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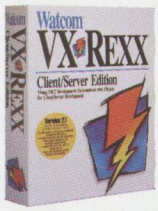

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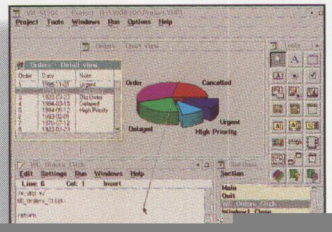

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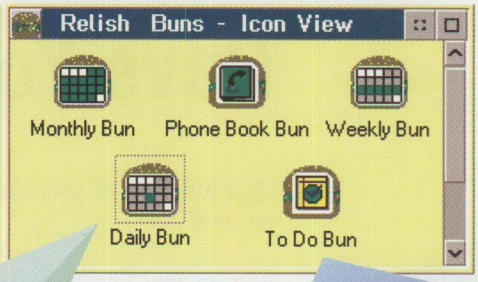
Relish Buns



Amazing Relish 2.2 Hot Buns

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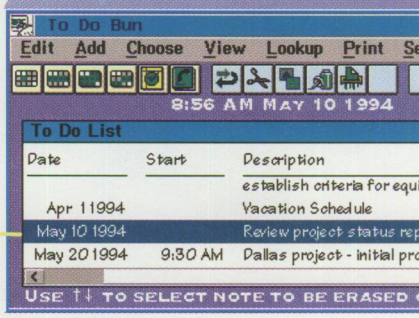

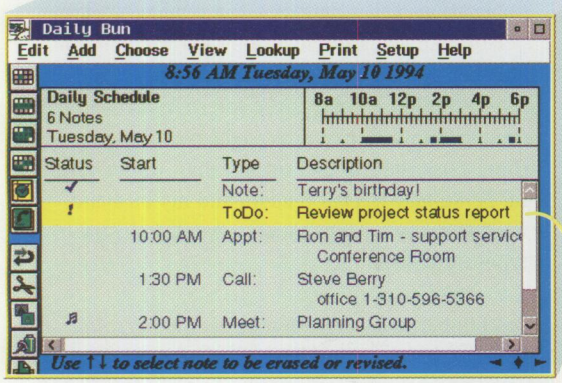

Here's how they work...
Buns give you views of your information when and where you need it. Use them just as you would Relish - or customize them to match your needs.

Aesthetically, change colors, fonts, window sizes and positions to fit your taste. And, there's a whole lot more.

Every bun can be copied and modified to present different collections of information.

Think of the possibilities.
One bun can show what To Do items remain for that important project. Another can have your meetings with Fred. Others for each category within your phone book. Put them in folders, on your desktop, anywhere you need them.

To Do's for Dallas Project

Meetings with Fred Jones

When you want just those project-related To Dos, open that bun and there they are. Need a printed copy? Just drag your bun right to a printer without even opening it.

Best of all, everything is always up to

Personal information where you need it, when you need it, always up-to-date, always consistent — a sure way to Relish every moment of your day!

Only Relish 2.2 Gives You All This

** NEW! Iconbar for one-click access to your preferred functions*

Have You Been Warped?

OS/2 Warp. You've got to love the name! And the look!

Well, anyway, I do, because I've worked for IBM for 25 years and I like to see us put some fun into our products. Color! Games! Can you imagine? OS/2 Warp is not gray and dull. The advertising (yes, we have a smashing ad campaign going) is bright and fun. We've stepped outside the lines, and I, as well as a lot of other vintage IBMers, am loving it!

Don't get me wrong. OS/2 Warp is more than good looks and a great name. It's the fastest, most versatile personal computer operating system available today. It's a real lightweight in the memory department and a real heavyweight in the function department. It's backward-compatible. What in the world does backward-compatible mean? It means OS/2 Warp supports every application you're running on your computer today and will continue to do so.

Now, let's review a couple of the most significant points: "available today" and "backward-compatible." That means we're not making promises about what we might and might not deliver and when we might deliver it. OS/2 Warp has been available since early fourth quarter 1994 and has delivered on all its promises. Don't you wish every operating system developer could say that?

Unless you've been holed away in a monastery or cave for the last six months, you've heard and read a lot about the operating system war that is going on. Most of what you read and hear is *opinion*. What you'll read about OS/2 Warp in this issue of *Personal Systems* is *fact*. Our own technical expert, Edward Duhe', has been testing Warp since "Warp" was its code name instead of its real name. His thorough article is filled with the features and functions of OS/2—not hype, not opinion, "just the facts, Ma'am!" Read Edward's article and form your own opinions.

Internet Stuff

Internet. Information superhighway. Surfing the net. Whew! This must be big stuff because one of the first new features I hear most people mention when they talk about OS/2 Warp is its great new Internet access. I just finished editing an article about OS/2 Warp's Internet interface for another publication. The author is just a regular working person like you and me. I don't know about you, but there's a big difference in that author and me—he knows and loves the Internet; it remains a mystery to me. I'll confess, right now the only thing I use the Internet for is e-mail—to my faithful *Personal Systems* readers and my husband, who works two counties and several industry types away from me.

But I'm betting you'll soon be seeing *Personal Systems,* along with a host of other industry publications, on the Internet. So I'm going to sit down with my copy of Warp and learn to surf!

You can do it all and do it right now with OS/2 Warp. So fire your highway transportation unit (HTU) up to warp speed, beam down to your local software dispenser facility (LSDF), get Warp, and get warped!

Betty Hawkins

Betty Hawkins, Editor

"Jazz it Up" at the 1995 IBM Technical Interchange

May 21-25, 1995
New Orleans, LA

Join IBM and "jazz it up" the week of May 21-25 at the 1995 IBM Technical Interchange. This Interchange will bring together, for the first time, the very latest on:

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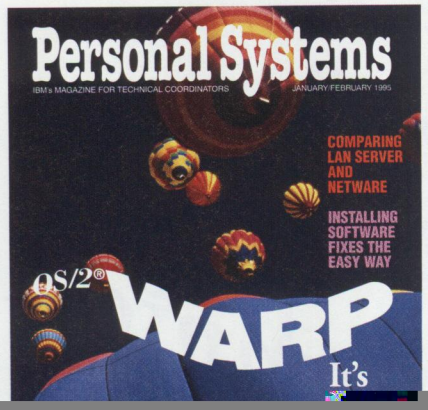

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Help is on the way! LAN Server Specialist, a productivity aid included with LAN Server 4.0, provides a problem determination tool for LAN administrators. It gathers the problems, offers suggestions, and learns from each incident. This article describes the timely operations of this handy tool, which is already available to you if you have LAN Server 4.0.

20 **One-Stop Shopping**
Now everything you need to get your local area network up and running, complete with application and performance monitoring service, is available in one package—IBM's Advanced Server for Workgroups. This article describes this product, its components, and the process behind its easy installation.

45 **Need a Fix?**
The IBM Corrective Service Facility (CSF), formerly called FixTool, is a tool to distribute and install corrective service packages. This article discusses the service call and fix processes, describes CSF's features, and explains how to use CSF when installing ServicePak or fix.

50 **IBM LAN Server 4.0: New Features and Comparisons with NetWare**
IBM LAN Server 4.0, announced in September 1994, has been a customer-driven product from the outset. Customers told IBM they wanted an easy-to-use, easy-to-install, and easy-to-administer network operating system. LAN Server 4.0 provides these things, and more, with its many new features and functions. This article covers the new features and

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Technical Connection Personal Software Is the Answer!

By Tira Gillig

And the question is: "Where do I get immediate and comprehensive access to the latest in service and product support information?" This article describes the support available through a subscription to IBM's Technical Connection Personal Software, details its implementation, and documents the enthusiastic response from early users of the product.

Technical Connection Personal Software CD-ROM is just the product you need for immediate and comprehensive access to the latest in service and product support information without accessing and downloading this information from bulletin boards. The Technical Connection is a CD-ROM loaded with answers to your technical support questions, information on the latest products, service updates, plus a bonus "OS/2 Collection" containing over 275 books on OS/2-related products.

It's like an electronic encyclopedia, only better! You can buy a one-time "set" of this valuable support tool, or you can subscribe to monthly or quarterly updates. Either way, you and your support team will have the answers you need at your fingertips.

Here's what some of the early Technical Connection users like about the CD-ROM:

- "It is a single source for many pieces of information I would have to spend much time and effort chasing down."
- "Everything is on one CD-ROM and readily available."
- "Online documentation and AskPSP are extremely helpful."
- "Lots of good information. I like it. A winner!!"
- "There's a paucity of in-depth technical information available–this [Technical Connection] gives a much needed boost in a concentrated, easily accessed format."

The Technical Connection, useful in both the OS/2 and DOS environments, is available in all geographical areas. You can access all the information (except AskPSP) in either operating system. AskPSP is an expert system tool and is an OS/2-only product. Language-translated versions of downloadable fixes are included.

OS/2 Implementation

The OS/2 installation process is quick and easy. You can accept the default paths for the installation, and, before you know it, you are ready to access Technical Connec-tion's information! If you decide to change the defaults, just change the drive letter; the rest is done for you.

The installation executes in two parts: first, the required files are loaded onto the hard disk and the desktop icons are created; then, AskPSP is installed. Because updates need to point to several programs, you need to reboot your system after installation.

You need to consider the following:

- *Which partition to use*–Subsequent installations (updates) of Technical Connection will use the original partition you choose for the required files.
- *Whether to install AskPSP on the CD-ROM or hard disk*–Installing AskPSP on the hard disk provides quicker access to the information; access times for CD-ROMs are much slower than hard disks. However, if space is a consideration, accessing AskPSP from the CD-ROM drive is a viable option.

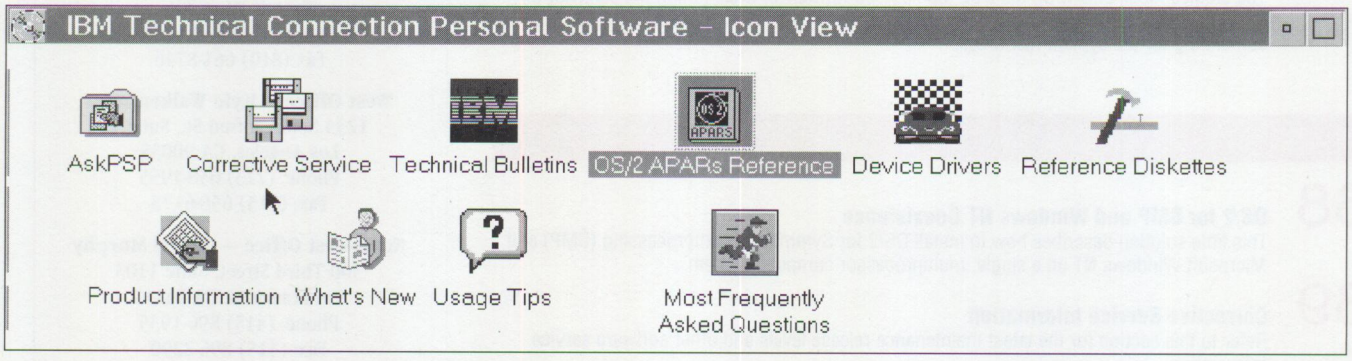


Figure 1. OS/2 Implementation: Database Icons

- *Which language version of Corrective Service Diskettes (CSDs) is needed*–If

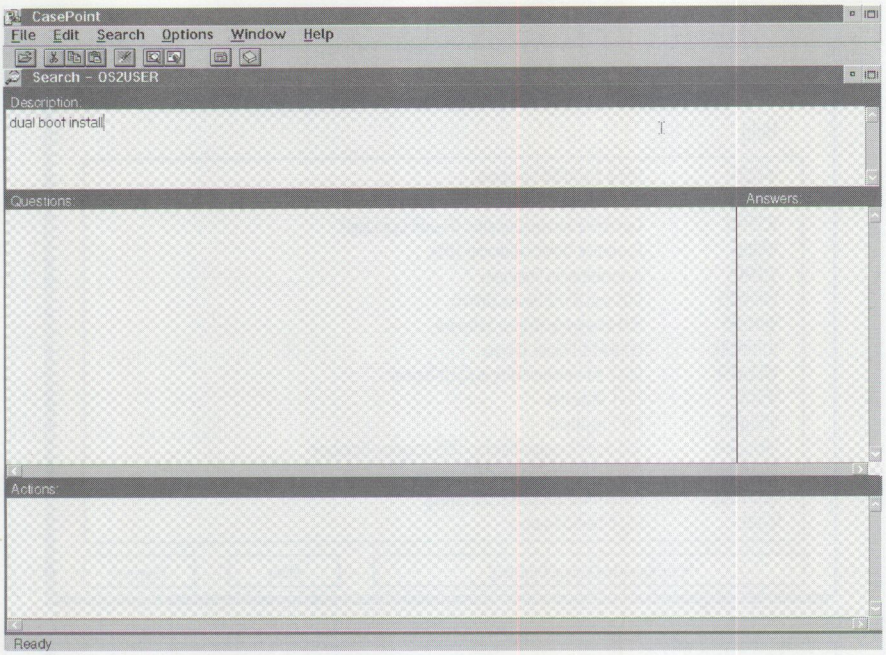


Figure 3. AskPSP: CasePoint Description

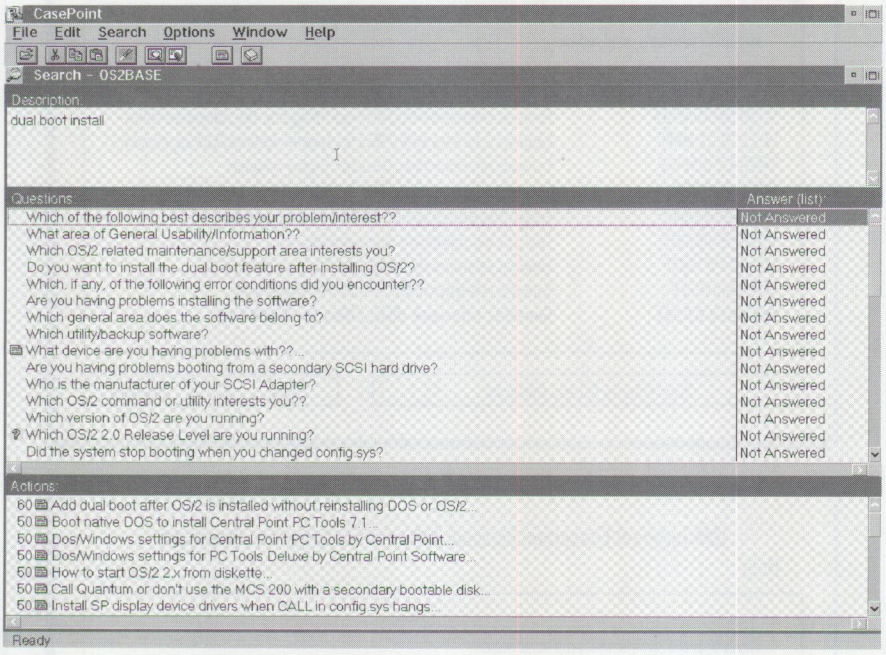


Figure 4. AskPSP: Questions and Actions

you highlight the Reference Diskette Directory and press Enter or click the mouse. The next screen shows the various reference diskette libraries. When you highlight the entry for ThinkPad (laptop) and press Enter or click the mouse, you will see the third screen showing the information available for laptop computers. A diskette is created for the file you select from this screen.

From Our Experts to Yours

The Technical Connection information comes from our technical support experts, developers, testers, and users of OS/2, DOS, and LAN platforms. Data is gathered from many areas: electronic bulletin boards, internal documents, problem databases, and many others. Most of these sources are updated daily.

The Technical Connection team adds the latest data to the CD-ROM monthly. Outdated material is removed as warranted.

Following are descriptions of the material that is available each month to enhance your role as a technical coordinator within your organization.

Information Areas

The Technical Connection provides you with three information areas:

- *What's New*–A quick snapshot of what files have been added, deleted, or changed on the current month's CD-ROM.
- *Usage Tips*–Hints for better usage of the CD-ROM–tips the Technical Connection team has found that will help you more easily access the information plus hints about the contents.
- *Most Frequently Asked Questions*–Answers to questions most frequently asked of IBM's various service organizations. Checking out this section may save you a call to IBM.

Databases

The Technical Connection contains seven databases of information: AskPSP, OS/2 Authorized Program Analysis Reports (APARs), Technical Bulletins, Corrective Service Diskettes, Reference and Diagnostic Diskettes, Device Drivers, and Product Information.

AskPSP

AskPSP is an expert system tool targeted for end users and help desk personnel–both novice and experienced users. Using AskPSP is easy. You choose the casebases (environments) you want to explore. These casebases are continually augmented as many of the cases are created directly from the calls coming into the support centers.

