



iSeries Client Access Express for Windows iSeries Access for Web WebSphere Host Publisher

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capabilities...and iSeries Client Access is the product that enables your users to effortlessly access all the iSeries server resources!

We live in a world that is constantly running short on time and talent, and we must make the best use of our existing skills and applications. Yet we need to move forward with new technologies (for example, moving applications to the Web, or making corporate business processes more portable for use from wireless devices). iSeries Client Access provides a variety of alternatives to best work with your data today, tomorrow, and in the future. Client Access has been meeting the needs of customers since the AS/400 first arrived

in the market, and Client Access is now continuing to exploit new iSeries leading-edge technologies and provide new e-business opportunities to customers in every corner of the globe.

The iSeries is IBM's integrated business server within its eServer family that lets you run sophisticated business applications effortlessly and continuously. With iSeries, you can run multiple

environments simultaneously to enable you to control deployment and speed up implementation. The iSeries is one of the most flexible

and easy-to-use servers in the industry, and this is why it is considered the leading platform for managing complexity and reducing the cost of e-business enablement. However, no server is complete unless it has desktop users connecting to it and using its

Who is iSeries Client Access for?

Client Access, the strategic iSeries connectivity product, is designed to be used by anyone connecting to iSeries

It is for <u>anyone</u> connecting to an iSeries or AS/400e server--this includes your end users, your OS/400 administrators and operators, and your programmers. It can be used by those who work within your enterprise, yet it is also ideal for those who need to access your iSeries through its web server interface or the Internet.

What is included in the iSeries Client Access Family product?

The iSeries Client Access Family contains three unique products:

Client Access is the leader in delivering the latest iSeries technologies to the desktop

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- iSeries Client Access Express for Windows runs natively on Windows 95, 98, Me, NT 4.0, 2000, and soon XP. This client includes many useful functions for your everyday intranet user (including 5250 emulation, database and printer access). It provides the window to your OS/400 GUI administration and operations through its Operations Navigator capabilities; and it contains a wealth of middleware for developing PC-to-iSeries client applications.
- iSeries Access for Web is a set of servlets that runs in the OS/400 JVM and sends HTML output to a browser--Internet Explorer, Netscape, or Opera. This alternative provides your intranet or Internet users access to work with iSeries resources, for example, perform database queries, use its printers, work with information in the Integrated File System (IFS). This is all accomplished using industry-standard HTTP (or HTTPS) access,

Client Access Express for Windows runs natively on Microsoft Windows 95, 98, Me, NT 4.0, 2000, and soon XP

iSeries Access for Web runs on the iSeries Java Virtual Machine (JVM) and sends HTML to any standard browser

WebSphere Host Publisher is a programming tool used to modernize your 5250 applications without ever touching the source code!

iSeries operators and administrators cannot use or manage their systems without Operations Navigator... and from a variety of workstations (such as Windows, Linux, Network Stations, Macintosh) without needing any unique iSeries software installed on their desktop.

• WebSphere Host Publisher - is a programming tool that can be used to web-enable 5250 applications, hosts screens, and DB2 UDB on iSeries queries. Users can work with legacy 5250 applications (entering input, extracting output) or work with the iSeries database (doing SQL queries, inserts, updates and deletes) using a thin client browser-based HTML solution that is firewall-friendly. Host Publisher applications can contain multiple components, yet all the programming logic runs on the iSeries--even the 5250 session management tasks. It is well suited for extending host application functionality over the Internet, without requiring the end user to download large client components or trying to navigate through an entire 5250 application.



Let us start with iSeries Administrators and Operators...what's in it for them?

Operations Navigator delivers the window to OS/400. It provides capabilities for stepping through the initial iSeries and OS/400 setup and configuration, then it moves into providing a

GUI for your day-to-day management of your single or network of iSeries servers. Some of the capabilities provided to iSeries users are:

- EZ-Setup is a set of wizards that guide you through the initial setup of a new iSeries server. It aids you in configuring your OS/400 Operations Console, setting system values, configuring security, creating system administration user profiles, configuring a connection from the iSeries to Local Area Networks (LAN), and then provides assistance for further setup such as setting up a Domino, Internet, or LDAP server or backing up your server.
- Operations Console allows your PC to be used as the system console (using Client Access Express 5250 emulation) and to perform control panel functions. You can administer your local iSeries server as well as iSeries servers at different locations. Operations Console provides support for LAN, TCP/IP dial-up connectivity, and direct cable attachment. This enables you to perform system functions such as IPLing the system, etc.
- Operations Navigator is a graphical user interface that provides a connection to your system that looks and feels familiar to those experienced with Microsoft Windows platforms. You get point and click functionality to manage a single or hundreds of servers -making the operation and administration of your iSeries servers

