

Enterprise Client Software for the Windows Platform

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ABSTRACT

There is a new family of thin client products available with the Nashville release. This suite of Enterprise client software currently has two products available, Enterprise Guide[®] and Enterprise Reporter[®]. Enterprise Guide provides a point and click, code based user interface to all the Version 8 SAS[®] System servers. Enterprise Reporter is a native PC reporting tool with transparent data access to all the Version 8 SAS System servers.

INTRODUCTION

This family of thin-client Windows applications is built using a set of common components that will serve as a foundation to all future additions. This foundation provides transparent, simultaneous access to all Version 8 SAS System platforms, including Windows, Unix and mainframe systems. Both Enterprise Guide and Enterprise Reporter are separate Windows applications that communicate with the SAS System to access data. In addition, Enterprise Guide can execute SAS code and generate results.

SAS SYSTEM ACCESS

The Enterprise Client products can simultaneously use the SAS System for Windows, Version 8, that is installed on your local PC as well as any Version 8 SAS System for Windows, Unix or the mainframe that is installed on these ma-

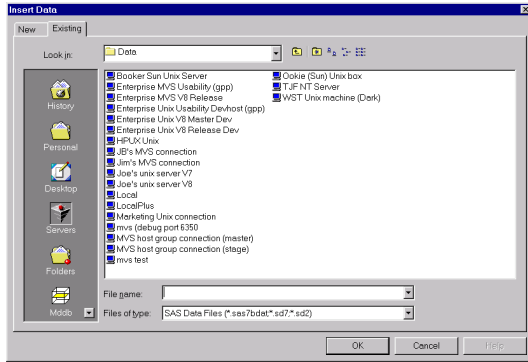
chines. In order to provide this access, the Enterprise Clients require a Version 8 or greater SAS server. These products are true thin client applications – there is no need for the SAS System to be installed on the same machine where Enterprise Guide or Enterprise Reporter is installed.

DATA ACCESS

The Enterprise Clients provide transparent access to both SAS and non-SAS data. For example, you can report on or analyze data that resides on your MVS system as well as a Microsoft Excel spreadsheet that is located on your PC. Data sources residing on different servers and of different architectures can be used in the same report or reside in the same project, and the logistics are handled completely transparently by the Enterprise Client technology. By default, data is processed and tasks are run on the server where the data is located.

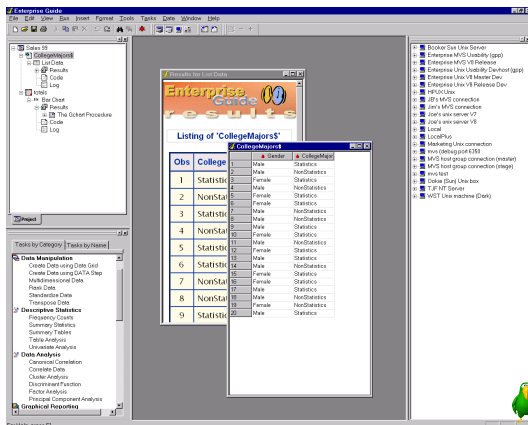
Moving data and accessing remote data is also easy within the Enterprise Client environment. Copying the contents of an Excel file from your PC to MVS is a simple drag and drop operation. The File Open dialog allows you to navigate the native file systems of all machines where the SAS System is installed.

Here is an example of what the File Open dialog would look like with several SAS servers defined:



In addition to file selection through the file open dialog, you can drag local data files from your Windows Explorer directly into your projects and reports. Enterprise Guide also provides a Server List control bar making it convenient to drag files from any remote server into a project or from the Windows Explorer to any remote server or from server to server.

Here is the Enterprise Guide application with an active Server List control bar:



QUERY

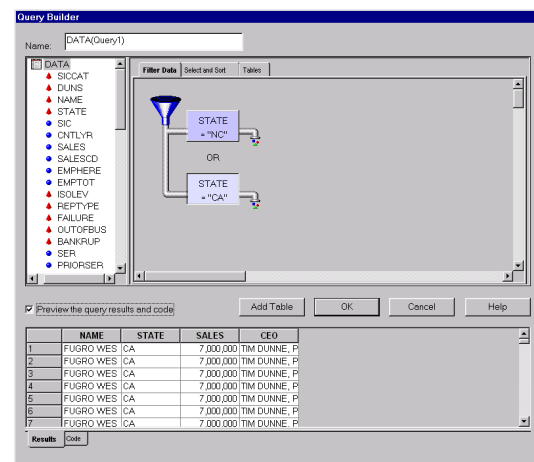
In addition to using data "as is" from the table, you can use the graphical Query Builder to join tables, filter data, select columns, set ranges and sort data before you use it for a task. This interactive tool lets you build queries without being an SQL expert. When joining one or more tables, the Query Builder performs a

