# iSeries e-business Update

*2001 Announcements*
*ITSO Technical Overview*
*May 2001*

# Agenda



- e-business "state of the world"
- Application Deployment
- Tools
- Security

# Objectives



**Understand where e-business "is going"**

**Understand how the OS/400 functions and AS/400-based applications enable customer to achieve high return of investment in e-business environments**

# Notes: Objectives



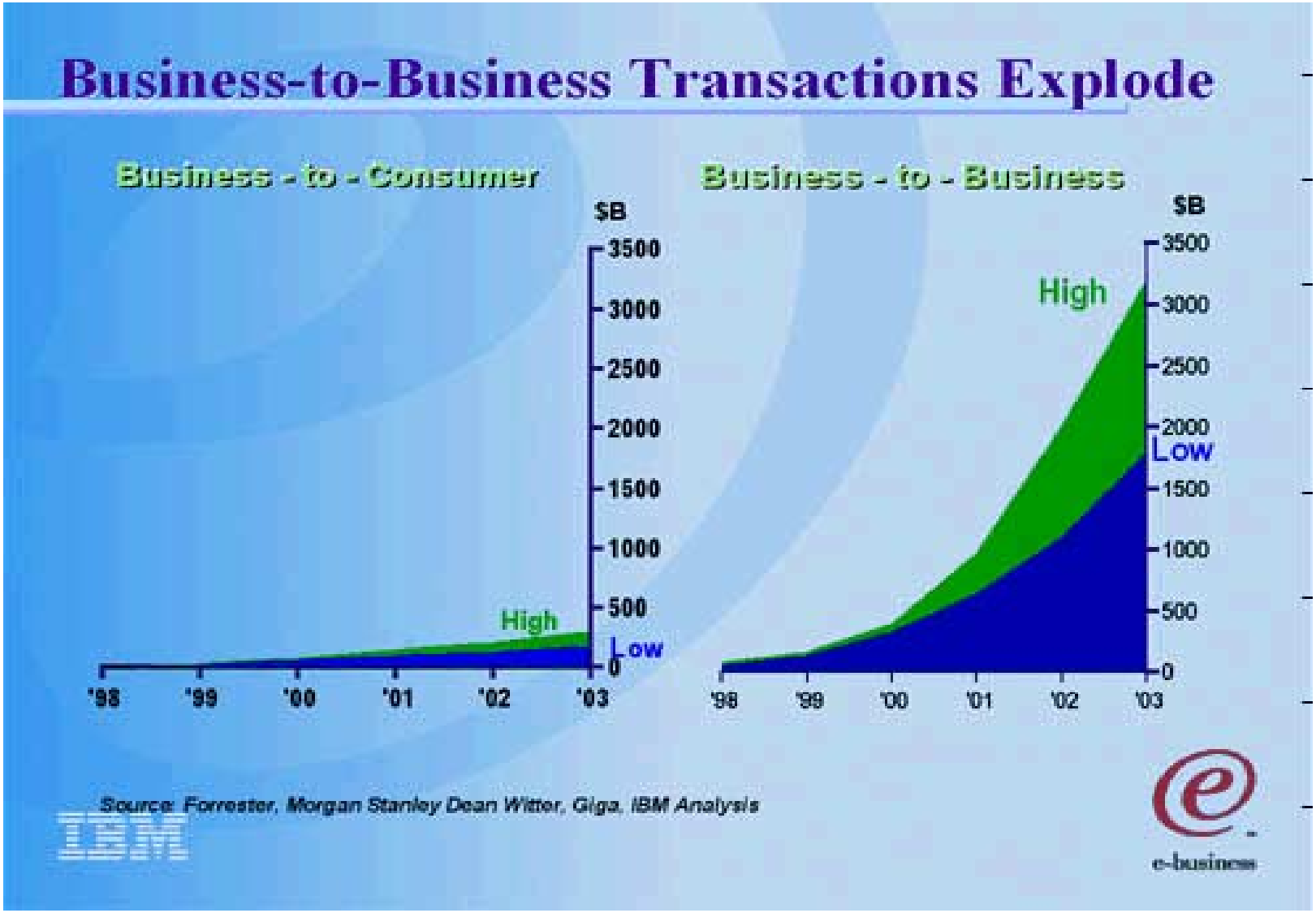
This presentation provides details on e-business facilities on OS/400 and e-business applications that run under OS/400. These capabilities are available under OS/400 V4R5 which runs on the iSeries technology servers (270, 820, 830, 840) and the older technology AS/400e servers. Within this presentation if only AS/400 is listed, it means the support runs on both the iSeries and AS/400e servers, unless otherwise noted.

Note some applications that do e-business work or are used to develop e-business applications are listed in the Application Development presentation.

# Where is e-business going?

# B2C and B2B projections







# Notes: B2C and B2B projections



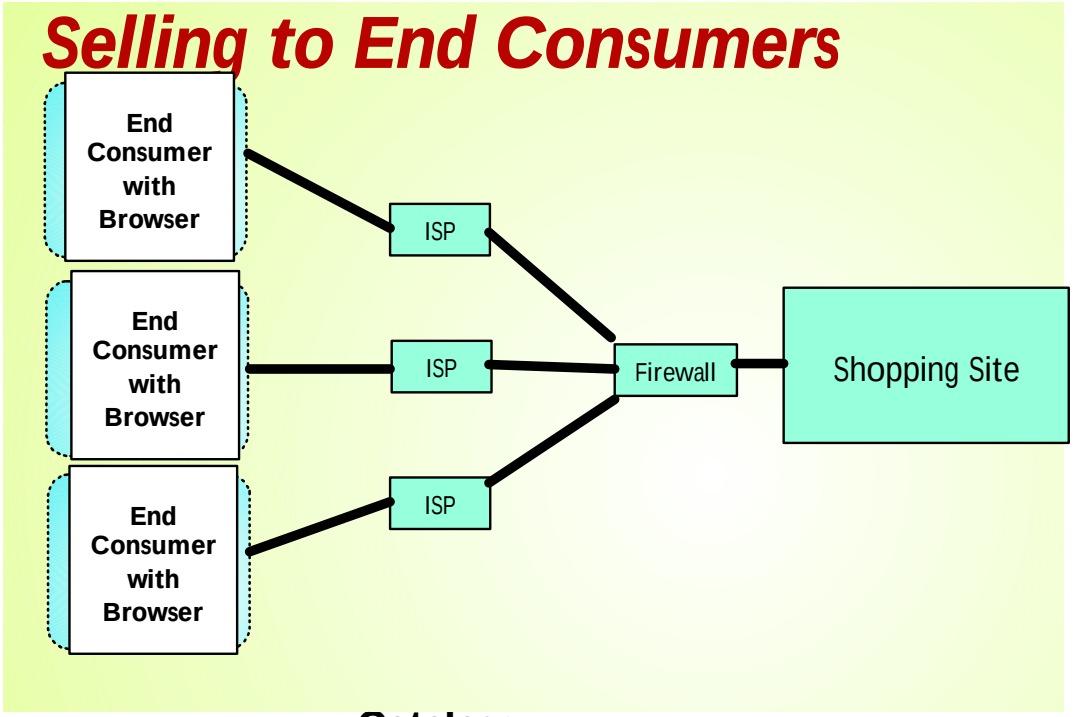
This graphic represents the results of several "industry watchers" who predicate slow growth in the increase of dollars spent on Business to Customers web sites, but an explosive growth in Business to Business web sites. The blue surface area represents low projected growth in dollars spent, where as the green surface represents the high end of projected growth.,

Hardware and software vendors who provide fast development and deployment of business to business applications are the ones who will be successful.

# B2C Model



**Commerce Oriented**




- Catalogs
- Cross-sell, up-sell
- Product recommendations
- Rarely standing orders
- Credit Cards for payments

# Notes: B2C Model



This foil is a graphical representation of the end user, that is you and me, using a browser to perform a "e-business transaction. You can see a relatively simple network typology between the end user and the actual web shopping site.

E-business transactions are typified by the attributes listed below the graphic. The shopping center is represented as one or more catalogs with product descriptions and recommendations. Over time it is typical that a customer profile could be built that says, for example, if you have purchase a number of running shoes of a particular brand, perhaps the "next time" you connect the welcome page displays a discount on shoes of the brand you have used most of the time.

There is rarely an environment (as would typically be present in business to business environment) where the consumer buys a new television set or 10 radios on the 15th of the month - rarely any "standing orders."

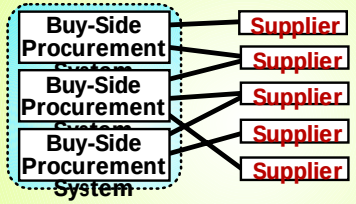
 

# B2B Models



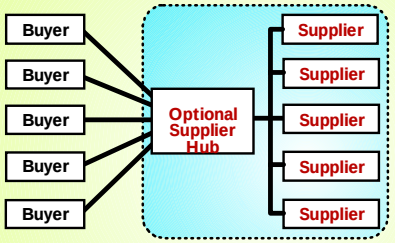
## Commerce Oriented

### Buy-Side



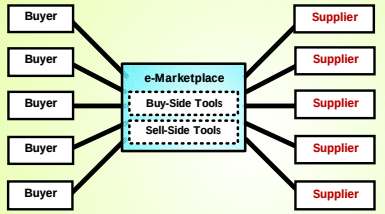

- Buyer controls the environment
- Local catalogs with negotiated prices
- Local connections to ERP
- Local approvals

### Sell-Side




- Aggregated/Indexed Catalogs
- Cross-sell, Up-sell
- Standing Orders/Re-orders
- Open Contracts for Payment
- Reach via browser or Buy-Side

### e-Marketplace




- Marketplace, Community
- Browser access
- Many suppliers, many buyers, all at one hub

## General Business

**Trading Partner Agreements**

- Transaction contracts
- XML - based
- Automate processes between trading partners
- Can deal with inventory, reservation status, shipping logistics, Purchase Orders, etc....

# Notes: B2B Models



There are 3 common B2B business models:

Buy-Side Character istics

In the "buy side" a company buys goods or services from approved vendors over the web. Characteristics of this environment include:

Aggregated Supplier Catalogs and contract based pricing

Roles based access control and catalog views

Approval workflow capabilities

Integration with buyer back-end purchasing and MRP systems

Inter-enterprise communications traditionally based upon EDI messages

Sell-Side Characteristics

In the "sell side" a company sells its good or services over the web to other companies. Characteristics of this environment include:

Catalog with buyer-specific views and personalization

Merchandising and promotion capabilities

Fixed and contract based pricing

Integration with supplier back-end ERP systems

Multiple payment options, including credit cards, purchase order, and so on

e-Marketplace Characteristics

An e-Marketplace represents a virtual shopping mall where multiple buyers and sellers transact business between each other over the Internet. Characteristics of this environment include:

Aggregation point for many suppliers and buyers to transact business

Provide one or more services, such as Auctions, Exchanges, and Portals

# Notes: B2B Models



The business to business model starts out a little more complex than the business to consumer, but in the real world can become much more complex, even generating the need for a "broker" between the buyer and the seller.

Let us begin with the text within the two-way arrow in the lower portion of the foil. We see business and the banking institution very prominent at each end of the arrow. The transaction types are many more than between business to consumer. There are Trading Partner Agreements and Contracts to help both sides. For example, the auto parts supplier wants to know that the automobile manufacturer buyer "always" wants at least 2000 radiator hoses shipped to them on the 15th of each month. And the buyer expects the supplier not to run low on radiator hoses s based on the suppler not being unable to predict how many radios must be in stock on the 15th of each month.

There also the needs to be a range of flexibility that can be as automated as possible. For example, if the supplier is working on a new style/better technology radiator hose there needs to be, as much as possible away for the supplier and buyer to communicate and make changes to the process without having to shut down a web site for several hours when a new "part" is being added to inventory.

At left side of the upper rectangle (Buy-Side) we have a graphic similar to the B2C model, except you see that the buy may be getting the same part from multiple suppliers, based upon their decision making process - the buyer controls the environment. Here, you can see local catalogs contain negotiated prices, that, in fact may vary over a period of time.

In the middle of this chart we the Sell-Side view of the B2B arrangement. Many catalogs are used, Volumes are such that it is normal for there to be a mixture of standing orders and reorders. There are open contracts for payment unless something abnormal begins to happen. You see an optional "buyer hub" where there is someone outside of the buyer and the seller who is helping administer activity and communication between multiple buyers and sellers.

On the upper right side you see "multiple brokers" between the buyers and sellers that are not employed directly by either the buyer or the supplier. For example, a radiator hose is now a "commodity", where there are many suppliers and the buyers. You may even have company getting their radiator hoses from same suppliers as their competitor.

Perhaps those keeping statistics could improve the process by identifying better quality suppliers and automatically switching to that supplier's product or ensure there are at least two suppliers of a product to protect against work stoppage.

# Application Deployment - Infrastructure

# Infrastructure



**TCP/IP, Communications base support**

**DB2 UDB for AS/400**

**Java Developer Kit (5769-JV1):**

- JDK 1.1.8
- Java2 Standard Edition (J2SE) 1.2.2 and 1.3.0

**General OS/400: security, work management, etc.**

**LPAR**

**iSeries SStar Technology, AS/400 reliability**


Key V5R1 enhancement in all areas

# Notes: Infrastructure



The first set of AS/400 capabilities necessary to support e-business application environments are categorized as Infrastructure. In other words if this base support is not there, you really cannot build e-business application on the system. Following charts expand on TCP/IP-based communications support and database support.

In this chart we are reminded how important "standard OS/400 security and work management, including the subsystem monitor constructs and other normal OS/400 components are to running any work on the system.

AS/400's reputation for high availability for a single system and additional high availability through High Availability Partner software is a good reason for deploying critical e-business applications on the AS/400.

Logical Partitioning (LPAR) enables a single hardware system to function as multiple "partitions" if desired. With V4R5 we can have up to 24 partitions on a single system, when all partitions are running.

While C and C++ can be used (along with back office RPG, COBOL, CL programs) to implement e-business applications, Java is considered the base language building block for future e-business applications. V5R1 has moderate function and performance improvements

As in previous releases, V5R1 options for Java 1.1.8 and Java2 Standard Edition (J2SE) 1.2.2 and 1.3.0 are shipped with the AS/400 Developer Kit for Java, 5722-JV1.

With V5R1 WebSphere Development Studio for iSeries, 5722-WDS, there is an enhanced packaging of host (iSeries) and client application development products including RPG COBOL, C C++ and VisualAge for Java , with a new WebFacing tool and a version of WebSphere Studio that has special "affinity" for interfaces to OS/400 functions.

We discuss more about these functions later in this presentation and in the Application Development presentation. Be sure to also review information at:

- http://publib.boulder.ibm.com/pubs/html/as400/infocenter.htm

# TCP/IP-based Support



**TCP/IP protocols supported**

- Transmission control protocol (TCP)
- User datagram protocol (UDP)
- Internet protocol (IP)
- Simple network management protocol (SNMP)
- APPC over TCP/IP
- Internet protocol over SNA
- Network status (NETSTAT)
- Packet internet groper (PING)
- Internet control message protocol (ICMP)
- Address resolution protocol (ARP)
- Proxy address resolution protocol (Proxy ARP)
- Routing Information Protocol (RIP) versions 1 & 2
- Sockets application program interface (API)
- IP multilink load balancing
- Serial line internet protocol (SLIP)
- Point-to-point protocol (PPP)
- SOCKS proxy enablement
- UDP multicast support
- CORBA ORB (IIOP)
- IP Security (IPSec)
- Internet Security Association Key Management Protocol (ISAKMP)
- Layer 2 Tunneling Protocol (L2TP)

Key V5R1 enhancement areas

**TCP/IP Servers & Services**

- GUI Configuration support (Operations Navigator)
- Secure Sockets Layer (SSL)
- Virtual Private Network (VPN)
- Digital Certificate Manager (DCM)
- File Transfer Protocol (FTP) client & server
- Simple Mail Transfer Protocol (SMTP)
- Post Office Protocol (POP) version 3
- Lightweight Directory Access Protocol (LDAP)
- IBM HTTP Server (HTTP), including Apache
- Web-based Administration server
- Network File System (NFS) client & server
- Domain Name Service (DNS) Server
- Quality of Service (QoS) support
- IP Printing to HP-compatible network printers
- Line printer daemon (LPD) server, Line printer requester (LPR) --> Internet Printer Protocol (IPP)
- 5250/HTML workstation gateway
- TELNET client & server
- REXEC client & server
- BOOTP Server
- Remote IPL TFTP Server
- REXEC client (Run Remote
- Command -RUNRMTCMD)
- Dynamic Host Configuration Protocol (DHCP) Server
- Internet Key Exchange (IKE) server
- Layer 2 Tunneling Protocol (L2TP) server (LNS)
- Netserver

# Notes: TCP/IP, Communications Base



This page is a pretty complete list of OS/400 base communications support and TCP/IP Servers and Services. The "star character" indicates a significant V5R1 enhancement has been made in that area.

