

Oracle Corporation

Enhancing Web Application with interactive Graphics

The Oracle Graphics Web Cartridge

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Introduction

This paper describes how to build and create powerful Internet applications using Developer/2000 - Graphics. Specifically, we will discuss how Graphics can be used to enhance Internet applications built with Developer/2000 for the Web. This paper will explain the current Developer/2000 solution, and point out that, though it is powerful, it is not a complete solution. We will show how Graphics can solve this limitation by creating graphical applications to help users explore their data and navigate to the appropriate Oracle Forms application based on their findings. We will discuss how Graphics can be used to create media rich displays, and how they can be used to organize your entire web site. Finally, we will cover the underlying architecture of the Oracle Graphics Web Cartridge itself.

State of the World Wide Web

The Internet offers technology that allows for the creation of visually pleasing applications that are easy to navigate, and understand. The World Wide Web and Browsers offer the promise of a media rich, highly visual interface to information and services. User's interact with information via the mouse, and use the information that is presented to them to decide what to do next. The simplicity of the interface to the Internet is appealing to a wide variety of users, including those with no previous computer experience.

User's expectations of the Internet are increasing daily. They expect to have information available on the Web, at their fingertips. They have become accustomed to interacting with a Web page to find information, and receive content. They demand that information is presented in a way that lends itself to exploration, and drilling down to the detailed information that they want.

For example, a user may take the following approach when deciding to book tickets to the Vienna MOZART concerts.

Starting at Yahoo!, index down to Vienna, then Arts, then Music. At this point look at the different types of musical events that are taking place during his visit. They may decide that they want more information about the Vienna Mozart Concerts and drill to that page. From there, they would decide whether or not to buy tickets, and go to an application that allowed for the purchase of tickets.

The key lesson to learn, is that browsing, or exploring the information, is a process of decision analysis. At each point in the users quest, he makes decisions about what to look at next finally arriving at the application that allows for processing a request, or updating information.

Another example could be planning and booking a vacation. The user will want to explore information about what type of vacation to take, what packages are available, what hotels, different airlines, etc. By the time that he is ready to book the vacation, a lot of analysis and planning has gone into it.

Administration is Expensive

The problem of administering and creating web sites is a huge challenge to corporations in that the tools for doing so are in their infancy. Currently, the type of interface that can be presented to users is, though pleasing, fairly limited. This is a direct result of immature

tools. It is impossible, or near impossible, to create applications for the web that have the same powerful human interface elements that are available on the Desktop, or in the Client/Server computing world.

With the release of Developer/2000 for the Web 1.4W we've enabled the deployment of Desktop style applications on the Internet. It is possible create Forms applications and deploy them on the Internet, unchanged. As a result, you can create powerful interfaces, with menus, widgets, multiple windows, etc.

Though this is a huge step in the right direction, D2K 1.4W is not enough to solve the Web administrator's problem. As long as you have to manually maintain thousands of HTML files and rich media files, to provide users with the kind of experience that they expect, administering a web sight will be painful, and expensive.

The Graphics Cartridge, and the Reports Server, parts of Developer/2000 2.0 for the Web go a long way in solving this problem. The rest of this paper will focus on How Graphics can be used to enhance your web applications, as well as reduce the cost of administering your web applications.

Graphics is the Solution

Oracle Graphics 3.0, part of Oracle's Developer/2000 Release 2.0, introduces new functionality that will allow developers to create applications for the Internet. These applications are dynamic, data driven, media rich with an intuitive point and click interface.

Graphics can be used to create a live infrastructure for you Web site, by using simple concepts, like drill down, and custom properties. Since Graphics, like all Developer/2000 components, sits on top of the Oracle Database, Graphics has very robust features for rendering visual representations of database data.