Today you have these options:

- OS/2 Initial User's Environment
- OS/2 Base Environment
- OS/2 LAN Environment
- Novell NetWare Environment

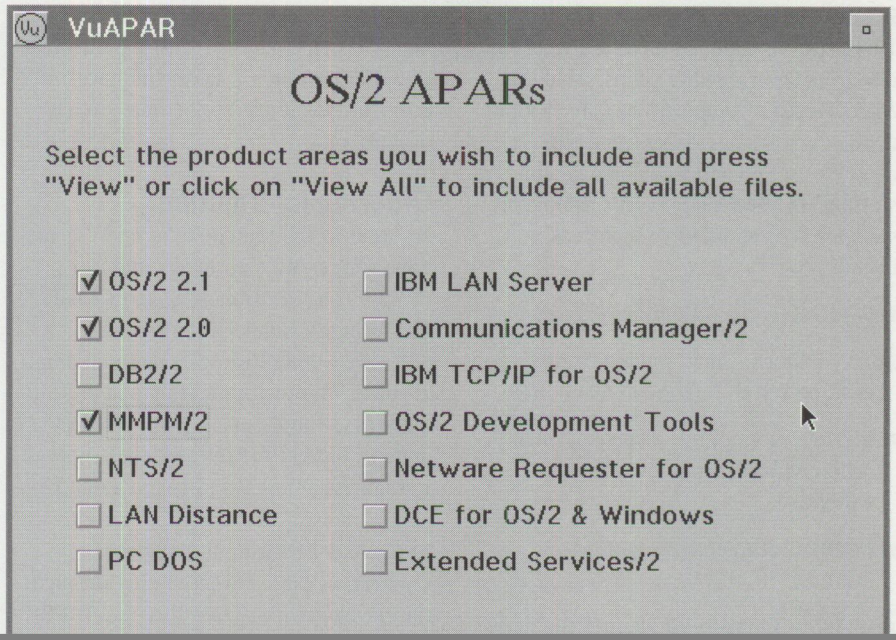
You can expect to find cases added each month as well as new product-related casebases added over time. All you need to know is the environment to which your

question relates and the parameters of your question. For example, if you want to find out about "dual boot" and how to implement it, you would enter "dual boot" in the Description area of the CasePoint screen (see Figure 3). AskPSP provides you with a set of questions to answer, as shown in Figure 4.

After answering the appropriate questions, the Actions section of the screen gives possible answers. Solutions with a rating of 80 or more will typically contain an appropriate answer to your search. If there is not a case for a particular problem, no answer will be shown.

OS/2 APARs

In this area, you will find the latest in closed APARs for the products covered on the Technical Connection CD-ROM



Product Information
This database contains the latest information from several publications, including *IBM Developer Support News*, Team OS/2 newsletters, PS newsletters, and DB2/2 newsletters. You will find some demonstration software along with a sample of software written by IBM employees, including:

- PS/2 L40 Battery Monitor
- Tiny Editor (a small [under 10 KB], easy, powerful, full-screen text editor)
- PMTREE (a graphical display of interaction with Presentation Manager windows)
- NetDUMP (three access control utilities)
- OS2PING (a utility to identify the paths in a local area network [LAN] to a specific adapter address)

Summary
All in all, these seven databases offer a significant amount of easily accessible information and data right on your

loading information from a bulletin board. When combined with the information areas on the CD-ROM, you have everything you need to be immediately productive.

Ordering Information
To order in the United States and Canada, have your credit card handy and call (800) 992-4777. In the U.S. and Canada, the Technical Connection Personal Software CD-ROM is available in an annual subscription with monthly updates for $299 ($429 in Canada), with quarterly updates for $119 ($169 in Canada), or as a single issue for $59 ($85 in Canada).

In the Asia Pacific area, Technical Connection can be ordered only through the Developer Assistance Program (DAP) in single and quarterly subscriptions:

- Australian DAP—+61-2-354-7684
- Taiwan DAP—+886-2-776-7965
- Korean DAP—+822-781-7770 or +822-781-7777

In Europe/Middle East/Asia areas, single purchases can be ordered through retail channels. Subscription orders can be purchased only through ISMS Direct Services.

As an added bonus, the "OS/2 Collection," containing over 275 books related to various OS/2-related products, is included with each purchase.

Note: The Technical Connection Personal Software product is a dynamic product, updated and improved every month. Screen representations in this article may not identically match those in your product. In addition, prices are subject to change without notice.

Thanks
The Technical Connection team thanks you for taking the time to read about our product. The core development team is located in Boca Raton, Florida; Austin, Texas; and Vancouver, Canada. We welcome comments on the product through the Customer Feedback card included with the product or throu

Point of View

Visualizer, DB2/2, and You—An End-User's Perspective

By Bob Angell

In this first of a series of articles, Bob Angell, principal with Applied Information and Management Systems, describes the features of Visualizer and details his experiences with its installation. Future articles will explore some of the functions available in this database product.

The word *Visual* has been part of IBM's naming strategy for several of its recently released products. Visualizer, not to be confused with VisualGen or VisualAge, is a graphical user interface (GUI)-based database product that allows you to interface with and use data generated from PC-based workstations as well as from midrange systems such as AS/400s.

Because data comes from different sources (relational and non-relational distributed databases, flat files, etc.) and can be presented in many different ways, Visualizer was developed to recognize and take advantage of these environments.

Visualizer's GUI gives even a novice the power to become an expert data analyst with a minimal learning curve. In this article, however, I will assume you are familiar with database design and development and have procedural programming skills but that you have limited structured query language (SQL) skills. I will give you an end-user's perspective of

wrote this database application to provide physicians and residents with real-time patient demographic, clinical, and research information. This application allows physicians and computers to do what they each do best–practice medicine and massage information respectively.

AIMS had evaluated other GUI development tools, from C ++ and VisualAge to the various visual REXX offerings. These other products either were too much work (C ++ and VisualAge) or were just not beefy enough (visual REXX tools). Visualizer provides many of the tools (queries, charts, procedures, development environments, etc.) needed to get a project up and running almost immediately.

Our next development phase will be to make the entire program more of a client/server application using DB2/2 as the database engine and the Visualizer family of GUI applications to gather, process, manipulate, and present the data. We'll talk about this in future articles.

Query for OS/2 and *Using, Visualizer Query for OS/2. Installing and Supporting* tells you how to install the product, obtain appropriate data connections, and support the product. There is also a discussion on using Visualizer's diagnostic aids and how to report problems back to IBM.

The installation process did not go as smoothly as I expected; however, it was nothing that couldn't be remedied by knowing a little about OS/2. I selected and tested only the DB2/2 data connection out of a variety of different options (DB2/6000, MVS, AS/400, Advanced Program-to-Program Communication [APPC] processes, etc.). As our project matures, we will likely use more of these data connections.

Using, Visualizer Query for OS/2 gives step-by-step instructions on using the program. The first section of the manual deals with the basics of Query for OS/2, showing how to use the Visualizer templates and online help. This section also shows how the Visualizer family of products (Charts, Development, Plans, Procedures, Statistics, and Ultimedia Query for OS/2) fit together. The second section of the manual shows how to use and create SQL tables and views as well as how to combine, retrieve, and manipulate

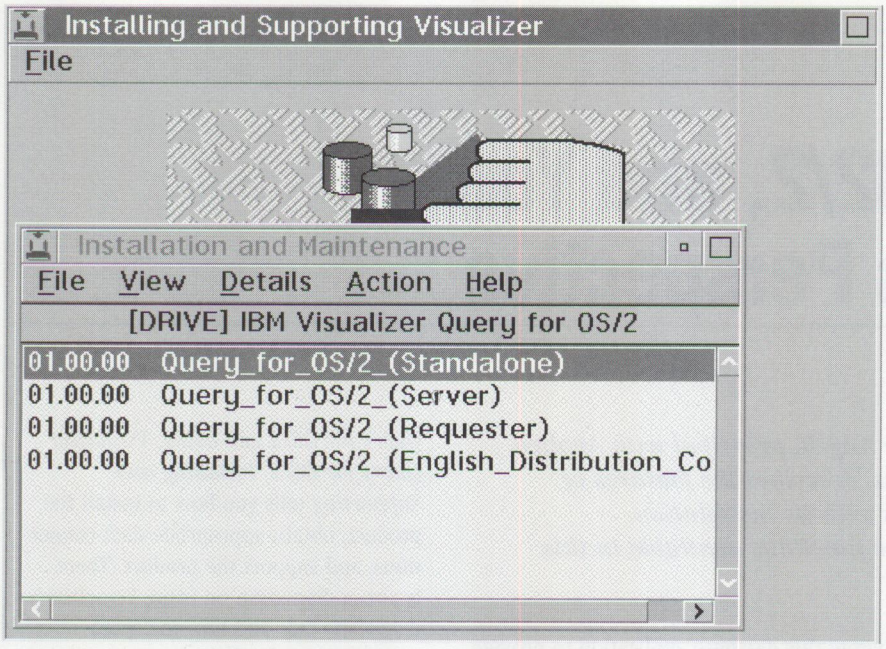


Figure 1. Visualizer Installation Screen

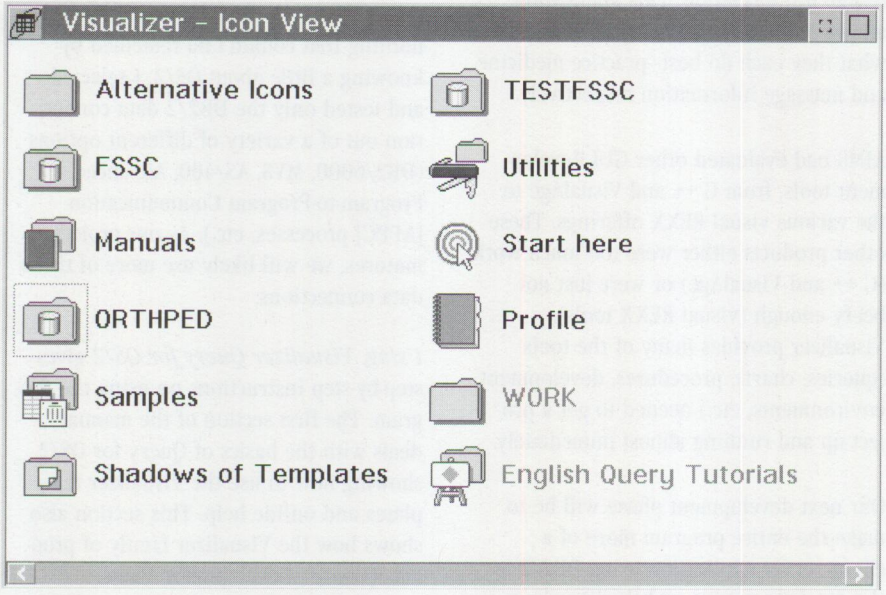


Figure 2. Visualizer Desktop Folder

statistical features, or take advantage of the Plans, Procedures, and Development code, the entire data interaction process could be painful.

As with most product documentation, the Visualizer Query manuals are incomplete when you want to understand the less-

table format. In fact, if the files had been a bit larger, we would have had to convert them to the new formats in pieces.

Note: At this point, it is still not clear to me what, if any, advantage a Visualizer table format has over a basic SQL structured table

users decide which table format is appropriate for which task.

I searched the documentation for how I could translate one table to another and finally figured it out by "doing" and "playing." This may just be a Visualizer weakness, but it does reduce the development efficiency Visualizer is supposed to provide. Overall, I found that most functions are intuitive to use. In fact, most of the time, I did not have to read the documentation.

Install Process Revisited

After accidentally deleting the Visualizer code from my workstation, I had to reinstall it. I mentioned above that the initial installation went fairly smoothly; however, during the reinstallation, Visualizer's installation programs did not work as well.

The installation program provides the options shown in Figure 1. This is a standard format for installing all the Visualizer family of products. Visualizer can be installed as a stand-alone or as a server application. The latter can be very useful if you are accessing a database on a network or larger system (AS/400, RISC System/6000, etc.). After selecting Action on the menu to install the product, you then have the option to install all, part, or just a single piece of the program.

I found the recurring installation problem when Visualizer has transferred approximately three-fourths of the first diskette. A pop-up message appears indicating that Visualizer has been detected on the hard file and installation can't continue. Another dialogue box appears and asks whether I would like to delete the partial installation. After answering "yes" to the last question, all files are deleted and the program takes me back to the screen in Figure 1. Then, without exiting the program and answering the preliminary questions, the program installs without a hitch.

This happened on all of the Visualizer products as each one was reinstalled. I

Insiders' Software Unveiled

By Lia Wilson

Here's something you'll want to see! IBM's AISPO catalog, your inside track to tools and productivity aids, is a phone call away. This catalog concisely lists over 50 selected IBM software applications (developed either internally or with customers) that are now available to you.

These tools and productivity aids come from a variety of sources, including IBM research labs, IBM industry groups, and IBM marketing divisions and are available for all IBM platforms. User-tested and proven successful, these products can benefit you by letting you take advantage of products designed for others with similar business requirements. Although AISPO products come with no warranty or support, you can contact your local IBM branch office and contract for technical support or other services such as education, customization, and installation for many of the products.

How Can You Receive This Catalog?

To receive your free copy of the AISPO products catalog, call (800) IBM-6676, ext. 650.

If you have access to TalkLink (through IBMLink), you can view an online version. (Several AISPO product forums also exist where you can ask questions regarding AISPO products.)

How Can You Order AISPO Products?

You can order AISPO products directly from IBM by calling (800) IBM-CALL. Please specify the product number when ordering. We've listed the products discussed in this article below along with their product numbers.

Product	Product Number
LAN Automated Distribution/2 (LAD/2)	5764-031
InterfloX Release 2	5764-053
IBM PlayAtWill	5764-085
IntelliAgent	5764-087
AGSS (A Graphical Statistical System)	
PC and PS/2 Version (DOS)	5764-009
Workstation Version (OS/2, AIX/6000, Sun Solaris)	5764-092
Distributed Database Query Services/2 (DDQS/2)	5764-056
Current ISO 9000 Audit Toolkit	5764-068

Humble Beginnings

Although AISPO products have been around for years, customers didn't have direct access to them until very recently. Originally, if a customer wanted one of these products, IBM would write a specific services contract. Wanting to make it easy for customers to purchase this software directly, IBM made these products available through the AISPO products catalog.

Ever evolving, the catalog that began as an online file emerged in its current printed format for the first time in May 1994. To keep the catalog as current as possible, IBM plans to update it frequently–at least three or four times a year.

The catalog not only includes descriptions of each AISPO product, but also includes information on systems and programming environments, ordering (such as the length of the test period), the license agreement, price, and product information sheet numbers. Use the product information sheet numbers to request more detailed information about specific products from the IBM FAX service. Simply call (800) IBM-4FAX and have the product information faxed directly to your fax machine.

Most products in the AISPO catalog come with a two-month test period. You can try the software and return it, no questions asked, if you are not completely satisfied.

Not So Humble Offerings

Catalog offerings span a range of user needs and are categorized by the following platforms:

- Personal Computer
- Multiple Platform
- RISC System/6000
- AS/400
- VM and MVS
- Retail Industry (4680/4690 and related platforms)

When asked which of the products designed for the personal computer platform are the most popular, Scott Ahlers, Manager of AISPO products, responded that LAD/2 and InterfloX Release 2 are especially in demand.

LAD/2 (LAN Automated Distribution/2) enables you to quickly and efficiently configure and install operating systems and applications on a local area network (LAN). By automating many of the manual tasks involved in installations across networks, LAD/2 saves you time and insulates you from the complex remote installation procedures through an easy-to-use Presentation Manager (PM) interface.

LAD/2 automatically:

- Generates a response file, a LAN CID utility (LCU) command file, and NetView Distribution Manager/2 (NVDM/2) change files.
- Partitions and formats client hard drives.
- Generates LDU MAP and PKG files.
- Creates OS/2 and DOS boot diskettes.

LAD/2 supports the configuration and installation of the following configuration/installation/distribution (CID)-enabled products:

- OS/2 2.0 or OS/2 2.1
- Network Transport Services/2 (NTS/2 - LAN adapter and protocol support [LAPS])
- Communication Manager/2 and Extended Services
- DATABASE 2 OS/2 and Extended Services
- LAN Server 3.0 Advanced
- NetView Distribution Manager/2
- OS/2 ServicePak

You can obtain technical support, installation, and customization services for this product from IBM for a fee. For more information about LAD/2, call (800) IBM-4FAX and request product information sheet number 2790.

InterfloX Release 2 is a programmer's toolkit providing a REXX application programming interface (API) to Lotus Notes. This robust, easy-to-use toolkit enables an OS/2 REXX program to access, modify, create, and delete Lotus Notes databases and documents. Use it to connect Lotus Notes to host systems and other databases such as DB2/2.

You'll discover how simple it is to program with InterfloX through the following features:

- InterfloX uses 60+ high-level functions instead of 300+ C functions.
- Ninety percent of programming needs are found in seven of the functions.
- Its enhanced error checking and data validation provides improvement over errors common with C-API programming.

You can obtain product support for InterfloX as an optional fee service. For more information about InterfloX, call (800) IBM-4FAX and request product information sheet number 2785.

