ESRI GIS Solutions for Telecommunications

The Business Challenge: Sure, it's just a business lunch. But suddenly your desk is covered with street maps, telephone directories, and last month's restaurant reviews from your favorite magazines. As the minutes tick by and paper is shuffled, a light sweat breaks on your brow. What's closest? What's best? How hard will it be to find? Can I provide directions to everyone involved?

Finding Solutions: Now imagine having the information on thousands of restaurants both at hand and under your command. Or locations of nearby dentists. Or government offices. That's been the dream of Web directory developers but until geographic information system (GIS) technology was brought into the picture, it remained an elusive goal.

Pacific Access, a subsidiary of Australia's largest telecommunications company, Telstra, and the developer of Telstra's directory products, is the first to deliver on this promise with its online GIS-enabled White Pages™ and Yellow Pages® directories now being used by thousands of customers daily over the Internet.

By logging onto the Web at www.whitepages.com.au or www.yellowpages.com.au, users have the world's most technologically advanced directory at their fingertips for finding

Maps Power Online Telephone Directories
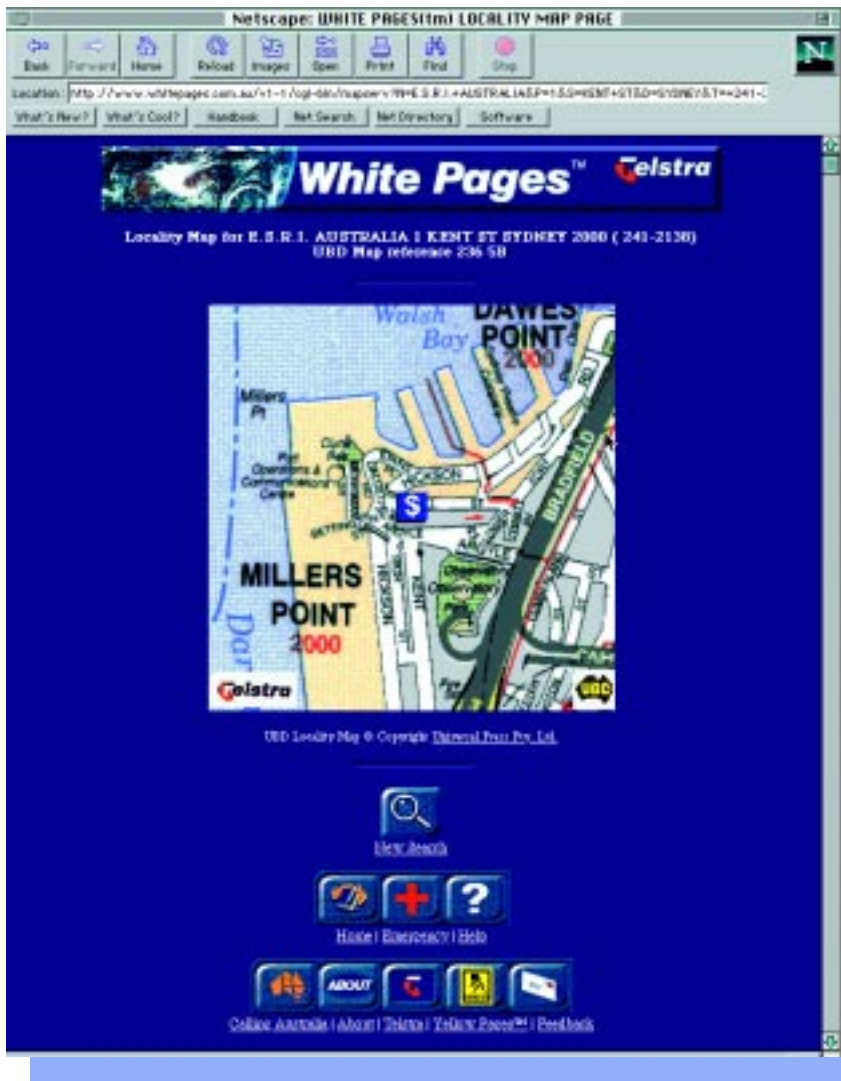
addresses and phone numbers and viewing the "smart" street maps.

The map link service is free to users and very easy to use. Visitors type in a name or address of a business or government agency to zoom to view that mapped location. The place is highlighted for them on the screen, showing a map tile 1,200 meters in width, with features like schools or parks labeled for easy identification.

Currently, the online map link includes UBD™ street maps covering all of the major Australian capital cities, with

extensions to the service area continuing. "With GIS we'll be able to provide high-speed access to what could be thousands of users at once, all looking at different areas of the spatial database," explains Telstra's Nick Gee, development manager for interactive mapping.

Using the System: Building the application required drawing together several advanced computer-based technologies including Telstra's White Pages and Yellow Pages Web directories, first delivered on the WWW in 1995, plus raster images from Telstra® GeoProducts™, the group within Pacific Access that has the distribution, development, and marketing rights for digital street data created by Universal Press.

Optimizing Technology: The GeoProducts Group at Pacific Access used ESRI's Spatial Database Engine™ (SDE™), a commercially available GIS tool set, to store and manage the millions of spatial features contained in databases. SDE has the ability to integrate with other information technology products used in mapping applications or other applications that require geometric analysis without the mapping component. That is, with SDE developers can embed spatial analysis in an application without having to invoke traditional GIS technologies.

Approximately 400 megabytes of images, updated and geocoded quarterly, are held in an Oracle® database. GeoMatch®, a sophisticated geocoder developed in 1992 by GeoProducts in conjunction with ESRI, is used to process eight million listings in the White Pages directory and geocode each for extremely fast retrieval.

As a user requests a map, a unique map tile is created. BLOBs of the raster image are retrieved from the Oracle database and then manipulated (including clipping) for display using the Web.

ESRI's SDE technology also has been used by the group to resolve the fundamental issue of allowing thousands of simultaneous users access to the maps in seconds.

"Beyond the map server application, GeoProducts perceives this technology as the key to providing a GIS backbone for other online services in the future," Gee says.

Bottom Line Advantage: The popularity of Telstra's Internet directory grows daily, mirroring the increase of Internet use in general by Australians. Currently, the map service is receiving about 10,000 requests per day for the White Pages and Yellow Pages sites. Development work is underway to continue to extend the spatial coverage of the service and to bring enhanced functionality to the users of the directory products.

The system will soon be improved in other ways, too, Gee notes. Ultimately the address geocode will be held in the directory's database and passed directly to the map server, thus avoiding the need for quarterly batch processing. This means that as each of the 2,500 updates are made each day to the listings, they will be geocoded and available to customers.

For more information contact Jacqui Broun, marketing coordinator at ESRI Australia Pty. Ltd. (tel.: 61-9-242-1005, fax: 61-242-4412, E-mail: jbroun@esri.com.au). Information on SDE can be found at ESRI's Web site (www.esri.com).

SDE at a Glance: SDE is a high-performance, object-based spatial data access engine implemented in several commercial DBMSs using open standards and true client/server architecture.

Software engineers can use SDE to develop focused and specific applications that provide access and manipulation capabilities for virtually any type of spatial data.

Because it integrates with ArcView® GIS Version 3.0 and MapObjects™, these ESRI® products can be set up as SDE clients. Thus, developers can choose among C, C++, or rapid application development (RAD) tools such as ArcView GIS software's Avenue™ or Visual Basic® for interface programming.

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