

## Appendix E

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### Review of Major Commercial DBMSs

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All the leading commercial DBMSs briefly reviewed in this appendix provide the standard database support discussed throughout the book, especially in Chapter 2. Therefore, the standard features are not repeated here for every product.

This appendix highlights only certain significant features of each product, particularly those in the latest version of the product. Use this appendix just as a brief introduction to each DBMS. Several good books and elaborate literature are available for details of any particular DBMS. Please refer to those for further information.

The order of the products as listed here does not imply any ranking. The DBMSs are just listed in the alphabetic sequence. The suitability of any product to your situation depends on the set of requirements.

#### DB2

##### Vendor

International Business Machines Corporation

##### Database Product Versions and Editions

DB2, IBM's premier relational database management system delivering leading capabilities in reliability, performance, and scalability is available as the following products:

*DB2 Universal Database V8.1.* Relational database management system for AIX, Linux, HP-UX, Sun, and Windows.

*DB2 Everyplace.* DB2 relational database and enterprise synchronization architecture for mobile and embedded devices.

*DB2 Universal Database for iSeries.* Combine to provide flexibility and adaptability for supporting multiple workloads.

*DB2 Universal Database for z/OS and OS/390.* Intended for using DB2 on the mainframe to run powerful enterprise and e-commerce applications.

*DB2 Server for VSE & VM.* Full-function relational database management system supporting production and interactive VM and VSE environments.

The following DB2 editions are available:

DB2 Universal Database Enterprise Server Edition

DB2 Universal Database Workgroup Server Unlimited Edition

DB2 Universal Database Workgroup Server Edition

DB2 Universal Database Personal Edition

DB2 Universal Developer's Edition

DB2 Personal Developer's Edition

### Highlights of Certain Significant Features

***Innovative Manageability*** Provision of significant automation capabilities including self-configuring, self-optimizing, and self-managing. Innovation includes Configuration Advisor providing knowledge as of a seasoned DBA, Health Center/Monitor keeping the database functioning, Memory Visualizer providing ability to dynamically see and control memory usage, advisors to deliver expert advice on index and materialized query tables, and simplified management of large-scale partitioned databases.

***Integrated Information*** Capability to integrate information across the entire enterprise through federated Web services and enhanced XML.

***Robust e-Business Foundation*** Inclusion of Connection Concentrator for more user scalability, dynamic configuration, online reorganization, online storage management, null and default compression, replication enhancements, and new client architecture.

***Enriched Data Type Support*** Provision of support for spatial data, text data, and flat files via Spatial Extender, Net Search Extender, and Data Links Manager respectively.

***Integrated Business Intelligence*** Incorporation of sophisticated business intelligence capabilities that enable information to be organized for faster and insightful queries.

***Application Development*** Inclusion of an extensive toolkit in the developer editions for building DB2 applications.

## Other Related Tools, Components, and Products

*DB2 and IMS Tools* support data administration, performance, application management, recovery, and replication.

*DB2 Extenders* manipulate multiple data types with powerful built-in functions.

*DB2 related tools* enable development of applications using DB2.

*DB2 Intelligent Miner for Data* enables mining even high-volume transaction data generated by point-of-sale, ATM, credit card, call center, or e-commerce transactions.

*DB2 OLAP Server* delivers analytic applications for fast, intuitive, multidimensional analysis.

*DB2 Warehouse Manager* provides capability for intensive and complete business intelligence applications.

## INFORMIX

### Vendor

International Business Machines Corporation

### Database Product Versions and Editions

Informix, IBM's object-relational DBMS for data warehousing, analysis and reporting, Web content delivery, and broadcasting from a digital media library, is available as the following products:

*Informix Dynamic Server (IDS)*. Best-of-breed, general purpose, mission-critical OLTP database software for e-business.

*Informix OnLine Extended Edition*. Easy OLTP for small and medium-sized businesses.

*Informix SE*. Zero-administration, embeddable, multiuser DBMS.

The following IDS editions are available:

Informix Dynamic Server Enterprise Edition

Informix Dynamic Server Workgroup Edition

### Highlights of Certain Significant Features

**Reliability** Provides high reliability particularly for applications with high-performance transactions.

**Online Transactions** Support for complex and rigorous online transaction processing requirements.

**Data Operations** Maximized data operations for the workgroup and for the global enterprise.

**Openness** Inclusion of J/Foundation to combine the features of IDS with an open, flexible, embedded Java Virtual Machine environment.

