Real-Time Web Reports

By Nick Decker

Reporting on corporate data has always been an integral part of successful business management. A concise report containing all of the relevant data organized in an accessible format has played an important role in the management of everything from entire corporations down to the level of a single project. The advance of computers, software technologies, and especially the Web have propelled us into the online age, and now that we have gotten used to ubiquitous access to our data, we are not about to give it up without a fight! Managers now carry mobile phones and smart devices that not only keep them connected to their associates, but keep their data within easy reach as well. Whether it is an e-mail with an attached Excel spreadsheet, the download of a .PDF file, or dynamically created Web pages reporting on the company's progress, managers are now reliant on the high availability of their data and reporting options. One of the BASIS demos, Real-time Web Reports†, demonstrates this capability and takes advantage of several technologies – both old and new.

Real-time Web Reports Overview

The Real-time Web Reports demonstration program uses the BASIC Web Utility at its core to integrate BBj® into the reporting process by serving as the CGI language. In other words, the end user points their Web browser to the appropriate server page on the Internet and the server responds by launching a BBj interpreter session with the correct program. The BBj program collects the desired data, creates the presentation report, and sends the output as HTML and supporting graphics back to the Web server. Once the server receives the report, it sends the page on to the end user's Web browser, resulting in a dynamically created Web page that reports on the company's data.

What Goes on Under the Covers

Although the demo relies on the BASIC Web Utility, which is been available for several years, it also makes use of some cutting-edge technologies that have only recently become available. The BBj program responsible for generating the report employs several Java-based libraries such as JFree Charts to generate the report graphics, SwingX to manipulate the resultant chart graphics, and iText to create a PDF file based on the report.

The program begins by calling the UTCGI.WBB BASIC Web Utility program, which is responsible for passing along the CGI environment from the Web server. The CGI environment contains all of the form values that the end user has access to, so from this information the program is able to determine the timeframe that the user wants to report on. Armed with the date range for the report, the program proceeds to gather the relevant data via an SQL query. After the SQLEXEC() is called, the program iterates over the resultant recordset and systematically adds each record to a JFree Chart dataset. After querying all of the data, the program has multiple datasets that will be used to create the bar and pie charts as well as a string containing the HTML code to display the data in tabular format.

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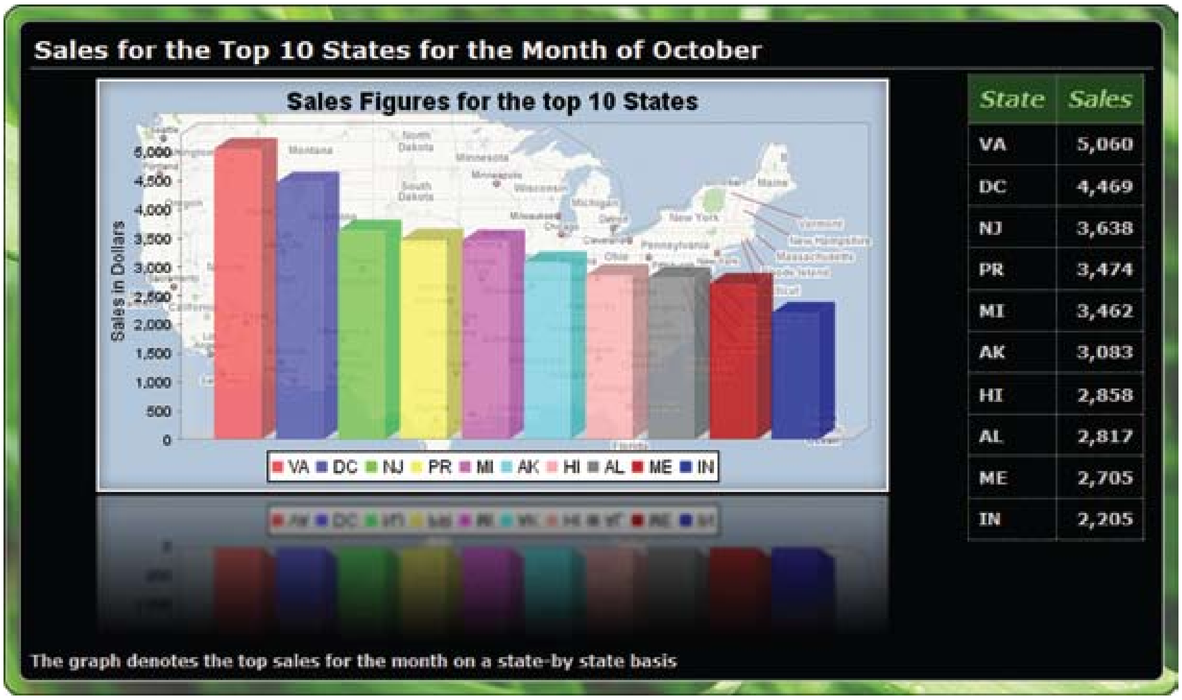

