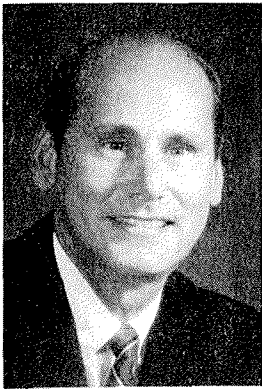


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Downsizing Applications from Mainframes to Client/Server

By
Dr. George Schussel
Chairman
DATABASE WORLD*

The problem with most new technologies is that they require you to throw away the applications you've built and start from scratch. This has especially been true for database conversions. I remember a project from the mid 1970's where Massachusetts Blue Cross wanted to convert several major applications from IBM to Honeywell computers. Since IBM's IMS database man-

agement system was an essential component of IBM processing, the applications were to be converted to Honeywell's IDS database management system on Honeywell 6000 computers.

After 16 months of conversion effort and no success, the joint Honeywell/Blue Cross team gave up the idea of a complete conversion. The logic of the applications was so enmeshed with the data models that using IDS to emulate another DBMS's data model produced neither programming nor developmental advantages, and in reality, extracted a performance penalty. Ultimately, the joint conversion team

was successful - they discarded the idea of a "conversion" and redeveloped, rather than converted, the Blue Cross applications for the Honeywell IDS approach.

Since those days, new application development technologies such as relational DBMSs, 4GLs and CASE have promised important productivity enhancements for the application developer. Taking advantage of these new technologies, however, has required users to rewrite existing applications. The questions then become: Will rewriting be necessary when downsizing? Which existing

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The Last of the Buggy Whips

By Ed Yourdon
Chairman
CASE WORLD*

Flashback: In the 1950s, my father was convinced that every American boy needed to learn the fine art of changing spark plugs, adjusting carburetors, rotating tires and changing the oil in the family car. I spent many miserable weekends attempting to earn a passing grade in these manly skills.

The last time I changed a tire was in the midst of a blizzard on New Year's Eve in 1970; I never did change the oil or fiddle with a spark plug. Even if I had memorized every technical detail my father

learned from his father, it would be of no use today if I began poking around the electronic components of the engine in my car. Those automotive details I've tried to learn in the 1950s are as useless today as were the details of buggy whips my grandfather probably had to learn from his father.

Back to the present: I asked my wife/partner/editor, Toni Nash, what CPU we have in our Macintosh computers. This is a woman who has spent 25 years in the computer field; her response was a shrug of the shoulders. Not only does she not know, she has no interest in finding out. Nor does she know what programming language the Macintosh software uses. The final irony was her question to me as

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applications can be converted to client/server approaches? Can we save our investment in existing code, especially if it's already relational?

The answers to all three questions is, well maybe, but probably not. The discussion below details some of my observations and experiences in reviewing a number of "conversions" to client/server computing.

Change the Architecture of the Application

Let's first look at the technical process involved in building a client/server approach. Here, we confront a very different architecture- one that places applications on desktops and data on shared servers. Jim Davey, Senior Consultant for DCI, has been developing a new analysis approach for the client/server environment (an article from Jim is in the works). Regardless of the analysis approach used, it is clear that the native I/O code that once resided in the application will now be removed and/or executed on a different computer. So the first step in a conversion to client/server computing is to re-analyze data I/O and recode to accommodate any necessary changes.

Change the Application's Approach to Record Locking

Along with the I/O code, a migration to client/server requires a change in the approach to record locking. With traditional applications, the record locking code is intimately tied into the process logic flow of the application program. With client/server, record locking needs to reside almost entirely on the data server.

Take Advantage of Stored Procedures and Triggers

Pioneered by Sybase and Ingres, client/server DBMS products have brought new functionality to database processing in the form of additional integrity. Stored procedures and triggers are the best known examples of the new functionality available on the server. Stored procedures are precompiled programs that reside in the database, and have both procedural and database access logic.

They are activated by instruction from the application program. The advantages of stored procedures are

"For Maximum Advantage of Downsized Client/Server Approaches, You'll Need to Trash Your Old Applications and Rebuild Them From Scratch."

found in reduced network traffic- instead of transmitting a series of program instructions to a remote server, the application can simply transmit a one line procedure call. Faster execution speed is a result of having a precompiled set of code that can be called and executed rather than be interpreted during a run.

Triggers are similar to stored procedures except that they are automatically executed whenever the status of the database reaches predefined conditions. For example, a trigger can be set so that whenever an entry is made to the OVERDUE table, action is initiated. Some DBMSs support a capability where triggers can be "cascading" and are initiated in series depending on the nature of the database activity.

Most system developers feel that these types of features are enormous- valuable as development aids. They allow data-based edits to be properly stored with the database and uniformly applied for all programs with access. Anytime such a "database concept" can be applied to program logic, development and maintenance ease are the results. Triggers and stored procedures are also available for DBMS' that run under time-sharing/host configurations, but their values are heightened in a client/server architecture.

The main point I want to make about features similar to and including triggers and stored procedures, is that most developers will be converting applications from a file or database environment where this type of functionality isn't supported, and will want to take advantage of these new approaches. As business rules and validity checks are added to the database code, they will need to be pulled from the application.

Re-Architect and Move to Windows-Style

The application logic flow in a G environment is very different from panel-based, time-sharing applications. Most developers want to take advantage of the "Windows" look in designing new client/server applications. Color, pull-down menus, mouse control, multiple open windows, and icons will all change the logic flow considerably. Most developers have found that by taking advantage of these new capabilities, the number of different screens that must be navigated can be drastically reduced. They have also found that since much of the application logic was centered around the flow of screens, none of the logic is salvageable for the migration to client/server.