According to Ahlers, several recently released AISPO offerings expected to do well include:

- IBM PlayAtWill
- IntelliAgent
- AGSS PC and PS/2 Version (DOS) and Workstation Version (OS/2, AIX/6000, Sun Solaris)
- Distributed Database Query Services/2 (DDQS/2)
- Current ISO 9000 Audit Toolkit

IBM PlayAtWill is an advanced Personal Computer Memory Card International Association (PCMCIA) software utility for PC cards that allows you to "plug and play" by identifying the type of PCMCIA card you've plugged in.

Using its auto-Configurator function, PlayAtWill automatically sets the input/output (I/O) address and interrupt level to make the card ready for immediate use. It also displays information on the type of PC card you've plugged in, along with its status and that of the PC slot. This program provides you with the ability to register an application that is supported on OS/2 and Windows platforms, directing PlayAtWill to automatically run that application when that specific PC card is plugged in.

For more information about IBM PlayAtWill, call (800) IBM-4FAX and request product information sheet number 1008.

IntelliAgent is an electronic tool to help you manage your daily work, including automatically handling routine tasks. It works for you 24 hours a day, 7 days a week.

By creating specific instructions (you need no programming knowledge), you tell IntelliAgent what you want done, when you want it, and how to perform it. Some of the tasks IntelliAgent can perform for you include:

- File activities such as monitoring a file for changes, then starting a program to update it and distribute it to others, send messages or reports, or print files.
- Mail activities such as checking and sorting your mail, then filing or discarding it, and/or forwarding it. You can even use incoming mail items to trigger other things like starting a program, backing up a file, etc.
- Time-driven activities such as sending a message or starting a program on specified days of the week or month at a given time.

IntelliAgent comes with online information and a tutorial to help you create the graphic instructions that will put your electronic assistant to work!

For more information about IntelliAgent, call (800) IBM-4FAX and request product information sheet 1372.

AGSS (A Graphical Statistical System) PC and PS/2 Version (DOS) and Workstation Version (OS/2, AIX/6000, Sun Solaris) This state-of-the-art interactive system provides an easy-to-use environment for scientific/engineering graphics, applied statistics, and exploratory data analysis. Although built upon APL, you need only a rudimentary knowledge of APL to use it effectively as a high-level, menu-driven system. With moderate knowledge of APL, the system becomes uniquely extendable and customizable.

Some features include:

- An easy-to-use menu-driven system with a complete set of context sensitive helps.
- A graphics component containing a wide assortment of two and three dimensional color graphics.
- Data analysis and statistics components that combine extensive graphical output with formal statistical model fitting and testing procedures.
- A statistics component that includes linear and nonlinear regression, reliability analysis, accelerated life testing, time series analysis, experiment design, and quality control.
- Extensive work management utilities.

AGSS is also available for the IBM S/370 and S/390 under VM platforms.

For more information on AGSS, call (800) IBM-4FAX and request product information sheet 2791.

Distributed Database Query Services/2 (DDQS/2) is an interactive query development application. Running on OS/2, this Presentation Manager application provides access to IBM's local and remote relational databases.

Features include:

- The ability to accommodate users with varying levels of structured query language (SQL) proficiency.
- A reporting environment for managing data, including mechanisms for exporting data for use in other PC applications such as spreadsheets.
- A "walk up and use" design allowing intuitive operation.

For more information on Distributed Database Query Services/2, call (800) IBM-4FAX and request product information sheet number 2782.

Current ISO 9000 Audit Toolkit is a DOS/Windows-based personal information manager (PIM) that allows business professionals to manage multiple assignments, projects, and people on a daily, weekly, and monthly basis. This program combines the power of the IBM Current Version 1 (plus enhancements) with a set of special forms and other information prepared to serve the needs of the ISO 9000 auditor.

ISO 9000 auditors will find themselves more productive with the "Smart Forms" included with this program. This set of special forms "knows" which fields require text, numeric data, dates, dollar values, etc. Multiple choice and linked fields aid in data selection. Multiple choice fields display all options; linked fields display all options when the user taps on the field; clicking on a choice fills in the field.

For more information about Current ISO 9000 Audit Toolkit, call (800) IBM-4FAX and request product information sheet number 2784.

Lia Wilson, editorial assistant for *Personal Systems* magazine, joined IBM five years ago. She is currently completing an MA in English at the University of North Texas at Denton.

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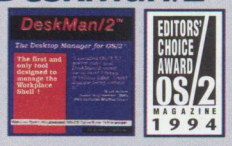

by Development Technologies, Inc.
Manage, secure, backup and migrate your Workplace Shell environment with the essential utilities no OS/2 user should be without! With new and enhanced features for ease of use, improved performance & functionality, improved window management and more! Use DeskMan/2 to secure windows or objects, standardize corporate desktops, authorize access and much, much more. Includes the powerful VUEMan/2 virtual desktop utility. (v1.51)
DEV32 .. MSRP ~~$79.95~~ ..... IB: $49.00

Mesa™ 2

by Athena Design
Designed with objects to the core, Mesa 2 for OS/2 is a powerful, full-featured, 32-bit native OS/2 spreadsheet. It takes advantage of OS/2 features, including multi-threading, large memory size, multi-tasking, drag & drop and the Object-oriented user interface. Includes context- sensitive help, interoperability with other OS/2 apps, 3D workbooks - each with their own thread, graphing capabilities, REXX scripting language support, and so much more!
ATH22 MSRP ~~$199.00~~ ..... IB: $99.00

PrntScrn
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4 integrated utilities provide screen capture (save to file or printer), color map B&W images, clipboard and screen saver. Date/time stamp screen images.
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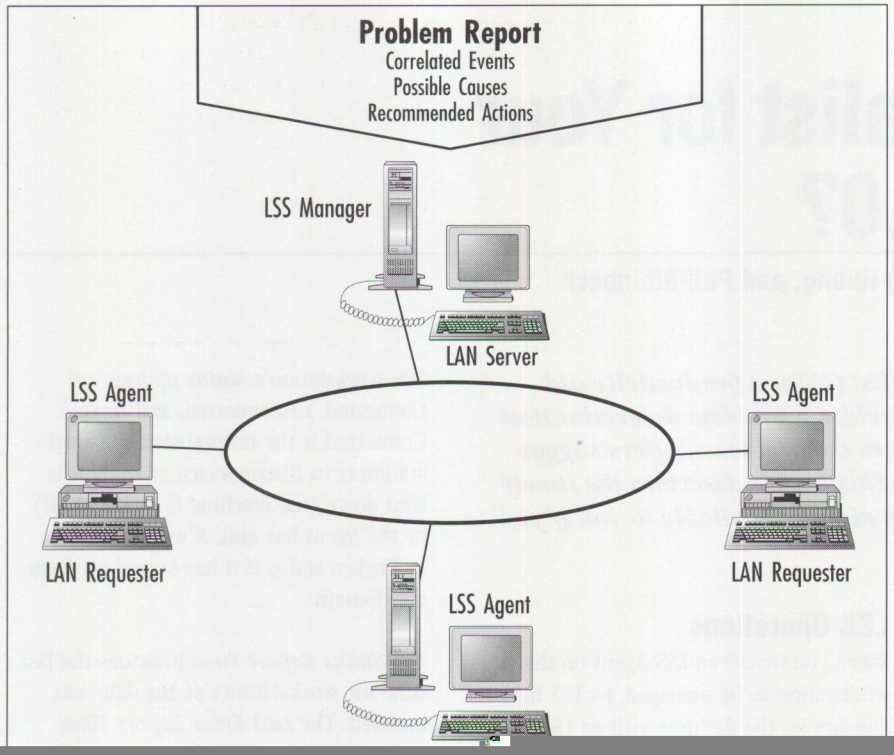
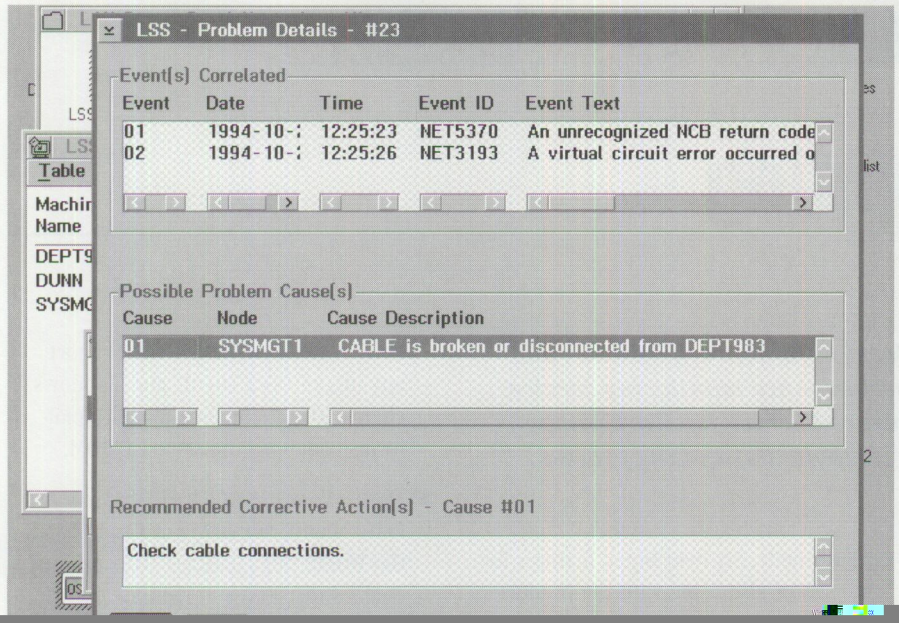


generic alert using code point information defined by IBM and stores it at a generic alert receiver such as IBM's NetView/6000. (For more information about generic alerts, see *IBM LAN Server Version 4.0 Problem Determination Guide)*. An *Unresolved Event* indicates that the knowledge base contains no information or no conclusion can be drawn. You can use the knowledge-base editor to add details about events.

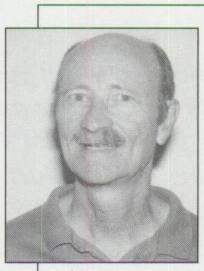
Time/Date indicates the time and date that the problem occurred. *Machine* indicates where the problem occurred. *Problem Cause* specifies the nature of the problem.

From the problem report list, double click on a line to see the detailed report of a problem (see Figure 3). The detailed problem report panel contains three major sections:



Acknowledgements

Thanks to the contributors to the LSS product: Alex Winokur, Yossi Shiloach, Amnon Ribak, Tom Porcaro, and Barbara Jensen, and to Mike Dunn for his contribution to the article.



Brooks Hickerson is a senior technical staff member responsible for software and system management architecture for personal software products. Since joining IBM in 1965, Brooks has worked at the Johnson Space Center in Houston where he produced simulation

One-Stop Shopping

By Fred Castañeda

Now everything you need to get your local area network up and running, complete with application and performance monitoring service, is available in one package–IBM's Advanced Server for Workgroups. This article describes this product, its components, and the process behind its ease of installation.

Implementing a workgroup computing environment with a groupware application–even with Lotus Notes, which stands out as the present standard–has not always been the easiest task to accomplish.

Whether the challenge was presented to a local area network (LAN) administrator in a corporate enterprise or to a value-added reseller, installing LAN software and workgroup applications was a time-consuming task.

Well, times have changed. Enter the IBM Advanced Server for Workgroups solution!

No, this is not a hardware PC server system–it's more like a software "bundle."

server node. Six distributed features for the server also come with the product. Thus, different departments can share DOS applications, Windows applications, and OS/2 applications from the LAN server.

- *Groupware application environment*–Lotus Notes is the application environment that comes with Advanced Server for Workgroups. In addition to a server license for Lotus Notes in the OS/2 environment, the product also comes with six additional client licenses. The Lotus Notes installation can support any mix of OS/2 clients and Windows clients. The client code for both platforms comes on the same CD-ROM.
- *Load-balancing utility*–IBM's System Performance Monitor/2 2.0 rounds out the Workgroups package. This product enables the server to monitor use of the fixed disk, processor, and memory. It presents details graphically online as well as saves log files that can be analyzed later to find the performance bottlenecks. Add to this Theseus 2, a detailed memory analyzer, and you have a tool that can significantly help in performance tuning.

Instead of just throwing together four separate products into a box, IBM took

care to ensure that this product is as "plug-and-play" as possible.

More Than Just Software

In addition to these four software components, the true added value comes in the installation support and the packaging of Advanced Server for Workgroups, which includes:

- All software programs on CD-ROMs.
- An introductory videotape, which gives a brief product overview, a short demonstration of the finished application environment, and a graphical view of the installation process.
- An offer for savings on consulting services for Lotus Notes application development and implementation in the U.S.
- 90 days of free customer service and support from IBM (even for the Lotus Notes component) through an IBM 800 number in the U.S.
- One single, small, but powerful installation booklet, considered by some industry analysts to be the most valuable part of the product.

This "common installation guide," officially called *Getting Started*, provides a detailed, step-by-step approach to the installation of *all* the software components, from the server to all the clients. By following the instructions in this "cookbook," the LAN administrator can save the several days that it previously took to integrate and test the pieces of

Customer Tested and Proven

The task of the "common installation"–integrating four components into a smooth step-by-step process–required that the installation have one and *only one* document: the *Getting Started* booklet. This is a 75-page document; the first 40 pages are instructions for the installation, and the remaining pages contain appendixes plus hints and tips for the groupware environment.

Usability Test

Three types of potential users thoroughly tested the installation process in the IBM Usability Test Lab in Austin:

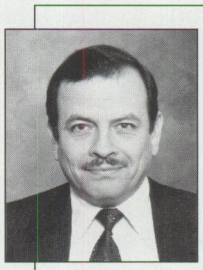
- LAN administrators whose time is spent installing LANs, especially Novell NetWare and IBM LAN Server
- Application programmers whose primary function does not include LAN installations
- Novice users (that is, those with only DOS and Windows experience)

Based on comments and suggestions from the customers testing the process, the installation guide went through many revisions, resulting in a *Getting Started* booklet created by the potential users.

Certification

In addition to the usability test for the installation, the product also underwent a certification process in the IBM Integration and Test Laboratory in Austin. The seal on the back of the box sequence of instructions and typing commands at the command line, the user is presented with a graphical user interface in an object-oriented environment, enabling icons and objects to be "dragged and dropped." The user only fills in the blanks or selects the items for naming conventions and other network information. With just a few clicks of a mouse on the installation screens, the whole installation is complete–from the server to the redirected download of code to the clients.

This is IBM LAN Systems' objective for future versions of this product and its derivatives in the world of server-based integrated products that provide customer solutions.



Fred Castañeda is a marketing brand manager for workgroup server products in IBM's Personal Software Products Division in Austin, Texas. He is responsible for product requirements, merchandising, marketing, and worldwide market support for the Advanced Server for Workgroups product. In his 17 years with IBM, he has worked in AIX technical support, PC applications marketing support, PC software product planning, as well as other support areas. He holds a BA and an MBA degree from Loyola University of Los Angeles.

OS/2® WARP

On October 11, 1994, IBM introduced OS/2 Warp Version 3, the next evolution of its premier 32-bit operating system. As its name implies, OS/2 Warp is fast and full of state-of-the-art features. This article describes the new features of OS/2 Warp, including performance enhancements, installation enhancements, usability improvements, printing enhancements, new applications, and more. Read on, and see what it's like to operate at Warp speed!

OS/2 Warp Version 3, the eighth release of IBM's award-winning 32-bit OS/2 operating system, continues the tradition of running DOS better than DOS, Windows better than Windows, and OS/2 better than previous versions of OS/2. OS/2 Warp builds on the mature, stable environment that comes from years of refining the OS/2 operating system.

You can run OS/2 Warp on an entry-level computer system, typically 386 or above, with 4 MB of RAM. Although OS/2 Warp is targeted for the home and small business user, all users can benefit from its great performance, new function, and outstanding BonusPak applications.

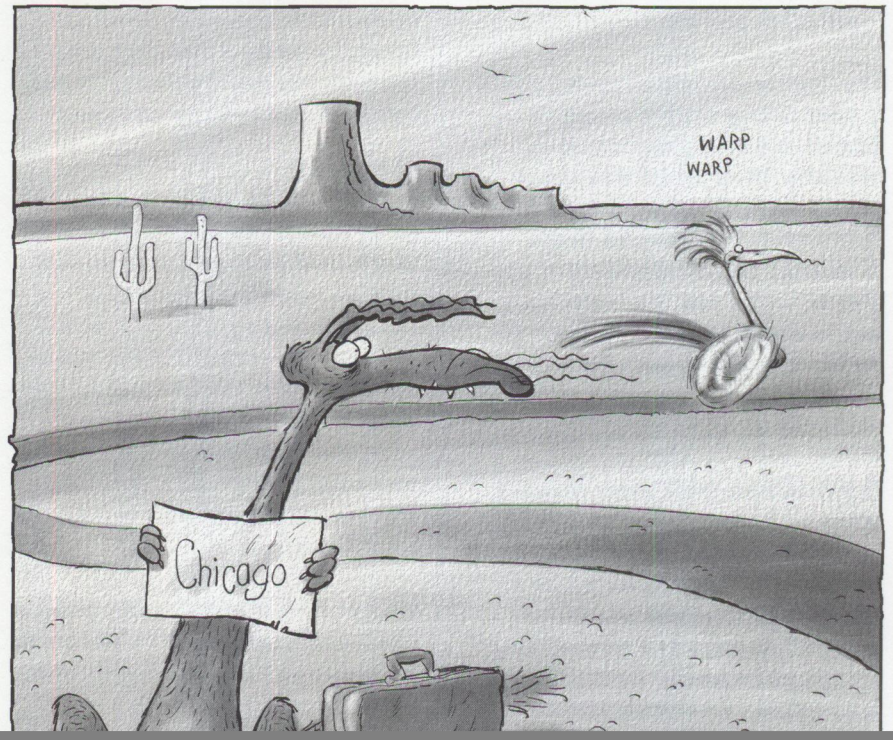
Edward Duhe'
IBM Corporation
Roanoke, Texas

This article outlines what is new in OS/2 Warp, focusing on the enhancements and changes in OS/2 itself. Also, it briefly describes the applications included in the OS/2 BonusPak that comes with OS/2 Warp. The BonusPak is an exciting addition to OS/2; it gives you full-function business and pro

available in the first quarter of 1995. The only difference between these two products is how you get support for running Windows applications.

