

# IA-64 and Oracle: Building Blocks for the Internet Economy

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"Intel's IA-64 technology has great potential in large-scale enterprise computing. It will drive mission-critical, high-end, high-transaction applications, as well as data warehousing applications where there's just a tremendous amount of data to process and push. e-Commerce, and the Internet in general, have created a new demand on data warehouses to provide not only analytical abilities to business users but to take information and interactively drive the customer experience on the Web. That demands tremendous increases in computing power. We're excited about moving to IA-64 technology."

—John Hnanicek,  
Senior Vice President  
and CEO, e-Toys

As e-Business moves from its first generation—the static display of information on the Web—to its second-generation—integration of back-end systems to perform e-Commerce—businesses need even more robust servers and databases. However, as e-Business enters its third generation, companies will start integrating not only their back-end but also their front-end systems with those of suppliers and customers. We will enter the realm of true customer-centric computing, where applications will demand real-time data mining, increasingly complex transactions, information in a variety of data formats, aggregation of multiple data sources, and anytime-anywhere information access.

This environment requires high-powered networked servers and databases to manage the explosion of digital information, process huge amounts of data, and manage peak workloads—all while maintaining security, responsiveness, availability, and reliability.

Intel's IA-64 technology is designed to address these needs. Set to launch in year 2000, the Intel® Itanium™ processor will be the first IA-64 product based on the Explicitly Parallel Instruction Computing (EPIC) architecture. The EPIC architecture brings together significant advances in microarchitecture and compiler technology and combines them with the power of 64-bit computing. The result is a very powerful processor, capable of executing multiple tasks simultaneously and achieving unprecedented levels of computational performance. The Intel Itanium processor will feature extremely large memory capabilities to provide a vast amount of room to store, deliver, and mine data. Advanced high-availability features will help provide the 24x7 uptime required for e-Business and mission-critical applications.

Oracle8i,\* the Database for Internet Computing,\* is also designed for the third-generation e-Business environment. With features like clustering, 64-bit large-memory addressing, and fault-tolerance, Oracle8i brings high availability, high performance, and high scalability to the Internet database arena, including the capacity to manage very large data workloads. IA-64 and Oracle8i together provide a robust platform for managing the data that third-generation e-Business will bring.

Intel volume dynamics continue to bring a new level of price/performance and to make Intel Architecture-based servers the platform of choice for many software developers. The result: more high-powered e-Business solutions, more broadly available, to more companies than ever before.

### Intel Architecture and Oracle8i: Designed for e-Business

In today's e-Business, servers must deliver ample performance, even during peak access times. Customers demand personalized services that make their contact with companies fast, efficient, and cost-effective. Applications must be available not only 24x7, but on-demand, anytime, anywhere. And business transactions must be secure, as more and more business-critical data begins to cross company boundaries.

Building on the broad support and remarkable value of the IA-32 server platform, IA-64 is positioned to help business excel at the hard work of e-Business. The result: businesses can advance their leading-edge IA-32 solutions today, and add even more innovative, responsive, and reliable systems and solutions based on IA-64 tomorrow.

### The Engine Inside the Internet Economy

Responsive, customizable, available, and secure are four words that sum up the benefits of IA-64 and how this architecture addresses the demands of tomorrow's e-Business environment:

- **Responsiveness.** The IA-64 architecture is designed to support more memory than previous Intel processors. Memory enough to let powerful databases like Oracle8i perform lightning-quick queries and real-time data mining, and smooth online transaction processing (OLTP) during peak periods. Based on the EPIC architecture, IA-64 processor-based servers will execute many instructions in parallel to optimize performance for e-Business applications. When customers interact with Oracle-based Web applications in real time, using a rich set of multimedia content served up on the fly, they require very high performance over the network. IA-64 technology will give Oracle the ability to handle workloads at great Intel price/performance.
- **Customizable.** A customized and personalized level of service is becoming a necessity for e-Business, offering customers a unique set of information and services. Varying user profiles, unique data views, and specially tailored interfaces—it takes considerable processing power to bring these benefits to a large and diverse audience. Rich data analysis and dynamic content rendering will demand near-supercomputing levels of floating point performance. The IA-64 architecture, combined with Oracle8i's rich data type support, provides the enhanced levels of performance, memory support, and scalability to support customized applications.

- **Availability.** Servers need to be more reliable and manageable to ensure continuous service in the anytime, anywhere economy. The IA-64 architecture has been designed with sophisticated error-checking and correcting logic, which will be able to detect and repair errors before they disrupt service. At the platform level, OEMs are incorporating built-in hardware redundancy; hot-plug and hot-swap disks, power supplies, fans, and PCI; failover network interface cards; and data protection via RAID. These technologies, in combination with Oracle8i's availability features, create a highly available environment for e-Business.
- **Security.** Tighter security requires more processing. From user authentication to data encryption, a protected environment places additional demands on server performance. Security needs to be immediate and transparent. IA-64 technology will let you deploy security applications while maintaining world-class performance. Oracle, with its support for both public and private keys, will take advantage of the processor security model and will provide an added level of application and data security. The result: a protected, responsive customer environment. Oracle8i technology supports lots of users, lots of data, and does it very reliably. When we combine that capability with the IA-64 platform, our customers get the mission-critical level of performance necessary to power e-Business.

