Delphi 3
Management Overview

The Highest-Productivity, RAD Client/Server Tool for Windows

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I   Executive Summary

Application developers rely on Delphi Client/Server Suite for high-productivity, high-performance, scalable client/server rapid application development tools. As corporate developers expand their scope to include the Internet and internal corporate "Intranets," Delphi's technological strengths in high-performance, reusable component technology help organizations realize a larger return on investment with better use of information.

Today, over 500,000 copies of Delphi have been used to produce commercial, client/server, enterprise, and Internet-enabled business-critical applications. For example:

- NASA's Atlantis and Russia's Mir Space station used Delphi to help identify and capture photographs of the earth. Also, NASA's "Scientific and Technical Information System", developed with Delphi was named one of the nations top client/server applications by InfoWorld magazine.

- American Airlines automated Flight Department procedures to eliminate paper-based-information bottlenecks. The flight department built a system to track air crew qualification requirements, schedule training events, and generate comprehensive reports. By using Delphi to develop applications that access the SABRE system running on IBM mainframes using DB2, American Airlines' Flight Department has been able to save the very high cost of developing for SABRE's Transaction Processing Facility (TPF) environment.

Other companies using Delphi Client/Server Suite to solve their business problems include: American Cyanamid, American Stores, Arthur Anderson, AT&T, BMW, BP Shipping, Bank of America, BBC Television, British Telecom, Compaq, DHL, EDS, Fiat, First National Bank of Chicago, Glaxo, KPMG, Sarah Lee Knitting, Standard & Poors, SwissBank, SG Warburg, Union Bank, US Marine Corps and many others.

Delphi will continue to set the standard for high productivity, rapid development of high performance client, server and multi-tier applications through the enterprise and across the Internet. Delphi 3 bridges enterprise wide client/server development and the Internet by building upon a it's unique combination of technologies, including rapid application development, scalable multi-tier database development, true object-oriented reusability and high-performance native-code compiler. Delphi 3 will deliver on five key solution areas:
- Enterprise and Internet – Client and Server Solutions
- Open, scalable multi-tier architectures
- Enterprise Component Foundry
- High speed dissemination of Database information over the Web
  - Improved ease and productivity.

Delphi 3 will reduce application complexity created by the increased demands of the enterprise and the Internet. Delphi adds significant functionality to smoothly and cost-effectively make the transition to large-scale computing. Delphi 3's new technologies, such as Remote Data Broker, Packages, OLEnterprise, and Internet enablement in Delphi 3 allow for thin client applications to be easily distributed, configured, and maintained, thereby reducing costs. Built in support for Microsoft systems technology including COM and ActiveX support, allow for language interoperability so that you can leverage your existing investments and extend them across the enterprise. High-speed native SQL Links drivers and access to Entera, intelligent middleware, allow you to integrate legacy data so that the company's knowledge base can be fully utilized.
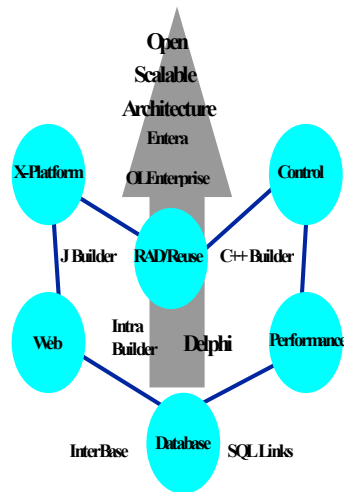
Delphi is the only scalable and open multi-tier architecture that puts your business at the center of development.

II   Introduction

The next stage of growth in client/server computing will come as development tools expand from the classic "two-tier" architecture of a client and a server to a more flexible multi-tier architecture (sometimes also called three-tier) to support more powerful distributed processing of applications. Today's predominant form of two-tier client/server computing works very well for applications that access corporate relational data that require efficient data access and support high volume of transactions.

For example, MCI uses Delphi Client/Server Suite to develop a call tracking application that provides up-to-the-minute information to executives around the country. The application processes several megabytes of call volume information every minute and stores it in an Sybase database system. With Delphi Client/Server Suite, MCI has improved their information reporting and decision making tremendously. The next step of their project is to take this application and Internet-enable it to allow users to view and analyze this information over the Internet.