With OS/2 Warp Version 3, you must have Windows installed on your computer to run Windows applications on the OS/2 Desktop. OS/2 Warp dynamically links into your Windows code, when needed, to run your Windows applications.

OS/2 Warp Version 3 with WIN-OS/2 does not require Windows to run Windows applications. This version comes with



WIN-OS/2, which provides the support for Windows applications.

Both of these products can be installed in three different environments that provide different capabilities.

- *No operating system previously installed:* If you install OS/2 Warp Version 3 on a computer that does not already have an operating system installed, you will be able to run both DOS and OS/2 applications on the OS/2 Desktop. If you install OS/2 Warp Version 3 with WIN-OS/2, you will be able to run DOS, OS/2, and Windows applications on the OS/2 Desktop.
- *DOS previously installed:* Either OS/2 Warp Version 3 or OS/2 Warp Version 3 with WIN-OS/2 can be installed on a computer that already has DOS 3.3 or higher installed. OS/2 Warp will automatically install the Dual Boot feature in this environment. This feature enables you to boot your computer to run either native DOS or OS/2.

  If you install OS/2 Warp Version 3 in this environment, you can run both DOS and OS/2 applications on the OS/2 Desktop. If you install OS/2 Warp Version 3 with WIN-OS/2 in this environment, you can run DOS, OS/2, and Windows applications on the OS/2 Desktop.
- *DOS and Windows previously installed:* This is the environment for which OS/2 Warp Version 3 was really designed. By installing OS/2 Warp Version 3 on top of DOS and Windows, you will be able to run DOS, Windows, and OS/2 applications on the OS/2 Desktop. You will also be able to take advantage of the Dual Boot feature to run in a native DOS plus Windows environment.

  OS/2 Warp Version 3 installs over Windows 3.1, Windows 3.11, Windows for Workgroups 3.1, and Windows for Workgroups 3.11.

  OS/2 Warp Version 3 with WIN-OS/2 will also install in this environment, giving you the same capabilities described for OS/2 Warp Version 3.

Also scheduled to be available during the first quarter of 1995 is OS/2 Warp Version 3 LAN Client. This member of Client will include OS/2 Warp Version 3 with WIN-OS/2, the OS/2 Warp BonusPak, plus LAN Server Requester, NetWare Requester, LAN Distance Remote, System Performance Monitor/2 (SPM/2), and many other features designed for the connected user.

Enhanced Performance

OS/2 Warp has been re-engineered to appeal to a much larger audience, including users of entry systems—those that are typically found in the home or small-business environment. These systems usually have few resources, including limited memory. The re-engineering of OS/2 focused on accommodating these entry systems.

Reduced Memory Requirements

One main design focus was performance and system requirements. When OS/2 2.x was announced, the minimum system requirement was stated as 4 MB of RAM. Although it was possible to run OS/2 2.x in 4 MB, the performance was, for the most part, unsatisfactory. By adding just 2 MB of RAM to your 4 MB OS/2 2.x system, you could gain significant performance advantages.

You will find that OS/2 Warp's performance on an entry-level 4 MB system is comparable to OS/2 2.11's performance on the same system with 6 MB.

Even on computers with 8 MB, 16 MB, 32 MB, or more of RAM, you will still see a faster-running system under OS/2 Warp. On a high-memory system, OS/2 Warp's windows pop up faster, the populating of objects in a folder is faster, and the system runs more efficiently overall.

With its increased performance and decreased system requirements, OS/2 Warp is an excellent operating system choice for most personal computers shipping today.

Tuned-Up 32-Bit Window Management

The OS/2 Warp developers have extensively reprogrammed and tuned the OS/2 kernel so that the system operates more responsively. Even though the kernel requires fewer system resources to run, Performance gains were achieved by rewriting the OS/2 window-management system (PM-WIN) as 32-bit code and combining several of the PM-WIN dynamic link libraries (DLLs).

The 16-bit version of PM-WIN was a performance bottleneck, because on either side of the 16-bit PM-WIN component were the 32-bit shell (PMSHELL) and the 32-bit graphics engine (PMGRE). This scenario caused a large amount of "thunking" (converting 32-bit addresses to 16-bit, and vice versa) between the 32-bit components and the 16-bit PM-WIN.

Merging `PMWIN.DLL` with `PMGRE.DLL` and `PMSHAPI.DLL` into a single DLL called `PMMERGE.DLL` improved PM-WIN's performance as well. The logic is that the fewer DLLs required for the PM-WIN function, the less overhead required.

Improved Paging Subsystem

The paging subsystem was tuned to improve performance. It now uses memory more efficiently so that the most frequently used pages are in memory when needed. This reduces the amount of paging or swapping to disk, thereby reducing the overhead and time necessary to perform paging.

Enhanced Workplace Shell

The Workplace Shell includes performance enhancements, particularly during loading. The time it takes to populate folders, open objects, and load applications is faster than in earlier versions of OS/2.

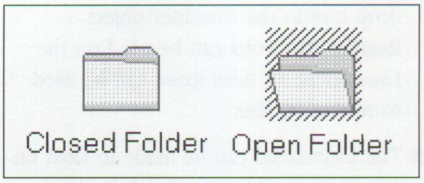
There is now a fast-load option for Windows applications. In OS/2 2.x, when loading a Windows application, DOS was loaded first, then a Windows kernel, and finally the application. Once your first Windows application was running, and if you were using a shared Windows kernel, the next Windows application would load more quickly. This happened because DOS and the shared Windows kernel were already loaded by the first application.

With the new fast-load option enabled in the WIN-OS/2 Settings notebook, OS/2 Warp starts an OS/2 Windows session at startup. This OS/2 Windows session does not show up in the window list but is used by Windows applications that are started from the Desktop, allowing them

Alt+F2

Alt+F2 provides valuable information when troubleshooting problems on your system. When you press Alt+F2 while the white area is on the screen, the system displays real-time information as the system boots.

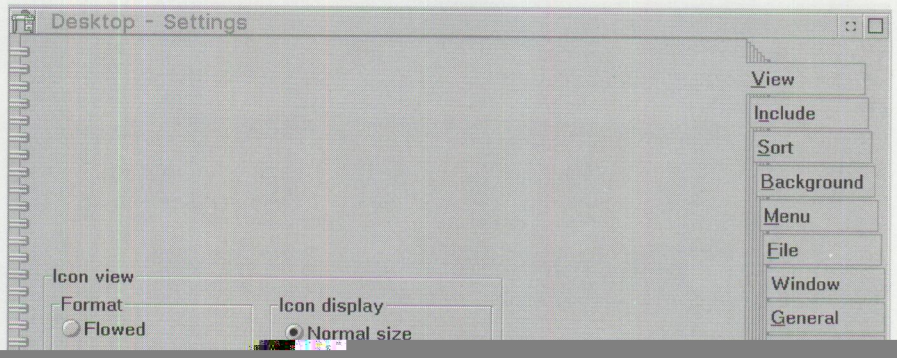
In OS/2 Warp, the Settings option has been moved to the primary pop-up window, right under the Open option, making it quicker and easier to access. An even easier way to bring up an object's Settings notebook is to hold down the Alt key and double-click mouse button 1 on the object

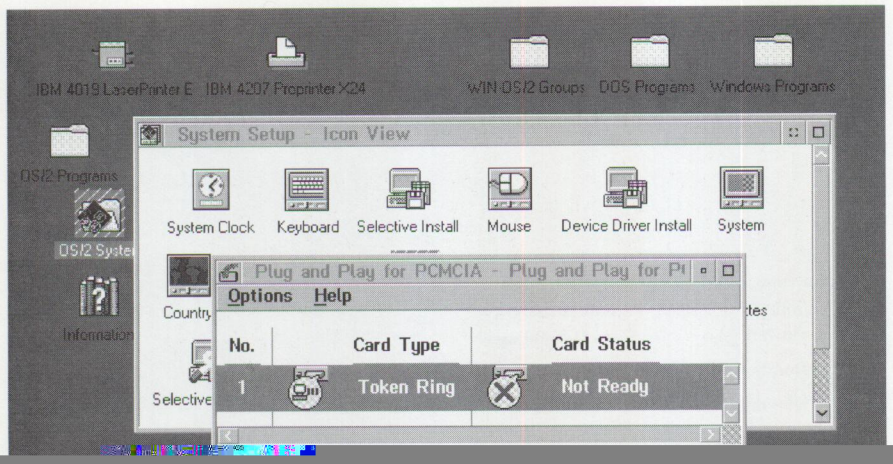


accept a drop from the color palette or from a bitmap object.

Schemes

Included with OS/2 Warp are 28 redesigned schemes in the Scheme palette. These schemes have separate settings for the Desktop folder and any other folder. This allows you to create a scheme that you can drag and drop to the Desktop while holding the Alt key, changing your





drivers, you must use Selective Install to change resolutions. OS/2 Warp has enhanced support for CD-ROM drives, including proprietary, small computer systems interface (SCSI), and ATA Packet Interface (ATAPI) drives.

New DOS/Windows Settings

OS/2 Warp has several new DOS/Windows settings.

`Touch_Exclusive_Access` is a dynamic setting that enables a DOS window session to detect your position anywhere

Performance of Windows sessions in OS/2 Warp has been enhanced by optimizing the kernel and memory allocation. OS/2 Warp now supports popular audio cards in the Windows sessions. This allows you to run your Windows sound-enabled applications under OS/2.

Online Documentation

OS/2 Warp comes with several information (`INF`) files that tell you how to get the most from your system. These files include Application Considerations, Command Reference, Multimedia, Performance Considerations, Printing in OS/2, REXX Information, and Windows Programs in OS/2. These files are located in the Information folder, which also contains the Master Help Index and the Glossary.

OS/2 Warp BonusPak

Previous versions of OS/2 contained small applications (called applets) in the Productivity folder. These "no frills" chart-

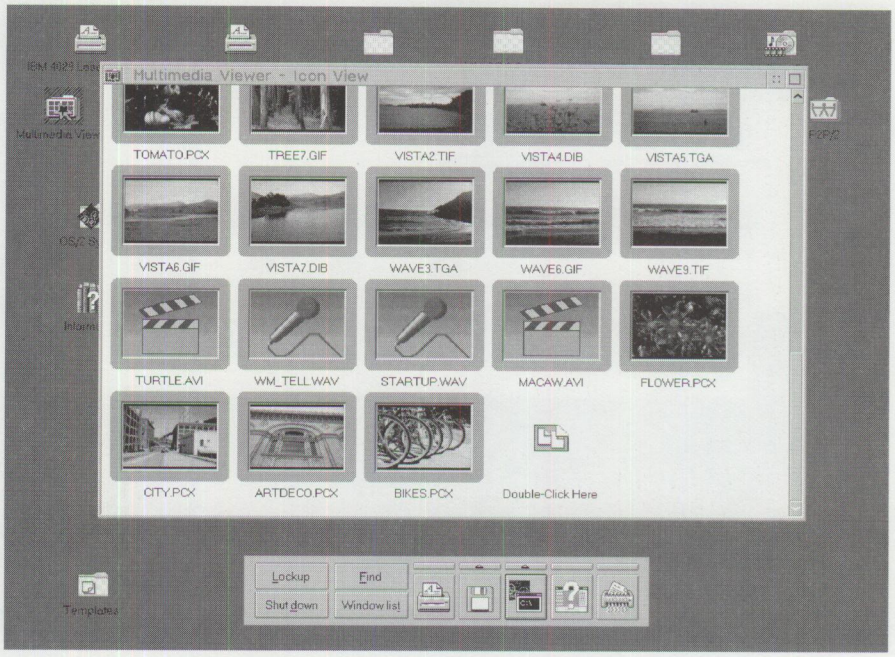


Figure 10. Multimedia Viewer

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TECHNIC

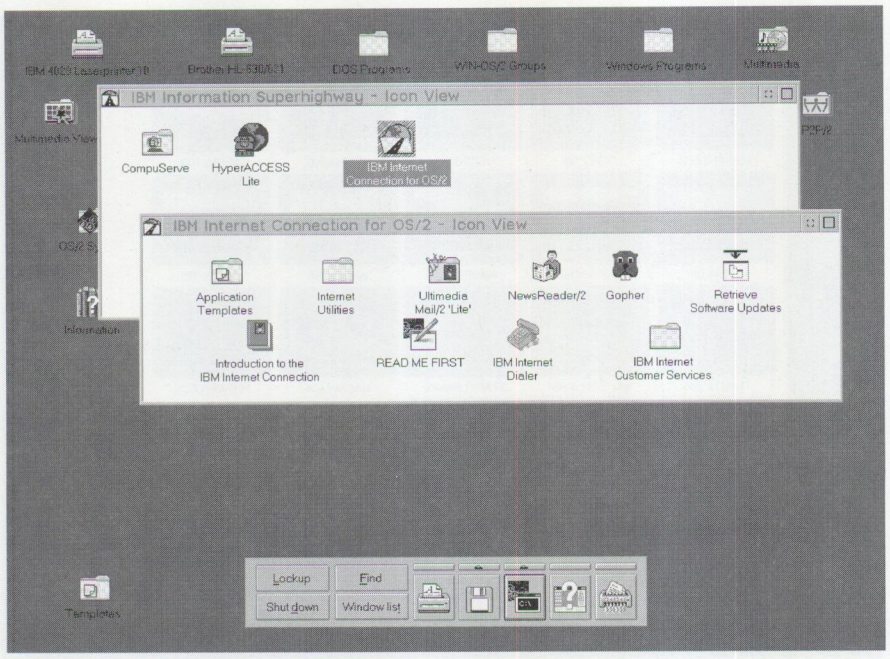
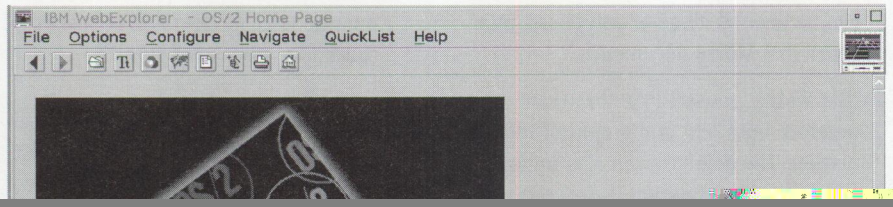


Figure 11. The Internet Connection for OS/2



both IBM's Ultimotion and Indeo AVI (audio visual interactive) formats for storing video files. These files can then be played back on your OS/2 Warp system.

Internet Connection for OS/2

The Internet Connection for OS/2 is a complete software package that gives you access to the Internet's vast resources (see Figure 11). Its easy-to-use, "one-button" registration with Advantis will get you connected and online quickly. Also supported are other Internet providers that support a Single-Line Interface Protocol (SLIP) connection.

The IBM Internet Connection consists of several applications to put you on the information superhighway:

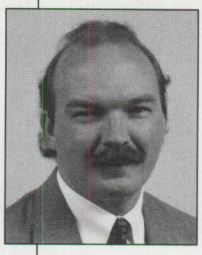
- *Ultimail Lite* provides an easy-to-use electronic mail application. Ultimail Lite supports the Multipurpose Internet Mail Extension (MIME) protocol, which enables multimedia mail such as video and audio clips.
- The *Internet Connection Gopher Client* provides a Presentation Manager-based graphical interface to Internet gopher servers. Gopher enables you to locate,

The World Wide Web is officially described as a "wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents." It means that, by using a Web browser like WebExplorer, you have a consistent means to access a variety of files using a variety of protocols.

A New Level of Excitement

OS/2 Warp Version 3 brings OS/2 to a new level—a very full-function, exciting, mature, and stable 32-bit operating system that is available for you to take advantage of today. With its full operating system and its complete set of applications, OS/2 Warp Version 3 is an incredible value.