For LDAP (Version 3.2) and HTTP server enhancements we discuss them under that topic later in this presentation. We highlight other enhancements here.

**TCP/IP Enhanced Areas Include**

TCP/IP SIMPLIFICATION EXTENSIONS: OS/400 Domain Name System (DNS) services are enhanced significantly in this release. The new V5R1OS/400 DNS services are based on the widely used industry-standard DNS reference implementation known as BIND version 8.2. Topping the list of enhancements are the new dynamic update capabilities, which have transformed the DNS into a Dynamic DNS (DDNS). Combined with enhancements made to the iSeries Dynamic Host Configuration Protocol (DHCP) server that allow it to be configured to send dynamic DNS update transactions, iSeries now supports an integrated Dynamic IP solution that automatically manages TCP/IP addresses and their associated DNS host names on your networks.

NETWORK QUALITY OF SERVICE (QOS): In V5R1, iSeries gives you the ability to control and manage TCP/IP traffic in the network and take advantage of the leading-edge networking Quality of Service (QoS) functions contained in routers and switches. The iSeries QoS functions for managing TCP/IP traffic give you the ability to drop, mark, and shape TCP/IP traffic based on the QoS policy being applied. In addition, QoS admission control capability is added for controlling bandwidth management requests. The QoS functions supported are:

- Resource Reservation Protocol (RSVP) including an iSeries RSVP agent
- Differentiated Services (DiffServ)
- QoS policies based on the TCP/IP 5-tuple (Source IP address, Destination IP address, Source Port, Destination Port, and Protocol), address ranges, and wild-cards. This support includes a policy agent, and a wizard-based GUI in Operations Navigator for configuring the QoS policies

# Notes: TCP/IP, Communications Base-2

APPLICATIONS PERFORMANCE AND SECURITY ENHANCEMENTS TO:

- OS/400 File Transfer Protocol (FTP) now can use SSL
- OS/400 Simple Mail Transport Protocol (SMTP)
- OS/400 Telnet

NETWORK SECURITY AND VPN: iSeries VPN (Virtual Private Networking) support, introduced in V4R4, is enhanced with additional security, greater reliability, improved performance, and is easier to use. Operations Navigator is redesigned to intuitively navigate VPN configurations, and you can use the VPN wizard to setup and implement your network security policy. Digital certificates add a scalable and secure mechanism for cryptographic operations, and in V5R1 you can now use them in your VPN configurations to authenticate the identities of the VPN endpoints. An integral part of iSeries VPN is IP Packet Filtering, and in V5R1 this component is enhanced to allow filter activation and deactivation on a per-interface basis.

NETWORKING SOFTWARE MANAGEMENT AND SYSTEM SETUP: Several TCP/IP management enhancements in V5R1 give the network administrator more control when monitoring their TCP/IP network and troubleshooting networking problems. The enhancements include:

- A graphical version of network status (NetStat) that includes the ability to map a socket connection to a list of jobs for that connection
- The ability to trace the route a TCP/IP packet will take through the network (TrcRoute - includes a TrcRoute CL command).
- Address resolution protocol (ARP) cache monitoring.

# TCP/IP, Communications Base-3



INTERNET SETUP WIZARD: The iSeries Internet Setup Wizard simplifies the steps required to connect your iSeries to the Internet and provide application and Web serving. The wizard allows you to connect your iSeries to an ISP over a dial-up connection or directly through a LAN connection. The Wizard can also connect your intranet iSeries to the Internet through a firewall or router and allow for Web and application serving by the iSeries over that connection.

TCP/IP PERFORMANCE IMPROVEMENTS: TCP/IP performance needs to keep pace with the new emerging workloads that go beyond the raw throughput of a single connection. The Domino server and Web servers need fast throughput as well as quick connection establishment for the thousands of connections. Through continued performance tuning and pathlength reductions, improvements have been obtained for throughput rates, multiprocessor scalability, and connection establishment abilities.

TCP/IP AVAILABILITY IMPROVEMENTS:

- Enhancements to STRTCPSVR and STRTCPIFC to start all servers and interfaces that had been configured to automatically start when TCP/IP is started
- Duplicate IP address detection
- Netstat connection information yields a way to link to the job associated with that connection

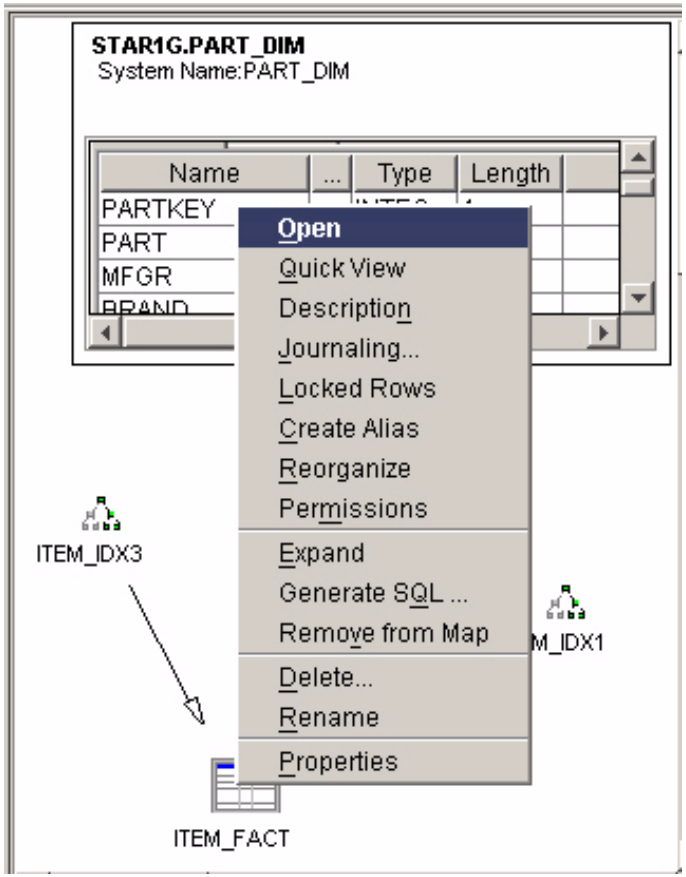
POINT-TO-POINT (PPP) CONNECTIVITY ENHANCEMENTS: Operations Navigator enhancements improve the ease-of-use when configuring and managing Point-to-Point connectivity. Significant enhancements in function and the GUI capabilities improve the iSeries Point-to-Point connectivity.

# V5R1 Database and File System



## Database

- Operations Navigator Database Navigator and more
- SQL Triggers
- ODBC V3.5 support including Unicode support
- Maximum size of large objects increased
- DRDA over TCP/IP




## Integrated File System (IFS)

- Improved backup support via
  - Journaling of byte stream files and directories
  - Switched disks (IASP) for all IFS file systems except QSYS.LIB objects

# V5R1 Database and File System



With V4R5 our most well known database enhancements were in the support of User Defined Types, User Defined Functions, and Datalinks.

DB2 Universal Database for iSeries is enhanced with V5R1, providing new support for open standards and portability enhancements. Support for distributed databases is improved with DRDA running over TCP/IP, allowing transactions which span databases to be committed or rolled back by using two-phase commit protocols. Another key DRDA enhancement is the ability to return multiple result sets from iSeries servers to clients for improved performance.

Database triggers can now be written in the SQL language, allowing more business logic to be built directly into the database. The number of possible trigger definitions active is now increased to up to 300. A new Database Navigator interface (part of Operations Navigator) displays the relationship among relational objects such as tables, views, and indexes. Another enhancement to Operations Navigator is the ability to generate SQL statements used to create a database object, regardless if it was created with SQL or not.

The ODBC driver for DB2 is enhanced with ODBC 3.5 support and support for Microsoft Transaction Server (MTS) which enables DB2 to participate in transactions involving two-phase commit coordinated through MTS. ODBC 3.5 also delivers support for Unicode.

The maximum size of large objects stored in column is increased from 15 MB to 2 GB and the maximum total size for all large objects for a table row is increased from 1.5 MB to 3.5 GB. In addition, DB2 UDB for iSeries supports the ability to optionally minimize the size of journal entries.

The Integrated File System is used to hold files in a variety of files systems, such as NFS, NTFS etc and is used to store and share PC files on the iSeries with NetServer. The IFS is also used as to store Lotus Domino databases as well as Windows disk images that are attached to the Integrated xSeries Server or via an Integrated xSeries Adapter. With V5R1, files and directories held in the IFS can now be journaled, allowing clustering support through third party software via replication to another iSeries server. The journaled information can also be used for other recovery and monitoring purposes.

# V5R1 Database and File System-2



Files (not Database files) within a file system mounted to a V5R1 IASP can be configured within Clustering support to enable switching disks between iSeries servers within the Cluster domain.

When the IASP is moved (switched) from one system to another the file system can be mounted and made available to applications and users on that second system (cluster node).

Domino for iSeries Release 5.7.0 and the HTTP for iSeries are able to make use of this "switched disk" technology to improve their "up time" (availability)  Refer to the Availability presentations for more details on this availability support.

# Database Extenders (XML) Support



Implemented via a New Licensed Program:

- DB2 UDB Extenders for AS/400 , 5722-DE1
- Contains options for both:
  - Text Extenders (option 1)
  - XML Extenders (option 2)

Contains Extender commands and command interface

# Database Extenders (XML) Support



As XML (Extensible Markup Language), which generically separates data description from the visual representation of that data (for example, on a browser screen), increases its usage in pervasive computing, the integration of XML and database storage structures becomes more important in B2B environments.

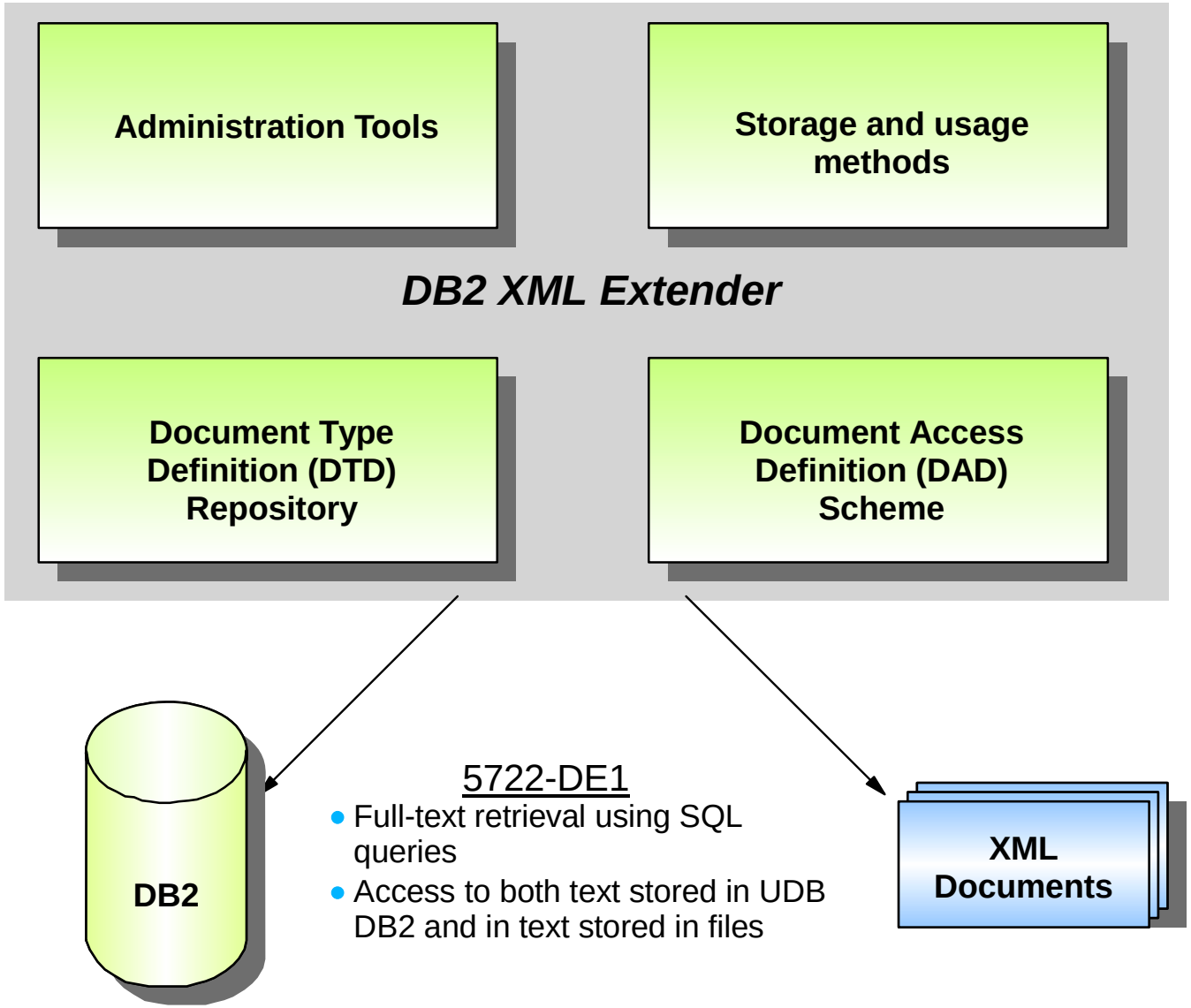
The DB2 UDB Extenders for AS/400 , 5722-DE1, product provides a major step forward in this XML and Database integration.

The next foil gives a view of what is involved in this integration.

See also later in this presentation foils on XML and Transcode Publisher.

# XML Integration in DB2






5722-DE1

- Full-text retrieval using SQL queries
- Access to both text stored in UDB DB2 and in text stored in files



# XML Integration in DB2



Text Extender adds the power of full-text retrieval to SQL queries in documents embedded in your DB2 tables with a size of up to 2 GB. This feature provides users and application programmers a fast, versatile, and intelligent method of searching through such text documents. Text Extender's strength lies in its ability to search through many thousands of large text documents at high speed, finding not only what you directly ask for, but also word variations and synonyms.

You are not restricted to searching only in text documents stored in DB2 databases, you can also search in text documents stored in files, since Text Extender can access any kind of text document, including word-processing documents in their original native form, and offers a rich set of retrieval capabilities including word, phrase, wildcard, and proximity searching using Boolean logic.

At the heart of Text Extender is IBM's high-performance linguistic search technology. It allows your applications to access and retrieve text documents in a variety of ways.