"smart join" by automatically connecting common columns between the tables. You also have the option of connecting the columns yourself through the drag and drop interface. The Query Builder provides dialogs to define both inner and outer joins.

Producing a subset of your data that meets certain conditions is easy to do with graphical filtering feature of the Query Builder. This capability allows you to create filters on data by choosing the column and using a simple dialog to define the condition. Creating exact match conditions is made easier with distinct value lists. The AND and OR relationships between the conditions can be changed by dragging the filters around to change the "flow" of data that is filtered.

If, at any point while creating your query, you wish to view the SQL code being generated, the Query Builder provides a preview window that displays the current query code.

Here is an example query created using the Query dialog.



SCHEDULER

One of the strengths of the SAS System is the ability to repeat tasks. Once you have created a project in Enterprise Guide, you can schedule either the entire project or a portion of that project to run in batch at a later time. Likewise, you can schedule data preprocessing to occur in batch for your report generation in Enterprise Reporter. The generated results or reports can then be published as HTML files, automatically e-mailed or printed or published to a specific web server.

You control Enterprise Client applications by creating a script to automate the application. Any script language that supports automation will work; for example, VB or Java scripts. Applications such as Wscript, Cscript and Microsoft Visual Basic can be used to run these scripts. Your script can be automated using various system schedulers such as AT on Windows NT or the Task scheduler provided by Internet Explorer.

Here is a sample VB script for automating an Enterprise Guide project named "c:\sales.seg". The entire contents of the project runs when this script executes. The output of the run is saved in "c:\salesout.seg".

```
' Start up guide using the project name
Dim obj
Set obj = WScript.GetObject(c:\sales.seg,
"SASEGuide.Project" )

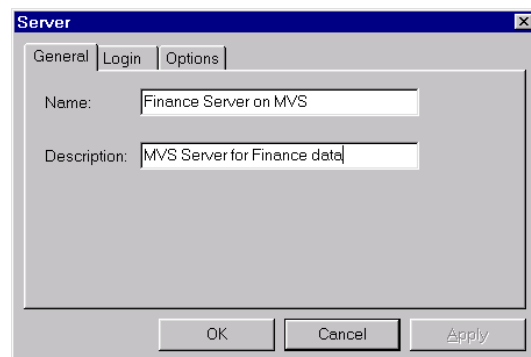
' Run the tasks
obj.Run()

' Save the new project
obj.SaveAs("c:\salesout.seg")
```

ADMINISTRATION

If you have a SAS System installed on your local PC; by default your Enterprise Client application can automatically connect to that SAS System and use it as the default server. If you want to connect to other SAS System servers, you need to tell your Enterprise Client application where the servers are located. Using the Administrator, you can set up the servers for groups of users at your site. For each server, you specify a name like "Finance server on MVS" and a description like "MVS Server for Finance data". You specify either the actual domain name like "mvs.sas.com" or the IP address like "10.10.3.255". You specify the type of protocol used to connect to the server - either DCOM or TCP/IP. You can either specify user login information or you can choose to be prompted for the user login name and/or password when an actual SAS System server connection is established. You can designate the default server.

Here is a sample property sheet for a MVS server:



For each server, you can set up SAS libraries that will be created when you establish a connection to that server.

Using the Administrator, you can set up users and groups. You can use groups to control user access to servers, libraries and folders.