For more information about OS/2 Warp, contact your IBM representative, connect to the IBM Personal Software Home Page on the Internet at `http://www.austin.ibm.com/pspinfo/`, or call (800) 992-4777.



Edward Duhe' is a marketing support representative in the IBM Personal Systems Competency Center in Roanoke, Texas. He provides technical support for LAN Distance and OS/2. Edward joined IBM in 1987 as a systems engineer in South Louisiana. He has a BS degree in Business Administration from Louisiana State University and can be reached via Internet at `eduhe@vnet.ibm.com`.

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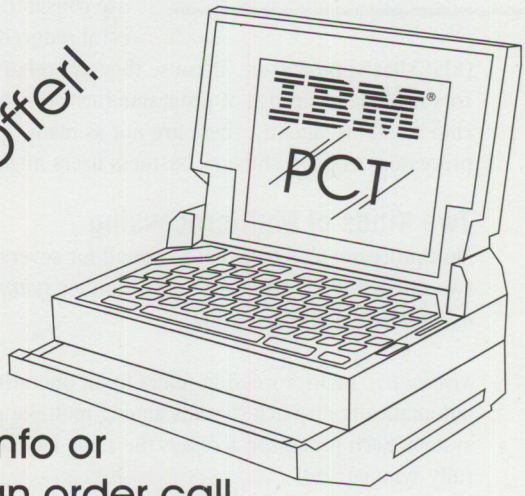
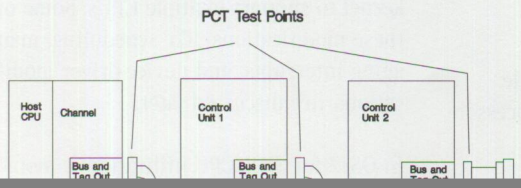
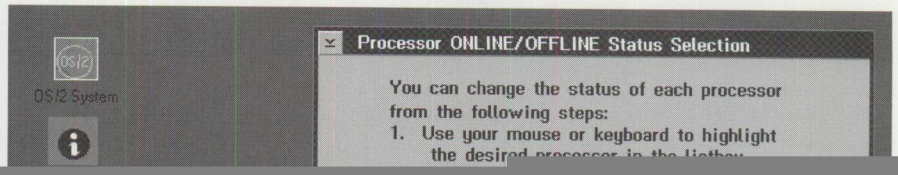


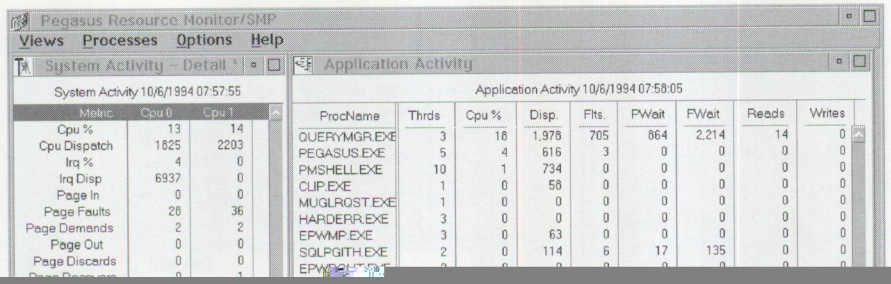


For more info or to place an order call

numbers of CPUs. The Monitor utility is located in the Productivity folder. There are no other changes or additions to icons, folders, or any other objects.



Performance Improvements



resource. When done with the resource, the spinlock is released (unlocked).

Spinlocks provide serial access to an exclusive resource for a very short period of time. Spinlocks have several characteristics:

- They do not replace semaphores.

hardware platforms without having to modify the operating system.

PSDs are specified in the `CONFIG.SYS` file and must conform to the 8.3 file-naming convention (e.g., `PSD=PROLIANT.PSD`). They cannot contain path information, because they are processed early in the startup sequence, before the path information has been processed.

If multiple PSD statements are encountered, OS/2 loads each PSD in the order listed in the `CONFIG.SYS` file. The first PSD to successfully install will be the one that OS/2 uses.

added to the end of the third register line to provide this information. `xx` is a reference to the processor; for example, `p=00` indicates that the currently selected slot is running on processor 0, while `p=01` indicates that the currently selected slot is running on processor 1. The `yy` flags can be an `s`, meaning that the processor is currently spinning, and/or an `r`, meaning that the processor is attempting to grab one of the kernel suspend locks.

- The `.SS` (change current slot) command has been modified to allow you to change the processor save area (PSA) that you want to view. The `.SS` command is identical to the `.S` command

Software Prerequisites

If you want to run IBM LAN Server, DATABASE 2 OS/2 (DB2/2), Communications Manager/2 (CM/2), or Network Transport Services/2 (NTS/2), the prerequisites listed in Figure 4 must be applied. These fixes can be obtained by calling (800) 992-4777.

Acknowledgment

I would like to acknowledge the help of Jim Macon, lead developer of OS/2 for SMP, in preparing this article, particularly the Kernel Debugger section.

LAN Server 3.01

Multimedia File I/O Services

This article explains Multimedia I/O Services (MMIO) functions in detail, as well as MMIO differences between the Windows Multimedia Extension (MME) and the OS/2 Multimedia Presentation Manager/2 (MMPM/2) subsystem.

The trend for people to use multimedia–text, graphics, video, image, animation, and sound–in their daily work is growing. These days, a personal computer can become a musical instrument, a CD player, a television, a movie recorder and player, and so on. Any home electronics equipment that you can imagine will eventually be integrated into the personal computer.

To expedite the development of multimedia applications, IBM and Microsoft have established an industry-standard interface for OS/2 2.x and Windows 3.x, respectively. This interface addresses two key areas: Media Control Interface (MCI), which provides the conceptual model for implementing

is a data-list chunk with only one data chunk, Chunk 6, which may consist of all waveform audio samples for the file.

Note that Chunk 1 is in level 0, Chunks 2 and 5 are in level 1, and Chunks 3, 4, and 6 are in level 2. Position transition from the outer level (low-level chunk number) to the inner level (high-level chunk number) is called *descend.* The converse is called *ascend.*

The advantage of the tag file structure is the flexibility to add new tags while maintaining data compatibility. If the application program always processes the

the number of disk accesses for many small reads. The buffer can either be provided by the caller or allocated by the system.

- *RIFF file I/O*–provides simple functions that locate, create, enter, and access the RIFF chunk.
- *Memory file I/O*–looks like a file to an application. This unifies the interface for applications that access both files and memory.
- *Installable I/O procedure*–knows how to open, read, write, seek, and close the file.

The basic MMIO functions supported by both Windows and OS/2 multimedia extensions are:

- `mmioAdvance`–advances the I/O buffer of a file set up for direct I/O buffer manipulation by `mmioGetInfo`.
- `mmioAscend`–ascends out of a chunk in a RIFF file that was descended into by

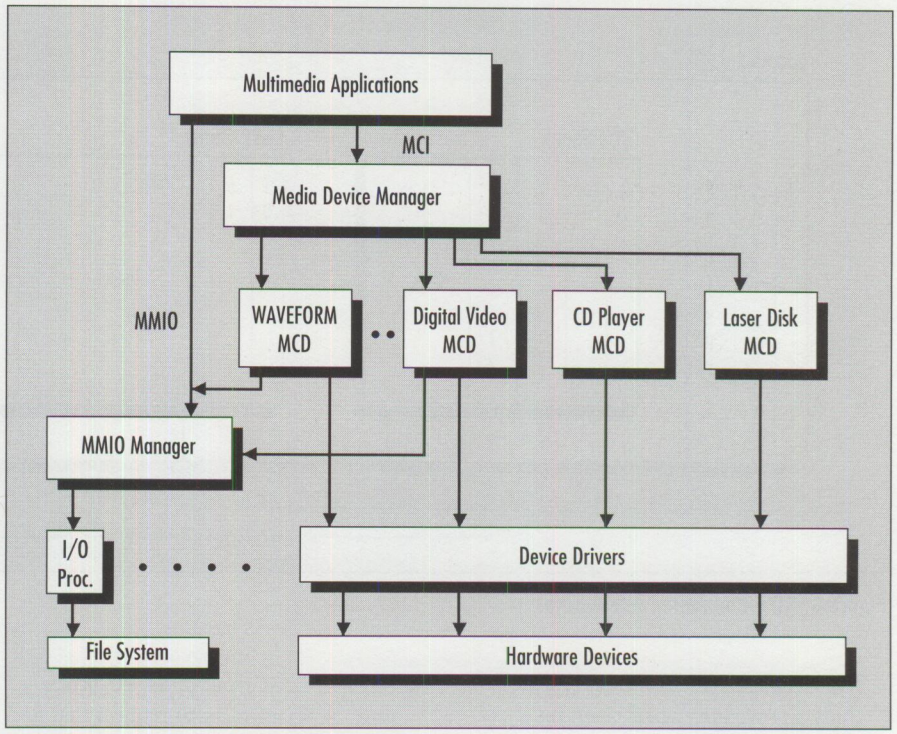
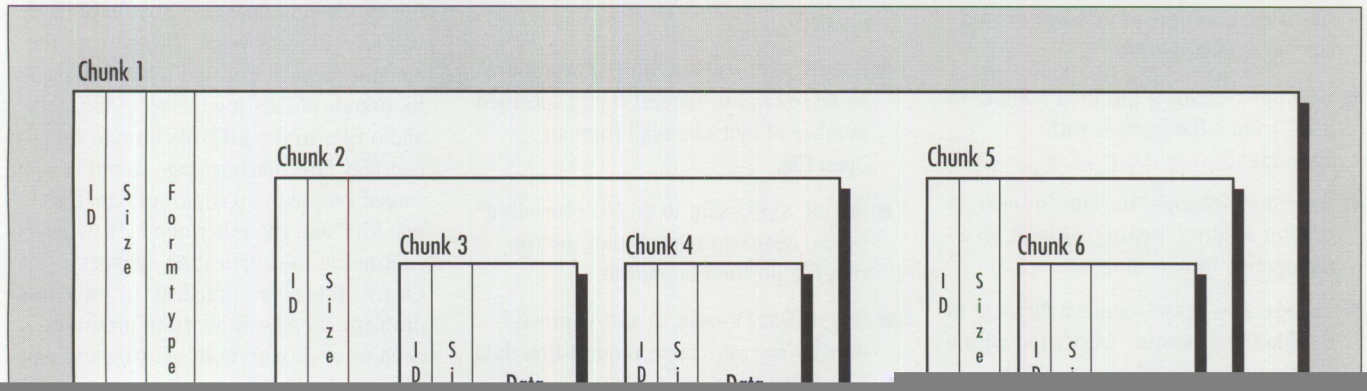


Figure 1. Multimedia System Architecture



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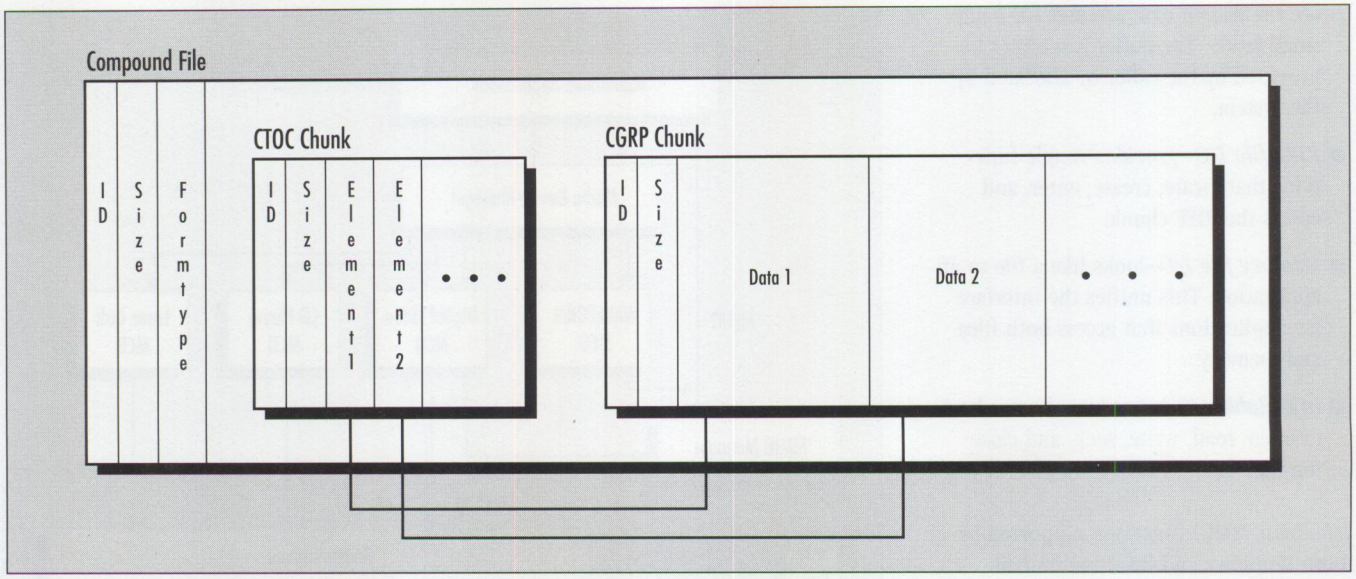


Figure 3. RIFF Compound File Format

removes an IOProc from the table, or finds a procedure when given its FOURCC identifier.

- `mmioOpen`–opens a file for unbuffered or buffered I/O. The file can be a DOS file, a memory file, or an element of a custom storage system.
- `mmioRead`–reads a specified number of bytes from a file opened with `mmioOpen`.
- `mmioSeek`–changes the current position for reading, writing, or both, in a file opened by `mmioOpen`.
- `mmioSendMessage`–sends a message to the file I/O procedure associated with a file that was opened by `mmioOpen`.
- `mmioSetBuffer`–enables or disables buffered I/O, or changes the buffer or buffer size for a file that was opened using `mmioOpen`.
- `mmioSetInfo`–changes information in the file I/O buffer of a file opened for buffered I/O.
- `mmioStringToFOURCC`–converts a null-terminated string to a four-character code (FOURCC).
- `mmioWrite`–writes to a file that was opened using `mmioOpen`.
- `MMIOM_CLOSE`–sent to an I/O procedure by `mmioClose` to request that a file be closed.
- `MMIOM_OPEN`–sent to an I/O procedure by `mmioOpen` to request that a file be opened.
- `MMIOM_READ`–sent to an I/O procedure by `mmioRead` to request that a specified number of bytes be read from an open file.
- `MMIOM_SEEK`–sent to an I/O procedure by `mmioSeek` to request that the current file position be moved.
- `MMIOM_WRITE`–sent to an I/O procedure by `mmioWrite` to request that data be written to an open file.

Three I/O procedures are built into the system: `DOS`, `MEM` (Memory), and `BND` (Bundle). These procedures are also called *Storage Subsystem I/O* procedures, since they can be viewed as wrappers or unwrappers to the physical layout of the files.

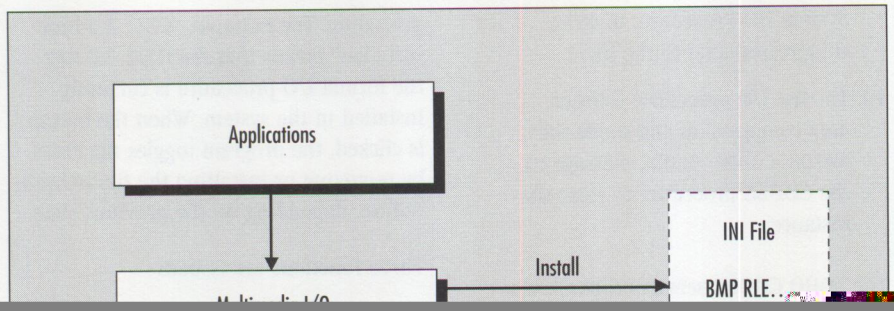
The `DOS` I/O procedure handles the regular DOS files. The `MEM` I/O procedure manages memory files without going through the file system. The `BND` I/O

OS/2 Extension to Base MMIO

The beauty of base MMIO is its ability to easily support a new RIFF file format by installing a corresponding file I/O procedure. However, it does not address existing application programs that have used non-RIFF files for years. Think about the amount of work it would take to convert thousands of existing image, video, and audio files to the RIFF file format. And consider how much storage would be consumed keeping two copies of data files, one RIFF and the other non-RIFF, while continuing the application support. Clearly, this is not practical. To solve this problem, all new application programs need to work with both existing and new file formats.

Standard Interchange Data Format

The OS/2 MMPM/2 solution introduces the concept of a *standard interchange data format.* The purpose is to provide a universal data-presentation level for each different type of media. This way, if the application program is coded to handle the interchange data, it can completely ignore the underlying file formats and still work successfully, provided that the installable I/O procedure supports the standard interchange data format.



In addition, as certain formats such as Photo CD image become pervasive, they can be packaged as an I/O procedure and shipped either directly with the base product, as a separate add-on package, or placed on a BBS. IBM is encouraging third-party developers to create I/O procedures and CODECs for the OS/2 platform.

Need a Fix?

