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How to Evaluate and Choose Client/Server Systems

by Richard Finkelstein

This is the first article in a two-part series on client/server architectures. This article is a condensation of a lecture Richard Finkelstein of Performance Computing gave at DCI's DATABASE WORLD in Chicago, November 5-7, 1991. In the first article, Finkelstein discusses the evolutionary trends leading to the development of the client/server model, as well as the benefits that this type of architecture can provide. His second article will focus on how to select hardware and software for developing a client/server system.

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Geo's Outlook

Will You Really Need a Network Operating System in the Future?

eompany-wide reorganizations dominated much of the news in late 1991. The biggest, of course, was IBM's announced plan to decentralize decision and move that power out into its smaller business units. But one smaller reorganization attempt that especially caught my attention was Microsoft's combining of its Network and Windows NT business units into one combined organization to be called Corporate and Network Systems. Under the direction of this new organization,

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How to Evaluate and Choose...

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Advantages of a mainframe topology

Everyone is somewhat familiar with multi-user environments where all of your applications, operating systems, and software are running on one box. Communication between each user and the processor is through a dumb terminal. This mainframe environment is very homogeneous, simple and predictable. I have found that such simplicity is difficult to achieve architecturally in a PC environment, especially with a client/server design.

The advantages of a mainframe environment are maturity, reliability and security. In addition, there is an abundance of software available to monitor and control the system. Especially vital is a transaction processor (TP) monitor which allows an operator to prioritize and control message traffic. Mainframes are robust platforms and can handle a very large number of concurrent users. Since the costs of mainframe computing are high, however, people have turned to networked PCs in the hopes of finding a different (parallel) architecture that can provide

the same level of mainframe performance at a lower cost.

The generation of networked PCs and file servers

In the PC world, topological evolution has been different from that of the mainframe. Here, the thrust has been on intelligent workstations rather than dumb terminals. In order to achieve the power of a mainframe, PCs must be linked together to communicate and share information, jobs,

...The client/server architecture is an attempt to maintain the control and stability of a mainframe, with the power and cost of a workstation environment....

peripherals, etc. The first attempt in designing a product that would allow PCs to communicate and share data was a file server. Basically, the file server is a machine that allows workstations to share printers and data at the file level.

Although they work well, file servers aren't useful in a client/server environment since many problems arise when entire files are transmitted over the communications cables. In a simple PC network architecture where database files are transmitted to local

workstations, performance problems arise if the granularity is too large. Even worse, however, are the consistency and concurrency problems that occur. Because the file server is essentially duplicating database files all over your workstation network, data is being distributed without any redundancy or concurrency controls. Therefore, at any moment in time, different users can be updating the information in the same file without proper concurrency controls. A technical response to this problem is the

client/server architecture. And this is why client/server is the next generation of architecture that will attempt to capture a mainframe's power at a PC's cost.

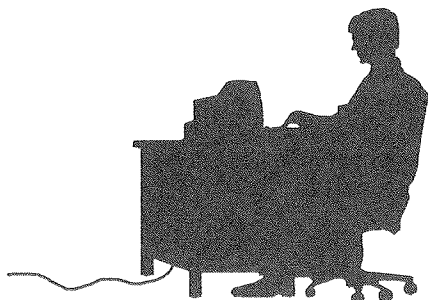
How a client/server architecture can benefit your computing performance

The principal purpose in using a file server is to exploit the performance potential of an intelligent workstation; this is also one of the guiding principals behind client/server. A client/server environment will be more flexible than a mainframe since software will have the ability to add or remove workstations or servers as required. You can execute fast file transfers over a network, which is important

when you're doing a lot of work at the workstation level.

Here, for the most part, we are talking about typical client/server environments, which involve modest transaction processing or decision support applications. This is not to say that people haven't successfully installed mission critical applications in downsized environments, but that is not the mainstream situation today. You may hear about a few success stories on these large mission critical applications, but there are also failures that I know about that you may not. To avoid client/server failures, I think it's important to set initial goals modestly, and that's what I always recommend.

In the client/server environment all functions are split between two platforms. In a mainframe, multi-user environment, both the DBMS and the application are located on the mainframe. With a file server both the DBMS and the application are in the workstation. With client/server, the DBMS is on the server while the application is on the workstations. Why this



division? The functions are split in order to maximize the benefits and minimize the problems of both mainframes and file servers. To do this, we need to centralize shared functions and take advantage of the intelligent power of the workstations. *The client/server architecture is an attempt to maintain the control and stability of a mainframe, with the power and cost of a workstation environment.*

Cost savings provided

When discussing cost savings I am limiting my discussion to quantifiable hardware and software costs. From this viewpoint it is much cheaper to deploy a client/server design than a mainframe. I am omitting from this argument any administrative and/or maintenance costs for two reasons: 1) with our lack of experience at this point in time, it is extremely difficult to quantify administrative and maintenance costs; and 2) the number of permutations and variables involved in determining administrative and maintenance costs are astronomical. If someone asked me what is needed to run a DB2 site, an IMS site, or an INFORMIX site running on UNIX, I could tell then the administrative costs. The problem with client/server is that I don't know that answer. It's not just me, no one knows the numbers, and that is why

client/server cost/benefit studies aren't available.