State	Sales
VA	5,060
DC	4,469
NJ	3,638
PR	3,474
MI	3,462
AK	3,083
HI	2,858
AL	2,817
ME	2,705
IN	2,205

The graph denotes the top sales for the month on a state-by state basis

Figure 1. A Bar chart with customized background image, transparency, and dynamic blurred reflections

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The next step in the process is the creation of the bar and pie charts, accomplished by accessing the JFree Chart API directly. Going beyond creating basic charts based off the datasets, the program proceeds to customize the charts by adding graphical backgrounds, setting parameters such as margins, padding, and insets, and setting alpha transparency values. Once the chart has been created, the program uses the SwingX libraries to add a drop shadow and a mirror image so that the resultant chart appears to float on a glass table that shows a blurry reflection (See **Figure 1**). After all of the post processing has been done, the program saves the image out to the Web server as a PNG file to be referenced by the HTML page which is ultimately displayed on the user's machine.

The next stop in the process is the dynamic creation of a PDF version of the report. Because the PDF will only contain the bar and pie chart images, this is done in just a few lines of code via the iText API, as shown in **Figure 2**.

```
REM ============================================================================
REM Create a .PDF file for output
REM ============================================================================
    declare Document myDocument!
    myDocument! = new Document()
    myDocument!.addTitle("Sales Charts and Report Data")
    myPDF$ = dsk("") + dir("") + "../WebBasedReports/SampleChart.pdf"
    PdfWriter.getInstance(myDocument!, new FileOutputStream(myPDF$))

    myDocument!.addAuthor("BASIS - Real-Time Web Reports")
    myDocument!.addCreationDate()
    myDocument!.addCreator("Basic Web Utility Program")
    myDocument!.addSubject("Generating reports in real-time and serving them up via a web server")
    myDocument!.open()

    REM Place a .png image of the chart into the .PDF document
    png! = Image.getInstance(ChartUtilities.encodeAsPNG(myBarChart!.createBufferedImage(width,height)))
    myDocument!.add(png!)
```