The IBM Corrective Service Facility (CSF), formerly called FixTool, is a tool to distribute and install corrective service packages. This article discusses the service call and fix processes, describes CSF's features, and explains how to use CSF when installing a ServicePak or fix.

A key component in IBM's desire to increase customer satisfaction with OS/2 is to provide timely service to customers who report problems.

When you report a defect with your OS/2 operating system, IBM responds by providing a repair, or fix, to the problem. Fixes come in a variety of formats: single fixes, FixPaks, private fixes, or ServicePaks.

A *fix* is a set of files that corrects an error in a program. Before IBM releases a fix to customers, the fix undergoes extensive testing and verification. After testing, the fixes are made

problems that cannot wait for complete testing and verification.

A *ServicePak* contains all the cumulative fixes developed and tested since the last product release, plus new printer and device drivers for which support is now available. A ServicePak might be released three or four months after the general availability of a new product. However, its timing can be influenced by the nature and volume of service calls.

Service Call Process

When you call IBM Service and Support to report a problem with your operating

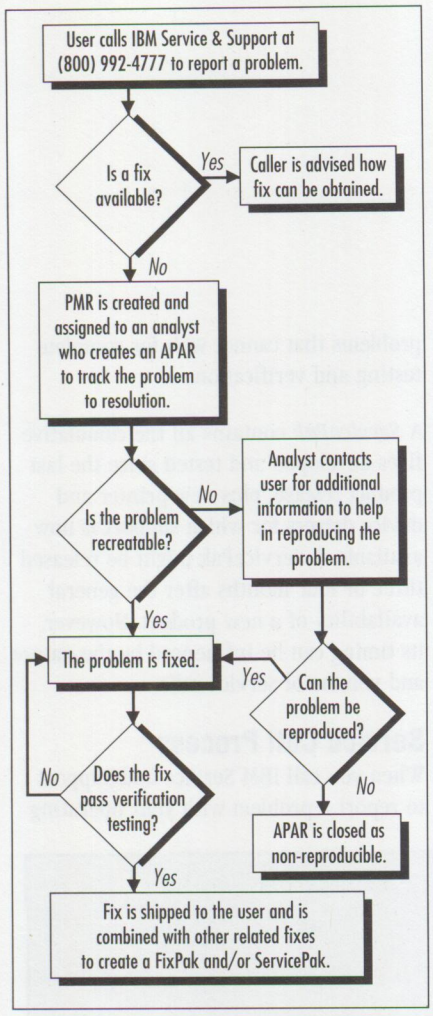


Figure 1. The Fix Process

the fix passes verification testing, it is made available to you.

Figure 1 describes the process of creating a fix.

Corrective Service Facility

CSF is IBM's software service tool for distributing and installing ServicePaks and FixPaks shipped since April 1994.

CSF greatly simplifies the once manual, labor-intensive installation of these packages. It has an excellent graphical user interface (GUI) for manually installing service and fixes to a single system. CSF is also enabled for configuration, installation, and distribution (CID) for fast and easy installation to multiple remote systems attached to a local area network (LAN).

CSF's GUI makes service and fix installation so easy and user-friendly that it will undoubtedly encourage more OS/2 users to maintain the most current code levels on their systems.

Four Major Components

CSF's four major functional components are Service, Backout, Redirect, and Commit.

The *Service* component applies fixes to the operating system. This component

To move an archive to another location:

1. Manually create an `ARCHIVE` directory on the target partition.
2. `XCOPY` all the files from your existing archive to the new directory. *Note:* Before you `XCOPY` your archive to a LAN drive, you should contact your LAN administrator. If you use a LAN shared archive, the `XCOPY` will overwrite the previous archive.
3. Use the Redirect window of the SERVICE facility or the Redirect keyword of the FSERVICE facility to change the reference path of the old archive to the new one.
4. Erase the old `ARCHIVE` directory and all its contents.

The *Commit* component is used to free up disk space used by the `BACKUP` directory. If you are sure that you want to keep the latest ServicePak that was installed on your system and you will not have to back out to the previous code level, you can use Commit to remove all references to your archive. By using this component, you commit to use the currently installed code level. The only time you can commit to remove references to the archive is after you have applied a ServicePak.

After using Commit, you can manually

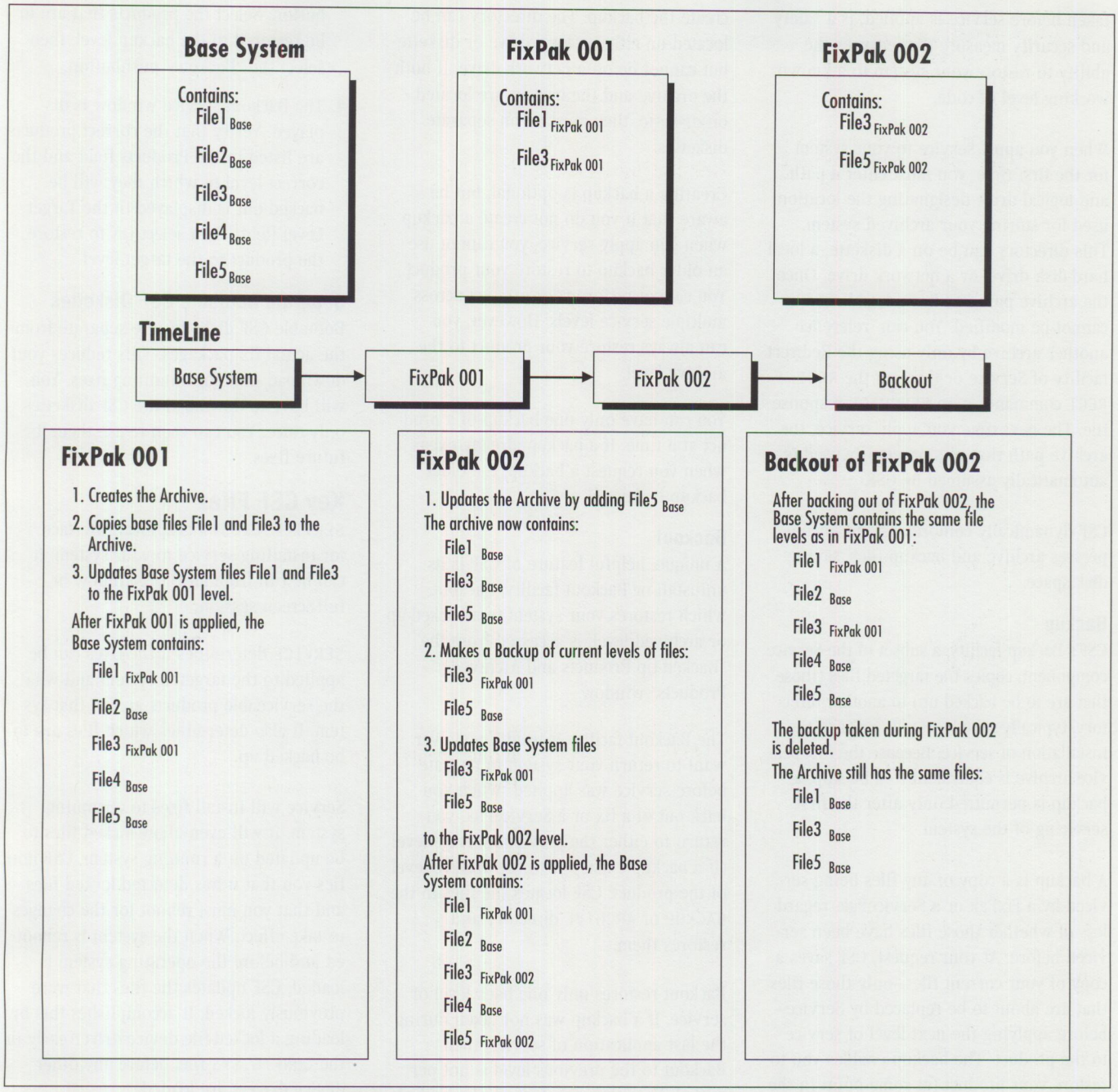


Figure 2. CSF Archive, Backup, and Backout Concepts

These checks are done by reading the `SYSLEVEL.OS2` file on the targeted system. The `SYSLEVEL.OS2` file keeps track of the current version of OS/2 and any optional OS/2 components installed on a system.

In `SYSLEVEL.OS2`, CSF checks the targeted software's country code, version, release level, edition (e.g., Standard Edition or Extended Edition), component ID, and CSD level before any fix is applied.

If prerequisite checking reveals that the installed version of OS/2 is not compatible with the fix that is about to be applied, the fix installation process halts.

If this version passes checking, a final verification is done on the actual file targeted for replacement. If the targeted file is older and differs from the file about to be installed, the installation continues and the file is replaced. However, if the targeted file is newer than the fix, the system notifies you and asks if you want to continue with the replacement. We recommend that you continue and use the service version of the file so that your system stays at the recommended service level.

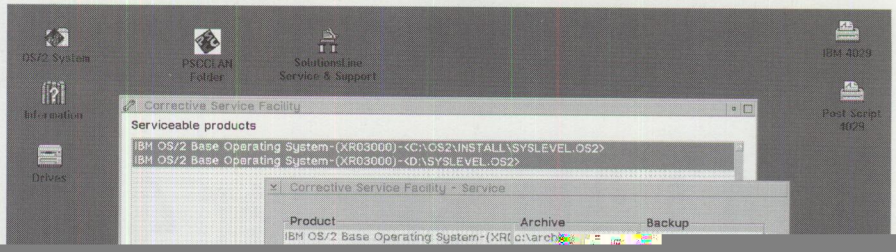
Archiving

For the following sections on archiving, backup, and backout, refer to Figure 2.

Archiving is the process of storing an OS/2 general availability (GA)-level system module in a user-specified directory and drive. A *system module* is typically a component of the operating system such as the kernel or the Workplace Shell. This archived level of code, which is

services all partitions on your system. It is also used in manual installations on systems that must be booted using the CSF installation diskettes.

When `FSERVICE` is invoked, it automatically determines if the service can be applied and to which products it can be



IBM LAN Server 4.0: New Features and Comparisons with NetWare

client. For additional information about coexistence in an OS/2 environment, see the "NetBIOS, SNA, and NetWare IPX Coexistence in an OS/2 Environment" article in the September/October 1994 issue of *Personal Systems.*

NetWare generally uses Novell's proprietary Open Datalink Interface (ODI), which is not Network Driver Interface Specification (NDIS)-based. You cannot interoperate as flexibly with NetWare as with LAN Server, because NetWare allows coexistence with NDIS at the client but not at the server.

DCE Compliance

NetWare 4.02 is not currently DCE-compliant. Instead, NetWare 4.02 uses NetWare Directory Services (NDS), which is a proprietary subset of the X.500 standard. This may be a concern if you are looking at DCE as a future direction.

In contrast, LAN Server is on an open (DCE) path. If you have a large, enterprise-wide network and you are looking for a network operating system that will comply with OSF/DCE in the future, OS/2 LAN Server 4.0 is the one to choose.

Non-Dedicated Server Capability

Because LAN Server runs as an application under OS/2, the server computer does not have to be a dedicated server. You can run other applications, such as CM/2 or DATABASE 2 OS/2 (DB2/2), on

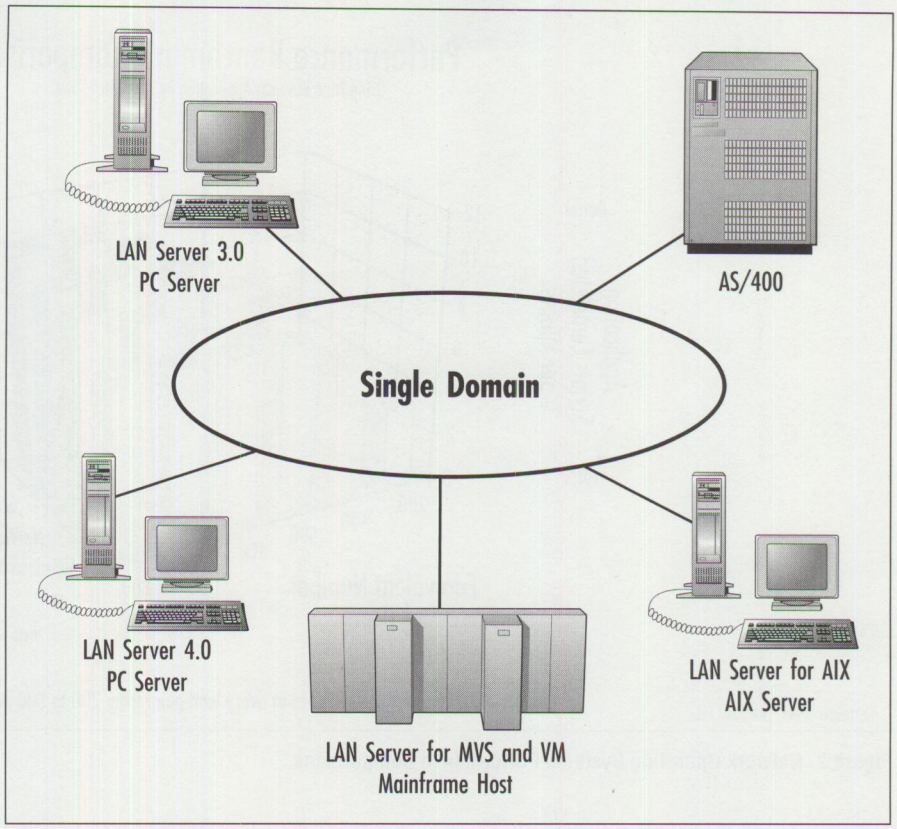


Figure 1. LAN Server Interoperability

NetWare 4.02 does not have this peer capability—to get it, you must purchase NetWare Lite.

Performance Improvements

LAN Server 4.0 includes a variety of performance improvements. The rest of this article discusses these improvements

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LAN Server 4.0 code exploits the Pentium processo

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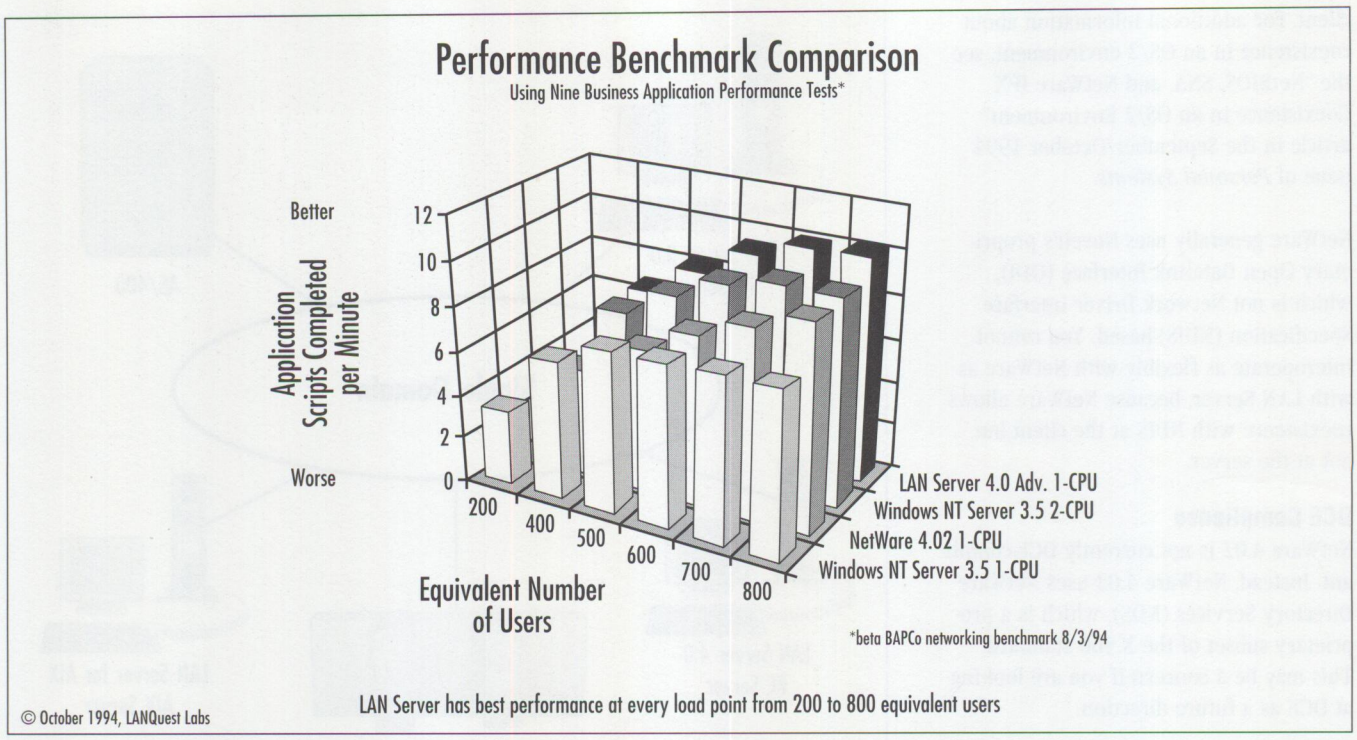


Figure 2. Network Operating Systems Performance Comparisons

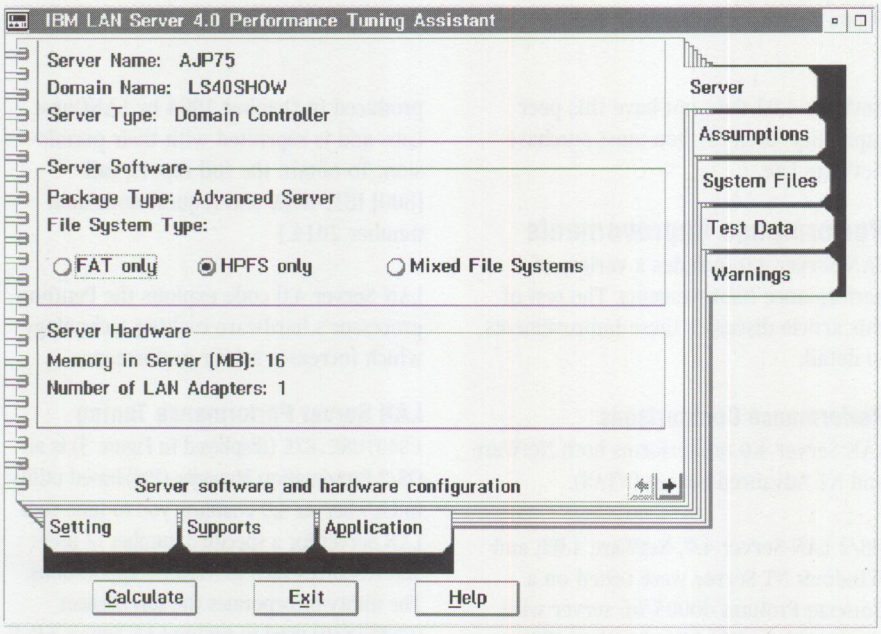


Figure 3. LAN Server Performance Tuning Utility

dynamically allocates memory to the server processes that need memory. This benefit, however, has a drawback: dynamic tuning consumes additional processing time. LAN Server 4.0 can be set up to have ranges of memory allocated for different server processes.