A network administrator's dream--nothing to maintain on the desktop!

easier and more productive. For instance, you can set up a new user profile onto another system by simply dragging the user profile from one server to the other. Wizards guide you setting up end user access to OS/400 resources, administering your DB2 UDB for iSeries, performing day-to-day operations (such as Work Management, managing the integrated xSeries servers), and



configuring advanced capabilities (such as Virtual Private Networks).

Operations Navigator also includes Management Central, that allows management of multiple iSeries servers from a central system. This includes real-time performance monitoring, fix management

(PTFs), distributing objects, and running commands from a central system.

Flexible tools to more easily manage your e-business

 Management Central has been extended to 'Pervasive' to enable operators to remotely monitor system performance and status using an Internet phone, a PDA with a wireless modem, or a traditional web browser, and take actions.

All the above functions are packaged in the iSeries Client Access Express for Windows product. This software is included with OS/400 at no additional charge so these capabilities are available for use by all OS/400 users.

How about the typical iSeries End User?

It is difficult to define a *typical iSeries End User*. With over 750,000 iSeries and AS/400e servers worldwide and millions of users connecting to them, what is *typical*? Some end users run the same 5250 application(s) day after day, others may additionally use Windows productivity tools (for example, Excel, 1-2-3, Access, etc.) to work with database information, many may be saving PC data in the Integrated File System or working with OS/400 printer output and printers. Perhaps they mostly run a desktop application that works with data in DB2 UDB for iSeries, or maybe they have fully moved into the e-business world... iSeries Client Access has a history of delivering a wide variety of easy-to-use and highly functional desktop-to-iSeries software to meet our end-user needs. Let's look at our two unique desktop offerings and our new programming tool.

iSeries Access for Web ican be used to access the iSeries through browsers, such as Netscape, Internet Explorer, Opera

iSeries Access for Web runs on desktops such as Windows, Linux, Macintosh, UNIX/AIX, or Network Stations.



iSeries Access for Web

With iSeries Access for Web you enter a new frontier for accessing your iSeries server information and resources. The Internet

movement has taken over, and businesses are quickly moving to embrace new technologies through e-business. and are looking for easy ways to work with business-critical OS/400 information and resources through a familiar user interface designed to be Internet-friendly. You use iSeries Access for Web by simply starting up your favorite browser and keying in the iSeries TCP/IP address, then OS/400 resources are delivered to browsers as familiar HTML web pages. iSeries Access for Web runs entirely on the server as a set of servlets in the iSeries Java Virtual Machine (JVM) -- no installation or configuration is required on end user desktops. With this kind of simplicity, it makes it easier to move more of your business to the web, and opens up new ways to use your iSeries in the world of e-business. Here are some of the features of iSeries Access for Web:

- Network administrators want maintenance-free connectivity code to their iSeries. There is no client code to install or manage on the desktop other than a web browser, such as Netscape, Internet Explorer, or Opera. The administrator needs only to install and configure iSeries Access for Web on their server, then users can simply invoke or link to its URLs and take advantage of the functions it provides.
- Businesses want access to iSeries servers from a variety of platforms. Since iSeries Access for Web only requires a standard web browser, this extends the desktop operating system choices from not only Windows but to other key platforms, such as Linux, Macintosh, AIX, UNIX, and Network Stations.
- iSeries administrators are looking for ways to streamline management and centrally control user access to their resources through OS/400 user profiles. iSeries Access for Web fully embraces OS/400 security, and puts control in the hands of the administrator. Additionally the iSeries Access for Web product itself is fully customizable (through templates and user profile settings) so administrators can define each user's (or groups of users) view of the iSeries server. This enables those not familiar with the OS/400 operating environment to easily and productively work with iSeries programs, its database, and other resources through user-centric, web-based portal views of iSeries server information and resources uniquely designed by the administrator. You can even customize what columns are displayed in various

Great for Internet and Intranet access to Series

lists, what actions can be taken, what functions appear in the navigation bar, etc.