Your applications can:

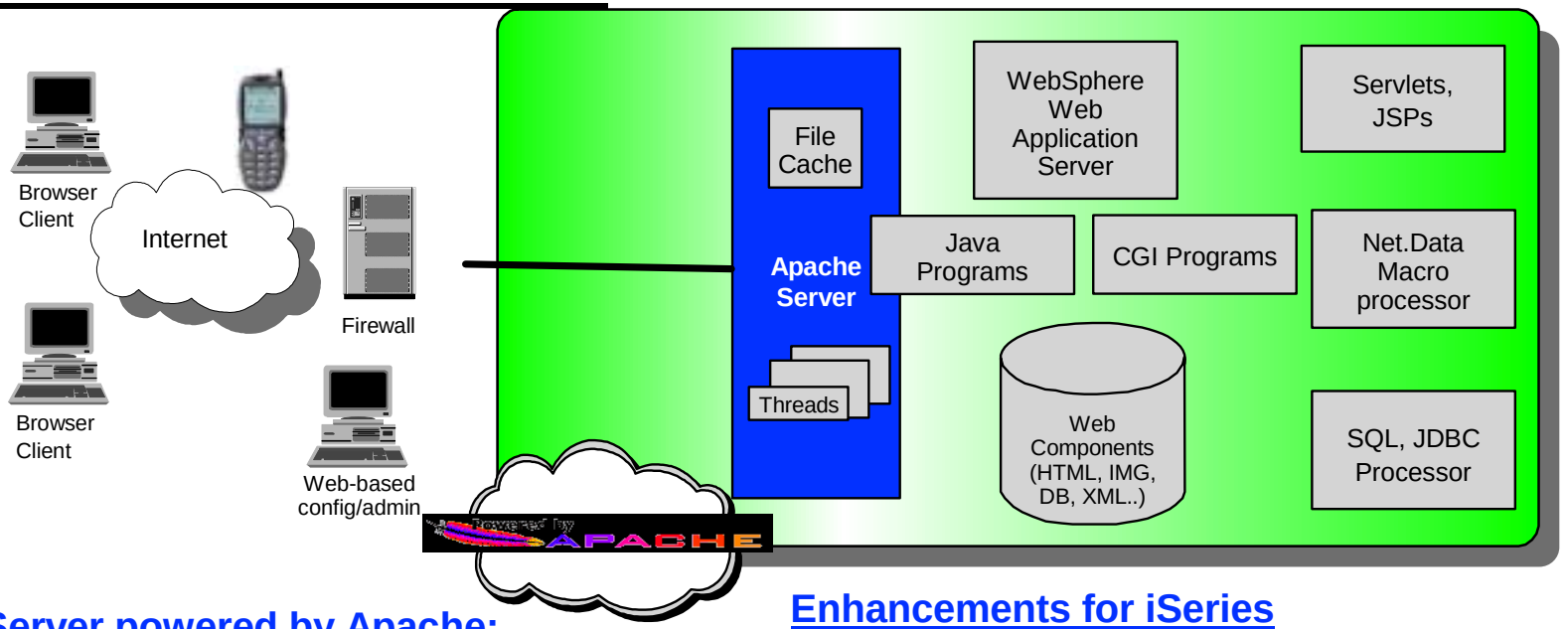
- Search for documents that contain specific text, synonyms of a word or phrase, or sought-for words in proximity, such as in the same sentence or paragraph.
- Do wildcard searches, using front, middle, and end masking, for word and character masking.
- Search for documents of various languages in various document formats.
- Make a "fuzzy" search for words having a similar spelling as the search term. This is useful for finding words even when they are misspelled.
- Make a free-text search in which the search argument is expressed in natural language.
- Search for the names of people, places, or organizations.
- Search for words that sound like the search term.

# Application Deployment

# IBM HTTP Server - Powered by Apache



## *IBM strategic Web Server for eServer*




### The IBM HTTP Server powered by Apache:

- Provides all of the function of the current IBM HTTP server
- Coexists with current HTTP server
- Will be the default server for new configurations
- Configuration GUI
- Available as an executable (source code will not be available)
- Migration wizards port config files from original HTTP Server to apache
- Portable Runtime

### Enhancements for iSeries

- V5R1 (V4R5 PTF)
- HTTP 1.1 protocol, Apache Version 2 base
- Authentication using LDAP, AS/400 User Profiles, Validation Lists
- CGI support for RPG, COBOL, Rexx, CL
- Persistent CGI
- Support for OS/400 file systems
- Full function, task-oriented web user interface
- Full native SSL support, including client authentication, associates client certificates to OS/400 Profiles and validation lists
- Triggered Cache
- Updated Web Server Search Engine support
- Configuration files stored in LDAP..

# Notes: IBM HTTP Server - Powered by Apache



In the past, the IBM's HTTP Server for iSeries was our leading web server. However, it is a proprietary iSeries web server and not one that many non-iSeries customers are aware of. In December of 2000, we delivered the iSeries newest web server, the HTTP Server for iSeries, powered by Apache. The Apache server is an "open source" server that is the most popular web server in the industry. Apache is also IBM's strategic web server. With the HTTP Server for iSeries (Powered by Apache), we've delivered the best of the Apache server as well as the best of iSeries ease of use/management. This new Apache server provides all the function available in the older HTTP server. This web server coexists with the previous web server so customers can take their time migrating to the new server. There are also migration wizards available to assist with the migration. With this new web server applications written with Apache Portable RunTime modules can run on iSeries by simply recompiling them.

# Web Serving-Apache



iSeries supports extending core business applications to the Web with options for HTTP Web serving and WebSphere Application Server. The HTTP Server for iSeries (5722-DG1) includes an option to configure and run either the HTTP Server for iSeries without the Apache environment or with the Apache environment - HTTP Server powered by Apache.

In this picture we show a hand-held device that can send and receive WML-based data streams. Limited WML-XML translation is performed by application-specific software, such as Management Central Pervasive or by interfacing to more full function products such as Transcode Publisher. We discuss Transcode Publisher discuss later in this presentation.

HTTP Server for iSeries enhancements include:

- Triggered Cache Manager (TCM) provides a mechanism to cache dynamically-generated Web pages. TCM allows a Web designer to build dynamic pages and will only update the cache when the underlying data changes, thereby improving the performance of a Web site.
- Highly Available Web server takes advantage of iSeries Clustering technology - simple clustering with switched IASPs, which makes it possible to build a highly available Web site, improving the availability of business-critical Web applications built with Common Gateway Interface (CGI) programs. This enhancement is only available on the original IBM HTTP Server (not under the "powered by Apache configuration").
- Updated Search enhancements including:
  - Support for Web crawling allows documents at remote web sites to be downloaded to a local directory to be used in creating a search index.
  - Thesaurus support allows search terms to be expanded with related terms for better search results.
  - Many search usability improvements added to allow search results to be sorted by rating, title, or document date. Also supported is the ability to do searches within search results.

# Web Serving-Apache-2



**HTTP Server for iSeries - Powered by Apache**

As we have said, in V5R1, IBM HTTP Server for iSeries now includes both the original IBM HTTP Server and the IBM HTTP Server (powered by Apache). Apache under OS/400 was originally made available during 4Q 2000 running on V4R5. For V4R5 information, go to:

- http://www-1.ibm.com/servers/eserver/iseries/software/v4r5ptfs

**HTTP Server for iSeries (5722-DG1)- Apache configuration option**

Apache, a freeware HTTP server, is open-source software that implements the industry-standard HTTP/1.1 protocol with a focus on being highly configurable and easily extendible. It is built for several server platforms and distributed under the Apache Software License by the Apache Software Foundation. OS/400's HTTP Server includes a highly scalable multithreaded runtime as well as Apache Portable Runtime (APR) which allows Apache modules to be written independently of the target deployment platform with only a simple recompile required to run on iSeries.

Working from a common Apache Version 2 code base, iSeries has incorporated many features that differentiate its Web serving from other Apache-based servers in the following areas:

- Usability:
  - OS/400 provides the only Apache-based server with a complete, task-oriented, browser-based User Interface that is fully NLS-enabled and translatable utilizing a built-in, industry standard Java servlet engine .
  - LDAP used to store configuration information and share across multiple physical systems .
- Availability and Serviceability:
  - iSeries delivers greater serviceability for its Apache-based server with robust, configurable, trace points and on-the-fly tracing capability.
  - APIs for updating configuration information allowing Web applications to set up server instances with no manual intervention .
  - Idle backup server provides seamless failover within one server instance with improved server throughput and scalability.

# Web Serving-Apache-3



**HTTP Server for iSeries (5722-DG1)- Apache configuration option continued**

- Security:
  - User credentials passed to CGI programs allowing true, secure, single sign-on for Web applications.
  - Persistent CGI and Net.Data to maintain process state across multiple browser requests as a single transaction.
  - Validation Lists to secure user lists with no inherent system authority.
  - Optional or required user sign-on using SSL Client Certificates (not userid/password) associated with either an OS/400 user profile or users in validation lists.
  - Configurable dynamic protection against denial of service attacks that try to tie up server TCP/IP connections.
- Performance:
  - Pre-started and reused CGI jobs, significantly improving performance and throughput.
  - Pre-cached static files at a directory level and dynamic caching of the most-accessed static files.
  - Asynchronous I/O to decouple browser requests from server threads, for high volume HTTP persistent connections.

For more complete information on Apache servers, refer to:

- http://www.apache.org/

# Notes: HTTP Server - Base



The following notes pages give a broad background to iSeries-based HTTP support.

The HTTP server is a file server, obviously you're serving up HTML pages, you're serving up PDF files, you're serving up images, audio, video, those types of things. So, it acts as a file server over the web. It acts as an application server over the web. It's a key way that we use to access applications on the AS/400. I'll talk about the different application models that we support. It's a security server in itself. The web server on AS/400 has security built into it. In fact, it's a trusted part of the operating system that deals with a lot of the security issues of the operating system itself and it's very integrated with our AS/400 security. It's also a management server. IT can do a lot for you in terms of determining who's accessing your system, how they're accessing the system, and being able to monitor that and monitor the health of your system real-time using SNMP, things like that.

Accessing applications over the web is typically done through the HTTP protocol, and here are the reasons why that is today. First of all, applications that are built on top of the HTTP server, especially our HTTP server, automatically get all kinds of capabilities that would be difficult to code in yourself. So, you as an application writer don't have to code any of these things because it's taken care of for you by the HTTP server. For example, encryption. Any time you send information over the web, you at least have to allow for the capability of encrypting that information. If you're running over HTTP and the HTTP server, that's handled for you automatically. Along with SSL support and encryption comes certificates. You have to have a certificate to prove who you are. Again, the certificate management and the use of those certificates are all handled by the HTTP server for you. You don't have to do that as an application writer. Security. Being able to determine who's signing on, being able to accept the log-in information, being able to authorize a user to your application, again is all handled by the web server and the web server administrator.

Another big reason why people use the HTTP protocol is because it is usually allowed through firewall. If you've come up with your own roll-your-own type of protocol, your own socket interface, your own port, typically that won't be allowed through a customer's firewall. They have to do special configuration to allow any different protocol through the firewall. Most enterprises will allow HTTP traffic going to port 80 in through their firewall with no problem, which is a big reason why people use the HTTP protocol today.

The number of clients that it supports. Obviously any browser out there today will support the HTTP protocol, and typically if you're writing a server side application using CGI or servlets, all you need is a browser interface. Again, there are often times you're building web applications and there is no client code to write at all. All that support and all the capabilities of encryption and security are handled by the browser. Also, if you're running applets inside the browser, there is a lot of this capability handled for you. Supporting for the same client with the browser thin clients and the thicker clients with applets is very easy through the HTTP protocol.

# Notes: HTTP Server - Base -2



HTTP Server for AS/400 administration has a full graphical interface and the administrator handles all these different capabilities for you.

Let us talk more about applications and application serving on the AS/400. These are some of the application models that we support. If you're going to write an application sitting on top of the HTTP protocol, these are your choices.

Number one is CGI or common gateway interface. This is really the industry standard. Ever since web servers came out, this is the initial programming model for web servers. This model requires that you be able to use standard in, standard out, environment variables, those type of things. It's not necessarily the easiest model to write in, especially in AS/400, but it is something that is very prevalent. and you'll find a lot of examples, CGI programs, out there. It's very well tested and people like this interface. However, on AS/400 we have another interface called Net.Data which we often recommend over CGIs primarily because it's much simpler. What happens is that Net.Data is basically a CGI program already written for you, but you just write a script that tells the Net.Data program what you want to do. Writing this script is much, much easier than writing a CGI program. Since it is an interpretive language, you're going to take a performance hit. However consider that, if you're talking about doing forms processing and things like that, you can build a lot of pages.
You can build hundreds of pages using Net.Data in the time that you can build just a few pages using CGI programs. So we often have people who are going to build these type of things, forms on their system and things like that, to look at Net.Data first. Net.Data is very powerful and continues to get some Java-based enhancements.

If there's something that Net.Data can't do for you or if you have a very performance intensive application, then we recommend that you look at CGI or, as we move down the list you (and the industry) would use the emerging program model for AS/400 and for all systems out there, which is the WebSphere Application Server. This is the servlet model. WebSphere Application Server supports Java servlets, Java server pages, and toward the end of this year, Enterprise Java Bean. These are all the industry standard programming models for writing server side Java applications. Whereas CGI was mainly for your C, RPG, COBOL types of programmers, servlets and Java server pages are for the Java programmers. It's probably the fastest growing programming model on our system as well as every other system out there.

We talk more later in this presentation about Java-based products, such as the WebSphere based application development, application deployment, and application management tools.

So those are the three main programming models that we have. We've made some modifications to some of our programs to fit better with the AS/400 system and to improve performance. For example, persistent CGI and Net.Data. One of the big problems with CGI programs is the way this standard works. A request comes in, we start an instance of the CGI program, actually start a job on the AS/400, and then we run that program. It sends a response back and then the program quits. The next request might come in for that same program and we have to restart it again.

We've taken some liberties here with the CGI model to make that a little faster. First of all we've used the concept of activation groups on the AS/400 so you can keep the CGI program active between requests so we don't have to have the problem of these startup times for the CGI program. We also keep a pool of CGI programs around to minimize the startup time and the overall CPU utilization as we run CGI programs. With our persistent CGI capability, we also have the capability of directing multiple requests from a browser to a single instance of a CGI program. When a request comes in to a CGI program, it's handed off to this instance of the CGI program. The response might go back to that browser. Then we keep some identity information in that browser request so the next request that goes back for a subsequent form or a subsequent interaction with that same CGI program, we're able to coordinate that and we're able to send that request back to that same instance of the CGI program.

This does two things. First of all, the CGI program is active. Nothing is terminated and we can handle multiple requests with the browser. Also, because the CGI program doesn't terminate, if we have open cursors, if we have open files, if we have data areas that we've initialized, all of that remains active through these multiple requests. So you can actually do long-running transactions with a browser using this capability. You really get very good performance. There's nothing that started up every time, you don't have to keep persistent information, you don't have to keep state information in the browser request. All that is handled for you and you just write it as you would a normal server program, keeping open cursors, keeping open files, keeping initialized data areas, etc., until at some point you say, okay, the session is ended, and then you stop the communication with the browser and everything gets cleaned up.

# Notes: HTTP Server - Base -4



How do you indicate that you want to have persistent CGI or not? It is documented in our web server programmer's guide on how to do that, but basically when you get a request in from the browser, you have to send a response back, and that response contains a header. In that header we have a special variable that the web server looks at. If you set that variable, that indicates to the web server that you want to have a persistent connection. Now it handles that pseudo session with the browser for you and directs requests back to that. It's pretty easy to get into that.

Now we also support this with Net.Data. Again, Net.Data is a CGI program, but we've added some special macro tags that you can put in your macro that says, I want this macro to be persistent. Now you can come back to multiple instances or multiple sections in the macro and you can have open cursors, you can maintain variables, and things like that in your Net.Data program also. We discuss more about Net.Data under the Net.Data section of this presentation.

There are some things we did special on the AS/400 to ensure that we can get optimal performance throughput with our CGI support. Some of the other industry standard things that we support include the non-parsed headers. Your CGI program can send back its own header information. We support the HTTP 1.1 protocol which includes persistent connections. That improves overall performance of the TCP/IP link. We support server side includes, another industry standard in terms of being able to annotate your HTML with file references and date references. We also have a server API which is seldom used on any platform except by real professional programmers that need to extend the capability of the web server. That's basically what the server API's are. Think of them as exit programs for the web server so in the process of the server running, you can make decisions for the web server and you can extend its functionality. This is not a programming interface that most people use just for writing simple web applications.

# Notes: HTTP Server - Base-5



The following are enhancements made to V4R4.

**Dynamic Cache**: In addition to fixed file caching already supported, V4R4 added dynamic caching where the system identifies the most frequently used pages and places them into the cache as specified by the administrator.

Extended Log Format: The Extended Log Format as defined in the specification "Extended Log File Format W3C Working Draft." The extended log format combines Access, Referer, and Agent log information into one log file. This format also allows you to configure the information that is written in each access log entry. If you do not specify a named extended log format, each access log entry will have a common format with agent and referer information appended. Use the ExtendedLogFormat directive to specify what information the HTTP server logs into the access log files. Using the extended log format does not affect error, referer, or agent log files. For the latest information and sample files, see http://www.w3c.org/TR/WD-logfile. ExtendedLogFormat works in IFS and in QSYS. In QSYS, since the record length is fixed, any log entries are truncated if they are longer than that fixed length. A message is sent to the error log the first time this happens. d

**Log Maintenance Options:** You can choose whether you want to keep old logs, remove logs after they reach a certain age and/or a collective size, or run your own program at midnight each night to handle old logs. Note that the “collective size” is the collective size of all access logs only (not combined with agent and referer logs), or of all agent logs only (not combined with access and referer logs), or of all referer logs only (not combined with access and agent logs). To reduce the space the access, agent, and referer logs require, you can specify that the logs be automatically removed, based on the age of the log and/or the collective size of the logs. If you are interested in running your own backup program to store the logs, you can specify a user exit. In this case, you specify the path to your program and the parameters to pass to your program. The server appends to this information the path to the logs**. T**he settings you specify on the Access Log File Configuration form apply to agent and referer logs, as well.