**Web Support** Provision for dynamic, database-driven websites. Fully integrated with Web technology for data access over the Internet or the company's intranet.

**Data Access** Ability to access client information, whether on IBM or other databases.

**Data Integration** Capability to link together a few or even hundreds of IDS databases.

**Data Replication** Ability to replicate data for quick dissemination across a global organization.

## Other Related Tools, Components, and Products

*All Informix tools* provide development aids to create powerful business applications.

*All Informix DataBlades* are server extensions that integrate into the core of the engine, delivering unparalleled application functionality and outstanding performance.

*Informix C-ISAM* provides fast and cost-effective file management technology.

*Informix Extended Parallel Server (XPS)* provides enterprise data warehousing.

*Red Brick Warehouse* enables online data warehousing.

## ORACLE

### Vendor

Oracle Corporation

### Database Product Editions

Oracle Database is state-of-the-art in object-relational databases available in the following three editions:

*Enterprise Edition.* For both clustered and single-system configurations providing comprehensive features for OLTP and decision support.

*Standard Edition.* Low-cost alternative for small and medium-sized businesses or departments needing the power of the product without requirements for high-end options of the Enterprise Edition.

*Personal Edition.* Full-featured version of the database for individuals who need full compatibility with the entire Oracle database family.

## Highlights of Certain Significant Features

**Row Level Locking** Ability to lock at the level of individual rows instead of the entire table, thereby allowing many concurrent users to access data from the same table in a multiuser environment.

**Materialized Views** Precomputing and storing of aggregated data to improve data access performance for common queries, thereby eliminating the need to recompute the results.

**Data Partitioning** Flexible partitioning of data to improve performance, availability, and manageability.

**Query Optimization** Proven query optimizer to determine the best data access strategy for each query, especially for the ones with complex SQL statements.

**Database Clusters** Clustered database with provision to scale your application on any platform with data protection comprising of fast hot failovers.

**Data Protection** Features Oracle Data Guard providing complete data protection scheme for all types of failures.

**Single Sign-On** Provision of single sign-on using interoperable certificates for authentication over Secure Sockets Layer (SSL), the Internet authentication standard.

**Data Encryption** Ability for selective encryption based on industry-standard DES.

**Self-managing and Tuning** Enhanced database management tools to automate routine DBA tasks including space, memory, and resource management as well as ongoing monitoring.

**Data Replication** Oracle Advanced Replication designed to support a variety of applications.

**Database Clusters** Clustered database with provision to scale your application on any platform with data protection comprising of fast hot failovers.

**Connectivity Options** Two connectivity solutions—generic connectivity and transparent gateways—providing seamless access to non-Oracle data sources.

**Content Type Management** Ability to manage various types of data content for traditional, Web, and wireless applications.

**Data Warehousing Support** Features including integrated OLAP, data mining functionality, and built-in data warehousing Extraction-Transformation-Loading (ETL) capabilities.

### Other Major Related Products

**Oracle9i Developer Suite** and **Oracle9i JDeveloper** accelerate the development of all types of applications. Features include: J2EE development, Web services, XML, modeling, rapid application development (RAD), reporting, and business intelligence.

## SQL SERVER

### Vendor

Microsoft Corporation

### Database Product Editions

SQL Server 2000 is a fully enterprise-class database product providing basic support for various types of applications including XML and Internet queries. Through data analysis and data mining capabilities integrating with familiar Microsoft Office applications, the database product provides timely business information. SQL Server 2000, a full-feature relational database product, is available in the following editions:

*Enterprise Edition.* Most scalable and available edition, includes the complete set of SQL Server data management and analysis features. Able to scale to the performance levels required to support large websites, enterprise OLTP applications, and data warehousing systems.

*Standard Edition.* Affordable option for small and medium-sized organizations, including core functionality for non-mission-critical and e-commerce solutions. Contains all XML features, all data mining, and core OLAP functionality present in the enterprise edition.