Improved DBMS control

Having a database server, which is an intricate part of a client/server architecture, offers the advantage of increased DBMS control. Two of the advanced features offered are data integrity and system-wide protection from a database application crash. The DBMS will insure that data is not being corrupted, which means that there is greater data consistency for multi-user access. A much finer level of security is also available; data can be secured to the value within a field. For example, it is possible to define that a certain operator can only view customers that live in Illinois. That is a very fine level of security.

In a database server environment, you have the potential to introduce new, high performance and high integrity characteristics through features like stored procedures and enforced business rules. The stored procedure is a program stored in the database server that can be accessed by any other application; it is a remote procedure call to a remote application. Business rules that were once normally part of the application can now become part of the database. For example, a company might have a rule that no

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customer is allowed to exceed their credit limit. That edit rule can be enforced at the workstation level through the application logic, or it can be enforced at the database server. You have the ability to centralize the enforcement of your business rules.

Allows system scalability

One of the most important features of a client/server architecture is scalability. Since applications are divorced from the server, the server platform can change without impacting the client applications. This means that it is possible to start developing your system with a DOS machine, an OS/2 machine, or a UNIX box and then later change your platform without effecting the application logic. Given this scenario, I normally suggest to my consulting clients that they begin their systems with an inexpensive platform, and as the project further develops and more of the application's needs are known, it will be possible to replace the platform with the most appropriate system.

Very often, a company is dealing with many remote sites, each with a different computing goal. Client/server affords you the option to choose OS/2 for some sites, UNIX for others, and VMS for yet other sites. With a client/server design there is incredible flexibility in determining the server type for individual sites, which makes it possible to defer risky decisions until much later in the development cycle

...Having a database server, which is an intricate part of a client/server architecture, offers the advantage of increased DBMS control....

when you have more knowledge about the application requirements.

Improved performance speed through job partitioning

Client/server also allows the user to partition jobs; once data is placed on the platform, it can be accessed either by gateways or by special application programming interconnects. You can have a cooperative

processing environment where the application has been split between two platforms. The result is part of the application running at the client and part at the server.

Why would you want to do this? There are least a two reasons: 1) to promote code sharing between applications; and 2) to provide better, faster performance. The portion of the application stored in the server is

typically the part doing the database work. Why? Because an application will interact with a database many times; it might do an update, an insert, a select, or a read. If all of those interactions are executed across the wire, performance is slowed down 40% or more.

Subsequently, if all of these interactions are bounded and executed on the server, then the communications lines are freer and there will be a tremendous increase in performance. This idea of a stored procedure or remote procedure call for database work is a very important concept in client/server, so keep the possibilities in mind when designing a client/server architecture and selecting a database. **RF**

This is the first article of a two-part series by Richard Finkelstein on client/server architectures. Part two will be featured in the March issue of Schussel's Downsizing Journal.

Winners and Losers

February Edition



Novell



Sybase



Intel



Borland



Best...



...Worst

Current Computer Wisdom

Dr. George Schussel

Novell everywhere, which is what I like to call the pervasive growth of Novell products and supporters, predominated the news last month. Unix Software Labs, Stratus, Hewlett Packard and many other leading players have joined IBM in aligning their LAN O/S strategy with Novell. The up and coming portable Netware will mean that many different hardware environments will be able to act as Netware file servers. These strategic business and technological alliances will continue to further isolate Microsoft and their efforts to establish Windows NT as the new PC operating system standard (see "Will You Really Need a Network Operating System in the Future" on the front cover for further details).

Sybase has been busy establishing strategic partnerships across the market. The company is already linked to Microsoft (which markets SQL Server for the PC environment) and Lotus (which owns a minority share of Sybase). Last month Dun & Bradstreet Software announced their intentions to build client/server applications around the Sybase SQL Server product. Sybase is currently the market leader in client/server database computing and appears to be holding on strong to its lead.

This past month has been good to **Intel** as its potential competitors have run into trouble. Two major industry consortia, the Apple/IBM/Taligent group and the Advanced Computing

Environment (ACE) initiative, have been created over the last year principally to challenge the hardware hegemony that Intel exercises over 90% of the worldwide desktop computing market. Apple/IBM seems to be off to a *very slow* start. At the time this issue went to press, no final top management team, board of directors, or CEO for Taligent had been named. Similarly, ACE is principally in the news these days for its squabbling among members. Santa Cruz Operations is pointing a finger at Microsoft (I won't say which one), MIPS is losing money, and DEC is rumored to be losing interest in the group. In the meantime, while competitors are arguing amongst themselves, Intel is gearing up for a major push to

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Will You Really Need...

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Microsoft will migrate some of the LAN Manager features, such as peer-to-peer networking, to a desktop version of Windows NT. Other mainframe-style networking features, such as multi-processor support and fault tolerance, will be migrated to a server version of Windows NT.

Microsoft's reorganization is just the latest in a series of moves which when examined can show us how the organization of network-style computing may change over the next few years.