**Log Reporting:** An administrator can create one or more data access log report templates. Templates allow you to define what information from the access log files should be included in an access report. Reports are generated based on access log information only; not for the error log information. The administrator can choose whether IP addresses in the access logs should be shown as host names in the reports. This can be controlled for all reports, but not individual reports.

V4R4 Log Reporting continued

An administrator can create one or more data access log report templates. Templates allow you to define what information from the access log files should be included in an access report. Reports are generated based on access log information only; not for the error log information. The administrator can choose whether IP addresses in the access logs should be shown as host names in the reports. This can be controlled for all reports, but not individual reports.

Here are some reasons for controlling what gets reported: To reduce the scope of the report: You might be interested in reducing the scope of the report so that it includes only a portion of what is contained in the log. You can even create several reports, each to gather different information from the same log. You might want to create your report template so that it includes log entries for access requests to HTML pages, but not for the access requests for the GIF images that the HTML contains.

To collect information about external hits only: You might be interested only in who is accessing your server from outside your company. In this case, you would filter out access requests that originate from internal company IP addresses.

To gather information about who is accessing a particular Web site: To help you determine the size of the audience for a particular Web site, you might want to create a report that shows only the hits to one URL.

To help you determine the popularity of a particular Web site, you filter out everything in the report, except for the most visited Web pages.

Using the DoReporting directive, you can configure reports to be generated at a certain time each day. Regardless of which option is selected, the log files still close at midnight. When generating reports at a certain time of day, the reports are generated for the previous day's log files and any log file entries for the current day.

The reports for all server instances can be viewed through the HTTP Configuration and Administration web pages.

The maintenance options for report files are similar to those for maintaining log files. You can keep the report files, remove them at a certain age or size, or run a program to control them.

Each server instance that wants to use logging and reporting must have its own configuration file with its own logging and reporting directives. Reports are stored in directories unique to each server configuration file (/QIBM/UserData/HTTPSVR/reports/instance_name) where instance_name is the name of the HTTP server instance that generated the reports).

**Web Usage Mining Reports**

If you want to understand how your users navigate through your Web site, you can look at the Web usage mining statistics. They tell you the sequence of Web pages a user clicked through during a visit. These reports can tell you where people enter and exit from your Web site and which Web pages as a group are visited most. You can see the browsing patterns and identify user behavior, which in turn allows you to better organize your Web pages. The reports are generated automatically and are not tailorable except through the standard report templates. The Web usage mining statistics reports come in 3 flavors: User-based, Path-based, Group-based.

User-based statistics help you understand how users move through your Web site. Each user session is recorded as the sequence of HTML links followed by a specific user. If a user remains idle for some predefined period of time, the next sequence of links is considered a new user session.

Path-based statistics identify paths used to travel through your Web pages. Each user path is a sequence of HTML pages chosen to by a user and can reveal the user's actual browsing behavior. Path-based statistics tell you how the HTTP links embedded in a Web presentation are actually followed by users.

**Web Usage Mining Reports continued**

Group-based statistics tell you the groups of pages most frequently visited during a user session, helping you to see which groups of pages are most popular. A user session can contain multiple paths; and the group of pages frequently visited in a session may not lie on the same path. By examining the path-based and group-based statistics, you can obtain valuable information to improve the organization and linkage of the Web presentation.

**Web Activity Monitor**

The Web Activity Monitor is integrated with the V4R4 HTTP Server. It provides a real-time view of server activity since the last time the server was started. Enabling the activity monitor is a function performed through the Systems Management options of the Administration server.

It places the following directive in the server instance:

```
Service /Usage*  INTERNAL: UsageFn
```

Once monitoring has been enabled, you can view the statistics through the administration server.

The Work with Server Instances has a "Monitor" button that displays the statistics.

There are four types of statistics displays initiated by the Monitor request.

- Activity statistics
- Network statistics
- Recent accesses
- Recent Proxy accesses
-

Statistics counters are reset when the server is started or restarted.

**Platform for Internet Content Selection (PICS)**

Using the Platform for Internet Content Selection (PICS), users of Internet applications, such as World Wide Web, FTP, and Gopher, can filter the material they encounter and accept or reject the material based on its ratings. This filtering allows parents, businesses, schools, or discerning individuals to block the access to inappropriate and objectionable material. PICS can also be used for other purposes, such as privacy and for third-party ratings of the timeliness and technical accuracy of a Web page. For the most up-to-date PICS information, see the World Wide Web Consortium's PICS Web site (http://www.w3.org/pub/WWW/PICS/).

Web sites can rate themselves or be rated by a third party, called a rating service. A rating service evaluates Web content according to their own published criteria and then distributes the labels through a label bureau. Often, a rating service acts as its own label bureau and distributes its own labels.

Some rating services will also give you assistance in assessing and labeling your own site and documents. The World Wide Web Consortium publishes a list of PICS self-ratings services at http://www.w3.org/pub/WWW/PICS/selfrat.htm

The PICS specification does not determine who can or will act as a rating service. You can set up such a service by:

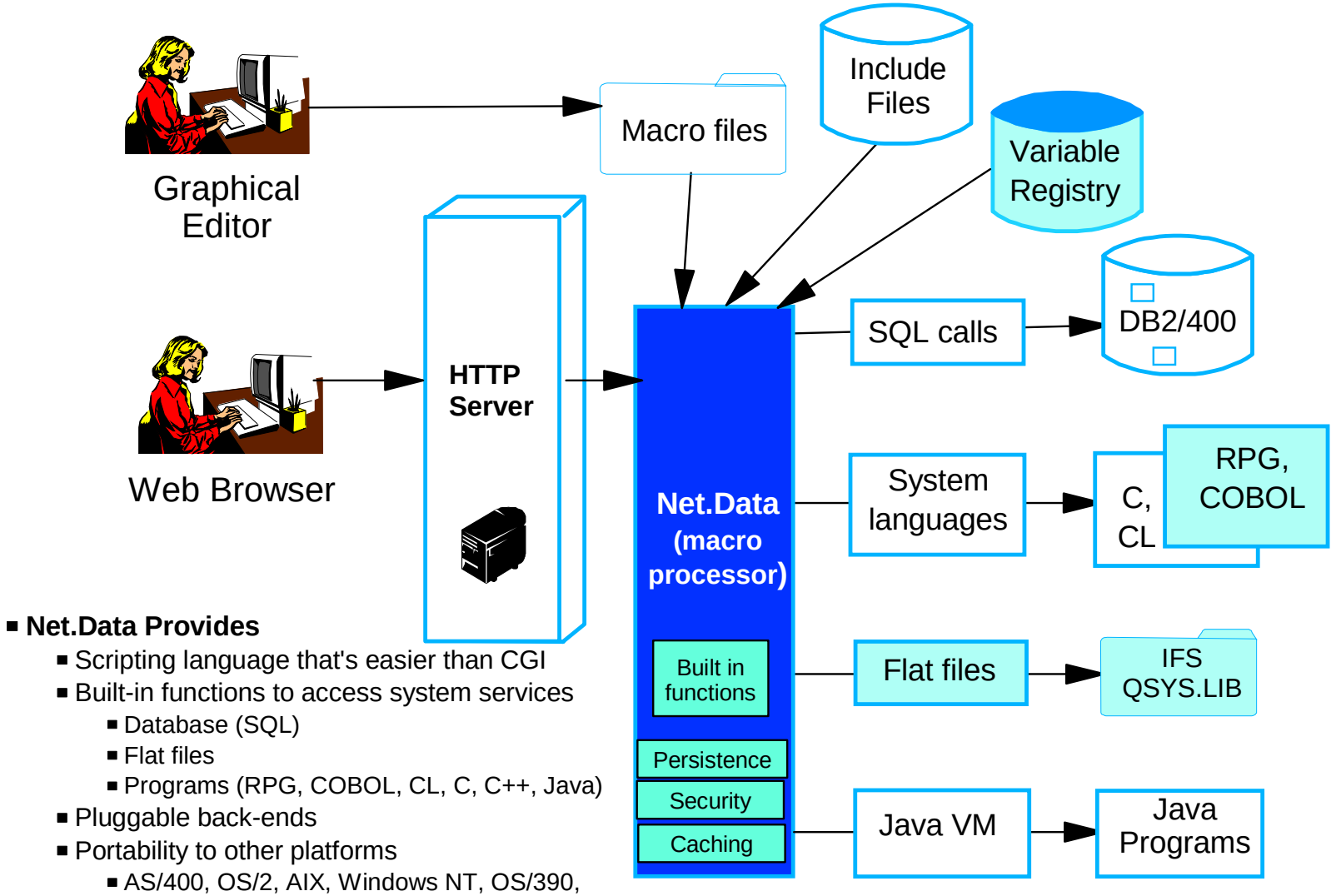
- Deciding on a rating system and publishing it
- Rating documents and creating the rating labels
- Establishing a Web site that clients can access to get your labels

A rating service can choose any criteria to rate Web sites. Some might rate them for their violence or sexual content, while others would rate them for educational or political content or even how "cool" a site is. A rating service can rate any and all Web sites it wants to rate.

Having your Web site and pages rated is often desirable. It may even be necessary for your Web site to be viewed by a minor child.

# Net.Data Overview






- **Net.Data Provides**
  - Scripting language that's easier than CGI
  - Built-in functions to access system services
    - Database (SQL)
    - Flat files
    - Programs (RPG, COBOL, CL, C, C++, Java)
  - Pluggable back-ends
  - Portability to other platforms
    - AS/400, OS/2, AIX, Windows NT, OS/390, Sun Solaris, HP-UX
  - NLS and DBCS support
  - V4R4: Object relational objects, Java, multiple result sets, 2-way parameters, ....

**Quick deployment of forms-based browser interface**

# Notes: Net.Data Overview



Net.Data is an IBM-written CGI program that supports a macro interface. It sits on top of the HTTP server and handles the standard-in, standard-out environment variables. It handles the interaction with the web server. Then you, as a macro writer, provide a macro file. That macro file is basically a script that tells the Net.Data parser exactly what your intentions are.

There are no new, unique to Net.Data enhancements in OS/400 V5R1.

Typically your intentions are to go out and access the database using SQL, going out and accessing a program, whether it be a C, RPG, COBOL, Java, whatever program out there. You want to be able to call that program and get results back. Perhaps you want to call out to the REXX programs. Perhaps you want to go read in a file to the file system. Whatever you want to do, you indicate that using tags in this scripting language. As the results come back, you need to format those results in a format that the browser can handle.

The way you do that is using HTML. You use HTML tags, paragraph tags, table tags, selection lists, check boxes, whatever. Basically what a macro is, is nothing more than a HTML file. Inside that HTML file are some directives that tell the Net.Data macro processor what external resources you want to access and how you want the results of that access to be displayed to the browser. It's very simple. It's excellent for any time you need to do forms processing. Any time you need to put up a button, put up an input field, ask customers information, what have you, you need some kind of a program behind that form to process the information that the customer enters. Net.Data is typically the best way of doing that. With persistent Net.Data you can actually do long running transactions and things like that also.

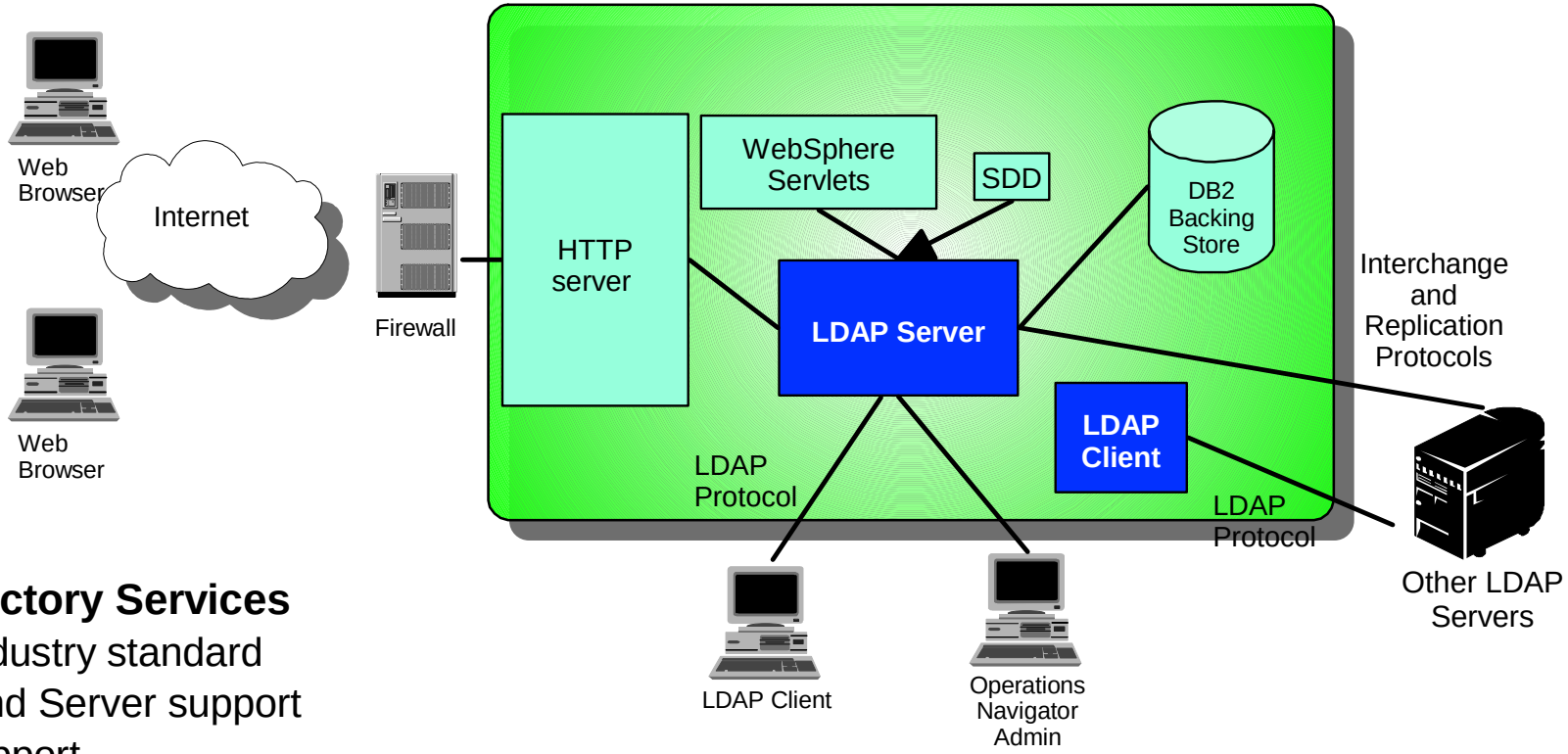
**Net.Data V4R4 enhancements**

Net.Data was significantly enhanced in V4R4 with numerous functional and performance improvements that continue to make it the easiest and most flexible way of building high speed dynamic business transaction applications for the web. Net.Data supports the new DB2/400 data types introduced this release (i.e.. Large objects, Datalinks, etc.). It also allows you to call SQL stored procedures and handle multiple result sets returned by those procedures. Direct program calls to AS/400 ILE programs that use input and output parameters is now possible. In addition, Java support is added that allows you to access Java applications or generate Java applets from Net.Data . Support for cookies and sending e-mail are also provided.

Performance is enhanced by only parsing macros once and saving the results for subsequent requests for that macro. Programming for Net.Data is made easier with new trace/logging support that makes it easy to find an error in your macro. New built-in functions make it easy to use Net.Data to send e-mail, generate browser cookies, and manipulate Net.Data tables.

# LDAP Directory Services






- **LDAP Directory Services**
  - Open industry standard
  - Client and Server support
  - JNDI support
  - Graphical Administration
  - SSL Support
  - Replication to other platforms
  - LDAP Version 3.1 with OS/400 V4R5
  - Dynamic schema managed by LDAP Server
  - **Director Management Tool** (schema and directory)

- **V5R1 LDAP - SecureWay Directory V3.2:**
  - Kerberos
  - GSKit
  - Event notification
  - Transaction support
  - Fine grained ACL support
  - for unlimited number of connections
- **OS/400 Default Directory option**

# Notes: LDAP Directory Services



LDAP - Lightweight Directory Architecture Protocol) provides a schema for a hierarchical ordering of directory information. LDAP is a specification for a client-server protocol to retrieve and manage directory information. It was originally intended as a means for clients on PCs to access X.500 directories, but can also be used with any other directory system that follows the X.500 data models. The first implementation of LDAP was developed at the University of Michigan, USA.

