

Enterprise Transaction Processing on Windows NT

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“We sit here and look at the world’s most demanding transaction-processor-based systems, and we ask ourselves ‘What does it take to make PCs or networks of PCs suitable for those tasks?’ ”

— Bill Gates, *Fortune*, January 16/95.

For over 10 years Prologic has been replacing mainframe and mini-computer based enterprise-wide transaction processing systems with distributed networks of PCs.

Prologic’s customer base includes over 100 installations of line-of-business systems in banking, insurance and inventory control. With the development of PROBE® for Windows NT™, our new partnerships include high profile transaction-processing environments at EDS, Dallas, Texas and Nomura Research Institute, Yokohama, Japan.

Back in 1987, Prologic’s first customer, Richmond Savings of Vancouver, B.C., used Prologic’s PROBE for DOS-based technology in production. This award-winning application (Best in MicroBanking, 1988) is a complete retail banking system, including a consolidated customer information file, deposits, loans, GL, and ATM, EFT/POS, VRU.

Richmond Savings has over 400 users in 12 locations performing approximately 150,000 online transactions per day; month-end batch transaction volumes exceed 300,000; their 20 million row database is located on their enterprise server: a 486/66 with 16MB of RAM and 3GB of disk using MS-DOS and Netware. End users experience an average 1.5 second response time over low bandwidth 9600 BPS WAN circuits with 99.98% availability. Richmond Savings’ new business system has paid off—since 1987 it has had an industry leading 16% compound growth rate.

Prologic established some key criteria early on for PROBE. These key features include: 1) simplified application development and maintenance through a *unified*, homogenous platform and tools for the entire solution including client, server, gateway, and batch components; 2) high *performance*, scalable transaction-

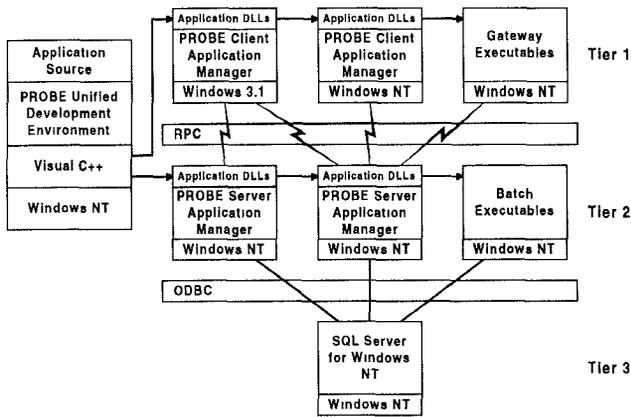
throughput utilizing the lowest available life-time operating cost platform and efficient communications; 3) increased developer *productivity* to improve responsiveness to business change, and reduce cost and risk of new application development.

Applications are developed using PROBE’s Unified Development Environment (UDE) and deployed using PROBE’s Unified Application Framework (UAF). The application is composed of the data dictionary where all database objects and properties are specified using SQL DLL extended to include features such as pre-defined relationships, time relationships, and visual properties of data objects. Compiling the data dictionary automatically generates the complete Windows user interface and SQL database catalog. The Windows interface includes a complete MFC MDI application including forms, menus, and data entry and retrieval functions. The SQL database catalog is automatically synchronized via ODBC including conversion of existing data, and generation of all indexes and stored procedures required for high performance transaction processing data access.

Application business rules are encapsulated in event procedures corresponding to the location, object, and event that fires the business rule using a full-function procedural logic language based on extended C and SQL. The application function is automatically compiled into high-performance 32-bit DLLs using Microsoft Visual C++. With this development environment, developers can see dramatic increases in productivity. In one case, a California financial firm replaced a CICS/COBOL application of more than 2 million lines of code with a PROBE application of less than 100 thousand lines.

Once written, the application is deployed with PROBE’s UAF to deliver a three-tiered, distributed-function, message-shipping, enterprise-wide transaction processing architecture on local and wide area networks. PROBE operates efficiently over 9600 BPS WAN bandwidth, reducing communications costs, improving response time, and providing greater scalability.

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The three-tier client/server architecture consists of:

- Tier 1, the Client Application Manager (CAM) coordinates the WIN32s presentation functions, data access, update operations, and client application dynamic-link libraries (DLLs).
- Tier 2, the Server Application Manager (SAM), a Win32 multiprocessing, multithreaded program that manages transactions, data, and server application DLLs, processes messages from the CAM received via NetBIOS, NetBEUI, IPX, or TPC/IP.
- Tier 3, the SQL database performs database management system functions requested by the SAM via a 32-bit ODBC driver.

CAM provides a complete user interface including a visual service and a non-visual service. The visual service supports object and task user interface models, workflow, views, security, navigation, forms, field input, printing, menu and toolbar management, keyboard and mouse management, status bar, context-sensitive help, clipboard functions, resource management, and OLE functions, including linking, embedding, drag and drop, and in-place activation. The non-visual service provides network session management, data entry and retrieval, field binding, event notification, error handling, and interfaces to 3rd party visual services via OLE automation and APIs.

SAM includes the Communications Manager (CM), the Transaction Manager (TM), the Temporal Data Manager (TDM), and the ODBC Optimizer (ODBC-O). The CM provides scalable transaction throughput with session management, context free operation, connection multiplexing, heuristic load balancing, transaction time-out, and priority queuing. The TM provides robust and scalable processing with features such as transaction bracketing, logging and recovery, nested transactions, lock initiation, deadlock/livelock resolution, commit, savepoints, transaction logging, exception handling, and event logging. The ODBC-O provides high performance through optimized set and ISAM access, catalogue and database synchronization, data conversion, automatic usage of optimized stored procedures, and metadata suppression. The TDM provides high quality and functional applications through automatic management of time ordered

relationships between tables, including: automatic audit trail of master changes, temporal integrity which guarantees the "sum" of transactions equals the master, "asof" past and future projections, automatic recalculation of master values on non-destructive error correction.

PROBE for Windows NT completely integrates with Windows NT for system administration using services such as Performance Monitor for transaction statistics and Event Viewer for problem tracking and diagnosis.

PROBE for Windows NT provides a complete unified solution when used with Microsoft BackOffice facilities such as SQL Server as the ODBC database management system, SNA Server to provide real-time data transfer with legacy systems, and SMS as a single, centralized control point for troubleshooting, monitoring, and distributing not only the PROBE transaction processing application but also personal productivity and DSS applications and data.