The leading network O/S products currently available

Network operating systems (see "LAN O/Ss" in the Nov/Dec issue of **Schussel's Downsizing Journal**) take multi-tasking, single-user environments, such as OS/2, and add functionality so that it becomes a multi-user, multi-tasking, communications capable environment. The principal market for network O/Ss has traditionally been PC-based LANs where the users operate on networked PCs and networking services are provided by a dedicated

(usually) PC style network server. Novell has dominated this market. Novell's future strategy is to continue building their strength in the PC arena and to expand through strategic partnerships with dominant companies in other market segments such as UNIX, mainframes, and proprietary minis. There are some companies that have decided that instead of fighting Novell, they would rather join in promoting "Netware everywhere," including Altos, Data General, Hewlett Packard, IBM, ICL, MIPS, Pyramid, Stratus, Sun, and Unix Systems Laboratory.

However, there are a number of computer companies that are not content in abandoning the network O/S market. In no particular order, some of Novell's leading challengers are:

Artisoft's LANtastic - The leading product in the small network market, LANtastic manages networks that can be handled with peer-to-peer approaches (e.g. no dedicated server). LANtastic has a good technical reputation and provides easy to install, easy to administer LAN management for networks with four to six users. Novell has countered this challenge in the small networking market with Netware Lite. However, early technical reviews of "Lite" haven't been positive. Despite the reviews, Novell's market

dominance is so pervasive that Lite is sure to gain major market share by the end of 1992.

Microsoft's LAN Manager - Targeted at traditional business environments (as opposed to office style computing), LAN Manager is layered on top of OS/2 (for now) and Windows NT (by the end of 1992), and is designed to emulate the kinds of architectures and services found in IBM mini and mainframe communications environments. As a stand alone product, LAN Manager is likely to disappear as Microsoft begins embedding communications capabilities into desktop and server versions of Windows and Windows NT.

DEC's Pathworks - An enhanced version of Microsoft's LAN Manager, DEC has added connectivity and support features to make Pathworks the highest rated of the LAN Manager cousins. DEC, like IBM, however, will be caught up in the future Microsoft move to distribution of LAN Manager functions into Windows and NT. At the current time DEC looks to be in a far better position vis-a-vis LAN Manager since DEC and Microsoft have announced that they're strategic partners.

IBM's LAN Server - Targeted at SAA environments, this version of LAN Manager is tightly

coupled with IBM's Communications and Database Manager OS/2 products. LAN Server offers a connectivity path into IBM mainframes, especially DB2. However, user surveys indicate that IBM's products are weak in support and user satisfaction categories. IBM's communications products seem (understandably) to have a mainframe bias, and now that IBM is remarketing Netware, it is fair to say that IBM's strategic vision for enterprise-wide, LAN-based computing is confused.

Banyan's VINES - Vines is built to run on top of the UNIX operating system and, therefore, has acquired many of UNIX's characteristics, including good connectivity to different types of operating platforms. VINES is most likely the most functionally rich network O/S at this time as well. VINES's directory services and WAN connectivity are at the top in the class. But overall, Banyan's market share is rather small; it certainly lags far behind Novell and Microsoft in finding strategic partners to aid in VINES marketing efforts.

Will Microsoft be O/S king?

In the near future, the competitive posture, historic market approaches and shares of all of these competing

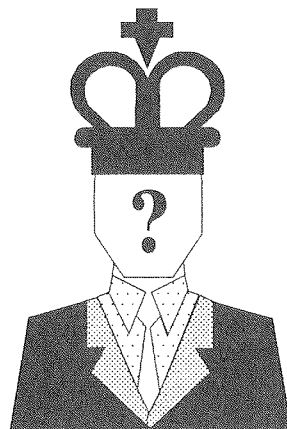
companies may be profoundly affected by Microsoft's internal reorganization that was mentioned earlier. To believe that statement it is important to understand that the architecture of a PC LAN is unique in the annals of computing.

The first operating systems developed were essentially job schedulers for the non-multi-tasking, second generation mainframes. Machines like IBM's 7090 and 1401 could only run one program at a time, and it was too expensive to allow these machines to sit idle while

...The evolution of network O/Ss such as LAN Manager and Netware may be a historical anomaly - a temporary aberration....

operators changed the job setup for the next program.

Subsequently, machines evolved to look like the IBM 360 series; they had the capability to support



concurrent multiple task executions. The level of complexity of those operating systems was enormously greater than what had been previously required. The first multi-tasking mainframe operating systems, like IBM's MFT and MVT, were able to run several programs or tasks during one interval of time. MFT and MVT, however, were oriented toward batch type scheduling, and their "user" was really the computer operator.

As time-sharing evolved, virtual memory hardware and true multi-user time sharing operating systems like MVS/TSO became the standard for mini-computer and mainframe environments.

What does all of this history have to do with network O/Ss? I believe it is necessary to establish a history of the computer evolution so that we can decide whether network O/Ss are an important component of modern technology or only a temporary aberration.