*Windows CE Edition.* Provides relational database management capabilities on Windows CE-based devices, with tools, application programming interfaces (APIs), and SQL grammar.

*Developer Edition.* Designed to allow developers build any type of application on top of SQL Server. Includes all the functionality of the enterprise edition for development and testing, but not for production deployment.

*Personal Edition.* Ideal option for mobile users, functionally equivalent to the standard edition in large measure.

*Desktop Engine (MSDE).* A redistributable version of the SQL Server relational database engine, ideal for software developers to include in their applications that use SQL Server to store data. Does not include any graphical management tools, nor any analysis capabilities such as OLAP, data mining, and data warehousing.

## Highlights of Certain Significant Features

***Distributed Partitioned Views*** Partitioning of workload among multiple servers for additional scalability.

***High Availability*** Enhanced availability of business applications with the use of log shipping, online backups, and failover clusters.

***Full Text Search*** Management of structured and unstructured data, including searching through Microsoft Office documents.

***Developer Productivity*** Provision of user-defined functions, cascading referential integrity, and reuse of code through the integrated Transact SQL debugger.

***XML Support*** Simplification of the integration of back-end systems and data transfer across firewalls using XML.

***Security*** Provision of role-based security and file and network encryption.

***Web Access and Hosting*** Connection to SQL Server 2000 databases and OLAP cubes flexibly and ability for third-party hosting e-commerce solution with support of multiple instances.

***Application Hosting*** Provision of multi-instance support to take full advantage of hardware investment so that multiple applications can be run on a single server.

***Data Replication*** Ability to implement merge, transactional, and snapshot replication with heterogeneous systems.

***Database Administration*** Simplified data administration with automatic tuning and maintenance features.

***Indexed Views*** Provision for performance improvement from existing hardware by storing query results.

***Data Warehousing Support*** Provision of metadata services and data transformation services (DTS).

***Advanced Querying and Analysis*** Inclusion of English Query, OLAP services, closed-loop analysis, data mining, Web-enabled analysis, and clickstream analysis.

## Key Technologies

*Key technologies in SQL Server 2000 include:* business intelligence and data warehousing, DTS, SQL Server 2000 Notification Services, SQL Server 2000 Windows CE Edition, SQL Server 2000 Enterprise Edition (64-bit), Replication, XML, MSDE.

## SYBASE

### Vendor

Sybase

### Database Product Editions

For a number of years, Sybase has been focusing on open-architecture enterprise infrastructure software. The software solutions bridge all technology platforms and ensure that everything works together and better. Sybase offers the following three version of database software optimized specifically for the demands and complexities of individual businesses:

*Sybase Adaptive Server Enterprise 12.5.* Powerful data management platform designed for transaction-intensive enterprise applications, with advanced capabilities for meeting the evolving requirements of e-business.

*Sybase Anywhere Studio.* Comprehensive package providing data management and enterprise synchronization for rapid development and deployment of distributed e-business solutions.

*Adaptive Server IQ Multiplex.* High-performance relational database designed specifically to satisfy the needs of business intelligence and a new generation of scalability requirements for Web-enabled data warehousing.

### Highlights of Certain Significant Features

**Open Architecture** Configured to run on several computing platforms.

**Content Management** Ability to support the demanding requirements of transaction-intensive, mission-critical OLTP and decision support applications.

**Security and Directory Services** Specially designed package to provide complete solution for data protection and application security.

**Row Level Access Control** Ability to lock at the level of individual rows providing flexible control in a multiuser environment.

**Data Replication** Provision of replication server supporting replicated databases that are geographically distributed.



**Navigation Server** Capability for integrating a variety of Sybase servers into a singular powerful distributed query engine for high throughput needed in complex applications.

**Internet Standards** Support for all of the open Internet standards, such as XML, UDDI, and SOAP.

**Tuning and Optimization** Complete SQL performance tuning and optimization solution that detects and rewrites problematic SQL.

**Transition to e-Business** Special provisions in XML/XQL and EJB data management, dynamic tuning for addressing the unpredictable nature of Internet-based computing, and enhanced security features including encrypted communications.

### **Other Major Related Product**

**Industry Warehouse Studio (IWS)** is an enterprise analytic infrastructure enabling the design, development, and implementation of focused business intelligence applications.