

The Evolution of a SAS/GRAPH Application

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INTRODUCTION

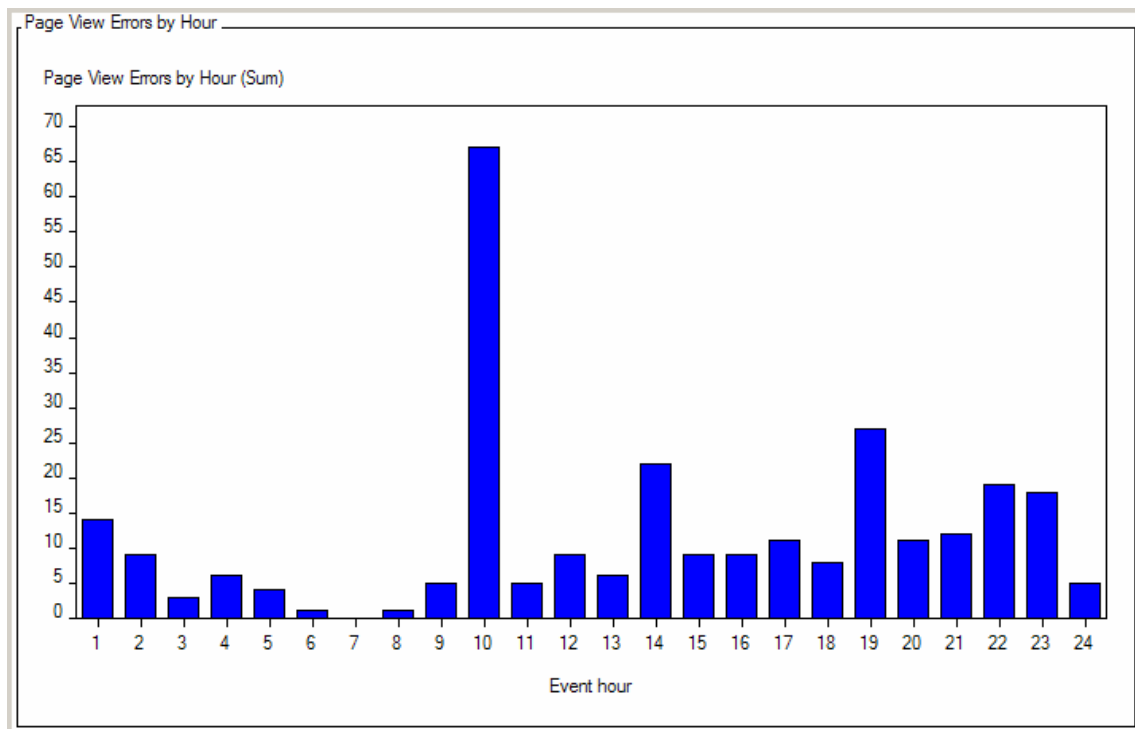
Graphs are an excellent way to represent any activity. The author is using web server errors tracked over a 24 hour period to represent such activity in a traditional SAS/GRAPH bar chart. With increased enhancements to SAS/GRAPH over the years, additional levels of data representation are available. Further understanding of ODS, its options, and the addition of html hyperlinks allows for expanded information delivery for continued drill-down capabilities.

This poster will introduce a basic SAS/GRAPH representing web server errors over 24 hours. With the addition of ODS and java output, drill-down capabilities are introduced allowing the user to identify individual servers and drill into a specific hour for its visualization. This can occur with just a few simple statements. To further the information delivery capabilities, html hyperlinks can be added to each bar in a graph. These linked graphs provide additional levels of data detail to be drilled into. Code to create the html hyperlinks and additional graphs will be revealed.

A BASIC SAS/GRAPH

The graph below was created using PC SAS's Graph-N-Go. SAS/GRAPH has many options to give more life to the already valuable data presented in this bar chart. Manipulating options, colors, titles, and fonts allows SAS/GRAPH to provide a professional look to graphing output.