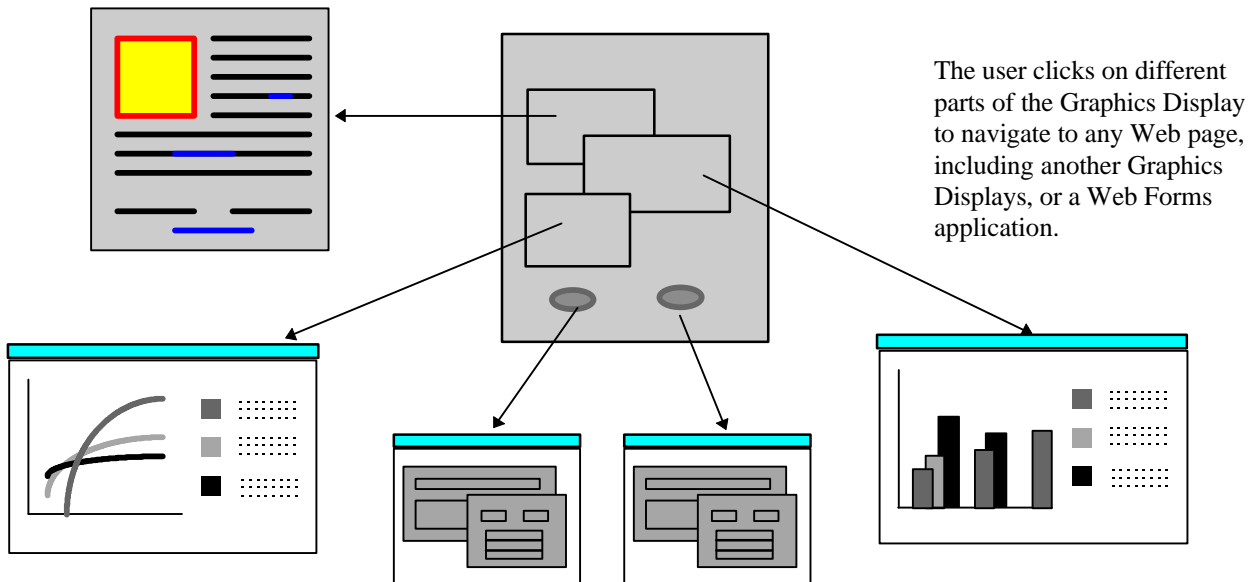
Graphics is the Glue

Using the URL custom property, developers can associate any URL with any Graphics object. On the web, this URL becomes a link to a new web location. That location can be anything, including another Developer/2000 application, like a Web Form.

Since Graphics is fully data driven, you can experience a large productivity gain by storing link and content information in your Database, and develop Graphics applications that visualize that information. Instead of having to create thousands of HTML pages, you may only have to create a few Graphics applications each displaying the right information based on the data in the database, and the users actions, thus reducing the cost of administration by a significant margin.

The following diagram illustrates how Graphics is used to navigate to other applications and web pages.

Figure 1



By storing Link information, as well as data in the your database, you can exploit the rendering features of Graphics to minimize the amount of administrative maintenance your web applications require. Since the Graphics display is running live on the web, against a database, you only need to change the information in the database, or at worst in a single Graphics file, as opposed to several hundred, or even thousands of HTML files.

Using Graphics for Data Exploration

Oracle Graphics has a strong, fully customizable Charting engine. Developers can create anything from a simple bar chart, to a complex directed Graph, or seating chart with a minimal amount of code. Like any Oracle Graphics object, charts can have associated procedures which will be executed when the user performs some action; like a mouse down. Additionally, Oracle Graphics Charts are smart charts, in that they can be configured to “drill down” to other charts, or detailed data.