OS/400 LDAP support provides a directory and publishing server for exchanging directory information within IBM LDAP servers and, hopefully, with non-IBM directory servers. WebSphere servlets through APIs can interface with the Directory Server. The OS/400 System Distribution Directory (SDD) entries can be exchanged with the OS/400 Directory server and publishing server.

Secure Sockets Layer (SSL) can be used to encrypt/decrypt directory information exchanged over the communications network.

The LDAP uses object oriented syntax for defining entries as various levels within the directory hierarchy, such as geographical entries, country entries, state or province entries, city entries, street entries, and specific user entries ("Distinguished Names" (DN)). With V 3.2 you are not limited to the traditional hierarchy when structuring your directory. The .domain component (dc) structure, for example, is gaining popularity. With this structure, entries are composed of the parts of TCP/IP domain names. For example, dc=ibm,dc=com may be preferable to o=ibm, c=us used in previous directory structures.

Note, every server and client intending to communicate directory information needs to be using the same structure for best results.

# LDAP Directory Services-2



S/400 Directory Services in V5R1 now supports IBM SecureWay Directory Version 3.2. Examples of IBM SecureWay products dependent on the directory for some of their distributed functions are:

- WebSphere Commerce Suite
- WebSphere Application Server
- SecureWay Policy Director
- IBM MQ Series
- IBM HTTP Server

Version 3.2 of the IBM SecureWay Directory provides the following industry-leading innovations:

- Support for authentication utilizing Kerberos - provides Network Authentication Services via Kerberos V5 protocol APIs (server and client), used for interoperability with Windows 2000. This function was originally announced as a PTF in 10/2000 to earlier OS/400 releases.
  With Operations Navigator you can enable your LDAP directory server to use Kerberos authentication. Kerberos is a network authentication protocol that uses secret key cryptography to provide strong authentication to client/server applications. To enable Kerberos authentication, you must have one of the Cryptographic Service Provider products (5722AC2 or 5722AC3) installed on your AS/400. You must also have a default Kerberos realm specified in the system's Kerberos configuration file.
  When the OS/400 directory server uses Kerberos authentication, the Kerberos principal name used by the server is in the form *service-name/host-name@realm*, where the service name is LDAP, the host name is the fully qualified TCP/IP name of the system, and the realm is the default realm that is specified in the system's Kerberos configuration. For example, if a system in the *acme.com* TCP/IP domain was named AS4ITSO and had a default Kerberos realm of ACME.COM, the LDAP server Kerberos principal name would be *LDAP/AS4ITSO.acme.com@ACME.COM.*
- GSKit 4.0 - the server and client is upgraded to use GSKit 4.0 as the SSL provider.
- Fine grain access control - allows the management of access down to the individual attribute level. A directory administrator may now control who may see individual attributes for each entry within the directory.
- "Unlimited" Connections - allows a much larger number of clients to connect to a server, which reduces the number of servers required.

# LDAP Directory Services-3



Version 3.2 of the IBM SecureWay Directory continued

- Transaction support - allows an application interface to include more than a single LDAP operation in a transaction with the server.
- Event notification - allows a server to notify a registered client that an entry in the directory tree has been changed, added or deleted, at or below the specified DN(s) for the event types of interest.

In addition to the IBM SecureWay Directory V3.2 updates, the following enhancements are made for Directory Services on OS/400:

- Security auditing was added to LDAP for administrators that want to audit LDAP operations to the server.
- The Directory Services server is automatically configured on the system when either the directory server or publishing is not already configured and when no LDAP DNS information can be found. Operations Navigator This "default configuration" does not include publishing users. Operations Navigator Directory Services can be sed to either create, re-create, or update the configuration. Remember starting with V4R5, the Directory Management Tool is shipped with OS/400 and can be downloaded to a Windows PC where additions and changes can be made to the directory.
- Directory Services has moved to the base operating system. OS/400 Directory Services, option 32, still exists for compatibility, but the LDAP function is now in the base.

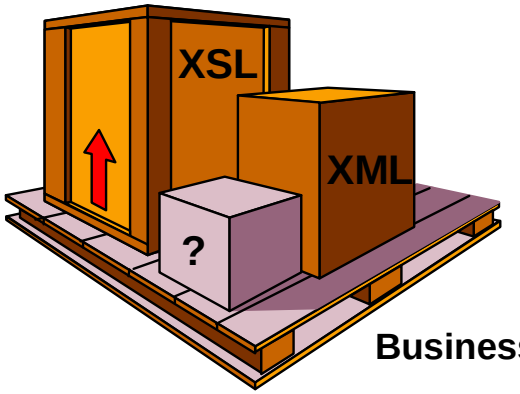
The Communications presentation includes examples of the V5R1 Operations Navigator interface to Directory Services and use of the Directory Management Tool.

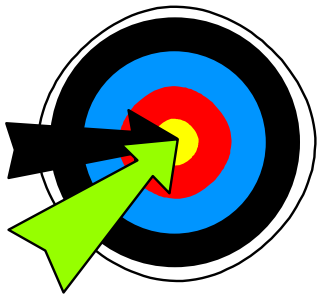
# XML Overview

# extensible Markup Language



- Data description specification (not really a language)
  - Separates data from application logic and data presentation
  - "Standard specification" for describing data with markup language tags
  - Allows for creation of specific markup languages (commerce (cXML), ....)
- Open Communication
  - Pervasive computing
  - Information reuse, business to business
  - Still evolving
- Complements Java
- Provides underlying support for content integration and transformation



**Business to Business**

Search with "XML" at:
- http://www.techweb.com
- http://www.ibm.com/eserver/iseries/developer

# Notes: eXtensible Markup Language



XML and versions of XML (such as Ariba's cXML and Metiom's mXML) and management of the XML "definition" are popular topics in the e-business media and touted as key to making it easier to implement e-business applications by separating description of the data being processed from formatting the data on a browser for maximum appeal to the end user. We include a brief overview of XML here.

Extensible Markup Language (XML) is an open standard for describing data to be exchanged over an internet application. The World Wide Web Consortium (W3C) has the task of both defining and validating the specifications for XML and XML related technologies. W3C is composed of companies that are heavy weights in the publishing industry, including Adobe, Ariba, HP, IBM, Microsoft, Netscape, Sun, Oracle ....

XML is used for defining data elements on a Web page and business-to-business documents. It uses a similar tag structure as HTML; however, whereas HTML defines how elements are displayed, XML defines what those elements contain. HTML uses predefined tags, but XML allows tags to be defined by the developer of the page. Thus, virtually any data items, such as product, sales representative and amount due, can be identified. This allows Web pages to function much like database records.

XML describes a class of data objects called XML documents and partially describes the behavior of computer programs which process them. XML is an application profile or restricted form of Standardized General Markup Language (SGML). Many computing areas have leveraged XML, as it lends itself to any type of data description. Many document type definitions, which are formal document grammars, can exist in an XML-based information system, enabling authors to create documents that comply with particular SGML DTDs (Document Type Definitions) format, since XML is a subset of the SGML language. . Any person or group can build document type definitions, which represent unique organizations of data.

Unlike HTML, which uses a rather loose coding style and which is tolerant of coding errors, XML pages have to be "well formed," which means they must comply with rigid rules. XML tags are defined in an XML schema, which defines content type as well as name. XML tags can also be described in the original SGML DTD format, since XML is a subset of the SGML language.

# Notes: eXtensible Markup Language-2



***Like SQL or Java, XML is an enabler of infrastructure technology. While many consider it a language, XML actually is a standard for specifying a document markup language based on plain-text tags. Where HTML tags tell the browser how to display various elements on a Web page, XML tags specify what those elements are.***

***XML statements define data content, whereas the HTML lines deal with fonts and boldface. XML defines "what it is," and HTML defines "how it looks."***

***Data typing*** enables defining data by type (character, integer, etc.). ***Schema reuse***, or ***schema inheritance***, lets tags referenced in one schema be used in other schemas. ***Namespaces*** enables multiple schemas to be combined into one. ***Global attributes*** assign properties to all elements. ***Associating Java classes*** adds processing to the data. ***Authoring information*** adds improved documentation for schema designers.

By providing a common method for identifying data, XML supports business-to-business transactions and is expected to become the dominant format for electronic data interchange. It is really a first step as there are several vendors with different levels of implementation and the XML standard is evolving.

There are several Web sites that provide repositories for publishing and reviewing XML schemas. Two Web sites are shown on this foil.

In both cases, search on "XML" to find a variety of articles and hotlinks.

# Comparing XML and HTML



- XML
  - Tagged markup for information
    - Focused on data structure
    - Data retains meaning
  - Extensible - new tags creatable
  - Uses <tag> & </tag> style
  - Descriptive markup
    - specific search criteria
  - Stringent syntax
    - end tags required
    - element nesting enforced
  - Associated components
  - Automatically generated & used
  - Requires newer browser
    - Internet Explorer 4.0 or later
    - Netscape 5.0 or later
- HTML
  - Tagged markup for text
    - Focused on presentation
    - Data is text (limited reuse)
  - Fixed set of tags
  - Uses <tag> & </tag> style
  - Document tagging
    - too many hits from searches
  - Loose syntax
    - end tags assumed
    - nesting errors effect display
  - Simple and complete
  - Manual handling & web use
  - Works with any browser

# Notes: Comparing XML and HTML



This chart shows a summary of the differences between XML and HTML.

- Both XML & HTML are tagged markup languages
  - However XML retains the meaning of the information while HTML focuses solely on the presentation
  - Data retaining its meaning so there is a wide opportunity for reuse of the information, but as text the data has lost its distinguishable characteristic
- By having the ability to define new tags within XML - tags are defined that specifically describe the data between the tags
  - In one example, an XML tag maybe <book title> while in HTML it would be expressed as <H1>
  - In another example, new tabs have come to be used to create "XML Dialects" that are being used more and more to implement Business to Business solutions:
- XML Dialect examples include:
  - WML (Wireless Markup Language)
  - cXML (Commerce Markup Language): Ariba, Inc. uses this to "define a request/response process for the exchange of transaction information. These business processes include purchase orders, change orders, acknowledgments, status updates, ship notifications, and payment transactions."
  - ebXML (electronic business Markup Language): United Nations/CEFACT/OASIS) uses this to "define a single set of internationally agreed upon technical specifications that consist of common XML semantics and related document structures to facilitate global trade - creating a single global trade - creating a single global market."(TM).
  - mXML: from Metiom.
- These descriptive tags allow specifying more discrete searches because you state both the tag name and the search data
  - For example if you wanted books written by George GoldFarb you could build a search looking for author name of George Goldfarb this would retrieve only books by that author.

# Notes: Comparing XML and HTML-2



here are a set of rules around XML which allows the parser to process the tags - unlike HTML which has little discipline

- Rules include having both a start and end tag with the same name.
- Tags are case sensitive and space sensitive they must be exact; <BOOK> does not equal <book>
- Nesting of elements is possible and is enforced

- Unlike HTML which is usable by any browser - XML has associated components ("related technologies") which necessitate components supporting XML to be continually updated. XML related technologies include:
  - XML parser
  - Document Type Definition (DTD)
  - extensible Stylesheet Language (XSL)
  - XSL processor
  - Other future components
- Programs can be written to extract data from databases and create XML; the important difference again is that the data does not lose its distinct meaning, This process does, in fact, occur in the Business to Business market place. See the section within this presentation that discusses IBMConnect for iSeries.
- XML requires newer browsers to process the XML and make it viewable - today HTML works with any browser.

# XML Enablers - Related Technologies



XML is used to represent the data / information

- XML Parser
  - used to translate XML into computer usable tree structure
  - provides interface for applications to view, update XML documents
  - optionally validates if XML document is compliant with W3C* XML specification
  - An XML parser typically implements either of two "structures" (algorithms):
    - DOM (Document Object Model), which creates a navigable "tree structure" for multiple passes through the XML document
    - SAX (Simple API for XML), which uses a sequential processing of keywords within the XML document
  - Two parser commonly available
    - XML4J: IBM XML Parser for Java
    - XML4C: IBM XML Parser for C++

XML works in concert with other related specifications

- DTD Document Type Description
  - defines valid XML Document syntax
  - "well formed" (w/o DTD) compared to "valid" (DTD used)
- XSL extended Stylesheet Language
  - defines how to format and transform XML data streams
- XLink eXtended Linking Language
  - allows linking to other documents and images

*World Wide Web Consortium

# Notes: XML Enablers - Related Technologies



This chart shows a summary of the key XML enablers - most are necessary to the job of passing data correctly between a source and endpoint within an internet business to business environment.

The XML parser is key, but the parser in most cases needs help in translating XML documents - typically the Document Type Description (DTD) file and an eXtended Stylesheet Language (XSL) file. The following pages have some more information on DTD and XSL.

An EML parser is typically implemented on one of two ways (structures) - the Document Object Model (DOM) and the Simple API for XML.

# Document Type Definition (DTD)



Defines the rules of the document

- Optional, but used to maintain data attribute and content integrity
- Which elements and attributes (if any) must be present
- Structural relationship between the elements

Without a DTD, an XML document can be:

- "Well formed" - XML document complies with the W3C XML specification

With a DTD, an XML document can be:

- "Valid" - XML document meets the rules specified in the related DTD

# DTD Example



## XML document

```
<payments>
    <payment>
        <customer>51234</customer>
        <invoice>1234567</invoice>
        <amount>9000.50</amount>
        <attention>Mr. BOSS</attention>
    </payment>
    <payment>
        customer>99084</customer>
        <invoice>1236789</invoice>
        <amount>1000.25</amount>
    </payment>
</payments>
```

## DTD

```
<!DOCTYPE customer payments[
<!ELEMENT payments (payment+)
<!ELEMENT payment (customer,
    invoice, amount, attention?)
<!ELEMENT customer (#PCDATA)>
<!ELEMENT invoice (#PCDATA)>
<!ELEMENT amount (#PCDATA)>
<!ELEMENT attention (#PCDATA)>
]>
```

Where:

"+" indicates the element must occur at least one or more times

"?" indicates the element may occur only once or not at all

" " (blank) indicates the element must occur only once

#PCDATA (Parse Character Data) specifies character content

Note: <attention> is an optional field. The "?" indicates the field is not required in the "payment" structure

# Notes: DTD Example



In this example the XML document on the left contains 2 "records" (instances of the payment structure). The records are indicated by the starting <payment> and ending </payment> tags. On the right you can see the DTD that tells the XML parser how to process the data within the XML document. In this example we have defined the "attention field" (element) as being optional by specifying the question mark character (?) to the right of "attention."