On the average, with proper tuning, LAN Server can easily handle the ups and downs of [illegible]

Adapter-Sniffing

A nice addition in LAN Server 4.0 is its adapter-sniffing capability. When you install the LAN Server code, it identifies your network adapter and its configuration. This simplifies the installation processes for the server and OS/2 LAN Requester. You won't have to open up your server system or workstation to identify its LAN adapter. NetWare 4.02 does [illegible]

LAN Server 4.0 supports a large number of Ethernet and Token-Ring adapter drivers. Adapter manufacturers such as 3Com, Eagle, Novell, Artisoft, Cabletron, DCA, D-Link, Intel, Madge, Racal, SMC, Thomas, Conrad, and Xircom are among those whose drivers are provided in LAN Server 4.0.

IP Protocol Support

Unlike LAN Server 3.0 and earlier versions, LAN Server 4.0 now includes the internet protocol (IP) stack for the server and both OS/2 and DOS clients. This stack is important in LANs connected remotely via IP routers. Many large customers have IP routers that connect their remote sites to central corporate sites.

With LAN Server 4.0, you can configure all your clients and servers to communicate via IP using LAN Server's TCPBeui protocol, enabling you to use your existing IP wide area network (WAN) configuration to connect LAN Server servers with clients located at different sites.

NetWare 4.02 includes the IP protocol and its transport only at the server. For NetWare OS/2 and DOS clients, you must purchase an additional package—either NetWare LAN Workplace for DOS or NetWare LAN Workplace for OS/2. Both of

under OS/2 (see Figure 5). This utility is the equivalent of IBM OS/2 LAN Server

DOS LAN Requester

In LAN Server 4.0, the DOS LAN Requester (DLR) is now called DOS LAN Services (DLS) and is 20 percent faster than DLR in LAN Server 3.0.

When installing DLS, you are given three options: Full Requester install, Base Requester install, and Virtual Windows install. If you plan to use advanced services like peer services and messenger,

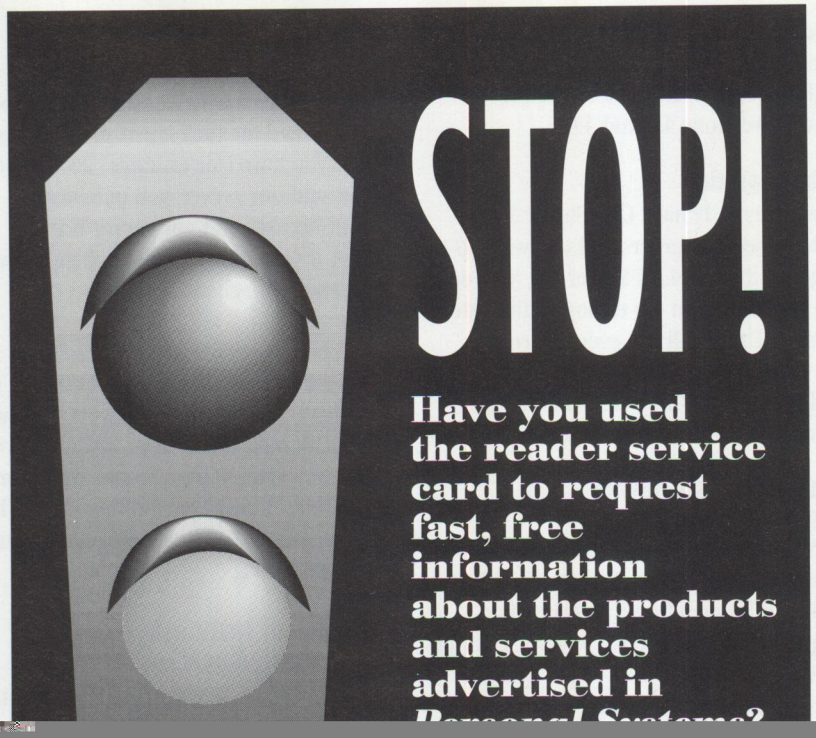
access Directory Services. NetWare 4.02 does not offer backward compatibility with the earlier versions of NetWare servers, versions 4.0 and 4.01.

Easy Migration

If you currently have LAN Server 2.x or LAN Server 3.0 servers and you want to upgrade them to LAN Server 4.0, you simply install version 4.0 on top of the older version. Users will not even notice that

Pricing

LAN Server has always been sold on a pay-as-you-go basis. This means that you are charged for each client you purchase; so, if you have (for example) 26 workstations and one server, you purchase 26 client licenses and one server license. Later, if you need two more clients, you buy two more client licenses.



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IBM DCE Heterogeneous Enterprise Performance

This article presents some of the Distributed Computing Environment (DCE) performance characteristics observed in a moderately complex heterogeneous enterprise environment. A variety of OS/2-, AIX-, UNIX-, and Windows-based DCE systems have been brought together to study DCE application behavior as workloads scale up to more than 1,500 clients supported by 12 to 16 DCE and application server machines.

The IBM Point of Sale (PoS) DCE distributed application benchmark is used to drive the workload for this evaluation. These studies focus chiefly on the DCE topology performance, while noting the behavior of the DCE Administrator, OS/2 Database Manager, and Network File System (NFS) services contending for the system resources.

The primary objective in this article is to extend our DCE performance evaluation to a robust heterogeneous enterprise. (An overview of the enterprise is shown in Figure 1.) As the test environment becomes larger and more complex, the combinations of configurations become too many to adequately evaluate in one article. We have confined these studies to some of the performance questions that are asked most often. In the "Customer Requirements" section, we summarize our customers' feedback from meetings and surveys.

Our secondary objective in conducting these tests is to assure the behavior and performance of DCE for OS/2 and DCE for AIX in a diverse environment. We use off-the-shelf hardware build on the performance knowledge previously gained.

Customer Requirements

Our customers' questions and needs set the direction for our DCE enterprise performance test planning.

During the first half of 1994, we had several opportunities to meet with customers who are, or will be, implementing applications on DCE. Using the results of the question-and-answer sessions and surveys from these meetings, we updated the priorities for our upcoming DCE performance evaluation.

Based on the survey results shown in Figure 2 and on the availability of systems, the studies were updated to include:

- System workloads greater than 1,500 clients. The surveys indicate the highest interest is between 100 and 500 clients. Our previous report focused on

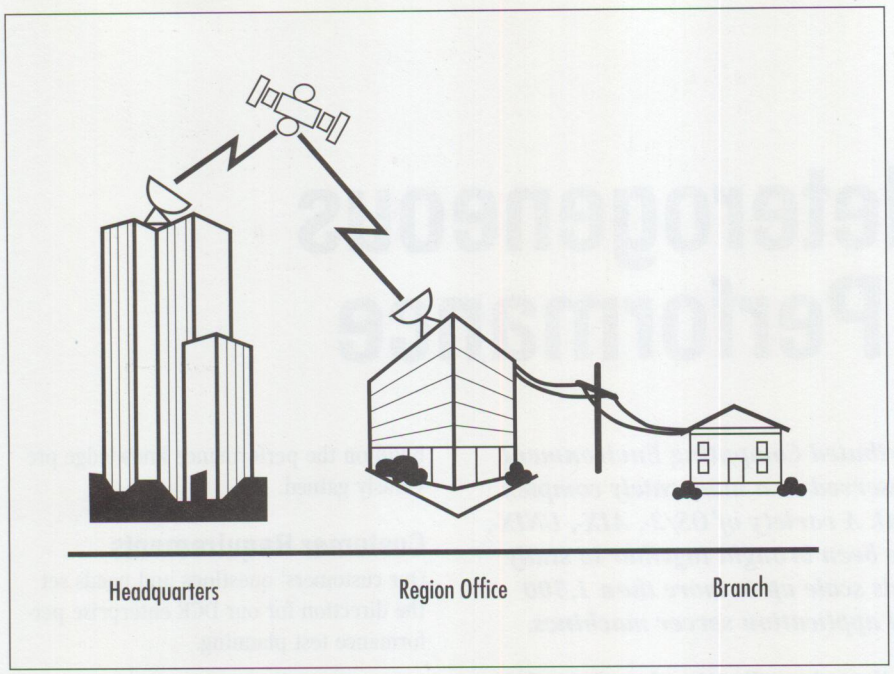

Figure 1. Enterprise Overview

Relative Importance (Normalized) (1 - Least Important / 10 - Most Important)					
Platform	**Windows**	**OS/2**	**AIX**	**Midrange**	**Mainframe**
Client Workstation	5	10	6	-	-
Application Server	-	10	9	4	3
DCE Server	-	9	10	3	2
Number of Clients	**1-99**	**100-499**	**500-999**	**1000-4999**	**5000+**
	2	10	7	5	1
System Geography	**Building**	**City**	**State**	**Country**	**Global**
	8	10	1	6	2
Application Characterization	**Database**		**Data Transfer**		**Graphical**
	9		10		3

this range. In this article, we are studying the second group, workloads up to 2,000 clients.

- Heterogeneous client and server environment. Some interesting clients were added, as well as new DCE and application servers:
  - New clients: Windows, AIX/6000, Sun, and Hewlett-Packard workstations. See "Appendix B: Enterprise Clients" for more information about the clients.
  - New DCE and application servers: Sun, Hewlett-Packard, and several additional PS/2 and RISC System/6000 systems.
- A comparison of the performance of a large single cell to the performance of two smaller cells.
- The performance of single and multiple cells connected by a wide area network (WAN). The survey feedback indicates the greatest interest in system geographies beyond a single contiguous location.

System Topology and Performance Studies

We analyzed and weighed the results of the customer surveys against our available resources in designing the system configuration for these studies. Our test system is a living organism; that is, as additional products on our "wish list" become available, they are added to the system at an appropriate breakpoint in our ongoing testing.

Our performance measurement philosophy in these tests is to view the system behavior from a high level. We do not use high-resolution timers to obtain microsecond-level measurements. Generally, we monitor end-user response time and system throughput and use the following

CSPM
2000 →

surrogate PoS servers (Figure 5 illustrates the distribution of the four PoS server remote procedure call [RPC] routines). Each client imports a new RPC binding

Hence the CPU capacity of the slower machines will continue to constrain the total throughput. A general rule of thumb is: Total throughput is equal to *n* times the throughput of the slowest machine, where *n* is the number of instances of the application server. In effect, the faster machine would respond more quickly but would be idle much of the time while most requests are queued in the slower machines. Therefore, to improve the total throughput, all instances of an application server must be upgraded to faster machines. This "feature" of DCE currently has no work-around.

Normally, the PoS clients import a new CDS binding handle from CDS for every customer sale. However, if the clients remain bound to the application server for longer periods, the throughput will be much higher. In the "standard" configuration, the throughput is 1,640 CSPM with rebinding for every customer sale. If rebinding is not done, the throughput increases to 2,080 CSPM. When there is not a specific need to rebind frequently, the PoS application improves 22 percent in total throughput.

Eliminating frequent rebinding drops utilization of the CDS server CPU from about 40 percent to near zero. The application server's CPU utilization also drops as a result of eliminating handshakes between the client and application server to negotiate the RPC authentication and re-establish the binding. The client's aggregate response time for a complete customer sale is reduced by about 0.5 seconds when rebinding is eliminated. Therefore, higher throughput can be achieved while maintaining acceptable end-user response time.

LAN and OS/2 Database Manager Servers

For the discussion of LAN and OS/2 Database Manager servers, refer to Figure 3, sub-topology C. Other enterprise support servers include:

- Two IBM LAN Server 3.0 domain controllers—an Advanced LAN Server and an Entry LAN Server. These domain controllers support sharing of benchmark programs, collection of performance data, and various network install services. All OS/2 systems are also LAN Requester 3.0 clients.

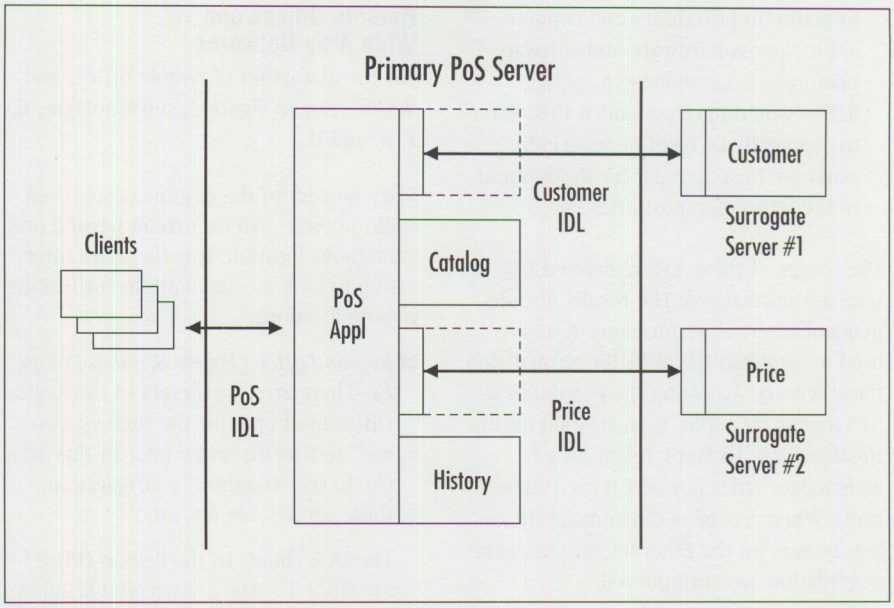

Figure 5. Distributed PoS Schematic

- OS/2 ES 1.0 Database Manager Server. This server supports the database OLTP benchmark clients and runs continuously to provide network loading.
- Network File System (NFS) for OS/2 Servers. The two LAN servers are also NFS servers. These compare the NFS I/O performance between OS/2, AIX/6000, SunOS/Solaris, and HP-UX servers.

The Token-Ring/Ethernet Gateway

For the discussion of the Token-Ring Ethernet Gateway, refer to Figure 3, sub-topology D.

The Headquarters network includes an Ethernet LAN segment to support the HP and Sun machines. The 16 Mbps Token Ring and 10 Mbps Ethernet are linked by a RISC System/6000-220 acting as a gateway router.

The Ethernet begins as a "thick wire" connection to the RISC System/6000 gateway, then to "thin wire," and finally to "10BASET" terminating at the Sun Sparcserver 1000. The HP 9000 827S server and 730 client are attached to the thin wire, and the Sun Sparcstation LX is attached to the thick wire.

Two simple tests evaluate the efficiency of this particular Token-Ring-to-Ethernet LAN gateway. It is not our mission or intent to compare the performance of specific hardware and operating system platforms, so we only make general observations about this LAN segment:

- The first Token-Ring-to-Ethernet gateway test measures a 4,096-byte "ping" from a single OS/2 client in each LAN segment. (The LAN segments are Headquarters Token-Ring segment, Headquarters Ethernet segment, Region Token-Ring segment, and Branch Token-Ring segment.) The OS/2 Transaction Control Protocol/Internet Protocol (TCP/IP) ping function is used for measurement, since it reports its response time with a timer resolution of 31 milliseconds. Each of the selected OS/2 workstations pings each of the 15 PS/2, RISC System/6000, HP, and Sun servers.