GRAPH 1



The code below is the logic generated by Graph-N-Go and creates the results in GRAPH 1.

```
goptions reset=all hpos=40
    ctext=CX000000 ftext="MS Sans Serif"
    colors=(CX0000FF CXFF0000 CX008080 CX00FF00 CXFF00FF CXFFFF00 CX00FFFF CX800000
        CX008000 CX800080 CX000080 CX808000 CXFFFFFF CX808080 CXC0C0C0 CX000000);
axis1 minor=none label=("Event hour") ;
axis2 minor=none label=("Page View Errors by Hour (Sum)")
    order=(0 to 70 by 5) ;

proc gchart data=TMP.GRAPH PAPER2;
    vbar HOUR /
        type=SUM sumvar=ERRCNT maxis=axis1
        discrete frame cframe=CXFFFFFF
        woutline=1 coutline=CX000000 caxis=CX000000
        raxis=axis2 ;
run;
quit;
goptions reset=all;
```

THE WEB BASED JAVA GRAPH

The code below creates a Java Applet that displays a vertical grouped bar chart. Using the same data and graphing the same information, a few changes are made to the procedure step. VBAR is now VBAR3D. We identify a subgroup that will allow the viewer to drill into the graph for more detailed information. The most notable change is the addition of ODS. An output location is required. A drilldown mode needs to be assigned to take advantage of the advanced drilling capabilities. The location of the applet is identified in the attribute option as well as noting the graphapp.jar.

This example highlights the ability of the Java Applet to identify subsets of information along each response axis.

```
goptions reset=all hpos=40
    ctext=black nodisplay
    colors=(blue red)
    device=JAVA;

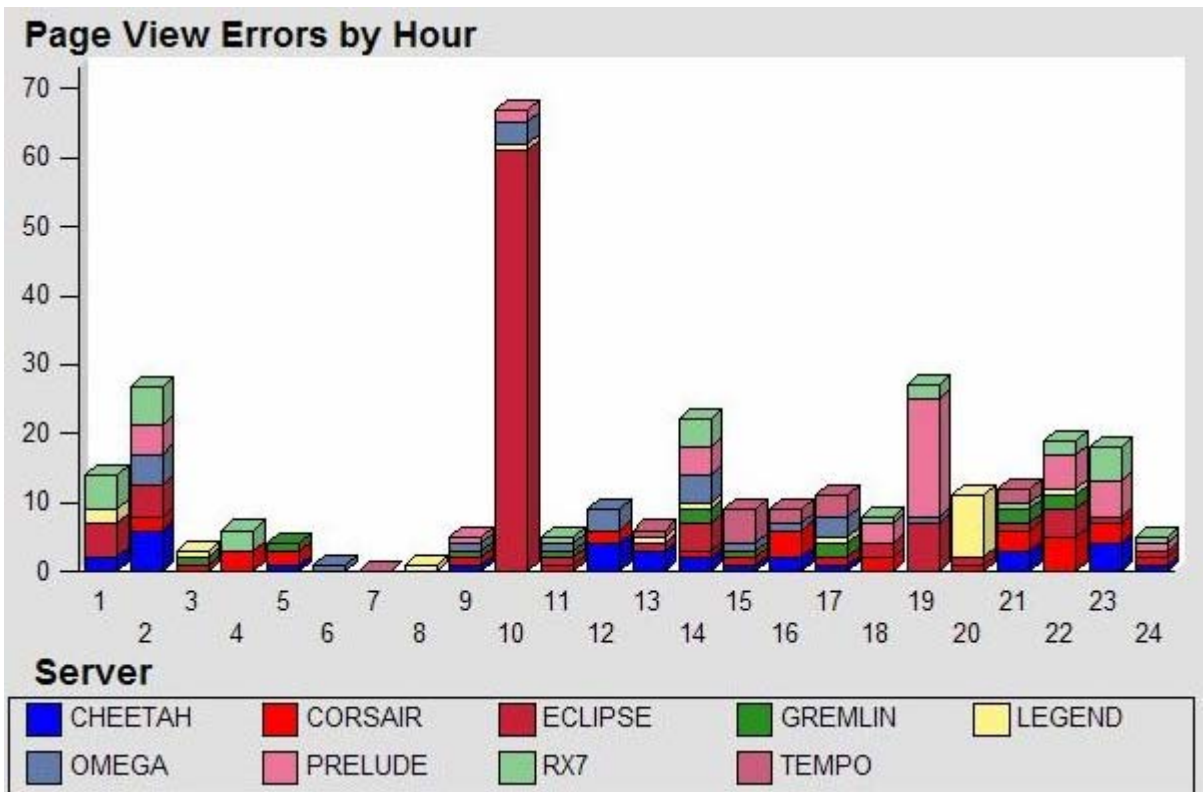
axis1 minor=none label=("Event hour");
legend1 frame shape=bar(1,1) cells cborder=black
    label=(justify=center position=(top center))
    position=(bottom center);

ods html file="C:\pg_errors2.html"
    parameters=("DRILLDOWNMODE"="LOCAL")
    attributes=("codebase"="C:\Program Files\SAS Institute\Shared
        Files\applets")
    archive="graphapp.jar";

proc gchart data=graphpaper2;
    vbar3d hour / subgroup=server
        type=sum sumvar=errcnt maxis=axis1
        discrete frame cframe=white
        woutline=1 coutline=black caxis=black
        legend=legend1 subgroup=server;
    title 'Page View Errors by Hour';
run;
quit;
ods html close;
```