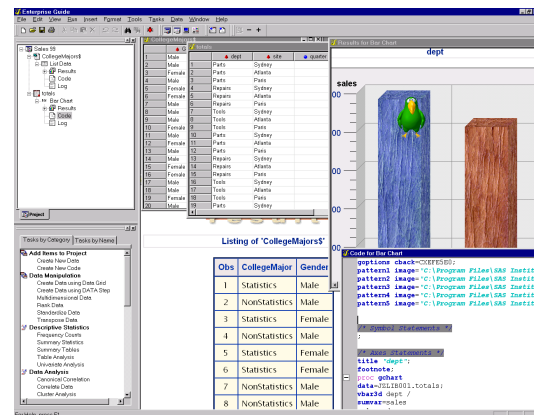
Using the Administrator, you can set up folders. Folders can contain files, shortcuts and other folders. Files can be SAS and non-SAS data. Shortcuts can point to other folders and files. The folders can be located on the local PC, the PC network as well as any of the remote SAS servers. These folders will be accessible via the open file dialog to allow you to easily find your favorite data.

On a site, group or user level, you can set up SAS server access, SAS libraries and folders.

ENTERPRISE GUIDE

Enterprise Guide provides transparent data access to both SAS and non-SAS data. Interactive dialogs, wizards and property sheets lead you through dozens of analytical and reporting tasks. You have the ability to export results to other Windows applications and to the Web as well as the ability to schedule your project to run at a later time. Behind the scenes, the SAS System does all the work so you get a native Windows user interface with the power, stability and scalability of the SAS System. The results generated by the SAS System take advantage of Version 8 Output Delivery System (ODS) to format and present results. You can save your results either with your Enterprise Guide projects or export them individually using e-mail or your favorite browser. Once you have created a project, you can schedule it to run periodically to create results that reflect changes that have occurred with your data. For documentation purposes, you can also add existing files to your project such as Microsoft Word or PowerPoint files. Tasks generate SAS code and formatted results. Below is an example of an Enterprise Guide project

that contains SAS and non-SAS data, a “List Data” task, a “Bar Chart” task and the results that each task generated:



Enterprise Guide also provides a color-coded, syntax-checking SAS language editor for editing new or existing SAS programs in your project. The editor uses different colors to indicate the various SAS language keywords as well as embedded comments and quoted strings among other things. The colors and attributes of the text are all controlled via options. Very handy collapse and expand tools are provided to allow you to collapse your SAS code to the step level.

The screenshot shows the SAS code editor in Enterprise Guide. The code is color-coded and includes comments. The code defines a bar chart task named 'bar' and uses the 'gchart' procedure to generate the chart. The code includes options for the chart's appearance, such as 'shape=bar', 'width=30', and 'height=40'. The data source is specified as 'data=collib.totals gout=collib.odsout'.

```

%macro bar;
  %local _infile_ _outfile_ _odsout_;
  %let _infile_ = %sysfunc(pathname('sascode\bar.sas'));
  %let _outfile_ = %sysfunc(pathname('sascode\bar.rtf'));
  %let _odsout_ = %sysfunc(pathname('sascode\bar.ods'));
  %include %_infile_;
  %ods _odsout_;
  %gchart data=collib.totals gout=collib.odsout
         quarter / discrete
                  subgroups=
                  shape=bar
                  width=30
                  height=40
                  legend=legend1
                  title=Bar Chart of
                    Quarterly Sales
                    name=_outfile_;
%mend bar;

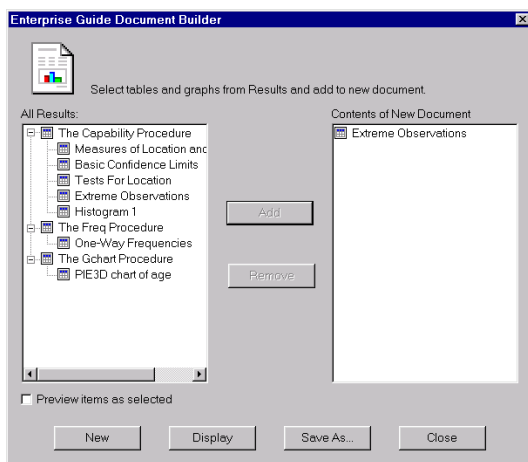
```

By default, code is run on your default server. If you would prefer to run your code on a different server, you can select the server from the list of available servers when you add your code to your project. Also you can change the design-

nated server using the Properties dialog or the Run->Designate server dialog.

You can create a custom report from your results using the Document Builder. You select which tables and graphs you want to save as well as the order you want these tables and graphs to appear. Once you have created your document, you can save it as HTML.

Here is an example of the Document Builder dialog:



The appearance of Enterprise Guide is customizable through a Customize dialog, which allows you to modify menus, toolbars and accelerators as well as add tools to your Tools menu.