Back to our history lesson. By 1980, every computer had a multi-tasking, multi-user operating system. And then a funny thing happened -- the PC was born. In a way it was like going back to the first days of computing when the

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capabilities of computers were very limited. The first PC operating systems, programs like DOS, Tandy DOS and CP/M, were simply collections of utility software designed to assist a single user. So these simple utility programs were not that different from the early machine schedulers for 1401's, except that they had a different goal. For example, no one used a 1401 for word processing!

As the 1980s progressed, users wanted to network their PCs to share data files as well as peripherals. Simple PC, single-user operating systems didn't have that functionality, and so a network O/S running on dedicated hardware was the vendor's solution.

Now that we have an historical analogy to guide us in what is likely to happen as PC hardware and software continue to evolve, we can get to the point of this discussion. *As PC operating systems evolve in the future it is very possible that they will acquire multi-user and communication capabilities, just as mini and mainframe computer operating systems did in the past. In other words, the evolution of network operating systems such as LAN Manager and Netware may be a historical anomaly - a temporary aberration.*

Continuing with our history, the current state at which PC computing exists at is:

- 1) Virtual hardware is now standard on PCs and workstations. Every machine with a 80386 or RISC processor has virtual memory capability.
- 2) While current PC operating systems like OS/2 and DOS are single user, hardware that includes at least a 386 with 6MB of memory is more than capable of

...As PC operating systems evolve in the future it is very possible that they will acquire multi-user and communication capabilities, just as mini and mainframe computer operating systems did in the past....

running multi-user, interruptible software - as Novell's products have clearly shown.

- 3) While the current PC architecture is skewed toward running separate network O/S from the desktop and database server O/S, there is no longer technical or architectural reason to do so. In other words, it is historical precedent and the current suite of products that cause people to think network O/S - as

well as desktop and database server O/S.

What has the market said?

Now let's look at the marketplace realities. In the mid-80's, Microsoft and IBM developed an architecture and then a market approach with which to attack the LAN O/S market. The partners wanted to copy the formula that had worked so spectacularly for DOS. They would develop the technology (OS/2 and LAN Manager) together, IBM would sell it on IBM hardware and Microsoft would license it to the clone industry creating another dominant product. However, this time it didn't work. The reason for this failure was that there were a few essential differences in this attempt from when DOS was established as an industry standard:

- 1) No one bought OS/2, and since OS/2 was required to run LAN Manager, that meant that there were only a few platforms available that would run the partner's products.
- 2) They were facing an entrenched competitor (Novell) that had a good distribution and support infrastructure.
- 3) LAN Manager and OS/2 didn't offer any technical advantages over Novell's

products. Even worse, the compatibility that had existed in the DOS world didn't carry over to the LAN Manager world; compatibility between different vendor's LAN Manager was not guaranteed.

What does Microsoft think about all this?

Finally we are at the current time in our history lesson. Microsoft has now emerged victoriously as the dominant company in the PC software business, but they have yet to play a significant role in networking. Between DOS and Windows, Microsoft absolutely owns the desktop, and is likely to play a major role on the server with Windows NT.

The logic behind the Microsoft reorganization should be crystal clear. What is Microsoft's story likely to be in the future?

Historically, operating systems have evolved from single-user to multi-user; from single-tasking to multi-tasking; from batch to networking. The emergence of network operating systems, then, is an historical anomaly. Networking really belongs in the kernel of the desktop and server operating system, just like in UNIX and VMS. And that is going to be the di-

rection that Microsoft takes in evolving its networking strategies. You can expect the networking functionality and hooks to be built right into the base versions of both desktop and server NT.

Buyers of Microsoft's vision, therefore, are not going to need a network O/S (or Novell!) So that's the strategy. I think it's a potentially big winner if Microsoft can deliver.

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What's wrong with the status quo?

The fact that Microsoft could have the audacity to attempt to change PC networking standards is only possible because the currently available LAN O/S products all have serious flaws or omissions:

LAN Manager and all of its cousins - Low market share, incompatibilities, expected future divergence and maybe no future at all if Microsoft succeeds with the strategy outlined above. IBM's new agreement to market Netware certainly calls in question its future strategy for LAN Server.

VINES - Not a bad product, but small market share (about 7%); sold by a relatively small, privately held company; and a general reputation for slow performance. Banyan has not had a good track record on developing strategic partners or marketing *VINES* either.

Netware - Top notch product, but one with an architecture designed for network file sharing, not serious client/server style applications. Its lack of memory protection, pre-emptibility and virtual memory, in particular make it just too funky to be a serious contender for mainframe style applications.

Conclusion

The big "If" here (and it's a huge one) is that Microsoft has to deliver quality quickly. Operating systems, whether single or multi-user, are notoriously difficult products to get out the door on time. Neither Novell or Banyan are sitting targets. Microsoft has a chance here, but as the third quarter of 1992 rolls around, watch the news for indications of Windows NT general availability. Also check the evaluation reports for bug and quality reports. If Microsoft can pull off its NT strategy, I give it better than an even chance of being an important networking player by the mid 90's. **GS**

My Downsizing Conference Favorites

Next month DCI is sponsoring the **Downsizing Exposition and Conference** in Chicago, March 10-12. Seeing as how downsizing is our common interest, I thought that **SDJ** readers might enjoy getting a sneak preview of some of my favorite keynote speakers that will be at the conference.