Borland has introduced an interoperable family of scalable client/server and Internet development tools that offers developers a competitive advantage. Borland has experience in optimizing compiler technology, reusable component technologies, scalable database technology and cross-platform application servers. Borland development tools iare uniquely able to address the broad needs of traditional client/server developers who seek to add Internet capabilities to their applications, as well as the needs of Internet developers.

Figure 1 Borland' Family of Products offers the business advantage of an open, scalable architecture from the desktop to the enterprise.

Delphi works within the framework of this family of tools to provide the easiest to use, highest productivity Client/Server and Internet Windows solutions. For example:

- Delphi 3's Open, Scalable Multi-Tier Architecture can re-use and incorporate, RPC objects generated in Entera and COM objects written in C++.
  - Delphi 3' Enterprise Component Foundry can also be used to creates high speed business rules and business process that run on an application server and can be re-used by C++, Latte and IntraBuilder.

This unique Family of Tools provides comprehensive solutions for all your business needs.
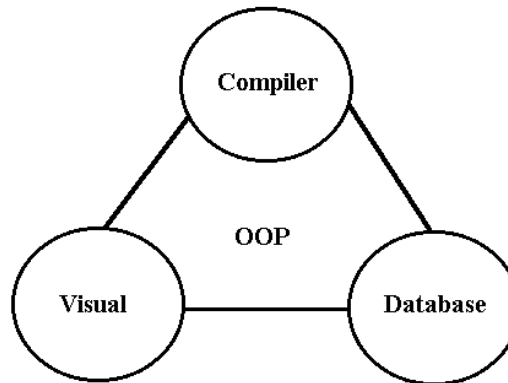
This paper will examine how the new technologies in Delphi 3 address the application complexities emerging from enterprise-wide computing and the Internet. In addition, it will show specifically how Delphi leverages its architectural advantages to Internet enable client/server development by including open, scalable multi-tier technologies.

III   Delphi -- Goals and Objectives

Delphi has consistently delivered a solid, open, and scalable architecture for building high-performance solutions for the enterprise and the Internet. The architecture of Delphi is a foundation to:
- deliver a Rapid Application Development environment for the Internet and Enterprise
- build scalable database solutions that leverage legacy systems
- build high speed, native-code compiled, client and server applications for the Enterprise and the Internet.
    - reuse objects through-out the enterprise in a multi-tier environment

Delphi 1.0 introduced a rapid application development environment with a unique combination of technologies, including rapid application development, scalable database development, true object-oriented reusability and high-performance native-code compiler.

Figure 2 Delphi combines a RAD environment, high speed native code compiler, scalable database and reusable componentry to provide developers with the highest productivity.

Delphi 2.0 Client/Server Suite built upon the foundation of Delphi 1.0 and delivered 32 bit application development, even higher performance, more object-oriented reusability, and client and server development tools. Additionally, Delphi 2.0 allowed developers to Internet enable their applications on the client and also allowed developers to easily create web server applications.

Delphi's allows customers to deliver on a backlog of applications that give them a competitive advantage in the market place. Delphi 3 scales to the new computing environments without incurring retraining and retooling costs.

IV   Computing Environment

Corporate developers are expanding their scope to include the Internet and internal corporate "Intranets" in future development in order to realize a larger return on investment with better use of information. Delphi 3 builds upon its unique combination of core technologies including -- rapid application development, scalable database development, true object-oriented reusability and high-performance native-code compiler to bridge enterprise wide client/server development and the Internet.

Delphi 3 delivers the only open, scalable, multi-tier architecture that allows you to respond quickly to the emerging computing environments brought emerging from the Internet and enterprise.