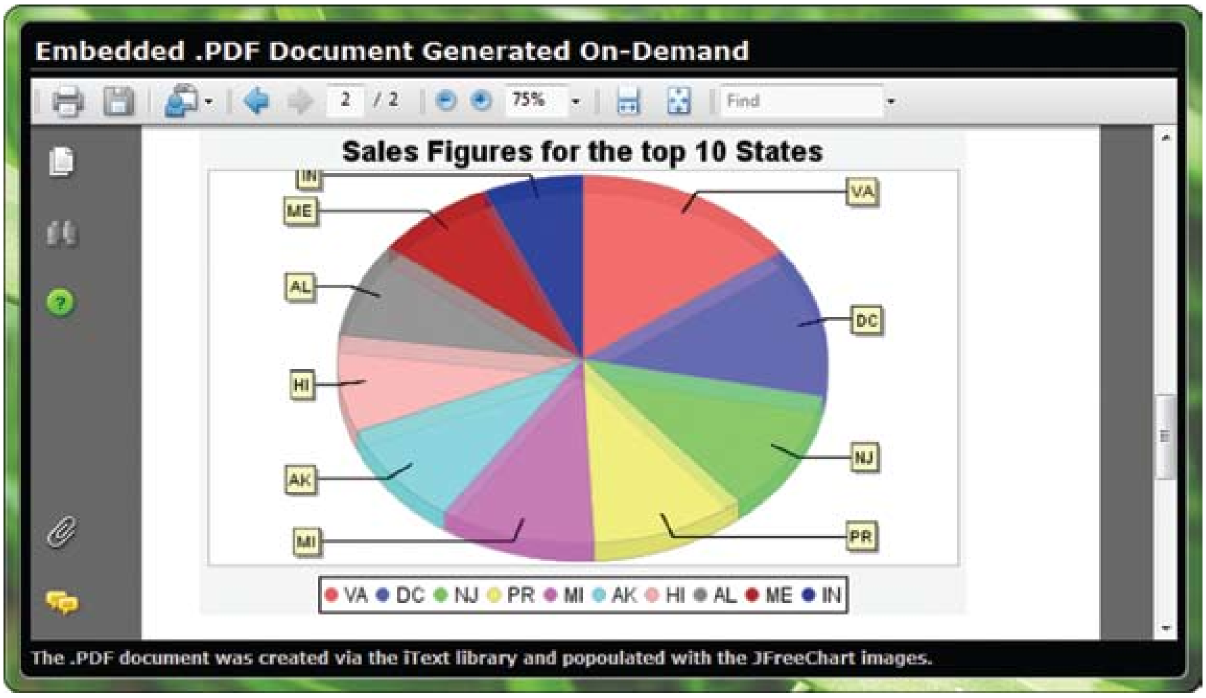
Figure 2. Code excerpt to create a PDF document and embed an image

The PDF document is saved on the Web server for eventual distribution to the client. The Web page could allow clients to download the PDF file by providing a simple link, but the demo takes this one step further. Instead, it embeds a fully-functional Adobe Acrobat Reader into the Web page via a single line of HTML code shown below:

```
<p style="text-align: center"><embed src=/WebBasedReports/SampleChart.pdf width=100% height=400px autostart=true></p>
```

This line of HTML takes advantage of the EMBED tag that references the appropriate browser plugin on the client's machine. In order for this to work correctly the clients need to have the proper plugin installed, but assume that this is the case for demonstration purposes. As a result, the client is given full access to the PDF via the plugin and can easily navigate through it, zoom in and out, perform text searches, and even save or print a copy for later use as shown in **Figure 3**.

continued...


