web Projects

Browser technology and SAS make a powerful partnership. As browsers gain in popularity, they will become a de facto standard as a user interface. They provide

relatively straightforward access to information dissemination and are widely accepted and used.

SAS can best support applications using this new technology by providing the background tools and bridges for conducting data management and analysis, and by porting mainline procs to applets. Just prior to the deadline for this paper, the Institute created a repository on their web site that lists their efforts to integrate SAS into the Web. For more information, see *SAS Web Tools* under the *Resource and Development* section of their web site.

## ACKNOWLEDGMENTS

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