Administrators and users also are looking for solutions that
provide hassle-free access through firewalls with no requirements
for proprietary TCP/IP ports or protocols. iSeries Access for Web
uses industry-standard protocols (HTTP and HTTPS) and the
built-in browser functions for encryption, i.e., Secure Sockets
Layer (SSL) which eliminates the need to install special
encryption programs on the desktops. This all contributes to
simplifying managment of 'the network'.

You're ready for e-business with iSeries Access for Web!

- Experienced iSeries users want easy ways to access their server information. iSeries Access for Web delivers services such as:
 - ❖ A GUI access to upload data to the DB2 UDB for iSeries database, and download data to the user desktop (for example into an Excel spreadsheet). Many database functions such as insert, delete, update, and query are provided through a graphical interface.
 - ❖ A simple interface for working with information in the Integrated File System (IFS), including download and view capabilities.
 - ❖ Full capability to work with iSeries and AS/400e printers and printer output (such as start, hold, delete, etc.).
 - Run 5250 host applications. The WebSphere Host Publisher runtime code has been seamlessly integrated with iSeries Access for Web to provide this capability.
 - The ability to run batch commands without starting a 5250 session. Prompt support is also available.
 - Users can send and display iSeries messages and manage message queues.

Simply put, the iSeries Access for Web's first release is a powerful enabler for your e-business, and it will get more powerful with each future release.

Client Access Express for Windows is the most powerful and easy-to-use client connectivity product in the iSeries marketplace Welcome to

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iSeries Client Access Express for Windows

iSeries Client Access
Express for Windows is an all-inclusive client solution for accessing and using iSeries and AS/400e resources from your Windows desktop. Client Access Express delivers a solid technology and solution foundation to

Runs natively on Windows 95, 98, Me, NT 4.0, 2000, and soon XP

improve end-user productivity, increase programmer options for working with iSeries resources, and enhances OS/400 administration. It is the flagship carrier for iSeries connectivity as it delivers unparalleled manageability and scale and incomparable flexibility. Express was introduced in 1999 and evolved from the previous Windows client called AS/400 Client Access for Windows 95/NT. The Express client is designed to take advantage of the latest technologies in the OS/400 and Microsoft operating systems. For example, Express uses the built-in functions of the Windows desktop to enable users to quickly and easily connect to iSeries and AS/400e servers, while also utilizing recent OS/400 advancements such as NetServer to provide PC users network print and file serving capabilities. Some highlights of the Express client content are:

High-function 5250 display and printer emulation capabilities

- Runs on PCs having Microsoft Windows 95, 98, Me, NT 4.0, 2000, and soon XP operating systems. It also is supported in 3-tier networks and runs on Microsoft Terminal Server Edition (TSE), Microsoft Internet Information Server (IIS), Microsoft Transaction Server (MTS). It can also be used with Citrix MetaFrame which extends the desktop coverage beyond Windows operating systems to Linux, Macintosh, UNIX, and even Network Stations.
- Leverages the Net through its TCP/IP connectivity support including LANs, WANs, and the Internet. Network security is enhanced through the use of Secure Sockets Layer (SSL) for server authentication. The PC5250 emulation also provides client authentication over SSL. The Express client is tightly integrated with the iSeries Key Management to simplify the administration of working with key databases for SSL connections.
- Contains 5250 display and printer Emulation called PC5250. This high-function emulation program enables PC users to run 5250 applications, work with OS/400 screens, and send OS/400 output to PC printers. It has had many recent enhancements, not only in additional functionality and ease-of-use, but to improve an iSeries administrator to centrally control PC5250 settings on the desktop. For example, an administrator can standardize the PC users' keyboard and display setting by maintaining all profiles (such as .WS profile) on the iSeries and multiple 5250 sessions

Easily work with iSeries database through Data Transfer

GUI. Fully integrated with Microsoft Excel

Exploits iSeries NetServer for file and print serving

An network administrator's dream, simply install Express on the iSeries server. PC users can then easily install client code to their desktops, and Express keeps the code up-to-date.

can share the same profile. Additionally, PC5250 provides several methods for assigning workstation device Ids. For example, part of the device ID can be assigned a generic name (such as, "WS1", or the Windows Computer Name, or the Windows User Name), it can also be prefaced with a "P" for a printer session or a "S" for a display session, and it can be appended with the session ID (for example, A, B, C) or an auto-incrementing ID (for example, 1, 2, 3).