Tuesday March 10, 1992

John Soyring - "Yes, I know, I love IBM too, but please don't make me listen to another talk by yet another blue-suited IBMer!" If that sounds like something you might say, then you're going to be *very* surprised by John. He is as good a speaker as he is honest - he'll tell you about IBM's advantages, as well as owning up to their faults. He knows and understands IBM's PC strategies and does an excellent job presenting them.

Robert Dickerson - Make no mistake about it, Borland is emerging as the 1,000 lb gorilla of database at the PC LAN level. If they can really make "object orientation" deliver products faster, they will make life uncomfortable for the competition. Rob runs

the database organizations at Borland, and he knows the bottom line. (*See our interview with Rob Dickerson on page 11.*)

Jim Davey - As DCI's senior technical researcher, Jim has spent the better part of the last year developing a new methodology for client/server applications -- a structured methodology for the 1990s. If your company is currently thinking about developing a client/server system, you should understand his ideas and theories.

Wednesday March 11, 1992

Dick Schell - Turner Industries is a real life story about a LARGE company that shot their mainframe. Turner, a multi-billion dollar company, entirely replaced their mainframe with PCs and LANs. Dick will tell you the truth about how it was done, the benefits that have resulted, and the trouble they encountered.

Richard Finkelstein - I've always called Rich the Don Rickles of the database industry. He insults everyone...only when it is deserved of course. It doesn't matter whether you're IBM, Oracle, or Novell - he's nailed them all. Rich has a tremendous amount of experience in implementing downsized systems. He is a great educator, as well as a



wonderful entertainer (that is of course, if you're not a vendor!).

Dennis McEvoy - Dennis, one of Tandem's lead engineers, has assembled a powerhouse team at Cooperative Solutions. They have been developing the software necessary to run large transaction processing systems on PC LANs. *There is no better TP guy around.* If your company is interested in developing a PC LAN implementation for large TP systems, this session is required homework.

Amy Wohl - She is smart, well-connected, extremely nice, and the top consultant on office system computing. Amy's advice is always practical and useful. I never miss an opportunity to hear her speak because I know it will help me make money.

Roel Pieper - The president of UNIX Systems Lab, Roel (pronounced "rule") is very knowledgeable, as well as a great speaker. He is arguably the most influential person in the UNIX world today. This session will give you the chance to find out what's happening in his world.

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New Plans for dBASE and Paradox

An Interview with Robert Dickerson, Vice President and General Manager, Database Business Unit, Borland International

With the completed acquisition of Ashton Tate, Borland International became the majority owner the PC DBMS market; between its two lead products, Paradox and dBASE, it is estimated that Borland controls 70% - 80% of that market. Though Borland now has a competitive lock on DOS DBMSs, the US Justice department allowed the merger by accepting the theory that there is to be a fundamental change in PC computing as the principal paradigm moves from DOS to Windows and Presentation Manager. Whether in the current business climate or the future under Windows, most observers expect Borland to emerge as an important force that has much influence on DBMS software trends. It was with these ideas in mind that SDJ interviewed Robert Dickerson, Vice President and General Manager, Database Business Unit, Borland International.

At SDJ, we believe that client/server computing is a fundamental paradigm shift

and will be one of the most important underlying technologies for database and downsizing in the 1990s. In the recent past, neither Borland nor Ashton-Tate has played a large role in the client/server market. However, despite their absence, the new combined company has some interesting technologies that are appropriate for client/server architectures. In particular, I am talking about dBASE IV Server Edition, and Ashton-Tate's subsidiary, Interbase. Tell us about your future strategy and product directions.

Historically, Borland has played an active role on the client side of computing. Our strategy at this point is to try to provide a different kind of client/server connection that is, in addition to the standard SQL connections, will allow us to transparently take existing micro-computer database applications and run them in a client/server model while minimizing the need for new development. We believe that with this tactic, companies will be able to move into a downsized, client/server environment more rapidly since the product will appeal to the installed base of users, as well as new users.

I know that Philippe Kahn has talked about the key role that Interbase might play in the future. Will you use the products of Ashton-Tate's subsidiary to compete

head on with Oracle and Sybase?

We already compete head on with both Oracle and Sybase. Interbase has a general purpose database server engine and so in the short term, we are selling it as a SQL server. In the long term, once we add a surface on top of Interbase as part of our upsizing strategy, an emulation of a client side data access layer will result. This object layer will not directly compete with either Sybase or Oracle as it is a very different kind of system -- think of it as an accelerator for your dBASE or Paradox.

Essentially, what Borland is trying to provide is a box that makes your stuff go fast. In doing this, we are eliminating the largest problem with downsizing: the difficulty of the decision to adopt a client/server design which requires a lot of development and/or re-development. Usually, client/server is only appropriate for new applications since once you have an application up and running, you should never "fix" it if it isn't "broken." It typically takes people nine to twelve months to decide which server to buy, how it should be set up, and how to write the code. What Borland wants is a system that makes the user's decision easier by providing a simple installation

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procedure and eliminating the need for any application

Could you expound on your earlier mention of an object layer that separates the tools and user interface from the underlying DBMS product?