> *"We use Delphi as a front-end development tool that plugs in real well with Open Environment's enterprise computing solution," says Tim Tully, VP of architecture and technology for T. Rowe Price, a financial-services organization in Baltimore that manages $92 billion in assets. T. Rowe Price started with Delphi this year after using Open Environment's products for about 18 months. The financial organization runs about 150 strategic applications supporting up to 700 simultaneous users. The company plans to have nearly 70% of the applications based on a multi-tier distributed model by the end of 1997."* Levin, Rich, Information Week, November 18, 1996.

Delphi 3 allows you to partition applications, so you can centrally locate business logic for maintenance and reusability. It integrates legacy code with new code by offering language interoperability in COM. It integrates legacy data with new data through high speed SQL Links and access to Entera, intelligent middleware for building, maintaining and managing information systems. Delphi 3 leverages existing investments and utilizes your company's knowledge base more fully. Delphi 3 incorporates a thin client architecture, reducing the complexity of business-critical systems and ensuring both high productivity and a robust application environment.

A   *Application Complexity*

Enterprise client/server applications are characterized by greater application complexity, a larger number of users, higher rates of transactions, larger databases, more diverse platforms, more complex networks and broader geographic scope than the departmental client/server applications. Application complexity is determined by the number of applications that are developed, delivered, and supported; the number of users of any given system; the amount and location of data; and a static amount of resources.

As a result, enterprise applications require more advanced distributing computing technologies to support what is known as a multi-tier architecture. A multi-tier enterprise architecture provides greater scalability and reliability than is possible in a traditional two-tier departmental client/server application. Additionally, enterprise applications require more advanced application management tools, for example, to support distributed performance monitoring and dynamic load balancing, for example. Delphi 3 delivers a series of technologies that reduce application complexity and increase productivity.

Applications	Users	Data
Maintenance	Predictability	Security
Distribution	Reliability	Legacy Data
Configuration	Performance	Heterogeneity
Interoperability	Stability	Scalability
Limited Resources		

Figure 3 Delphi 3 delivers significant solutions to simplify application complexity

Applications:
Information Technology teams in corporations deliver a large volume of new applications and also maintain and support existing applications. These applications must be distributed and configured for a growing number of users on the Internet, Intranet, and extended enterprise.

Delphi 3 provides a solution for the development of efficient application executables that need to be quickly and easily distributed via an Intranet to a large number of users.

Delphi 3 allows you to recompile **Packages** to reduce executable size by an order of magnitude.

Packages are a unique leading-edge compiler technology that gives developers the ability to breakdown applications into separate, reusable compiled pieces without a slowdown in performance. Packaged applications use a customizable application environment that is delivered and configured once, thereby reducing both the configuration complexity and reducing the need for additional distribution resources.

Delphi 3 uses the ActiveX architecture to easily deploy these thin-client, zero-configuration, applications over the web thereby reducing the cost of software configuration and distribution. Active Web Deployment, unique to Delphi 3, uses Microsoft standard application delivery mechanisms (File, INF, or CAB File delivery) and the web infrastructures to distribute your applications easily.
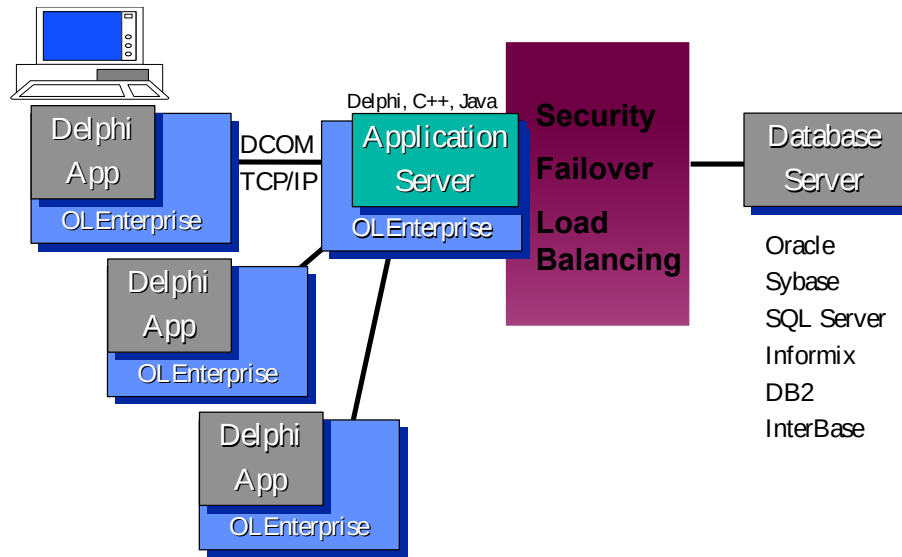
Only, Delphi 3 allows you to create high-speed web server applications with Web Broker, which enables you to use your existing Delphi and client/server knowledge to create, manage and deliver data over the web. Web Server applications are run from the server each time a web client runs that application. This means that the application takes up no disk space on the client machine. Because Delphi 3's Web Broker is platform neutral, it can operate and fully support Internet strategies from both Microsoft and Netscape thereby reducing the risk of platform selection.