- Data Transfer simplifies the flow of data between a PC and the iSeries database (DB2 UDB for iSeries). It is used to extract selected database information, convert it, and transfer it to the PC. It is also tightly integrated with Microsoft Excel and Lotus 1-2-3 to make it easy to exchange data between spreadsheets and the iSeries database. Data Transfer also provides a plethora of conversion formats so data can be used from a variety of sources. It continues to improve support of Web serving by also supporting file types such as UTF-8 which is used by Netscape Navigator and Internet Explorer. Data Transfer also supports batch transfers, and enables an administrator to build requests which can be provided to end users or could even run automatically at predefined times with no end user interaction. Data Transfer keeps in step with new OS/400 database capabilities, for example it supports of 64-bit integers and floating-point data types, Datalinks, etc.
- Utilizes AS/400 NetServer for PC file serving and network print support. This better enables an iSeries administrator to fully control what his PC users can access and use on the server. It also eliminates needing proprietary software to be installed on the desktop to convert Windows file system requests to iSeries file system requests--this improves performance and stability of the client connection.
- Delivers client/server application drivers for iSeries (including Open Database Connectivity (ODBC) driver, OLE DB provider, IBM Toolbox for Java) so users can run any client application to access resources on the iSeries server.
- Is fully integrated with OS/400 security, and provides both a
 Microsoft Windows and OS/400 user profile way to control user
 access to iSeries resources. Express also provides a variety of
 ways to centrally administer the PC network so users never need
 to manually initiate and perform updates to their desktop software.

I am convinced that the iSeries Client Access Family is ideal for end users, administrators, and operators, but what does it provide for Programmers?

There are a variety of way that a global 2001 company may want to develop or run applications with their organization. They may have legacy applications that they want to take to the Web, to wireless devices, or to Windows desktops. They may want to front-end their business applications with applications that can run on any desktop, or they may simply want to create desktop applications that work with iSeries database and resources. The iSeries Client Access Family meets all these needs. Let's look at some of the options you have when using Client Access:

WebSphere Host Publisher is a is a flexible programming tool to modernize your applications, and make your users more productive

WebSphere Host Publisher V3.5 i



Whether your objective is lower costs or higher revenue through web-to-host deployments or through new e-business application development, WebSphere Host Publisher can get you there quickly and can grow as your e-business grows.

Host Publisher provides a refreshingly rational approach to modernizing existing applications without ever touching the source code! You continue to run your applications on the iSeries -- eliminating any need to download large client components to end user desktops. Best of all, your new look-and-feel applications can be run from any desktop that has a browser.

You can combine multiple applications into a new-looking, single application without touching source code.

- use parts of a 5250 application,
- add a database access application
- use parts of a Visual Age for Java application

Host Publisher includes development and runtime components. The Host Publisher Studio is the development toolkit with a simple graphical wizard-like interface that enables you to:

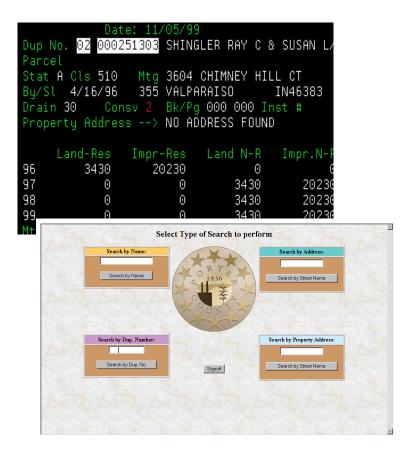
- Work with 5250 application tasks, such as entering input, extracting output, and represents them as reuseable Java bean components without making any changes to the existing 5250 applications. It provides other distinct advantages over HTTP-based products as it eliminates the need to force-fit a session-based protocol (TN5250) over a sessionless (HTTP) connection, and it keeps the 5250 tasks running on the iSeries
- Create new DB2 UDB for iSeries tasks, such as performing SQL inserts, updates and deletes, using JDBC; and then represent them as reuseable Java bean components.
- Integrate Host Java components (such as host access beans, database access beans, or other Java applications) using the Studio's interactive application builder Java Server Pages (JSP) with no changes to the existing Java applications.

WebSphere Host Publisher takes advantage of IBM's strategic WebSphere Application Server technology. Using the Studio, all the above is done without programming, and enables you to easily consolidate multiple applications into a single composite web application. Since it is based on open-industry standards, these new components can be reused in other e-business applications which reduces the cost and risk associated with new application development.

