Title: <u>Next Generation of Client/Server</u>
<u>Applications Emerging</u>

☐ Report
☒ Research Bulletin
☐ Profiles
☐ Newsletter
☐ Reprints
☐ Other_____

Fulfillment - Please print list to order covers>>

TO: GBC
<u>Covers Order</u>
Date_____
Quantity_____
Color_____
Size_____
P. O. Number _____
GBC Control Number _____

TO BRADFORD ADAMS

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Other Information/Notes

Pls. print on <u>green</u>
"Client Server Software
Program" Research Bulletin
Masthead

3 hole drill

Fulfillment/Printing for INPUT	
Date 1-23-97	By ch
Program Code CLRB	Project Code CLRB3
INPUT P. O. # 9196	BAC Ref. #_____

Reports		Executive OV	
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Total	____	Total	____

Research Bulletin		Newsletter	
Fulfillment	105	Fulfill.	____
Stock	60		
Total	165		

Date/ FedX GBC	_____
Date Due INPUT	_____
Date Rec. INPUT	_____

Date _____
PLEASE PRINT ☐ labels ☐ packing slips
To: BAC_____

☐ Folder ☐ Disk ☐ Hard Copy ☐ Blue Form
Dates   ☐ GBC Cover
For Set Up/Proof_____
Proof rtn to INPUT _____
Final proof rtn to BA_____
Scheduled to Ship _____

Instructions:
☐ Window Cover
☐ Hot Strip
☒ 3-Hole Drill
☐ Staple
☐ Shrink Wrap
☐ Other_____

Return to INPUT   Ship Date_____
☐ Originals/Disk in folder
☐ For Stock: ____RP____OV____RB____PR
☐ Internals for Distribution
☐ International for mailing/DHL
☐ Other_____
☐ INPUT *add stock quantity to inventory report*

Next Generation of Client/Server Applications Emerging

SmartStream Leads Pack

A number of large software vendors have object-oriented versions of their client/server enterprise applications forthcoming, but Geac SmartStream leads the pack of large vendors, and already offers a next generation HR application. Geac SmartStream has already started to re-architect and migrate their SmartStream application to the Internet platform by using the Java programming language and CORBA IIOP standard, designed to overcome the obstacles of traditional client/server applications.

Second generation client/server systems introduced a middle tier to improve logic reuse and allow users to mix and match different databases. But some logic and data remained on the clients, requiring users to deploy, update and maintain platform-specific, client-side software.

Next generation client/server systems bring the computing world back to the days of mainframe maintenance by eliminating stored client-side software. These applications are developed on a platform which fuses the ease of use and deployment of the Internet with the performance and extendability of today's client/server technologies. As Object Request

Broker (ORB) technology is integrated into Web browsers, next generation applications based on components, such as Java, will begin to replace traditional client/server applications.

These next generation client/server applications promise to lower maintenance and training costs, and support a wider range of distributed clients and servers. Not only do these applications allow companies to extend their reach to customers, suppliers and business partners, but also allow applications to link and interact with other applications and services across corporate boundaries.

Geac SmartStream addresses the requirements for next generation applications and offers flexibility, application, and cost advantages to its customers.

Benefits of Next Generation Applications

The client/server era emerged as a means of addressing the issue of managing desktop systems in an enterprise environment. Traditional client/server systems rely on proprietary network protocols, whereas 3rd generation client/server systems use the open, Internet protocol. Architectural differences of

client/server systems are summarized in Exhibit 1.

The Internet has brought about a revolution in computing and will offer many benefits to users of next generation client/server applications. Key among these are application flexibility and re-configurability, open application interaction, continuous application enhancement, lower IT costs, and applications that extend beyond the boundaries of the enterprise.

Exhibit 1

Architectural Characteristics of Client/Server Systems

Need	1st Generation	2nd Generation	3rd Generation
Scope	2-tier	3-tier	n-tier
Network protocol	Proprietary	Proprietary	Open (TCP/IP)
Client-side software	Platform-specific	Platform-specific	Platform-independent
User interface	GUI	GUI	Visual objects
Middleware	Stored procedures	ORBs over Proprietary Networks	ORBs over Intenet (IIOP)
Re-use of business logic	No	Yes	Yes

Messaging

The crucial piece of distributed object computing which drives both flexibility and scalability is messaging. Through encapsulation the application is shielded from the operating environment and separate discrete business processes from one another.

Each of these processes can run on the same or different platforms and is invoked via a message. Each discrete business process or event can be a client requesting information, a server supplying information, or both to another event.

Scalability

Applications servers built on a distributed and scalable architecture can scale from three-tier environment to an n-tier environment, capable of handling loads required by distributed applications and of optimizing application processing. Third-generation client/server applications also introduce a middle tier, similar to second-generation applications, which allows users to use any type or combination of standard database solutions.

Hardware Advantages

It is impossible in developing and designing third-generation systems to predict the range of clients or servers likely to be supported over the life of a system. Clients need to be separated from servers. Hence, Internet servers and browsers from companies like Netscape and Open Market are increasingly being used as platforms for third-generation applications.

Servers
Next generation applications utilize distributed servers, upon which reside business applications or objects to be accessed by clients across the Internet. The servers represent a range of price/performance points to be tailored to specific applications, but they share the common features of interfacing with

legacy code and databases and delivering application services to client devices. The term "Application server" is a logical distinction and may be combined with Web or object servers.

Clients
Because applications are independent of the underlying target client device, the same application is dynamically downloadable, without modification, to a broad range of client devices including "smart" telephones, point-of-sale devices, PCs, workstations, Internet appliances, set-top boxes and more. INPUT estimates that over 34% of the client devices purchased by corporations will be Internet appliances or network computers by the year 2000.