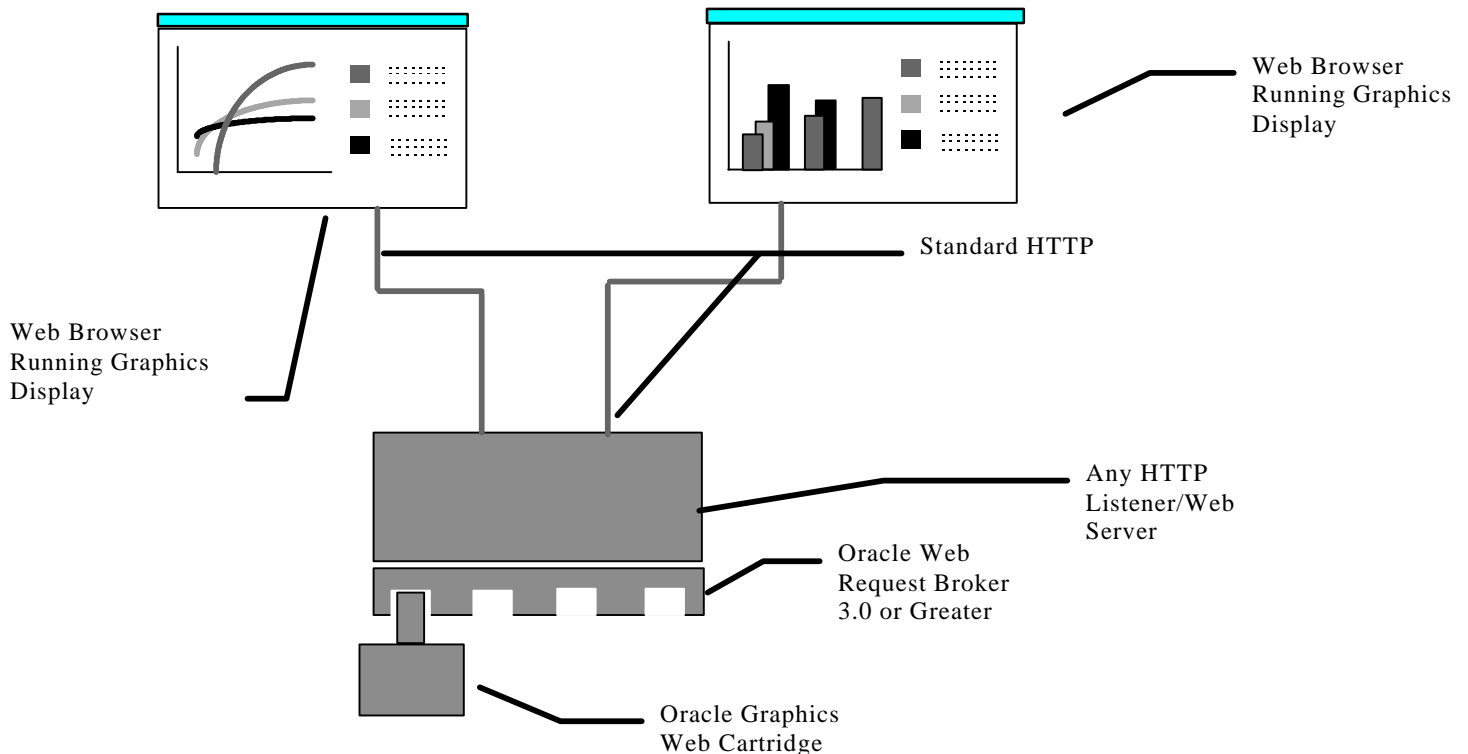
As a result, you can use Graphics to build applications which will allow users to explore their database data in an intuitive visual way. Once the user is ready to go to the details, Graphics calls other Developer/2000 applications on the web to let the user enter information as described above.

How Do We Do It?

The Oracle Graphics Web Cartridge Architecture

The Oracle Graphics Web Cartridge is part of Developer/2000 2.0. It will enable users to run existing Graphics displays from their favorite web browser, by connecting to any web server that supports the Oracle Web Request Broker (WRB). The WRB provides a framework for these "cartridges", and manages client connections to them through an API which is much simpler to write for than regular HTTP, and is similar in construct to a cgi-bin interface. Along with "Oracle Forms for the Web", the Graphics Web Cartridge opens up grand possibilities for Developer/2000 as a platform for network-deployed applications. Most importantly, it does this without requiring any additional development effort.