The Host Publisher runtime component is built on WebSphere technology and takes advantage of IBM's strategic WebSphere Application Server (WAS) technology to provide the quickest, easiest way to extend the reach your applications to web browser users. It can be used with Websphere Transcoding Publisher to extend host data to pervasive technologies such as SmartPhone devices and personal digital assistants.

The WebSphere Host Publisher provides broad legacy application support and scalability, security, and availability features that make it the ideal solution for extending host applications to web browser users and creating new e-business applications. It also provides the 5250 XML Legacy Gateway used by iSeries Access for Web to enable interactive 5250 applications to run.

Here is an example of a 5250 legacy application that has been modernized with Host Publisher



Optimum performance and high-function access to the iSeries database through ODBC an industry-standard database access method from Windows operating systems Client Access Express for Windows provides a wealth of middleware to enable you to develop PC applications that can interact with existing 5250 applications, or simply access iSeries resources directly from a desktop or server application. Client Access Express middleware has been implemented using a number of different programming technologies. For example:

- ActiveX automation is a programming technology defined by Microsoft.
- C/C++ is a procedural C programming language.
- Java is an object-oriented programming language, defined by Sun, for developing portable, web-based applications
- 3-Tier Development is a programming methodology which involves dividing an application into presentation, business logic, and services/database layers. This architecture allows applications to scale across multiple processors on different machines.

Support for 3-tier environments so iSeries resources can easily be accessed by a variety of heterogeneous network options Using these programming options, Client Access Express enables client applications to:

- Access iSeries data queues
- Call iSeries system APIs and user programs
- Manage iSeries connections and validating security
- Run CL commands on the iSeries
- Perform data type and code page conversions
- Transfer data to and from the iSeries database

One of the most widely-used components of the iSeries is its database. This advanced, 64-bit relational database system provides leading-edge performance and functionality. It can satisfy the needs of the smallest departmental server to the largest enterprise-wide data warehouse. Client Access Express provides numerous programming interfaces into DB2/400--some are common interfaces, allowing a single application to access iSeries and non-iSeries databases, other interfaces are unique to iSeries and expose the real strength of DB2/400. Here are some programming middleware provided in Client Access Express for database access are:

- Delivers industry-standard programming access as well as unique OS/400 server programming interfaces
- ADO/OLE DB this specification was developed by Microsoft and designed to run on Windows. Applications written to this interface are capable of accessing database files on any server (via an OLE DB provider). The iSeries OLE/DB provider is easy to program to, provides SQL access and record-level access to database files with excellent record level access performance, and does automatic data type conversions and data translations. It also provides Visual Basic Wizards to simplify developing client applications.
- ODBC this specification is also developed by Microsoft and designed to run on Windows. Applications written to this interface can access database files on any server (via an ODBC driver). The iSeries ODBC driver provides good performance for SQL operations including queries, inserts, and updates, supports three-tier environments (Microsoft Transaction Server (MTS), Microsoft Internet Information Server (IIS)), and supports Unicode.

Programming wizards plug into Visual Basic to simplify application development for Windows programmers ActiveX automation objects aid Windows programmers in working with iSeries resources

- Database Transfer ActiveX automation objects are designed to work with the iSeries database. They are easy to use as they have high-level objects for easiest data transfers, and low-level objects for customized data transfers. They support creating, modifying, saving, and executing data transfer request files, and do automatic conversion to and from many popular PC file formats.
- ActiveX automation objects and C APIs (optimized SQL API) are designed to support native iSeries database functions with excellent performance. SQL operations include: SELECT *, INSERT, UPDATE, ORDER BY, WHERE, JOIN multiple files and blocked queries, inserts, and updates. The C APIs can perform blocked operations (multiple row SELECTs and INSERTs) as well as individual (record level) record operations.