## Oracle8i, Everything Needed to Run an Enterprise

Companies today are using Oracle's database and Internet technology to build dynamic, database-driven Web applications that not only sell products and services online but also help them expand markets, improve customer service and retention, and increase efficiency throughout the enterprise. Oracle8i enhances the world's leading database management system with several breakthrough Internet features that simplify development and deployment of Web applications to make data management easier.

- **Java in the Database.** Oracle provides for a scalable Java Virtual Machine in the database. This allows developers to safely write, store, and execute Java code within the Oracle8i database, for faster, more secure, more reliable applications. Oracle also supports CORBA and JAVA Beans in the database. These can be accessed through the industry-standard IIOP protocol.
- **Oracle WebDB.\*** This Internet-ready development tool provides users with a quick and easy means of building and deploying dynamic, data-driven Web sites using a standard Web browser.
- **Oracle *interMedia*.\*** Oracle *interMedia* allows you to easily manage multimedia content so your dynamic Web applications can incorporate image, audio, video, spatial, text, and relational data to provide a rich multimedia experience to anyone visiting your Web site.

- **Oracle Internet Directory.** Oracle Internet Directory and the iMAP server component provide for standard LDAP protocols within the Oracle database. It uses LDAP servers to authenticate the user and allows for easy configuration and management of user profiles. The messaging server provides support for Internet messaging using industry-standard protocols such as IMAP, POP3, and SMTP—all within the Oracle8i database.

Oracle8i also leverages the power of Oracle Parallel Server (OPS) which takes advantage of clusters and symmetric multiprocessing (SMP). OPS protects against system downtime, so applications are available. Oracle8i also introduces a new technology called "cache fusion," which increases system scalability to support more transactions, more users, and more data. Oracle's protected database experience, combined with the IA-64 platform, gives customers a powerful offering that provides the scalability, availability, security, and customization they need for e-Business tomorrow.

"We are working closely with Oracle to optimize Oracle8i and related server applications for the Intel® Itanium™ processor. Our future IA-64 products, when combined with Oracle8i's performance and stability is a **winning combination.**"

—John H. F. Miner, Vice President and General Manager,  
Communications Products Group, Intel Corporation

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When we combine that capability with the IA-64 platform, our customers get the mission-critical level of performance necessary to power e-Business."

—Gary Bloom, Executive Vice President, Oracle Corporation

## How IA-64 Impacts Oracle's Business Strategy

Oracle has Web-enabled all its products, from customer relationship management (CRM) and enterprise resource planning (ERP) to business intelligence, and is porting all its database and server-related products to IA-64. Oracle has made a major commitment to IA-64 because of the power, scalability, availability, security, and affordability it delivers to Oracle customers. Oracle has used its extensive enterprise expertise to optimize its technology for IA-64. Applications that require high performance, especially Web applications that mix multimedia content with e-Commerce transactions, can benefit from IA-64 technology.

Oracle and Intel have worked together for years to produce powerful products. Examples of this alliance's productivity are the system management tools that Intel and Oracle are now bringing to their vendors. Oracle and Intel are also working on compiler technology so that Oracle software will continue to be well optimized on Intel Architecture. When the Intel Itanium processor is launched, Oracle plans to have their products IA-64 ready and available on all major operating systems.

## Porting Oracle-based Solutions to IA-64

As businesses begin the move to IA-64 after the launch of the Itanium processor in 2000, both Oracle and Intel offer assistance in porting Oracle-based applications to IA-64 servers. The Oracle Technology Network (OTN) program for Oracle developers and partners offers technical documentation and tools to assist end users and software developers in porting applications to IA-64 technology. The Oracle Technology Network is a definitive source for Oracle technical information in developing for the Internet platform. It offers the online community access to free software, OTN-sponsored Internet developer conferences, and discussion groups on the latest Oracle technology. For more information about OTN, go to: <http://technet.oracle.com/>.

The Intel Application Solution Centers (ASCs) are high-tech labs around the world equipped with the latest Intel hardware, the most advanced performance tools suite, and a staff of highly skilled and trained performance engineers. ASCs are dedicated to helping software vendors deliver performance-tuned applications on current and next-generation Intel Architecture-based systems. Oracle was the first independent software vendor to open

an Intel ASC. Today, there are two Oracle ASC sites: Redwood Shores, CA and Dublin, Ireland. For more information about the Oracle ASCs, go to the Oracle Web site at: <http://platforms.oracle.com/intel/>, or to the Intel Web site at: <http://developer.intel.com/software/asc/about.htm>. In addition to Intel Application Solution Centers, Intel offers numerous technical documents and tools to help developers port their applications to IA-64. See <http://developer.intel.com/design/IA64/index.htm> for more information.

## No Limit to Your Business

Intel and Oracle share a common view of the future direction of e-Business. Not only has the Internet changed everything, as Oracle's Larry Ellison predicted, but Intel volume economics have changed the competitive landscape. Small- and medium-sized companies can today afford computing power and powerful database software that was once the sole province of Fortune 500 companies. This new level playing field dramatically increases the number of competitors in every industry, and the Internet allows companies of all sizes to interact as equals.

The initial IA-64 platforms are just the entry point to a very long roadmap that will continue to scale. Today's systems contain a handful of processors, but with clustering technologies like Oracle Parallel Server, companies can move far beyond to hundreds of processors. The alliance between Oracle and Intel is constantly expanding how far you can take your business using Oracle software and Intel Architecture-based servers.