The notion of an object layer is not new -- it is actually fundamental to many data access systems where there exists a virtual layer, a logical layer, and a physical layer. The physical layer consists of file drivers that read and write data off and onto disks. The logical layer represents the unique capabilities of each different file format, and the virtual layer mates a common interface into all of the file formats or data access methods. The object layer, then, is a set of C++ classes that have a virtual index, and virtual table, and different classes for each individual data type. It sits on top of the various logical and physical layers for a variety of file formats and data requesters. We like to call this promiscuous database connectivity -- it will connect to anything.

One of Interbase's technologies is a locking scheme for databases called optimistic locking. Most analysts I have spoken to seem to agree that for complex objects in engineering types of applications, optimistic locking is definitely the way to go. There is speculation

that for simple commercial types of applications, this type of locking scheme would not produce the same number of transactions per second as do, for example, Oracle's or Sybase's locking schemes.

One technology that can increase TP speed and performance is the result of the combination of Interbase's optimistic locking with its multi-generational architecture. Sybase, which is very much tuned for short burst transaction processing, uses traditional record locking; as soon as you grab a record in a transaction, it is yours until that transaction is completed. With Interbase's multi-generational architecture, as soon as you initiate a transaction, you are sent a snapshot of the data. Your transaction is then ended with a two-phase commit. With this method, other users can continue to manipulate snapshots of the same data.

If you talk to Interbase users, most of them will tell you that they have switched from either Oracle or Sybase to Interbase for performance reasons. While it is certainly possible to make up a benchmark that would allow any given product to win in any given category, the real life experiences of our users shows that the real performance of this system is quite good and TP speed is in no way sacrificed.

What you said implies that transaction processing performance depends on the category of the application. The entire point of my question was that Interbase had positioned itself not to compete with people like Sybase -- they had said that they simply wouldn't bother competing with transaction processing oriented applications. Will Borland continue with this strategy?

I think that in the near future, we will directly compete with Sybase. We are starting to find that transaction oriented applications often have a better performance with the Interbase system. Within a complex environment, there are many different factors that determine your application's performance. I can see Borland going after the same type of customers that Sybase wants. In fact, at the last Interbase user group meeting, I found that many of the current Interbase users are ex-Sybase users.

Let's move away from Interbase and towards the other Ashton-Tate products. The first reviews on dBASE IV Server Edition have been positive. Since Borland acquired Ashton-Tate, I haven't heard any news on the product. What is Borland's strategy for the new dBASE IV?

The initial version of dBASE IV links to both Microsoft and Sybase.

dBASE IV supports both static as well as dynamic SQL connections. This capability allows the user to view tables and forms without having to issue a SELECT statement. Where there exists a problem with dBASE is within their architecture: the SQL requesters that allow communication with the SQL server are only statically linked with dBASE. This means that a different version of dBASE is necessary for each server the user wants to access.

For Paradox, Borland uses a particular memory management scheme called Virtual Run-time Object Oriented Memory Manager, or VROOM. Essentially, VROOM lets us dynamically