# eXtensible Stylesheet Language (XSL)



## XSL has two roles

- Transform an XML document into another XML document or HTL
- Format an XML document for presentation (called "rendering")
  - Fonts, size, color, alignment, ...
  - Provide rules for ordering presentation information (eg book <author> or <title> listed first)

## XSL enables data reuse by:

- Data rendered to web browsers
- Transforming data rendered to a variety of devices
- Data transformed to different file structures *

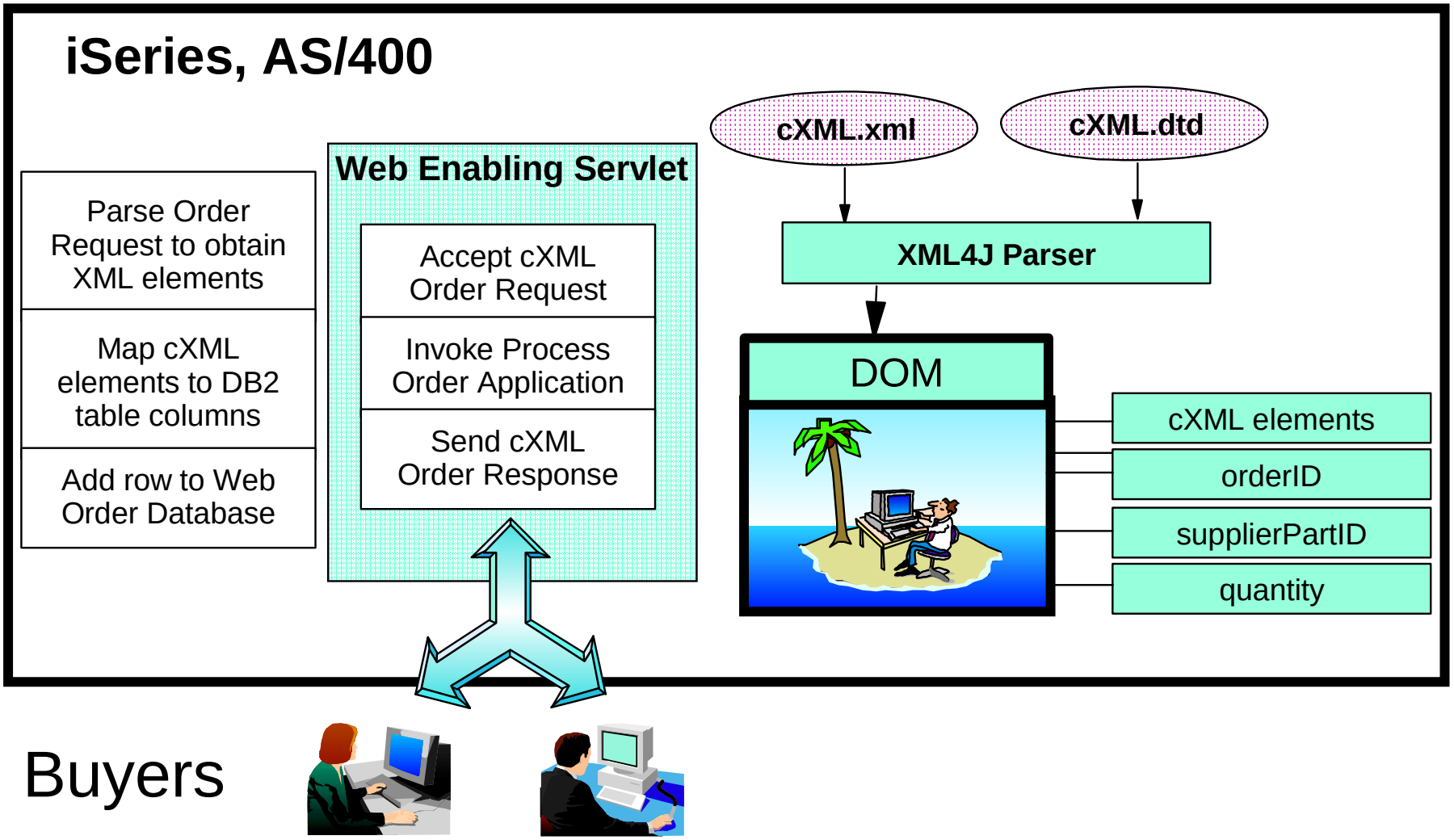
*For example, translating one XML dialect to another

# Web Servlet Using cXML - simple example



*B to B: iSeries, AS/400 Seller to Buyer*



# Notes: Web Servlet Using cXML - simple example



This foils shows a very simple Business to Business transaction using XML and related technologies. The seller's server is an iSeries or AS/400 that processes an order request. the XML document exchanged with the buyers on the lower portion of this foil is in the "cXML dialect. You can see the Java parser is processing the cXML document elements according to the cXML Document Type Description (cXML.dtd).

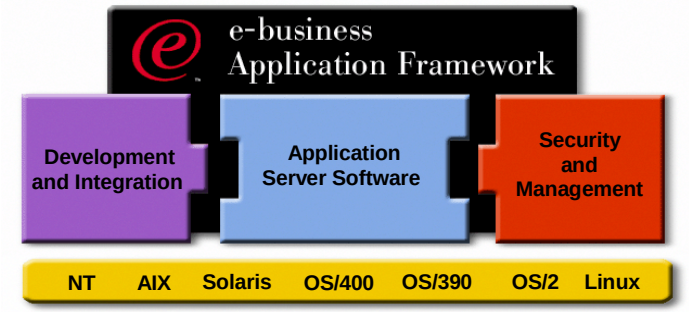
The servlet processes the order request, updates the affected inventory tables and adds a new row to the new order tables. The order response is formatted back into cXML because cXML is the "language" the Buyers' software uses.

# AS/400 and XML



- XML for C++ (General Availability: March 8, 2000)
- Supported, since V4R4, also via:
  - Panel Definition Markup Language (PDML) in AS/400 Toolbox for Java
  - Program Call Markup Language (PCML) n AS/400 Toolbox for Java
  - WebSphere Application Server
- Existing AS/400 management practices and tools support integrated Web-based applications via XML with enterprise systems
- XML parser and other related XML technologies (DTD, XSL, ...) are also included in products such as WebSphere Commerce Suite and MQSeries family products that run under OS/400



# Notes: AS/400 and XML



IBM's XML for C++ parser (XML4C) is based on Apache's Xerces-C XML parser, which is a validating XML parser written in a portable subset of C++. XML4C integrates the Xerces-C parser with IBM's International Components for Unicode (ICU) and extends the number of encodings supported to over 150. It consists of three shared libraries (2 code and 1 data) which provide classes for parsing, generating, manipulating, and validating XML documents. XML4C is faithful to the XML 1.0 Recommendation and associated standards (DOM 1.0, SAX 1.0, DOM 2.0 etc). Source code, samples and API documentation are provided with the parser. Supported Platforms are AS/400, AIX, Linux, Solaris, Windows NT, Windows 98, HP-UX 11 and HP-UX 10.2. You can download these libraries from **http://www.alphaWorks.ibm.com/tech/xml4c**.

PDML and PCML are both included in the AS/400 Toolbox for Java as of V4R4. PDML is used for defining GUI layout and components, provides a conversion tool for Microsoft GUIs to XML and gives runtime support to generate Java/Swing GUI classes. PCML defines AS/400 program interfaces and facilitates program calls from Java to other OS/400 Languages. It also performs data type conversions between JAVA and OS/400 and simplifies Java programs by handling complex relationships in AS/400 data.

All editions of the WebSphere Application Server have a Document Structure Services component which contains features for building applications that support data in XML format, including:

- XML4J: the IBM Java-based XML parser
- LotusXSL: Java-based XSL stylesheet processing runtime
- Library of common DTDs
- Sample servlets which support the use of XML

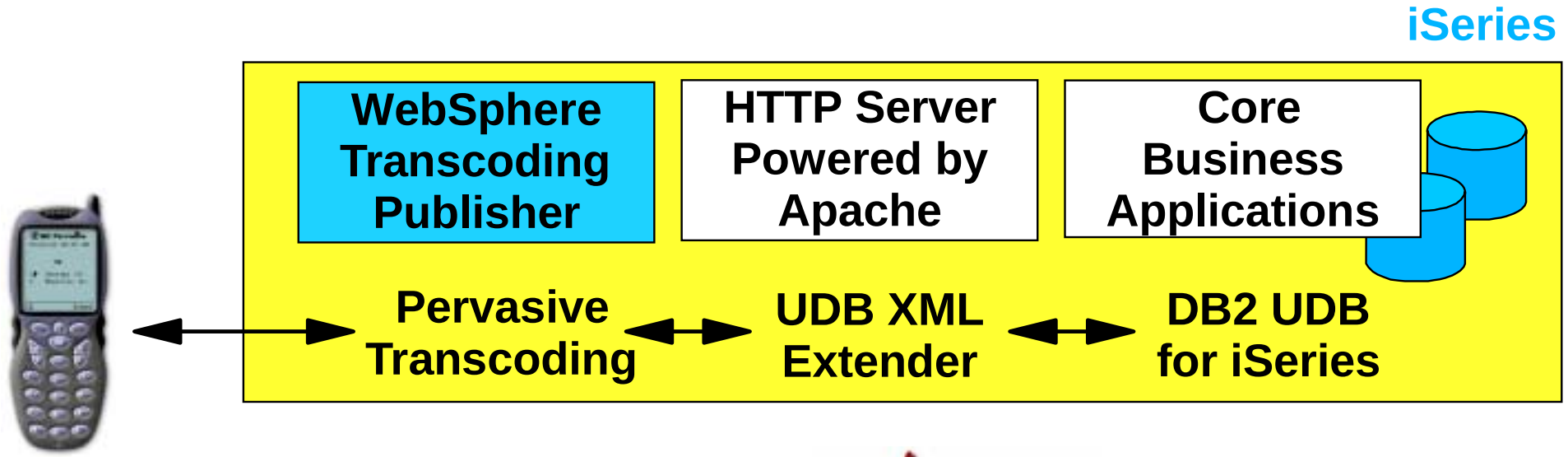
# AS/400 and XML - Pervasive Computing



## iSeries application enablement for pervasive devices

- XML
- DB2 UDB XML Extender
- WebSphere Transcoding Publisher*
- Management Central Pervasive

*Supported on V4R5; Watch for V5R1 support later in 2001





# Pervasive Computing



iSeries provides a wide range of application enablement options for extending business solutions to pervasive and wireless devices. In addition to solutions from IBM, such as Management Central Pervasive, a number of iSeries Business Partners provide wireless solutions. The Business Partners include LANSA, Seagull, Jacada and Advanced Business Link.

Extensible Markup Language (XML) is one of the key technologies fueling growth of e-business and mobile e-business solutions. XML is becoming the standard way to represent data in a portable, reusable format for use in a number of solutions, ranging from B2B solutions which link together trading partners, to pervasive computing applications which connect mobile devices such as cell phones to core business solutions. OS/400 includes a wide range of XML applications enablers, including with V5R1:

- XML parsers (common building blocks) used to work with data in new Java and C++ applications.
- XML parsing interfaces to extend enablement options to existing applications written in RPG, COBOL and C.

IBM DB2 UDB XML Extender is a new iSeries licensed program (5722-DE1) that provides two-way data interchange between XML and DB2 relational database formats. It provides new data types to allow XML documents to be stored in DB2 UDB databases plus utilities to work with the new database formats. See the Database topic of this presentation for more information.

Management Central Pervasive is shipped with OS/400 and based on the industry standard protocols WAP and WML. It allows iSeries operators to monitor their iSeries servers from a pervasive devices. Using an Internet capable cellular phone (mobile), a PDA with a wireless modem, or a Web browser, the administrator can monitor and manage iSeries operations. With V5R1, you can both monitor system messages and jobs and, now, manage jobs and run commands.

IBM WebSphere Transcoding Publisher is designed to extend existing Web pages to pervasive computing platforms (cell phones, PDAs) via on-the-fly data conversion. The publisher allows you to select the data in a Web page and omit graphics and images that are not practical to render to the smaller mobile device screens or with the available wireless bandwidth. It is supported on V4R5.

# Pervasive Computing-2



IBM WebSphere Transcoding Publisher is designed to extend existing Web pages to pervasive computing platforms (cell phones, PDAs) via on-the-fly data conversion. The publisher allows you to select the data in a Web page and omit graphics and images that are not practical to render to the smaller mobile device screens or with the available wireless bandwidth. It is supported on V4R5.

WebSphere Transcoding Publisher is a server-side, easy-to-use solution for bridging data across multiple formats, markup languages and devices. Transcoding Publisher adapts, reformats, and filters content to make it suited for pervasive computing, giving companies better access to customers, business partners and mobile employees on a variety of devices:

- Leverage existing investments in HTML and XML-based content to reach wireless Internet users.
  - HTML to simplified HTML
  - to WML (Wireless Markup Language)
  - HTML to i-mode (a variant of compact HTML)
  - HTML to HDML (Handheld Device Markup Language)
  - XML to XML variants using XSL (Extensible Stylesheet Language) stylesheets
  - JPEG images to GIF and WBMP (Wireless Bit Map) formats
  - GIF images to JPEG and WBMP (Wireless Bit Map) formats
- Avoid the expense of creating multiple versions of your Web sites by dynamically adapting content for a wide range of devices including Personal Digital Assistants (PDAs), WAP-enabled phones, and now HDML-based and i-mode phones.
- Respond quickly to emerging trends with easy deployment of new transcoders
- Respond to the limited storage capacity of phones. Fragmentation, which allows Web pages to be dynamically broken into smaller pieces, is available for HDML, i-mode and WML

# Pervasive Computing-3



- Customize content presentation for the end user
  - Choose content to be delivered through two techniques.

    Annotation makes it possible to tailor source content without programming through an XML-compliant annotation language.

    Text clipping allows for content to be tailored for devices with some Java programming.
- Apply XSL stylesheets dynamically to XML content to customize the format and layout.
- Use a wide variety of device profiles to allow for more detailed personalization of content.

Watch this space for plans to support it on V5R1.

For more information on WebSphere Transcoding Publisher, refer to:

- http://www-4.ibm.com/software/webservers/transcoding/

# Web Application Servers

# What is an Application Server?

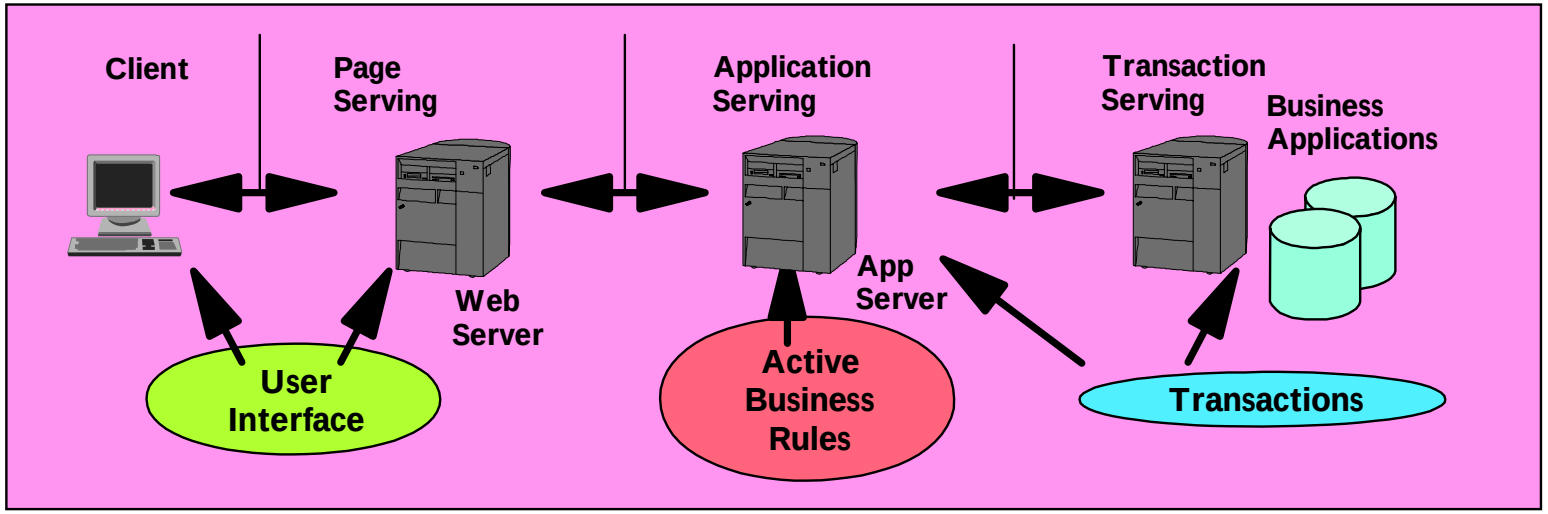


**Emerging software for applications which**

- Manage browser and Java based client sessions
- Provide server-side business logic (Servlets/EJBs)
- Connect to back end computing resources for data and transaction processing

**Application servers are a hot topic by:**

- Simplifying development and deployment of web-enabled e-business applications.
- Supporting connections to legacy data and applications
- Providing a complete set of visual development tools
- Delivering a set of application deployment and management tools.



# Notes: What is an Application Server?



An Application Server is a set of routines or software that serve to link existing "legacy" applications and data to web applications, without the use of 'screen-scrapers' or things like 5250 HTML Gateway that do not provide a true graphical interface or CGI programs that do not make use of the existing application programs and data.

As depicted on the next foil, IBM supports four different Application Server foundations:

- WebSphere Application Server, the IBM Application Server
- Domino for AS/400
- AS/400's open environment providing API's and offering from Independent Software Vendors and Business Partners
- Java

The servlet manager also keeps track of session states for a specific client to server session. There is no concept of persistence as we have for AS/400 CGI persistency where, based upon a CGI parameter in a response to the browser's request, you can keep an ongoing connection with a browser; however, the server manager does maintain state information for you. If you want to know where you left off in the last response to the browser, with APIs you can examine a "state object" that helps keep track of where you are. For example you would know what "goods" are already in a particular browser's shopping cart!

We discuss more about Enterprise JavaBeans under the "Valued Network of AS/400 Web Serving Application Partners" and IBM WebSphere support.