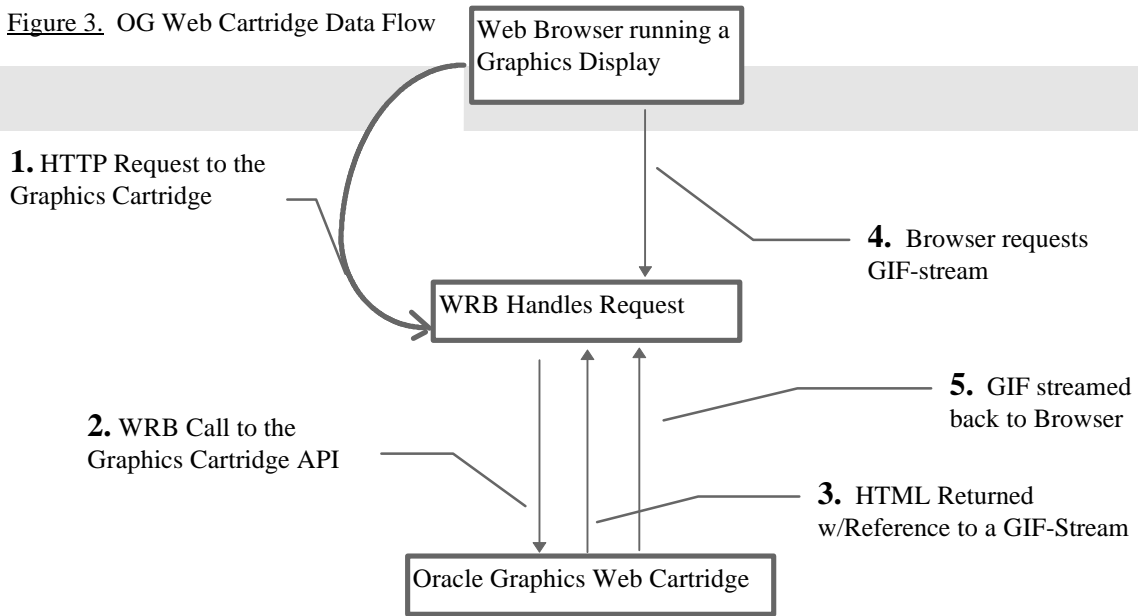
Figure 2 This diagram illustrates the architecture of the Oracle Graphics Web Cartridge.



How We Do It

In D2K R2.0, the Graphics Web Cartridge dynamically generates an HTML document containing a view of the display. This document contains image reference to a GIF-stream. The GIF-stream is then returned by the Graphics Web Cartridge via the HTTP connection. This GIF-stream is the image of the OG display. A special HTML construct in the returned HTML document causes another request to be sent to the cartridge whenever the user performs mouse-click in the region of the display.

Figure 3. OG Web Cartridge Data Flow



The HTTP request is in the form of a parameterized URL similar to a typical cgi-bin request. Any dialogs displayed to the user, such as the "connect" dialog and error dialogs, are handled for this solution via more special-purpose HTML that is generated to serve these needs. For example, error messages might be displayed in a separate "message line" frame below the chart-display, or on a new page in the standard format used for browser errors.

Support for linking to embedded URLs is accomplished by the server resolving the user's mouse down coordinates to an object in the display. If that object has an associated URL, the Graphics Web Cartridge issues a redirect command to the client via the Web Request Broker API.

The Graphics Web Cartridge supports a standard WRB API. The HTTP commands passed to the Web Cartridge are the same familiar command line used by Oracle Graphics Batch. A single Graphics Web Cartridge can support multiple simultaneous users and requests. Multiple Graphics Web Cartridges are created by the WRB as needed during heavy load periods.