The Client Access Express PC5250 emulator additionally provides a variety of ways to work with 5250 applications from a Windows desktop. It provides:

- Host Access Class Library (HACL) contains a set of objects that allow ActiveX automation so programmers can access host applications easily and quickly at the data stream level. Its advantage over "screen-scraping" interfaces (such as EHLLAPI) is that no overhead is associated with interpreting the emulator screen. These objects can be used from Visual Basic and other languages that support ActiveX automation, as well as from C++.
- Emulator High Level Language API (EHLLAPI) enables access to the emulator's presentation space data (such as characters on the host screen). It provides functions for sending keystrokes to the host, intercepting user-entered keystrokes, querying the status of the host session, uploading and downloading files, etc. This interface is often used for "automated operator" applications that read host screens and enter keystrokes without direct user intervention.
- Dynamic Data Exchange (DDE) allows applications to exchange data. The exchange of data between two applications can be thought of as a conversation between a client and a server. The client initiates DDE conversations; the server responds to the client. PC5250 is a DDE server for the open sessions that PC5250 is managing.
- Macro/Scripting interfaces allow users to define a sequence of commands or statements that can be performed by a single action (such as pressing a key on the keyboard or using a hotspot). Users familiar with VBScript (a subset of the Microsoft Visual Basic programming language) can leverage existing knowledge to generate PC5250 scripts, and scripts can access the HACL ActiveX automation objects. Macros and scripts can be built using the Record Macro function or the Macro/Script editor. PC5250 also provides a utility for converting existing macros into scripts.

5250 emulator provides ActiveX automation objects for use with existing 5250 applications.

IBM Toolbox for Java enables Java program to access DB2 UDB for iSeries

If you own an iSeries or AS/400e server and you are not using the Client Access Family, you are not taking advantage of all the industry-leading technologies

being provided on your server.

The **IBM Toolbox for Java** also ships with Client Access Express, and can be used on any platform that has a Java Virtual Machine (JVM). It provides:

 JDBC (Java Database Connectivity) driver - so Java programs can access iSeries database files using standard JDBC interfaces and the standard JDBC extensions. These standard interfaces

can be used to issue SQL statements and process the results.

 Low-level access classes as well as graphical user interface (GUI) classes - that support record-level access to iSeries database files. The record-level access classes provide the ability to create

and delete files and members, lock files, access records sequentially by record number or by key, update, write, and delete records, perform commitment control, and retrieve record formats.

iSeries Client Access Family Summary

The iSeries commitment to delivering a leading-edge client connectivity solution for its users is demonstrated year after year as it continues to invest in strengthening the iSeries Client Access offerings. Since AS/400 was introduced in 1988, Client Access has been delivering the required desktop solutions for this midrange market. Its innovative *family of products* packaging and terms is now mimicked by others delivering client software solutions.

- You can obtain the iSeries Client Access Family by ordering Product No. 5722-XW1.
- If you are running on OS/400 V4R5 and have the V4R5 version of Client Access (Product No. 5769-XW1) and have Software Subscription, you can get all the new V5R1 Client Access functions by ordering no-charge feature number 2643 of Product No. 5755-AS5.
- iSeries Access for Web and WebSphere Host Publisher start shipping with the family product worldwide on September 28, 2001. If you received your V5R1 Client Access Family product prior to this date, you can order a no-charge refresh of your product. Simply order Feature No. 2644 of Product No. 5722-XW1 (Software Subscription is not required to receive the refresh).

Future Investment Plans*

IBM plans for continued delivery of top-of-the-line connectivity offerings in the areas of:

iSeries Client Access stays abreast of desktop needs to deliver client solutions that make iSeries the best server in the marketplace.

- Client Access Express for Windows just gets better with each new release. For example, its V5R1version doubled the function it previously provided. It is positioned to support current and new Microsoft Windows operating systems. As Microsoft moves into 64-bit operating systems, Express will also provide the capability to use these technologies with iSeries. Express plans to continue exploiting new OS/400 capabilities and tightly integrating their use with the desktop.
- In the short term iSeries Operations Navigator plans to continue adding even more administrative functions. The emphasis remains on increasing customer productivity through the use of highly visual, tightly integrated, and easy-to-use GUIs. The underlying technology will continue to move toward Java and XML, leading toward a longer term goal of being able to run much of Operations Navigator in a browser.
- ❖ iSeries Access for Web plans to continue tight integration of its offering with browsers, just as Express continues to tightly integrate with the Windows desktop. Next year, iSeries Access for Web plans to deliver fully translated versions and provide more printing options. It also plans to expand its Internet access support to give iSeries administrators even more control of what users can see and do.
- WebSphere Host Publisher is strategically aligned with other WebSphere technologies, for example, WebSphere Application Server. Host Publisher plans to continue enhancing its product to keep in step with other WebSphere products. IBM plans to provide additional tools in Host Publisher that will aid in web-enabling host applications.

^{*}IBM plans are subject to change without notice.

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