Embedded .PDF Document Generated On-Demand
2 / 2
75%
Find
Sales Figures for the top 10 States
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VA
DC
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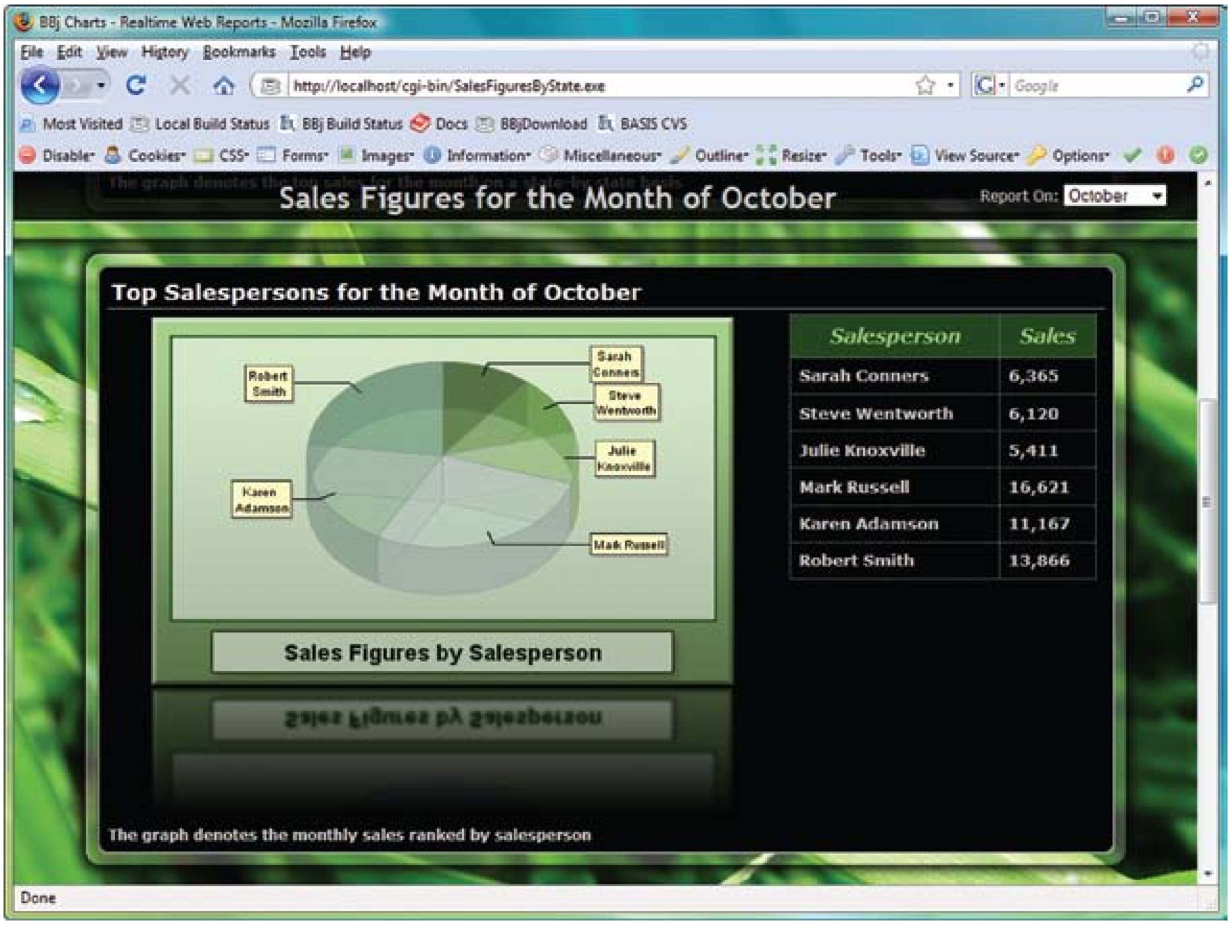
The .PDF document was created via the iText library and popoulated with the JFreeChart images.

Figure 3. An excerpt from the Web Report showing the embedded PDF reader

Now that all of the content for the Web page is ready to go, the next step is to assemble all of the pieces into an HTML document. To speed up the creation of the HTML code for the various pieces, the demo loads a template HTML document into memory. The template contains various placeholders throughout the document to indicate where to ultimately place the pieces. The program then uses the replaceAll() method of the BBjString object to quickly and easily insert the newly created graphics, customized titles, and tables into the HTML document via regular expressions. This process of meshing dynamic content with a pre-defined template saves time and eliminates the overhead of recreating all of the style information for the document and its components. Once the HTML document is finalized, it is ready to ship back to the Web server via the BASIC Web Utility that marks the end of the process. **Figure 4** shows the demo in action, reporting on the sales figures by salesperson for the month of October.



Sales Figures for the Month of October

Top Salespersons for the Month of October

Salesperson	Sales
Sarah Conners	6,365
Steve Wentworth	6,120
Julie Knoxville	5,411
Mark Russell	16,621
Karen Adamson	11,167
Robert Smith	13,866

Sales Figures by Salesperson

The graph denotes the monthly sales ranked by salesperson

Figure 4. Screenshot of the Web Report showing the chosen report date and the Salesperson sales data

Summary

Keeping track of how your company is progressing is valuable, and often it is as simple as viewing the latest sales reports. Making this data available to you at any time and any place can be priceless. The BBj Real-Time Web Reports demonstration program shows how this can be done given the tools your programmers have available to them today. By following its example, you too can have access to your important data whenever you desire!

Read other related articles in previous issue of the *BASIS International Advantage*

A Tour of the BBjCharts API
www.basis.com/advantage/mag-v11n1/BBjCharts01adv07_Links.pdf

PDF Now Also Means Perfectly Displayed Forms
www.basis.com/advantage/mag-v9n2/pdf.html

† Download with BBj from www.basis.com/products/bbj/download.html and select "Demos" in the Optional File section. After completing the installation, select **BBj > Demos > LaunchDock** from the BASIS folder to run the demo.