Users:
As the number of users or clients increases due to larger distribution over the work-group, Intranet or Internet, IT departments want to know that the network loads will remain constant, applications will not degrade in performance, and applications will remain stable. Delphi 3's exception handling capabilities provide enormous power, flexibility and stability. They can significantly reduce the amount of code needed to create stable applications thereby shortening the development cycle, and helping to maintain the application environment twenty-four hours a day, seven days a week.

Delphi '97 incorporates a thin client architecture for reducing the complexity of business critical systems and ensuring, low-cost deployment, less configuration, less maintenance, and a robust application environment.
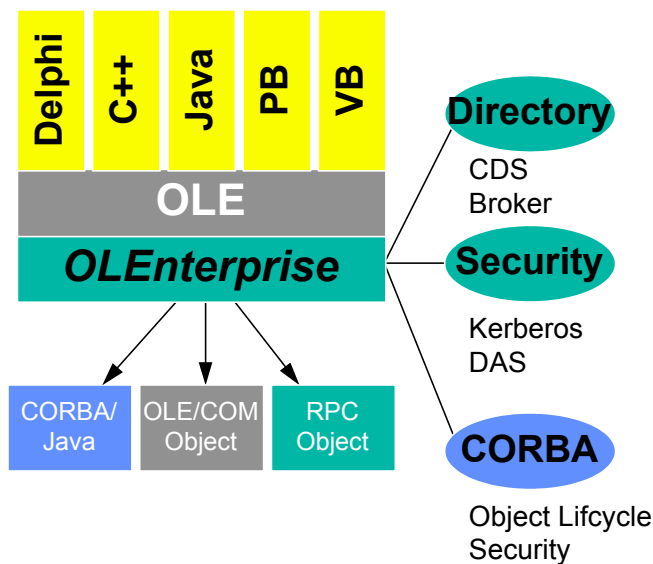
OLEnterprise allows for application logic and data access to be aggregated in a central application server. The application server becomes a one-to-many service provider of business objects and business processes. Therefore business logic can be reused among multiple applications, and application logic need only be changed in one location.

Figure 4 Delphi's multi-tier architecture provides integration of legacy data and fail-over safety. With Entera, Delphi 3 offers load balancing and security.

Each application server in the multi-tier environment can be tuned and dedicated for the task at hand. An application server is managed for load balancing to maintain high-speed performance, fail over safety to keep business critical applications running, and security to ensure data integrity.

Because OLEnterprise is built on top of Distributed COM, which is in turn built on a DCE compliant RPC, a single architecture enables applications that can scale from one to tens of thousands of users. The open support for standards allows you to select the object format of your choice while enabling interoperability across distributed object standards. Industry standard services such as directory and security can be layered into the system without retooling or rewriting the application.