# WebSphere Application Servers



- **Standard Edition 2.0x, 3.0x**
  - Servlets, JSPs
- **Advanced Edition 3.0X**
  - Standard Edition, plus
  - Enterprise JavaBeans
  - Scalability
  - Work Load Management
- **Enterprise Edition**

**http://www-4.ibm.com/software/webservers/**
**http://www.ibm.com/eserver/iseries/websphere**


**Standard Edition version 2.0**

- Servlet 2.0 level of support
- 5769-AS1

**Standard Edition and Advanced Edition 3.0.2**

- Standard Edition 5733-AS2, 5733-AS3
- Advanced Edition 5733-WA2, 5733-WA3
- Servlet 2.1 level of support
- Strategic servlet provider for the future

**Standard and Advanced Edition 3.5**

- Improved Administration GUI and performance
- Java2 support

# Notes: WebSphere Application Servers



WebSphere Standard Edition 1.1 shipped as part of the V4R3 HTTP Server for AS/400. In V4R4 it was shipped as a separate no charge program 5769-AS1. Shortly after Standard Edition 2.0 became available, still under 5769-AS1. Standard Edition Version 3.0.2 is becoming available during May 2000. This Version 3.02 becomes more like Advanced Edition in user interfaces where functions are similar. Version 3.02 comes as 5733-AS2 (56-bit encryption) or 5733-AS2 (128-bit encryption).

The Standard Edition is a Java application server based on a servlet-based engine that turns your existing Web server (IBM HTTP Server for AS/400) into a Java Web application server. As the core element of the IBM Application Framework for e-business,
the Standard Edition forms the foundation of the WebSphere application server family and offers application developers a solution to build, deploy, and manage e-business Web sites. The Standard Edition gives companies an open, standards-based, Web server deployment platform and supports servlets and Java Server Pages (JSP) components. The Standard Edition offers an excellent way to initially get your business on the Web.

WebSphere Advanced Edition became available for the AS/400 as Version 3.0.2 in March 2000 - 5733-WA2 (56-bit encryption) or 5733-WA3 (128-bit encryption). Advanced Edition builds on and enhances the Standard edition to give you additional support for scaling Web sites into security-enhanced, transactional, e-business application sites. The Advanced Edition provides EJB support for host-based transactions, and offers sophisticated tools to simplify distributed, component-based application development. The EJB architecture is component-based for development and deployment of server-based business applications. It allows the separation of business applications from underlying system services.

You can see here the primary functional distinguisher between Standard Edition 2.0x and Standard Edition 3.0.2 is the level of Servlet support. However, from a user administration of servlets support viewpoint the Standard Edition 3.0.2 is now similar to the equivalent interface under Advanced Edition 3.0.2.

# Notes: WebSphere Application Servers



Advanced Edition 3.0.2 has 3 major enhancements over Standard Edition 3.0.2 - Enterprise JavaBean support, greater scalability, primarily through workload management on multiple servers, transparent to the application coding.

Standard and Advanced Edition 3.5 became available under OS/400 during October, 2000. Version 3.5 contains GUI ease of use improvements and performance improvements in the Administration interface. Version 3.5 also support the newer Java2 from Sun that base OS/400 V4R5 already supports

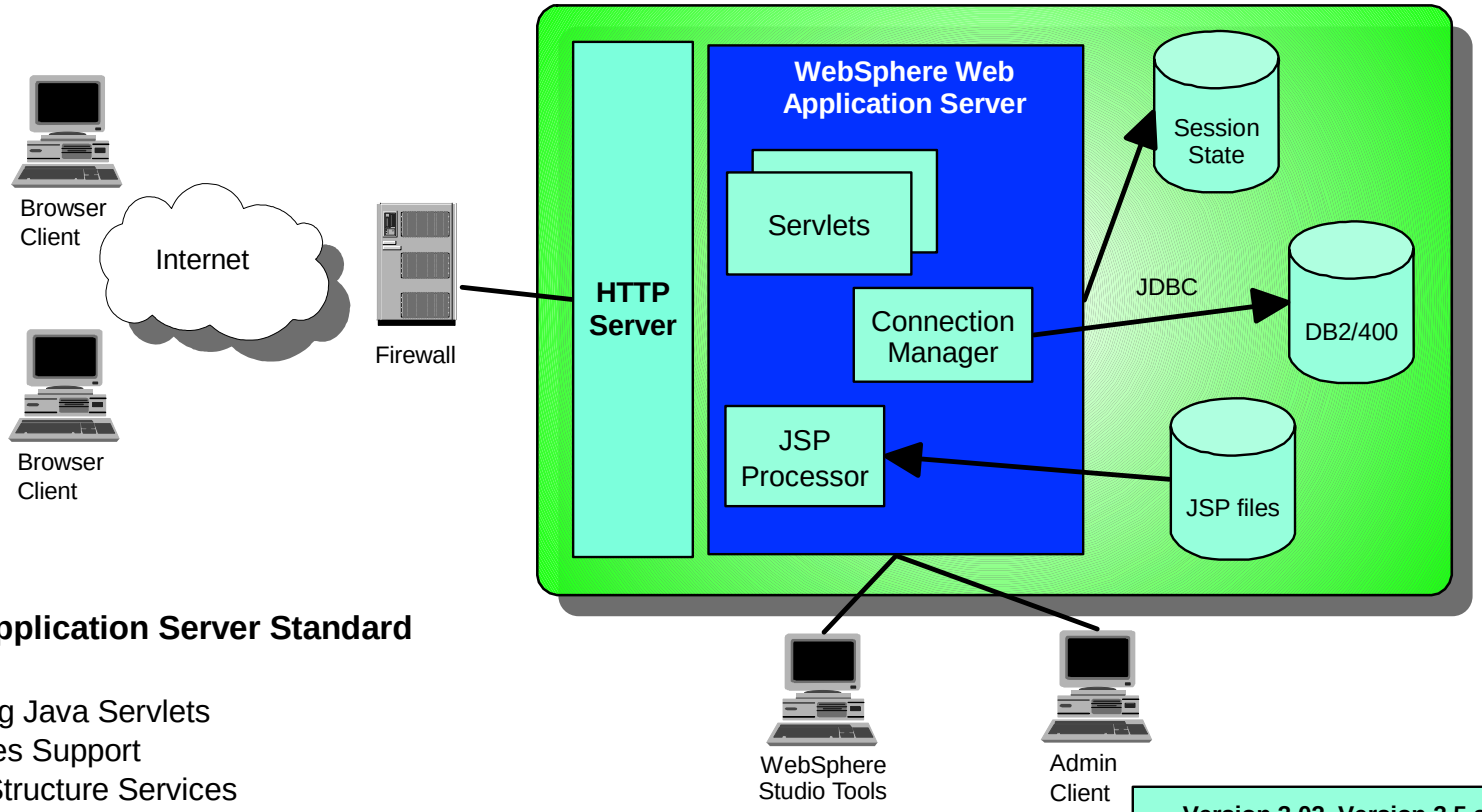
The following charts give some more details on these different editions.

There is also a WebSphere Enterprise Edition (no plans to run this on OS/400). The customers who require EE today are those with:

- investments in CB & TX Series (S/390)
- Few, if any, AS/400 customers have this requirement today or will in the future
- For those who do (AS/400 & S/390 shops), our interoperability should meet their needs

# WebSphere Application Server Standard Edition






- **WebSphere Web Application Server Standard Edition**
  - Engine for running Java Servlets
  - Java Server Pages Support
  - XML Document Structure Services
  - Storage for Session state
  - Java access to data (JDBC and Data Beans)
  - Database Connection Manager
  - Plugs into IBM HTTP Server
  - Graphical Administration
  - Sample applications
  - Application development via WebSphere Studio

- **Version 3.02, 3.5**
  - Multiple JVM support
  - Site analyzer support included
  - Includes a language translation engine
  - Tivoli ready
  - Servlet spec level 2.1
  - JSP spec level 1.0
  - Advanced Edition-like Administration
  - Query, Connection tags

**Version 3.02. Version 3.5 available**
**Version 4 planned 3Q 2001**



# WebSphere Application Server Standard Edition



This chart pictorially shows the primary Standard Edition functions such as managing servlets, use of JSPs (Integrated Java and HTML page definition syntax), XML (Extensible Markup Language), access to data via JDBC and Data Beans, and a graphical interface to administering the servlets and plugging them into the HTTP Server for AS/400.

The 3.5 administration interfaces are quite different from Advanced Edition Version 3.0.2.

Simple sample applications are provided. Development of the Java servlets can be performed under WebSphere Studio.

WS Application Server for AS/400 Standard Edition Version 3.0.2 provided updated XML, and JSP support and administration interfaces are now very similar to the Advanced Edition Version 3.0.2.

Here is a summary level of the Standard Edition support.

**General**

Standard Edition 3.02 provides Servlet 2.1 level support, multiple JVM support and site analysis tools. The product is Tivoli ready, which means Tivoli Agent support (responds to Tivoli Manager request) without an additional installation of Agent support required.

Note: the user programmer must use "session storage" to maintain "application persistence," whereas Advanced Edition would provide that support more easily.

**XML Management**

Like SQL or Java, XML is an enabler of infrastructure technology. While many consider it a language, XML actually is a standard for specifying a document markup language based on plain-text tags. Where HTML tags tell the browser how to display various elements on a Web page, XML tags specify what those elements are. XML statements define data content, whereas the HTML lines deal with fonts and boldface. XML defines "what it is," and HTML defines "how it looks."

The Standard Edition integrates new XML/Extended Stylesheet Language (XSL) features to enable sites to take advantage of the latest technology to define and share data, while allowing data to be separated from its presentation. These updates include:

- An XML parser utilizing the latest World Wide Web Consortium (W3) XML 1.0, Document Object Model (DOM) 1.0, and Simple API for XML (SAX) 1.0 recommendations
- W3 (World Wide Web) name spaces recommending a Document Type Definition (DTD) library for local validation
- A new, enhanced XSL processor

Also included are tools that enable sites to tailor data to specific devices including initial support for the Wireless Markup Language.

We have an earlier topic on XML and also discuss it under the Tools section later in this presentation.

# Notes: WebSphere Applic. Servers-Standard Edition-3



**JSP Enhancements**

Java Server Pages (JSP) provide an easy way to access server-side components from Web pages -- thereby separating the presentation of dynamic content from the generation of that content. You do not need to know the Java programming language to use Java Server Pages. JSP gives you the ability to access the feature set of Java in an easy-to-use tagging framework that generates dynamic content for the Web.

Java Server Pages are HTML files written in a combination of industry-standard HTML, Java Server Pages HTML tags, and -- if you like -- Java as a scripting language. A Java Server Pages file has the extension .jsp and calls reusable components that reside on the server. In this release, the components are JavaBeans or Java Servlets.

Full support for levels .91 (standard Edition 2.0x) and 1.0 of the JSP specification. Two additional tags, including a Query Tag for rapid building of a database connection and a Connection Tag for building and maintaining connections, will increase Web site builders productivity without having to have the team write code, but simply use tags similar to what they do to build a page in HTML today.

**Deployment Management**

As discussed the administrative client has been redesigned (to be more like Advanced Edition counterpart ) to simplify the creation, deployment, execution and monitoring of servlets and JSP components**. **

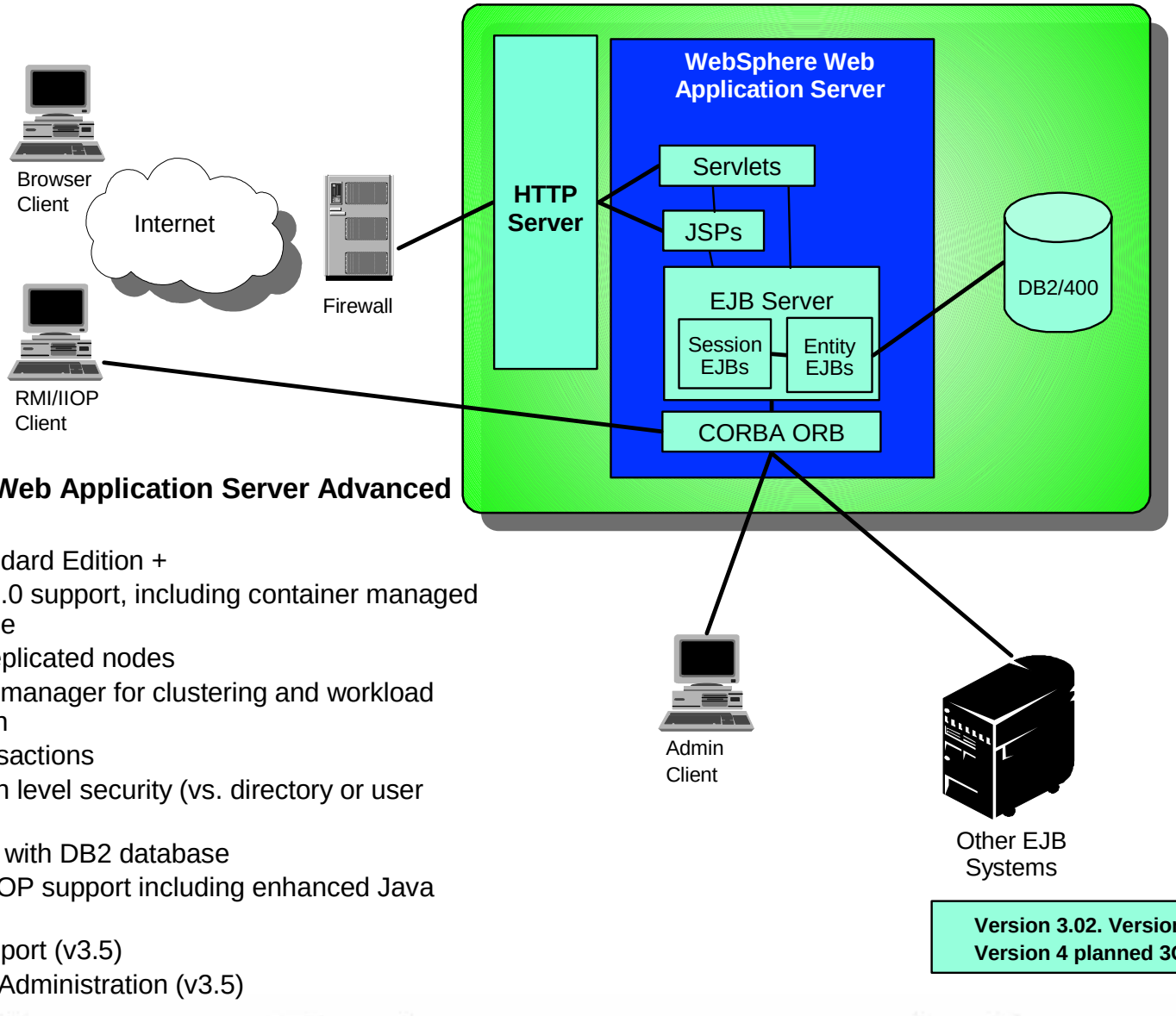
**Security Management**

Security controls and application access protection are enhanced with V3. The secure access control lists can be established at a much more granular level than in the past. In addition to setting up security at the user and group levels, control and policies can be established for specific calls or methods within the applications themselves. Greater depth of control and protection is available within the server deployment environments. Support is also provided for LDAP-based user registries.

**The WebSphere Application Server is available on V4R4 (formal support ends May 31, 2001), V4R5 and V5R1. The WebSphere Application Server V3.02 is compatible and can coexist with the previous version of the WebSphere Application Server Standard Edition 2.02x.**

# WebSphere Application Server Advanced Edition






- **WebSphere Web Application Server Advanced Edition**
  - All of Standard Edition +
  - Full EJB 1.0 support, including container managed persistence
  - Multiple replicated nodes
  - Workload manager for clustering and workload distribution
  - ACID transactions
  - Application level security (vs. directory or user level)
  - Integrates with DB2 database
  - CORBA/IIOP support including enhanced Java ORB
  - Java2 support (v3.5)
  - Improved Administration (v3.5)

**Version 3.02. Version 3.5 available**
**Version 4 planned 3Q 2001**

# WebSphere Applic. Servers-Advanced Edition



The biggest additions in Advanced Edition 3.02 support over Standard Edition 3.02 include Full EJB 1.0 (1.1 recently now available from Sun Microsystems, Inc.) and full transaction management and integrity "outside of the program" - ACID transactions, workload management, advanced security functions, and distributed object CORBA/IIOP support. The CORBA/IIOP support includes Java ORB support.

There are high level declarative interfaces for:

- Security
- Transaction integrity
- Transaction and object persistence

As advertised Enterprise JavaBeans (EJB) has as a stated goal to "... make it easy to write applications: Application developers will not have to understand low-level transaction and state management details; multithreading; resource pooling; and other complex low-level APIs. However, an expert-level programmer will be allowed to gain direct access to the low-level APIs."