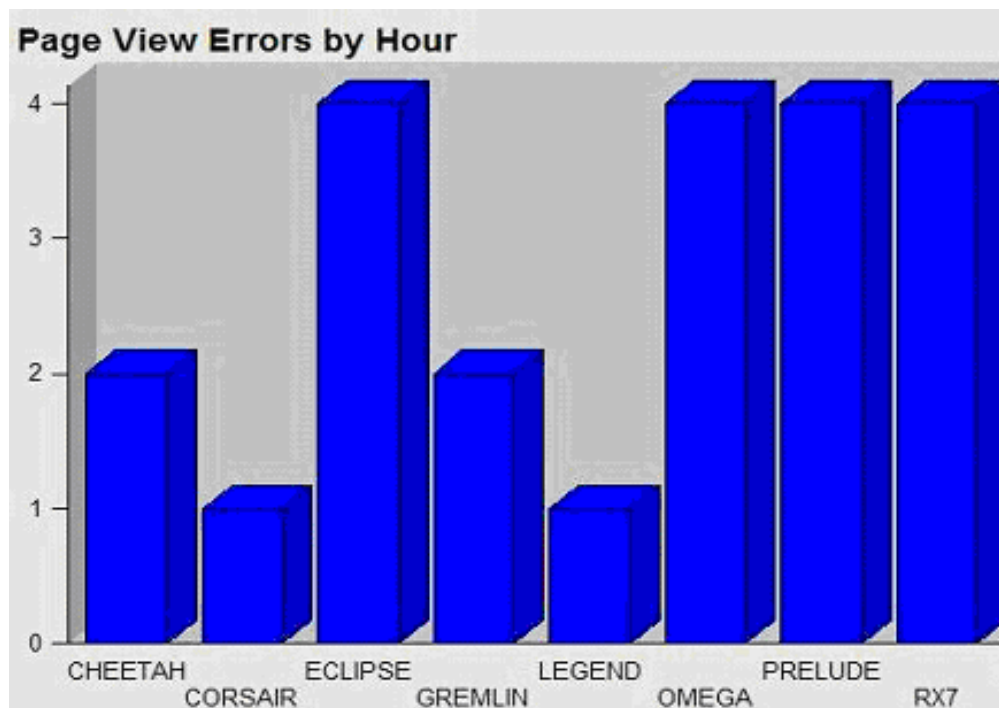
The code results in the following java graph:

GRAPH 2



In this example, website error activity is captured. The need here is to identify periods of high error activity and group them in a way that is helpful in identifying the source of the error. By clicking on hour 14, the following view is presented. This chart identifies these errors within each hour of a single day and is subset by web server.

GRAPH 3



The ability to view the information detailed in GRAPH 2 in a more detailed glimpse is shown in GRAPH 3.

While the code creating this Java Applet Graph has a lot of valuable information and versatility, you can only drill in for a closer view of something that is already available on the main graph. Hour 14 is a good example. It can be viewed on its own by drilling down into this bar of the chart. But the same information is already available on the main chart. By expanding and isolating the hour, no new information is obtained by drilling deeper into the chart.