Through an Options dialog you can configure the way the Enterprise Guide application behaves. For instance you can change your default server or control the presentation of your project view – you can suppress the code and log nodes under each task. Many other options exist to control the appearance and behavior of the application.

ENTERPRISE REPORTER

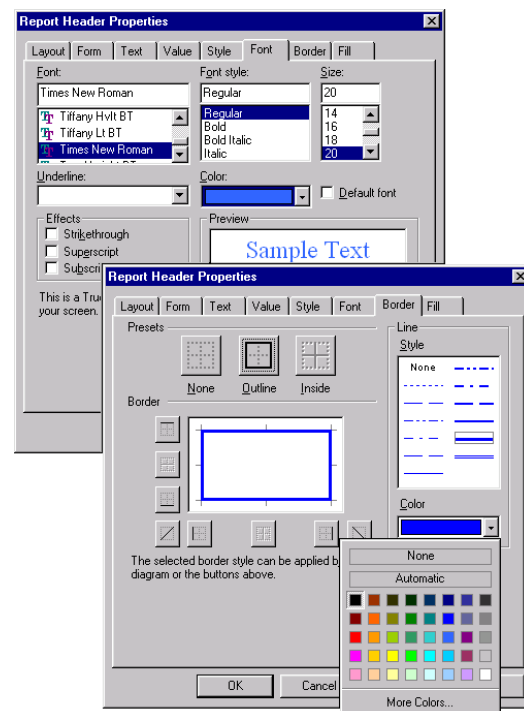
Enterprise Reporter 3.0 is targeted at the business user who wants easy report creation. By combining the power of a

native Windows interface with transparent data access to the SAS System and other data providers, you can quickly view your data in the printed form.

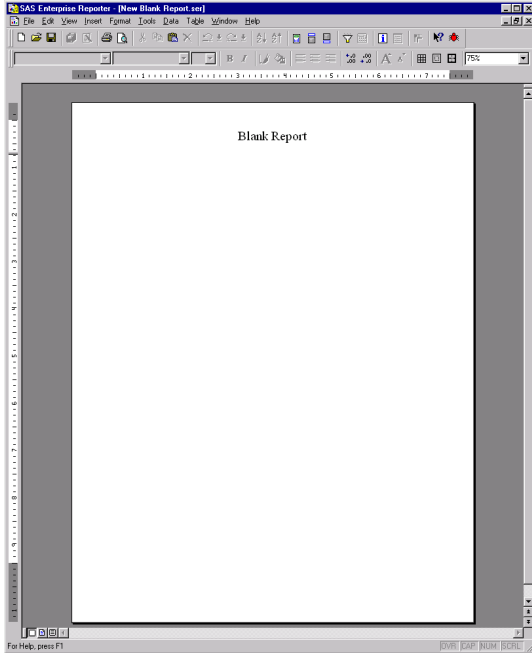
Native Windows Interface

Enterprise Reporter is designed around the user interface common to native Windows office productivity software. Through the common appearance with other applications, you can reduce the time to fully learn the application and become productive.

This includes all of the dialogs for selecting common things such as fonts, colors, sizes, and borders. In addition, you are presented with a workspace environment that has the same appearance and organization as a typical word proc-

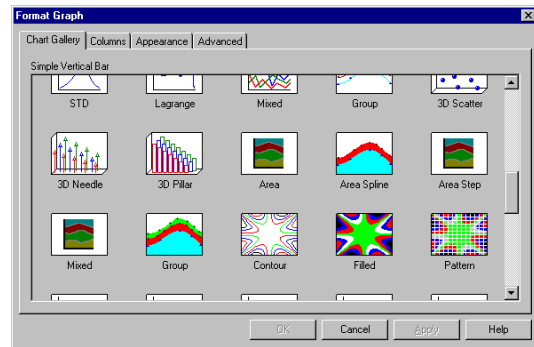


essing application.