This will ensure the widest possible audience for these next generation applications. Next generation applications will allow companies to select the client-side device with the best price/performance for each particular user. And next generation architecture are resilient to changes in underlying hardware and network technologies.

Application Characteristics

With next generation client/server applications, object browsers and cross-platform, architecture-neutral components replace platform-specific, client-side software. Applications are built from components that assemble in real-time at the client device.

These client/server applications offer several advantages over early generation client/server applications.

Open Application Interaction

Managed Interaction with Clients
Next generation applications maintain information about the session with the client and about the client's current state by employing the IIOP over the Internet. They also have a mechanism for managing the client sessions so that transactions can be completed or rolled back if a client should lose a connection with a server in the middle of a transaction.

Next generation applications allow remote branches and external organizations to connect into mainstream corporate environments. They enhance the ability to further extend their reach to "casual" and traditional end users in and outside of an enterprise.

Interaction with Other Applications
The third-generation is where leading-edge users are able to accelerate processes the most by linking systems across enterprise boundaries.

Third generation client/server applications will provide "plug and play" capabilities with other next generation enterprise systems, or application objects. These applications enable transactions to cross enterprise boundaries and interact with more than one business application, even if they use different underlying object programming languages.

Next generation applications break the enterprise software monopoly model and allow companies to select best-of-breed components to build enterprise solutions

Interaction with Other Services
Third-generation client/server applications can make use of other Internet services available on corporate Intranets.

These services include directory (LDAP), network administration (SNMP), naming such as DNS or common Internet file system (CIFS), security, events and workflow. These services are accessible by objects and allow IT managers to centrally manage enterprise applications.

Self-Service

Next generation applications create a new business paradigm of "self-service", empowering the individual user to perform data processing tasks typically assigned to trained administrative staff.

With object browsers, next generation software will emphasize self service, by extending information and application access and updating capabilities to every employee, supplier, and customer.

Continuous Application Enhancement

Multi-tiered, object-oriented applications allow for fast incremental improvement of software. Next generation applications which utilize object technologies and platform-independent programming infrastructures can easily handle the evolution of a company's business model.

Applications will exist as a set of objects, business rules, and data models in an object repository. These objects, business rules and data models are independent of any specific platform, database, or execution environment. With repositories, users will be able to take advantage of improvements in computing technology without having to re-engineer the application.

Cost Characteristics

Less Maintenance

Client software management is greatly reduced with next generation applications. All code, data and configuration information is stored and managed centrally. Use of other Internet services such as directory, naming and security decreases IT administration costs because individual application preferences are stored centrally.

Another advantage of next generation applications is that there is no need to move desktop computer files when a person is moved. All permanent-state information is maintained in the application server, not on the desktop.Companies are able to swap components in and out of a system to support new hardware, failed client devices, and make business changes.

Less Training

Third generation client/server applications are designed with the Web browsers in mind. Applications that are simply connected to a Web browser do not lend themselves to the Web experience. Applications which fall under this category are re-architected in order to retain the Web format to which users have become accustomed. The familiar Web interface leads to reduced training costs.

They present data in a meaningful, intuitive manner. Users of next generation applications require less training than those using traditional user interfaces.

Conclusion

Next generation applications can provide quantum improvements in enterprise-wide software maintenance and re-usability. It will dominate the future of software services and applications development. Next generation enterprise software will have to be implemented using object technology because current procedural methods and tools cannot support the complexity of the operating system and network management needed to control the infrastructure.

The Internet and object browsers will accelerate the movement towards the use of objects to create network-aware applications that extend beyond the boundaries of the corporation.

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Covers Order
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Color_____
Size _____
P. O. Number _____
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Other Information/Notes

Pls. print on **green**
"Client Server Software
Program" Research Bulletin
Masthead

3 hole drill

Reports		Executive OV	
Fulfillment	____	Fulfill.	____
Stock	____	Stock	____
		TU Pkg.	____
Total	____	Total	____

Research Bulletin		Newsletter	
Fulfillment	105	Fulfill.	____
Stock	60		
Total	165		

Date/ FedX GBC   _____
Date Due INPUT   _____
Date Rec. INPUT   _____

Date _____
PLEASE PRINT ☐ labels ☐ packing slips
To: BAC_____

☐ Folder ☐ Disk ☐ Hard Copy ☐ Blue Form
Dates   ☐ GBC Cover
         For Set Up/Proof_____
         Proof rtn to INPUT _____
         Final proof rtn to BA_____
         Scheduled to Ship _____
Instructions:
☐   Window Cover
☐   Hot Strip
☒   3-Hole Drill
☐   Staple
☐   Shrink Wrap
☐   Other_____

Return to INPUT   Ship Date_____
☐   Originals/Disk in folder
☐   For Stock: _____RP_____OV_____RB_____PR
☐   Internals for Distribution
☐   International for mailing/DHL
☐   Other_____
☐   INPUT *add stock quantity to inventory report*

PURCHASE ORDER

INPUT
1881 Landings Drive
Mountain View, CA 94043-0848
(415) 961-3300 Fax (415) 961-3967

9196
This Purchase Order Number must appear on all invoices, shipping papers, packages and correspondence.

To: Bradford Adams

Ship To:

Date: 1/23/97

Date Required:

Charge Code	Quantity Ordered	Description	Price	Amount
		RBs:		
1 CLRB3	165	Next Generation of Client/Server Applications Emerging		
2				
3				
4				
5				
6				
7				
8				
9			TAX/ RESALE	
			TOTAL ►	

ATTACHED: ☐ Contract   ☐ Specifications Doc.

Auth. Sig. _____   Auth. Sig. _____

☐ Request for check with order   ☐ Deliver to: _____   ☐ Mail with docs provided   ☐ To be invoiced

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