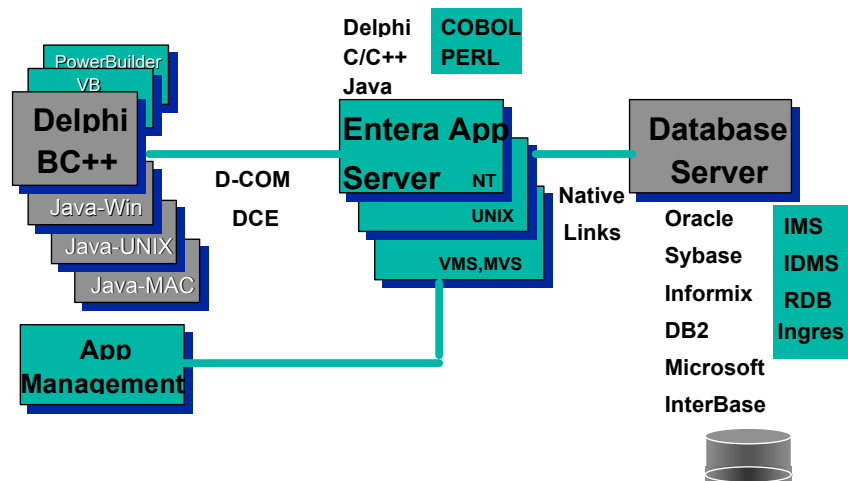**Figure 5 Delphi's OLEnterprise enables interoperability across distributed object standards**

Data:

Delphi 3's open, scalable architecture reduces an organization's need to predict shifts in technology. A scalable architecture is a critical necessity for a development tool to adapt to both technological and business changes. Technology shifts, such as the Internet, open up new possibilities for gaining a business advantage but also pose significant challenges. By providing timely access to information, leveraging applications across the enterprise, and integrating customers and suppliers, Delphi 3 creates that advantage.

Data is a corporate asset if used effectively. Thousands of users, using hundreds of applications need to access an increasing amount of data to make decisions quickly. Security , heterogeneity, and access to legacy data facilitate corporate success.

Borland and OEC Architecture

Figure 6- The combination of Borland and OEC provides an open, scalable multi-tier architecture.

Delphi 3's distributed data access is a breakthrough technology that allows for an ultra-thin client architecture with the lowest configuration and distribution overhead. Delphi 3's unique **Remote Data Broker** delivers a new computing paradigm with the following benefits:

Reduces network traffic: Remote DataSets communicate only the changes to the data (the deltas), not the entire result set and not the entire row of data.

Centralized transaction management, security, and performance: Because the core database engine and native drivers are centrally served and maintained, application logic can be applied effectively at the application server to manage transactions, access rights, and performance.

Reduced Network Loads: The Remote DataSets allows you to disconnect from your server and work with the data locally as if you were still in communication with the database server. Changes published back to the server are automatically synchronized with the Database engine and notification of the results are handled by your centralized transaction management.

<u>Reduced Database Connections:</u> Connections to the database server are centrally allocated and managed. Sharing connections reduces the overall number of simultaneous connections thereby reducing cost.

V   Conclusion

Borland has a comprehensive family of client/server and Internet development tools that offer developers the competitive advantage of an open, scalable architecture with high-performance and high-productivity. Within the family of tools, Delphi 3 is the highest productivity RAD client/server tool for Windows that seamlessly scales from the desktop to the enterprise.

As application complexity has increased due to the demands of the enterprise and the Internet, Delphi has added significant functionality for a smooth transition. The DataBroker, Packages, OLEnterprise, Business Broker and Internet Enablement in Delphi 3 allow for thin client applications to be easily distributed, configured, and maintained, thereby reducing costs. Built in COM and ActiveX support allow for language interoperability so that you can leverage your existing investments. Access to Entera and the high-speed native SQL Links drivers allow you to integrate legacy data so that the company's knowledge base can be fully utilized. Open support for industry standards provides directory and security services crucial to business-critical applications. Delphi is the only scalable and open, multi-tier architecture that puts your business at the center of development.

This paper has examined how Delphi leverages its architectural advantages to enable client/server development on the Internet by delivering on

- Ease of use - Rapid Application Development
- Enterprise and Internet – Client and Server Solutions
- the only open, scalable multi-tier architecture
- the ability to create, manage, and deliver data over the web
- reusable objects: the Enterprise Component Foundry
    - graphical displays of any data.

Delphi will continue to set the standard for high productivity and rapid development of high-performance client, server and multi-tier applications through the enterprise and across the Internet.