SUPER ENHANCED DRILLABLE JAVA DRILL-DOWN GRAPH

There are other factors that can contribute to website errors. Specific URLs is one. Finding a way to incorporate URLs into a Java Graph would help isolate issues. To accomplish the additional level of detail required and the approach presented in this paper is to bring in another level of reporting to the Java Applet Graph. *The method to achieve this is to create an html link from each bar in the chart to its own individual Java Applet Graph.* To do this, a link needs to be created within the input data set. The href assigned to each hour will be the location of the additional Java Applet Graph.

The code below accomplishes the creation of 24 additional graphs, one for each hour of the day. It then creates the main java drill-down graph that utilizes and links to the 24 graphs with additional information.

```
data errors; set tmp.graphpaper;
  length links $40.;
  do i = 1 to 24;
    if hour = i then links = compress('href="file:///c:\erhour|||..html"|');
  end;
run;

goptions reset=all hpos=40
  ctext=black nodisplay
  colors=(blue red)
  device=JAVA;

axis1 minor=none label=("Event hour");
legend1 frame shape=bar(1,1)cells cborder=black
  label=(justify=center position=(top center))
  position=(bottom center);

ods html file="C:\pg_errors.html"
  Parameters=("drilltarget"="_self"
    "menuremove"="Graph,Legend,Options:Tips,Variables,Help")
  attributes=("codebase"="C:\Program Files\SAS Institute\Shared Files\applets")
  archive="graphapp.jar";

proc gchart data=errors;
  vbar3d HOUR /
    type=SUM sumvar=errCNT maxis=axis1
    discrete frame cframe=white
    woutline=1 coutline=black caxis=black html=links
    legend=legend1 subgroup=server;
  title 'Page View Errors by Hour';
  title3 "&tdy";
run;
quit;
ods html close;

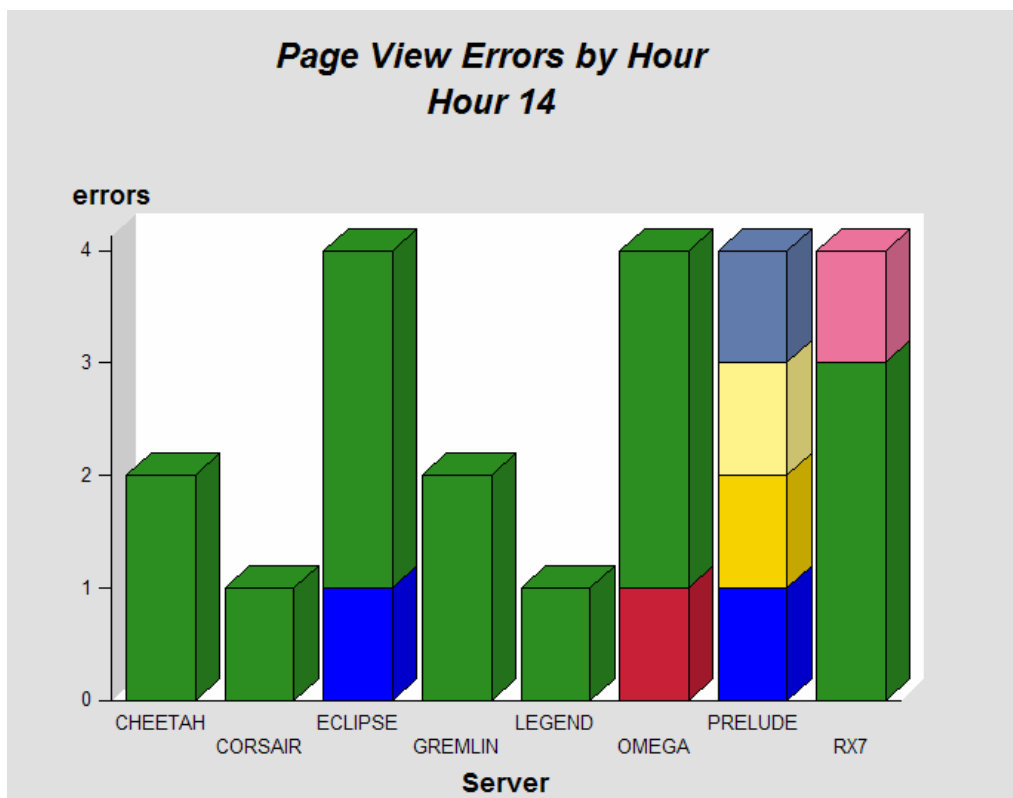
%macro hours;
%do i=1 %to 24;
goptions reset=all hpos=40
  ctext=black nodisplay
  colors=(blue)
  device=JAVA;
```

```
ods html file="C:\erhour&i..html"
  parameters=("drilldownmode"="local"
    "menu remove"="Graph,Legend,Options:Tips,Variables,Help")
  attributes=("codebase"="C:\Program Files\SAS Institute\Shared Files\applets")
  archive="graphapp.jar";
```

```
Proc gchart data=errors(where=(hour=&i));
vbar3d server / levels=900
  type=sum sumvar=errcnt
  discrete frame cframe=white nolegend
  woutline=1 coutline=black caxis=black
  subgroup=url;
title 'Page View Errors by Hour';
title3 "Hour &i";
run;
ods html close;
%end;
%mend hours;
%hours;
```