Highly Interactive Graphics

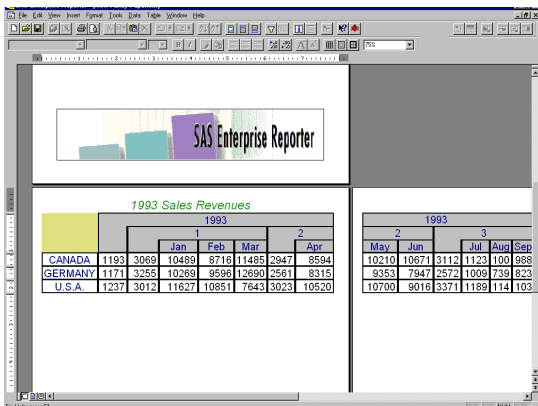
As a result of significant enhancements made in the SAS/Graph® User interface and integration, graphs are presented in a manner that allows you to make changes to their appearance and see the results immediately. You get full control over all aspects of the graph including the fonts, orientation, layout and even the style of graph. As a result, Enterprise Reporter presents you with a gallery of over 60 graph styles with an almost infinite variety of customizations.



WYSIWYG Environment

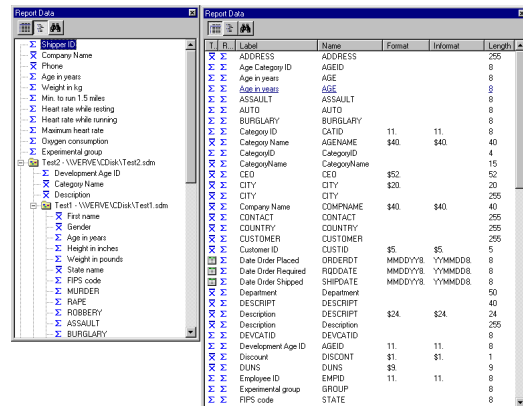
Through an innovative approach to interactive data viewing, you can see your information exactly as it is going to be printed out. There is no need to go to a print preview window to see how the final printed page will look.

All of the data is presented in a live manner so that you can update the report and immediately see the results of the changes. Optionally, you can switch the view to a design mode in order to see a more macroscopic view of how the report is built.



InfoCenter

With a focus toward a business user, Enterprise Reporter provides a method of selecting data that does not require you to know the complete schema of a database in order to bring the data into the report.



Through the InfoCenter concept, you select variables directly instead of selecting and joining tables. Given that choice of variables, the InfoCenter automatically calculates the appropriate database table joins in order to create the table.

In addition, the InfoCenter allows you to browse through the accessible variables as well as sort and prune them to locate the data needed for a report. This style allows you to focus on creating the report and not having to understand the data in detail.

Automatable

To further integrate into the office productivity environment, Enterprise Reporter provides an automation environment that allows access to all parts of the application as well as control over how the application runs. This allows you to customize Enterprise Reporter to integrate with your applications and also provides hooks to create advanced applications through combining multiple office productivity applications and scripting languages with Enterprise Reporter.

XML for compatibility

In looking toward the future of the Web, we have seen that XML is playing an important part in representing data. In order to future-proof your investments in reports, Enterprise Reporter utilizes XML to store all reports and templates. This will allow reports to be integrated into XML knowledgeable browsers as well as ensures that Enterprise Reporter can read reports created from any future or past version.

```
<?XML Version="1.0"?>
<!DOCTYPE SEREPORT SYSTEM "SEReport.dtd">
<SEREPORT>
  <Description Title="SAS Enterprise Reporter (Report Template)" Version="6"/>
  <Attributes Units="MM" CodePage="US"/>
  <Styles>
    <Style Name="Document">
      <Font Name="Arial" BackColor="white"/>
    </Style>
    <Style Name="Report Header">
      <Font Name="Times New Roman" Size="20 pt" BackColor="white" WrapText="TRUE" />
    </Style>
  </Styles>
  <ReportForm>
    <Report GroupID="-1" Flags="FieldsChanged|SectionSizeUnknown|LayoutUnknown">
      <Header Type="Header" Height="0.5 in">
        <FormField>
          <FormFieldText Type="HeaderReport" HAlignment="Center" Width="0.5 in" />
        </FormField>
      </Header>
    </Report>
  </ReportForm>
  <Page GroupID="-1" Flags="FieldsChanged|SectionSizeUnknown|LayoutUnknown">
  </Page>
</SEREPORT>
```

CONCLUSIONS

At the time this paper was written all the details concerning Enterprise Guide and Enterprise Reporter were still being finalized. For more details on Enterprise Client software, refer to the web site, <http://www.sas.com/software/app/activex.html>.

REFERENCES

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