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Surprise! Throw Away Your Old Programs

In review, the changes that need to occur when moving an application to a client/server environment are:

- Splitting an application across two machines
- Moving functionality from the application to the new database code
- Redesigning the user interface

Interestingly, after all of these changes are made, most applications have nothing left to convert.

An Alternative Approach

Some software vendors are offering a short cut to client/server approaches and downsizing. They are selling alternatives, PC and LAN-based products that are compatible with their older mainframe offerings. The idea here is to allow the customer to downsize (and possibly migrate to client/server applications by simply running the older code on a PC platform rather than a mainframe).

Computer Associates (CA) and Microfocus are two leaders in this short cut approach. CA now offers PC-based implementations of its mainframe IDMS and DATACOM product offer-

ings. Tools such as ADS/O and IDEAL have also been migrated to the PC. If you have an IDMS and ADS/O application running on a mainframe, it is possible to port that application down to the PC without changing any source code. Of course if you do that, your application will still look and operate the same. It won't have new GUI or trigger functionality, but then it won't need to be redeveloped either.

Many of CA's customers have found advantages in distributing their current applications in this manner to small remote offices without redevelopment or time delays. This form of downsizing also quickly takes advantage of the significantly cheaper MIPS available on PC platforms.

A large disadvantage of "short cut" downsizing, however is that your application doesn't have the new Macintosh/Windows-type GUI, and isn't able to take advantage of the improved architecture offered through the stored procedure approach. Another disadvantage is that the resulting downsized application is closely tied to the CA product line and therefore, is not open. Many of the new client/server style tools are open in the sense that they

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life cycle development, from analysis and design through application generation, redevelopment, and software configuration management.

Lotus

Toronto, ON

Lotus Notes is a document database used for building applications that enable workgroup communications and information sharing to take place across local and wide-area networks. Notes is used by people who need to create and access shared information, such as words, spreadsheets, graphics and images. Notes lets you discuss ideas, track sales, distribute reports, route messages... and solve problems together. All with a single easy to use product.

MAGIC SOFTWARE ENTERPRISES

MSE

Computer
Aided
Programming
Tools

Irvine, CA

An Object-Oriented, code-Free Application Development System based on a table-driven post 4-GL technology. Basic design tasks include Environment and Menu Design; Data Definition; Automatic Program Generation; Object-Oriented Programming; and Display and Report Design. Magic runs on DOS, UNIX, VAX/VMS, OS/2 BTOS/CTOS, and supports MS-Windows deployment.

mSP

Lexington, MA

MSP, known worldwide for its flagship repository product DATAMANAGER, will demonstrate METHODMANAGER its repository based Application Development Environment (ADE) framework in which an organization can support, automate and integrate their chosen methodology and CASE tools.

MUST SOFTWARE INTERNATIONAL

Norwalk, CT

MUST Software provides high-powered productivity tools for distributed applications and transparent access to data on

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IBM and compatible mainframes, PCs and DEC VAX machines. MUST's flagship product, NOMAD, a comprehensive 4GL/DBMS, provides flexibility for application development, power for reporting and overall performance in client/server design.

NETRON



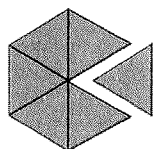
Toronto, ONT

Netron, Inc.'s NETRON/CAP combines CASE and object-oriented design methods for designing and constructing COBOL applications for downsized, multi-platform client/server and open systems architectures. Netron's NETRON/Client products provide full GUI support for Presentation Manager, Windows 3.X, and OSF/Motif.

WARD ASSOCIATES

Toronto, ONT

Ward Associates is a professional services company providing unique people-based information expertise to our wide base of corporate clients. We consult and serve our clients for short and long term people requirements. Our name underscores the fact that we view our three prime constituents: our employees, our clients, and contract professionals, as true associates.



Pacific Information Management, Inc.

"Optimizing the Impact of Information"

Culver City, CA

Pacific Information Management is recognized as a premier developer and supplier of quality Information Engineering products and services including training, consulting, and project support directed at improved information effectiveness throughout an organization. Based on business re-engineering concepts, the company has developed IE/IMPACT, a proprietary Enterprise Wide Information Engineering methodology.

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are designed to work with any of the popular servers (SQL Server, Oracle Server, IBM's Data Base Manger, etc.). The full realization of openness is still in the future, but through the efforts of groups such as SQL Access Group, as well as individual vendors, the direction towards independence of tools from DBMS is unmistakable.

The Microfocus approach to downsizing is to offer exact execution or simulation of mainframe products like COBOL, IMS, and DB2. Many customers don't want to run COBOL on the PC, but want to take advantage of the cheaper MIPS, faster turn around times, and greater programmer/developer productivity- all benefits realized when developing mainframe applications on PC platforms. Realia, a major Microfocus competitor that offers PC-based mainframe development tools (including COBOL), was recently acquired by CA. XDB, another competitor, is currently selling a DB2 clone for PCs.

Conclusion

Some types of downsizing can be rather simple. If you want to migrate mainframe application development to PCs, there are tools that can

help you do this quickly and with a good return on investment. Some mainframe software vendors have aggressively moved to offer downsized versions of their mainframe applications almost overnight. Those who take this path can later take advantage of the improved functionality offered by PC LANs by re-architecting their applications.

But, for maximum advantage from the added power, functionality, and richness of downsized client/server approaches, you'll need to trash your old applications and rebuild them from scratch with the new generation of tools now available.

The good news is that new "Windows 4GLs" from companies like Revelation Technologies and Powersoft allow the application building process to proceed faster than ever before. And, the new generation of SQL-based servers offers performance and functional richness far superior to any previous database technology. ■

This article was reprinted with permission from Schussel's Downsizing Journal, April 1992 edition. For more information on the Journal, please call (508) 470-3880.