The first level graph looks identical to that in GRAPH 2. This time, Clicking again on hour 14 provides the following graphical view.

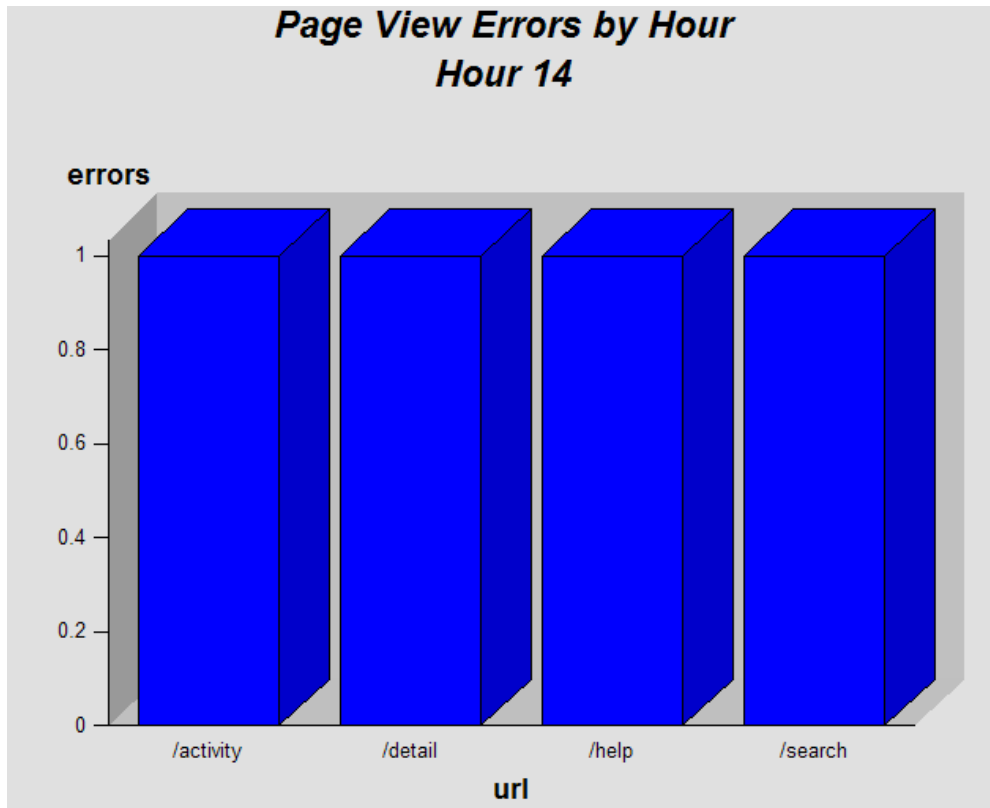
GRAPH 4



You can already see the added level of detail in the breakouts within these bars compared to those in GRAPH 3. There is even an additional bonus. The URLs associated with each server can be identified by clicking on any bar on this chart. This is the enhanced level of detail that is the success of this graphing method.

Below is the view when clicking on the bar representing the single server PRELUDE.

GRAPH 5



CONCLUSION

Being able to bring in another level of reporting into an already dynamic application makes SAS/GRAPH a more valuable reporting tool. Links are easy to create and attach. Now you can really “drill-down” into a chart for more specialized information.

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CONTACT INFORMATION

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