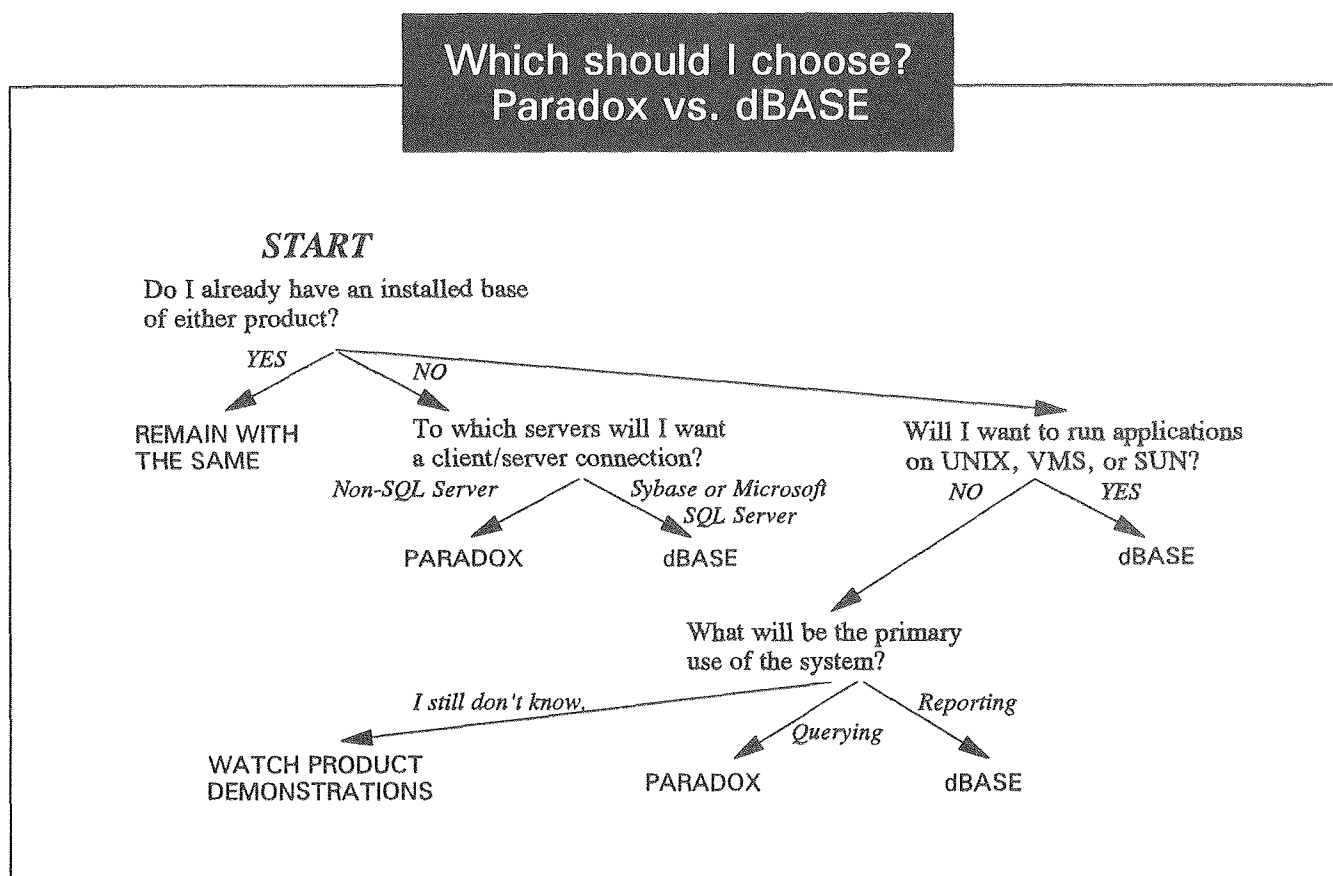
link in a manner similar to what exists under Windows; there are different SQL connections depending on which server you are trying to reach, but all are within one version of the product.

What we now want to do is plug VROOM into the next major version of dBASE for both Windows and DOS. We will then be able to use all existing Paradox SQL connections. Borland is pushing to make this capability available for dBASE by the first quarter of 1992. We have built so many of these SQL connections that at this stage, we are into straight development and I feel very confident about those delivery dates.

What is happening with the DOS version of dBASE and will we be seeing some new and improved versions?

Borland is currently working on new versions of dBASE for DOS. Our short term strategy includes leveraging work that Ashton-Tate did for a new version so that we can deliver a product fairly quickly. However, long term plans are somewhat different. Borland has developed a large amount of technology in-house such as our memory management system, SQL connections, etc. Our strategy will be to bolt these advanced technologies onto the existing Ashton-Tate product.

(continued on next page)



Borland will have both Paradox and dBASE for some time into the future. How do you go about positioning a new customer into one product or the other?

What I usually do with a new customer is ask them a bunch of questions starting with what they need the product to be able to do. I always want to know if the customer already has a lot of dBASE or Paradox elsewhere in the shop. If the answer to that question is yes, I usually suggest that they remain with the same product. If they don't have either of the products installed, then I ask to which server do they want a client/server connection. If they list a server other than Sybase, I encourage them to buy Paradox since SQL connections for any server other

than Sybase exist in Paradox. I will also ask them if they want the ability to run their applications on UNIX, VMS, or SUN. If they say yes to any of those three, then I encourage them to buy dBASE since dBASE is available on those platforms while Paradox isn't. Then, if the decision is still not obvious, I ask about the primary use of their system. For example, will they be doing a lot of querying? If so, then I will explain how Paradox would be more useful since it has a nicer implementation than dBASE. But, if the primary function will include a lot of reporting, then I would suggest that they use a dBASE product, since its implementation of that feature is the superior. Finally, if there is still ambiguity in the decision, I demonstrate both products on-line

and let the customer make the call.

Can you see a time in the future where, on the client side, the Paradox and dBASE product lines would be merged?

In Windows, between Paradox and dBASE, all of the reporting tools, forms tools, and query by example are the same. At this point in time, Paradox and dBASE are two separate products, but if you buy one, soon I'll have a package for you that encompasses the missing components of the other. We don't plan on merging the two products, but instead want to make each of the technologies accessible and interchangeable. **GS**

My Downsizing...

(continued from page 10)

**Thursday
March 12, 1992**

Robert McDowell - One of the true few "old timers" at Microsoft, Robert has an enormous amount of experience in "real world" downsizing. Luckily for us, his superb story-telling skills make sharing his knowledge an enjoyable experience.

Jeff Tash - Day in and day out, Jeff is always one of the top-rated speakers and consultants on systems building,

4GLs and database. Jeff offers very practical advice in an enormously entertaining form. Over the last several months he has been involved in testing the new generation of Windows 4GLs. At the conference his talk will focus on what he has discovered about this new software.