  Within each subnetwork (Headquarters, Region, and Branch), the 4 KB ping responds in 31 to 34 milliseconds (one timer tick). A ping between the Region and Branch (null modem) is about 2,580 milliseconds; between the Region and Headquarters (4 Mbps link) is about 62 to 64 milliseconds; and across the Token Ring-to-Ethernet gateway adds 10 to 30 milliseconds.
- The second gateway test indirectly accesses the four PoS data repositories using the NFS mount command. For this test, a single instance of the PoS primary server is running.

  Although applications usually employ a relational database manager (RDBM) to manage their data, the PoS data is stored in plain binary files and accessed using portable ANSI/POSIX C language calls. We made this decision

to maintain portability and comparability across hardware and software platforms, because using a specific RDBM would have precluded this. Refer to "Appendix D: Point of Sale (PoS) Database Descriptions" for descriptions of the four PoS repositories.

The results of these NFS redirected I/O tests are normalized. The results of independent external performance tests are used to establish the basis for normalizing these servers. Accessing the PoS data via NFS mount on a RISC System/6000 on the Headquarters 16 Mbps Token Ring is assigned an efficiency of 1.0 (or 100 percent). When accessing data on the HP and Sun servers on the Ethernet, two levels of degradation are encountered:

- When the NFS mount is from a Token Ring-attached PoS Primary server through the gateway to the Ethernet-attached servers, the efficiency is 0.75, meaning a 25 percent loss in maximum throughput.
- When the PoS Primary server is moved to the gateway server and the NFS mount is done from this gateway server, communication goes directly to the Ethernet adapter. The efficiency improves to 0.88, or only a 12 percent loss in maximum throughput.

Remote Offices and Wide Area Networks

For the discussion of remote offices and WANs, refer to Figure 3, sub-topologies E, F, G, and H.

Sixty percent of the customers surveyed indicate their systems extend beyond one contiguous location. It is therefore interesting to look at some options for linking remote locations.

- *Region Office (Figure 3, sub-topology F)*—There are two servers in the Region Office used only for the "one vs. two cell" testing discussed later in this article. In the "standard" configuration, these servers are not used.

  The DCE clients in the Region Office are OS/2 2.1, OS/2 Warp, and Windows. In the "standard" configuration, these clients can exert the workload of 190 clients, or 190 CSPM. The 190 CSPM includes the 7.5 CSPM workload of the Branch Office. (The Branch Office is connected to the Region Office by an IBM LAN Distance null-modem line.)

Several tests evaluate the impact on performance of traversing the links. . .

  When running the entire system at 1,640 CSPM, the Sniffer shows less than 0.8 Mbps flows across the 4 Mbps link. The throughput exerted by the Region Office is 190 CSPM. Therefore, if we assume a 1 Mbps link, the 0.8 Mbps traffic is nearly full utilization of the link. Thus, 190 clients would be about the maximum a single 1 Mbps link could support.

- *Low-Speed Link (Figure 3, sub-topology G)*—The Branch Office (H) is connected to the Region Office (F) using IBM LAN Distance. The physical link is a Null Modem set at 38,400 bps.

  We did encounter a problem configuring the Windows client in the Branch Office. The increased response time across the null modem caused an unidentified time-out situation that terminated the Windows 3.1 desktop. When the Novell LAN Workplace 4.1 TCP/IP was replaced with the IBM TCP/IP, the problem was eliminated. The IBM TCP transport for DOS does not perform as well as either the Novell transport or the other two non-IBM transports for DOS that we have tested, and it would not normally have been our first choice.

Between the Branch and Region (38,400 bps), the ratio is 75:1, where the line speeds ratio is 426:1. Between the Branch and Headquarters (across both WANs), the ratio is 77:1.

- *Authenticated RPC 4 KB Data Transfer*–The next test uses an application program to transfer 4 KB of data from a client to a server in an authenticated RPC call. This test should be expected to perform better than the ping test, but since the application is still data-transfer-intensive, the degradation remains high due to the effect of the line speeds.

  Using DCE Security "call" level authentication, the ratio is 36:1 across the 38,400 bps link and 1.4:1 across the 4 Mbps link.

  Using DCE Security "packet privacy" (encryption) authentication level, the ratio is 8:1 across the 38,400 bps link and 1.1:1 across the 4 Mbps link. The ratio improves because the larger portion of the total response time is expended by the server and client encrypting and decoding the data packets.

- *PoS Customer Sale (the average data size is 3.2 KB, with a range of 1 to 16,384 bytes)*–In real life, the time spent within the client and server application is much longer than the time spent actually moving data across the network. Therefore, we should expect the response-time ratio to improve to a more acceptable level, since the RPC portion of the PoS application is less than 5 percent of the aggregate response time when run locally in Headquarters.

  The PoS ratio between the Branch and Region on the 38,400 bps link is 9.2:1 and between the Region and Headquarters the ratio is 1.5:1.

- *DCE Calls*–Although many DCE func-

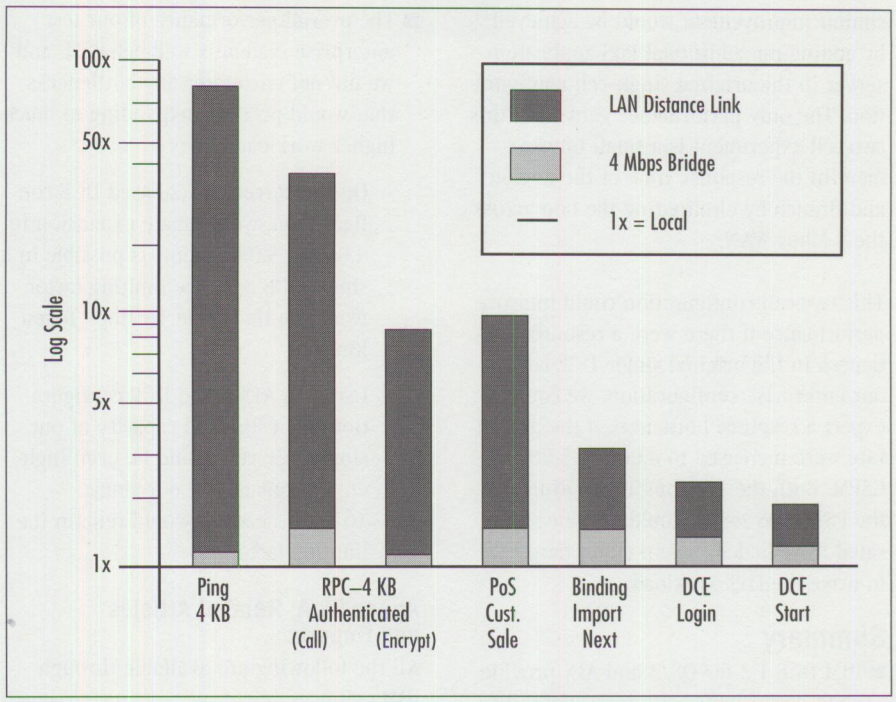

Figure 6. Response-Time Cost for WANs

  - DCESTART–The ratio across the 38,400 bps link is 1.4:1 and across the 4 Mbps link is 1.3:1.

End-user response time across the wide area network is closely tied to the frequency and data size of data transfer operations. The PoS application makes an average of 5.5 RPC calls and seven DCE API calls for each customer sale. The overall response-time ratios for a complete PoS customer sale (null modem 9.2:1 and 4 Mbps link 1.5:1) are probably more representative of many interactive end-user applications across these specific WANs.

Since the two clients in the Branch Office are able to saturate the 38,400 bps link at 7.5 CSPM, this LAN Distance link can handle up to 7.5 clients under the best of conditions. In reality, LAN Distance is intended for a single client; and extrapolating from our results, a minimum 5,120 bps link would be sufficient for one clients' DCE and PoS activity, while the Headquarters cell handles only the clients on the Headquarters network. Both cells are running, and some amount of LAN Server activity is the only traffic across the 4 Mbps link between Headquarters and the Region Office. There is no DCE Global Directory Server (GDS) for this test.

- The throughput in Headquarters drops from 1,640 CSPM to 1,570 CSPM due to the reduced client horsepower. When we start up more clients to replace those now in the other cell, the throughput returns to 1,640 CSPM. Therefore, the capacity of the Headquarters' DCE cell is neither diminished nor improved by splitting the Region and Branch off into a new cell.

- The throughput in the Region Office remains at 190 CSPM with a PS/2 8595 DCE server and a RISC System/6000-

OS/2, DOS, and Windows NT Coexistence

Scenario | Installation Sequence | Results

If both the Boot Loader and Boot Manager

When you restart your system, Boot Manager will let you select either Windows NT or OS/2.

Scenario 2: Windows NT, DOS, and OS/2

Because DOS cannot recognize data on an NTFS or HPFS partition, you should install all of your applications on a FAT partition. OS/2 and Windows NT can access the FAT partition with no problem.

Figure 4 shows the partition information needed for installing Windows NT, DOS, and OS/2 in Scenario 2.

Partition Type	Drive	Size
OS/2 Boot Manager		1 MB
NTFS (for Windows NT)	C: (primary)	100 MB
HPFS (for OS/2)	D: (logical)	100 MB
HPFS (for applications)	E: (logical)	as large as possible

Figure 3. Partition Information for Scenario 1

Partition Type	Drive	Size
Boot Manager		1 MB

OS/2 for SMP and Windows NT Coexistence

```
Boot Loader V3.1

Windows NT could not start because the following file is missing
or corrupt:

<winnt root>\system32\ntoskrnl.exe.

Please re-install a copy of the above file.
Boot failed.

    ------- OR -------

Microsoft « Windows NT (TM) Version 3.1 [32320 KB Memory]
autochk program not found - skipping AUTOCHECK

STOP: c000021a {Fatal System Error}
The Session Manager Initialization system process terminated
unexpectedly with a status of 0xc000003a. The system has been
shutdown.
```

Figure 1. Windows NT Error Messages

If both the Boot Loader and Boot Manager are installed, Windows NT will fail with one of the errors shown in Figure 1.

Performance is a primary concern in this coexistence scenario. While the NT File System (NTFS) and High-Performance File System (HPFS) ensure maximum system performance, you should install your applications on an HPFS partition. Windows NT can access data on an HPFS partition, but OS/2 cannot recognize data on an NTFS partition.

Figure 2 shows the partition information needed for installing Windows NT and OS/2 for SMP.

Corrective Service Information

Figure 1 shows maintenance release levels for the listed products. This information is effective as of November 18, 1994. CSDs may have been updated since press time.

To order all service packages—except for the OS/2 2.0, OS/2 2.1, OS/2 2.1 for Windows, and OS/2 2.0 Toolkit ServicePaks—call IBM Software Solution Services at (800) 992-4777. For the OS/2 2.0 ServicePak (XR06100), OS/2 2.1 ServicePak (XR06200), OS/2 2.1 for Windows ServicePak (XR06300), or the IBM Developer's Toolkit for OS/2 2.0 ServicePak (XR06110) on diskettes or CD-ROM, call (800) 494-3044. Most OS/2 service packages are also available electronically from the following sources:

- **OS/2 Bulletin Board Service (BBS)**: Once connected, select Option 2. (Corrective services are also listed under the General category on the IBMLink BBS.) To subscribe to the OS/2 BBS, call (800) 547-1283.
- **IBM Personal Computer Company (PCC) BBS**: Call (919) 517-0001. Service packages are located in Directory 4.
- **CompuServe**: Download service packages from the IBM OS2 FORUM library (GO IBMSERV).
- **Internet**: Do an anonymous FTP from software.watson.ibm.com. Most packages are located in the `\PUB\OS2` directory. TCP/IP packages are located in the `\PUB\TCPIP\OS2` directory.

—Arnie Johnson, IBM Corporation, Austin, Texas

Product/Component	Release	CSD Level	PTF Number	Change Date	Comments
OS/2 Standard Edition	1.3	XR05150	XR05150	2-10-93	
OS/2 Extended Edition	1.3	WR05200	WR05200	5-12-93	WR05200 replaces WR05050, which can no longer be ordered on diskette.
OS/2	2.0	XR06100	XR06100	9-1-93	XR06100 replaces XR06055.
OS/2 2.10 ServicePak	2.1	XR06200	XR06200	3-1-94	This package is not for OS/2 2.1 for Windows.
OS/2 2.11 for Windows ServicePak	2.11	XR06300	XR06300	5-24-94	

Product/Component	Release	CSD Level	PTF Number	Change Date	Comments
OS/2 Network Transport Services/2 SelectPak	2.00	WR07045	WR07045	4-27-94	
OS/2 LAN Adapter and Protocol Support SelectPak	2.20.2	WR07045	WR07045	4-27-94	
Communications Manager/2 Version 1.01 ServicePak	1.01	WR06050	WR06050	6-11-93	Available only on diskette.
CM/2 Version 1.11 ServicePak	1.11	WR06150	WR06150	5-31-94	
DOS	4.0, 4.01	UR35284	UR35284	9-26-91	
	5.0	UR37387	UR37387	9-22-92	
C Set/2 Compiler	1.0	CS00050	XR06150	6-29-93	
C Set C++ Compiler	2.0/2.01	CTC0002	XR06102	12-15-93	
C Set C++ Compiler	2.0/2.01	CTC0010	XR06190	9-15-94	
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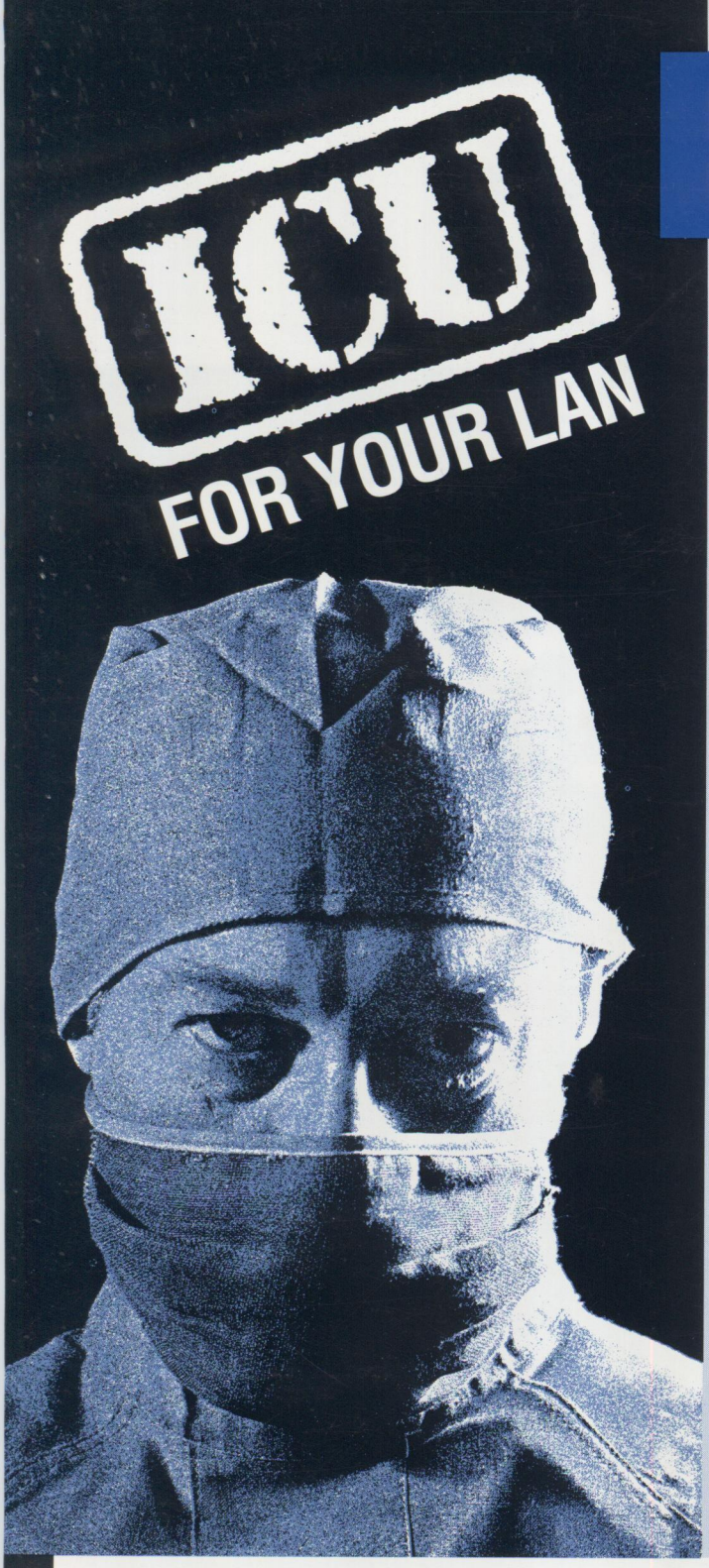

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