Larry DeBoever - DCI's ex-Marine, Larry is a true genius in the networking/enterprise architecture arena. Microsoft pays large sums of money for his advice and training. Not only will you get his advice at the conference, you'll also receive the Marine stories at no extra charge!

ceive the Marine stories at no extra charge!

Will Zachmann - Perhaps the most outrageous speaker at this conference and the man who coined the word "downsizing," Will is the walking definition of the phrase "well-connected." In the past, his forecasts of the computer industry have been accurate beyond belief. He is the best in the field, so we saved him for last. **GS**

For more information on the Downsizing Conference and Exposition, please call DCI at (508) 470-3880.

A Letter to the Editor

Dr. George Schussel:

I enjoyed your article in the August 1991 American Programmer entitled, "Downsizing - a Review of the Enabling Technologies".

I have read a lot lately concerning this "hot" topic in the business and IS world, and it is interesting to note some of the dynamics surrounding it. For example, most client managers have the secret feeling that they are paying their "techies" too much money. Most "techies" feel that both customers and managers do not adequately exploit new technologies and applications. Downsizing provides benefits to both groups. Client business managers see the promise of massive reductions in IS system costs, and "techies" see a chance to make their resumes shine with words such as "client/server", "distributed applications" and the like.

In light of the fervent rhetoric on both sides, I can't help wonder if we are abusing a responsibility to our customers in not advising them on important issues related to downsizing including: data security, hardware facilities, data integrity, network band-width, projected growth.

I refer you to an article in "Network Computing" April 1991, page 71, in which Keyport Life Insurance of Boston, MA recently completed a downsizing of one of their "mission critical" applications. They state a cost reduction of 30% per policy due to increased performance. However, they did have some difficulties which included:

- * A major LAN reorganization to accommodate Ethernet.
- * A power failure which zapped their superserver(no power backup or protection).
- * The inability to safely do Netware upgrades due to the production capability being entirely on one superserver.
- * Since backups were done over the Ethernet, a 5Mbps limit bottle-necked the backup of over 2.4 GB of storage. This resulted in 10 hour backups.

These problems indicate to me a lack of understanding as to some basic issues that any mainframe shop could have warned the customer about.

- * Did the cost savings include the effort and labor needed to keep this "mission critical" equipment in good working order?
- * What about the headaches involved with security management?
- * How much is it costing to risk the entire production system when attempting an operating system upgrade?

In conclusion, I personally believe that downsizing is an important step that may have real advantages in many situations. I also believe that customers with mainframe resources should be helped to understand how to best exploit that resource in light of current technology trends. The bottom line is not always the best indicator of a successful downsizing effort, unless the true costs are being evaluated.

Michael O'Shea
Boeing Computer Services
Seattle, WA



Current Computer Wisdoms...

(continued from page 5)

establish the 486 chip as the 1992 desktop standard. And just as the 486 takes the market, Intel will have the 586 chip ready for late-in-the-year, large quantity deliveries. This strategy, if followed through, will be an excellent attack on SPARC and other RISC chips.

Borland has been on a roll since last summer. Its stock price has doubled since the summer, and the Ashton-Tate acquisition seems to be complete. The reason I am giving Borland one thumb down is only to caution that anytime a stock has been run like Borland's has, careful investors will be wary. Also, there are some rumors that the spring shipment dates for dBASE for Windows may be more fantasy than reality. Adam Green in his January Green Letter predicted that a more realistic initial release date would fall in September, 1992.
GS

Schussel's

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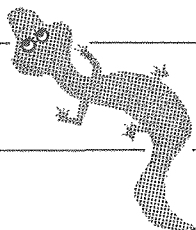
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UPCOMING downsizing Events...

The next **Downsizing Conference and Exposition** is being held in Chicago, this March 10-12, 1992. With top keynote speakers including, George Schussel, Theodore Klein of Boston Systems Group, Robert McDowell of Microsoft, Rob Dickerson of Borland, and Dominique Laborde of Computer Associates, conference attendees will be receiving the most up-to-date information on a vast array of downsizing topics. Just some of the issues covered will include: downsizing existing mainframes, downsizing to LANs, downsizing problems and solutions, client/server, LAN O/Ss, GUIs, OS/2, case studies. The exposition will feature over 100 exhibits from industry leading companies. *For more information on the conference speakers, turn to "My Downsizing Conference Favorites" on page 10 of this issue.*

One key fact emerging from the downsizing trend is the knowledge that as PCs rival mainframes in power and performance, local control of data and applications on distributed databases can be cost effective for your company. **Implementing Client/Server Applications and Distributing Data** is a two day seminar dedicated to the key issues of inter-operability among distributed databases. Chaired by Herbert Edelstein of Euclid Associates, the seminar is being held in Toronto, February 24-25, 1992.

For more information on any of these classes, call DCI at (508) 470-3880.



For your enjoyment and ease of reference, like a chameleon, **SDJ** will be changing its colors monthly. Our changing color scheme will make it easier to spot each new issue at a glance, and quicker to reference past issues.