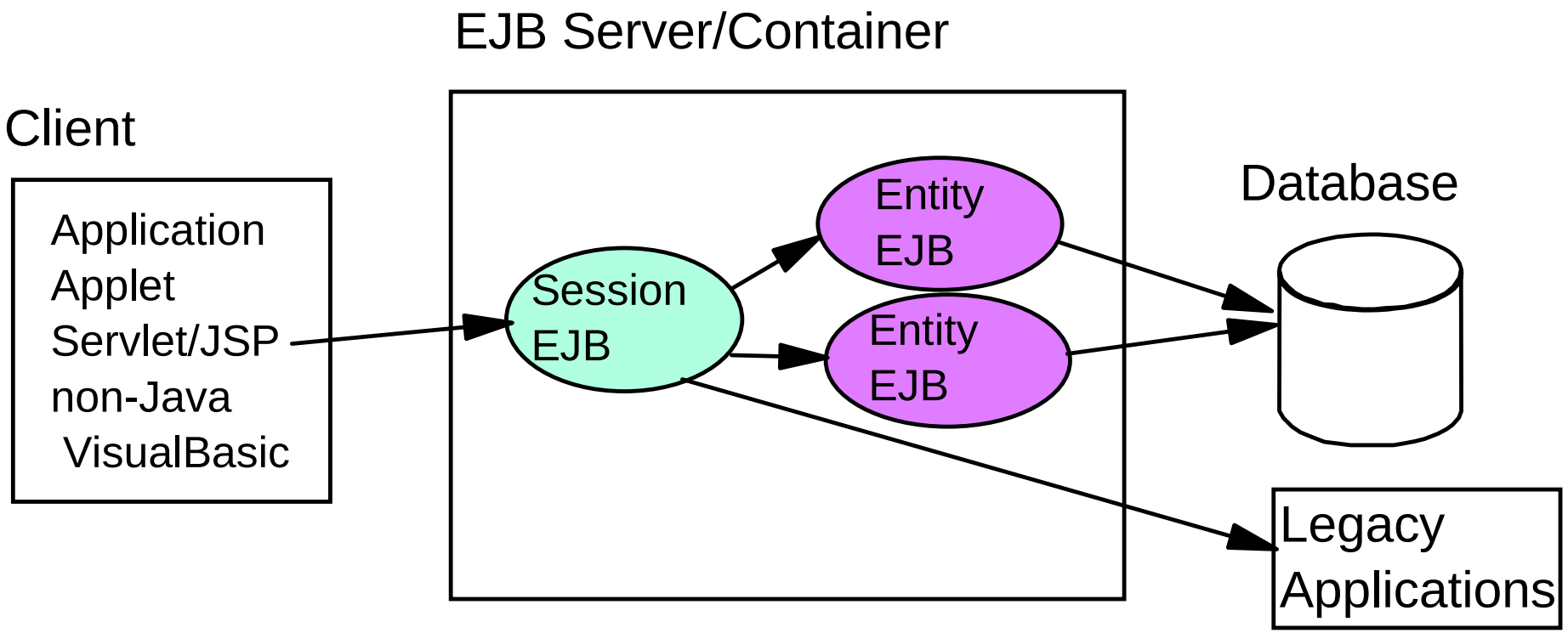
EJB is not a tool to build these mission critical applications, but rather it is the architecture for defining components that can be used with a variety of tools. Another goal of EJB is to be "... the standard component architecture for building distributed object-oriented business applications in the Java programming language. Enterprise JavaBeans will make it possible to build distributed applications by combining components developed using tools from different vendors."

Compatibility Notes:

- Standard Edition 2.03 and Advanced Edition 3.02 can reside on the same AS/400 system
- Standard Edition 3.02 and Advanced Edition 3.02/3.5 cannot reside on the same AS/400 system
  - They use the same AS/400 libraries and IFS structure

# Enterprise JavaBean Review






- Component model for server-side business logic
- High-level, attribute-based interfaces for:
  1. Security
  2. Transactions
  3. Persistence
- Separate from, but complementary to, JavaBeans

# Notes: Enterprise JavaBean Overview



Enterprise JavaBeans (EJB) technology is the hot Java topic. Enterprise JavaBeans and the AS/400 or iSeries system are a perfect match. The Enterprise JavaBeans component model logically extends the JavaBeans concept. It is targeted at the server tier business logic development. It provides interfaces that insulate the programmer from the complexities and dependencies that are unique to a platform.

EJB technology provides a component model for server applications. It allows you to easily separate user interfaces from business logic. The server-side business logic is packaged as Enterprise JavaBean components. Once they are written and deployed on a server such as the AS/400 system, client programmers can use them with very little knowledge of how the beans actually work. The client programmer only has to know what methods the Enterprise JavaBeans support and how to call them. Another key advantage is that whether you are writing a Java application, a Java applet, a Java servlet or even a Visual Basic program, it always works the same. You only need to call the methods provided by the Enterprise JavaBeans to handle the application processing.

A Session EJB contains the business logic.  An Entity EJB is contains data. You can see the  Entity EJB accessing the actual database object.

A Session EJB can call another Java program/Bean or a legacy program, such as an AS/400 RPG program

OS/400 commitment control and related journaling are part of Advanced Edition EJB transaction integrity.

# Java Application Development on iSeries



## Java Virtual Machine

- Integrated in OS/400 (V4R2 and later)

## iSeries Developer Kit for Java (JDK)

- V4R4 supports 1.1.6, 1.1.7, and 1.2.2
- V5R1 supports 1.1.8, 1.2.2, 1.3


## iSeries Toolbox for Java

- Programmer tool to access iSeries-specific resources
- Open Source version also available (JTOpen)
  - **http://www.ibm.com/developerworks/opensource**

## WebSphere Development Studio for iSeries

- Host and Client Tools
- Application Development Tools for Cobol/RPG (Code/400)
- Java and Web development tools

# Notes: Java Application Development on iSeries



Every iSeries since the OS/400 V4R2 announcement has included a Java Virtual Machine. It's integrated at the lowest levels of the operating system to optimize Java performance. The Java Developer Kit (JDK) for iSeries is called the iSeries Developer Kit for Java and, as you can see, different versions of the JDK are supported (concurrently) under OS/400 release levels. The iSeries Toolbox for Java is a programmer toolkit which allows any computer running a JVM to use this programmer productivity tool. The iSeries Toolbox for Java allows developers to easily access iSeries resources such as UDB/400, the Integrated File System, call an RPG or Cobol program and access other iSeries resources. Finally, WebSphere Development Studio includes programmer tools to help legacy applications (RPG/Cobol) as well as new tools including VisualAge for Java, WebSphere Studio and a new GUI-facing tool.

# iSeries Developer Kit for Java (JDK)



## V5R1 Enhancements

- Java Currency: 1.1.8, 1.2.2, 1.3
- 1.3.1 upgrade off release
- JIT 3.6 (default exec mode)
- Single object 4 GB (removal of 16 MB limit)
- System Programming in Java
- JVMPI infrastructure
- Debug enhancements
- Enhanced RAWT
- Performance Tuning

## iSeries JVM Optimizations

- Designed for Server environments
- Direct Execution and JIT
  - 3.6 is the default
- Mixed Mode execution
- Concurrent garbage collection
- Optimized JDBC
- Remote AWT

- iSeries continues to be current with Sun's Java specifications
- iSeries performance optimization improves with each release
- iSeries has one of the best Java server environments in the industry

# Notes: iSeries Developer Kit for Java (JDK)



Many of our Java related announcements are being delivered in the iSeries Developer Kit for Java. These improvements include Java currency, a updated Just In Time (JIT) compiler, along with several other Java improvements which are important for programmers. The real message on this chart is that Java continues to be tuned and optimized for iSeries, our investment levels are continuing at a high level and iSeries is one of the best Java servers in the industry.

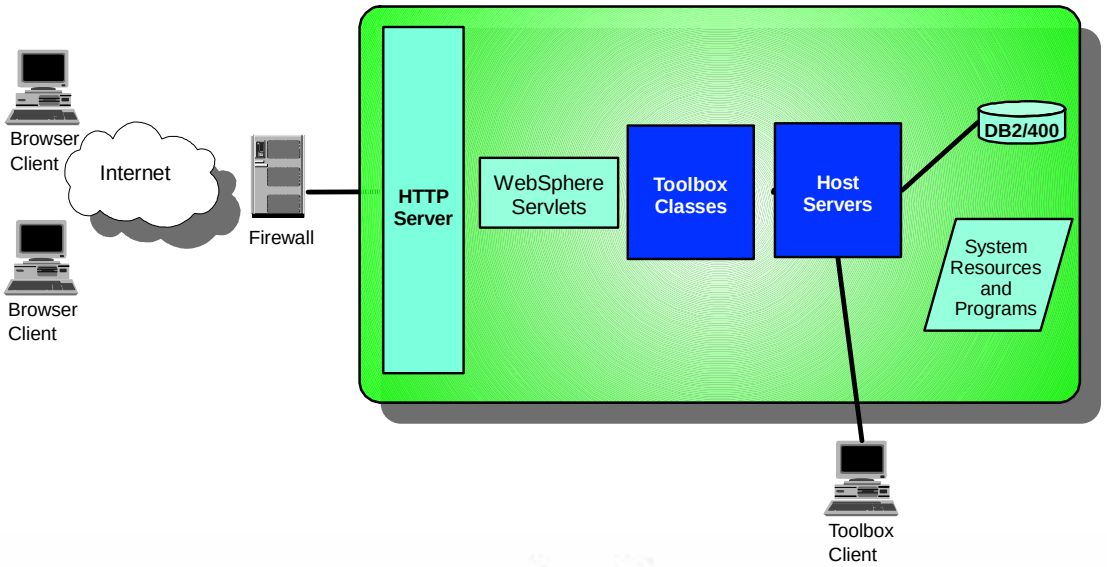
 

# iSeries Toolbox for Java



## V5R1 Enhancements

- OS/400 use by Management Central and Install
- Thread enabled program and command calls
- Unity enablement and BIDI support
- Currency: JDBC, IFS, Management Central, SSL, XA
- JDBC Packed/Zoned support
- Data Stream compression
- HTML manipulation enhancements
- Performance improvements: connection pools, list processing, JDBC, File I/O, data conversions



# Notes: iSeries Toolbox for Java



There are also several improvements in the iSeries Toolbox for Java. These V5R1 enhancements are technical improvements to the Toolbox and ones which programmers will like. The overall message to give customers is that the iSeries Toolbox for Java is a great productivity tool for application developers. It is another proof-point that iSeries continues to invest in this important technology. Finally, it's important to let customers know that Java isn't an "either/or" decision. The RPG/Cobol languages will continue to be used in the future as well as Java. Where customers need a language to develop web-based, graphical & portable applications, Java is the preferred language. However, if these attributes are not important, customers will continue to use 3rd generation languages.

Note:

- iSeries Toolbox for Java is a key differentiator
- iSeries continues to invest heavily in Java
- Customers will continue to use both RPG and Java in future

# Notes: iSeries Toolbox for Java-2



V5R1 enhancements to the Toolbox include:

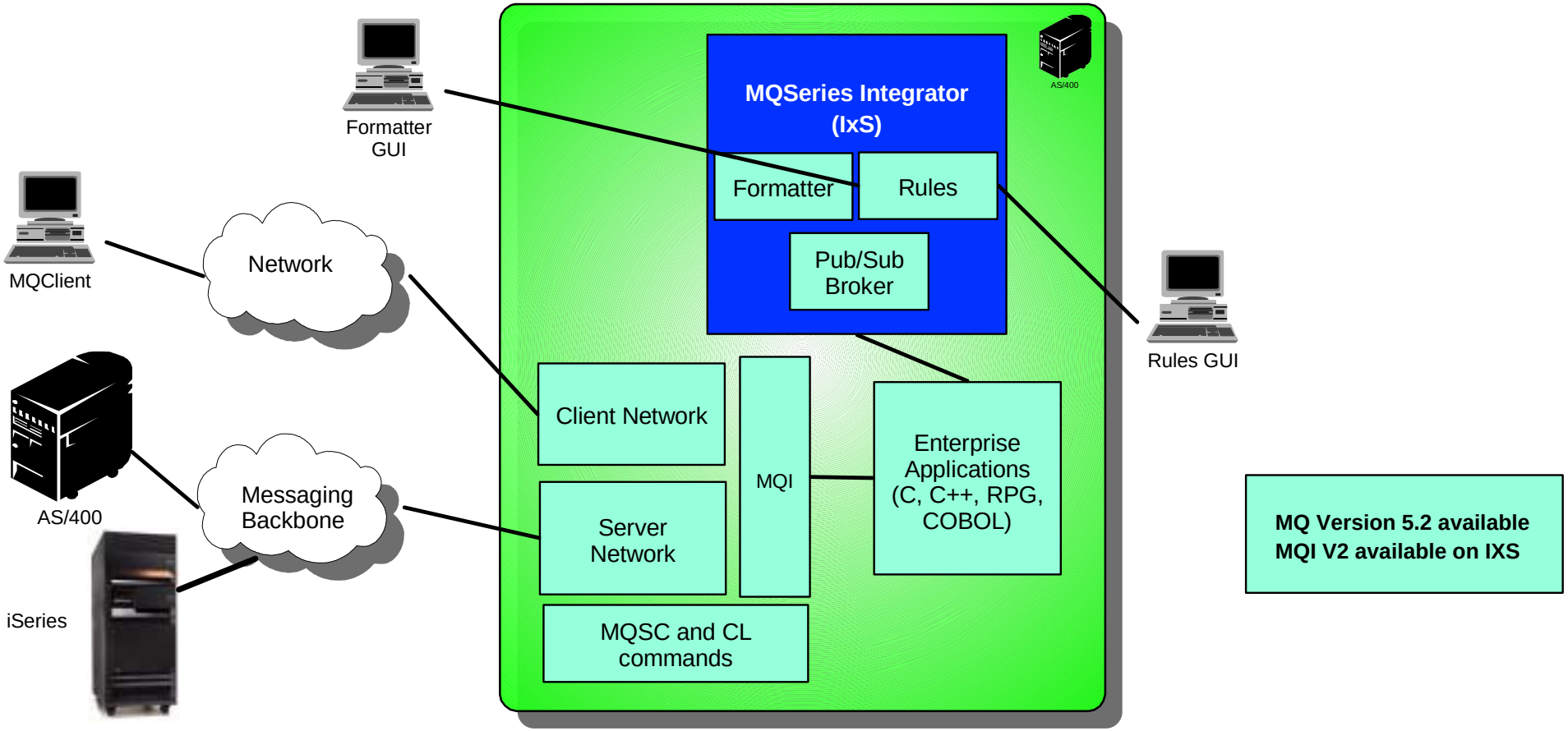
- A new set of classes in the resource package provide a generic framework and consistent programming interface for working with various iSeries objects.
- Bi-directional text conversion between iSeries and Java formats is now supported.
- JDBC 2.0 Optional Package extensions are now supported.
- A new set of classes in the report writer package provide a programming interface for creating formatted documents in Adobe's PDF format or documents that can be sent directly to HP PCL printers attached directly to the iSeries or to the network.
- A new set of print classes that enable Java applications to write data to iSeries spool files in the form of records and use existing iSeries formatting tools to format the records of data to be printed.
- Classes are included to work with iSeries environment variables.
- Classes in the HTML package are improved to increase the variety of HTML tags you can include in your Java programs.
- Classes are included to configure AS/400 NetServer.

Remember, the iSeries Toolbox for Java is at Open source community version of AS/400 Toolbox for Java JTOpen 2.0 level as it has been available in the at the following URL since mid 2000.

- (http://oss.software.ibm.com/developerworks/opensource/)

# MQSeries for iSeries






- **MQSeries = Message Oriented Middleware**
  - Cross platform API to deal with messages & queues
  - Assured message delivery and transactional messaging (commit/rollback)
- **MQSeries Integrator**
  - Reformats message data appropriately for receiver (based on format definitions)
  - Intelligently routes messages based on message format and content

# Notes: MQSeries for iSeries



MQSeries offers infrastructure for the exchange of data between disparate applications. This is very important in B2B because not every business you do business with has the same applications that you do. This is excellent infrastructure for data exchange between these differing systems. MQSeries is XML compatible today. The base product can send and receive XML structured messages and version 1 of Integrator can support XML. MQSeries V5.2 is available for iSeries. MQSeries Integrator is not natively supported on iSeries but can be supported on the Integrated xSeries Server.

**MQSeries Messaging** provides robust middleware that integrates applications across multiple heterogeneous platforms offering:

- Messaging services
- Assured delivery

Version 5.2 has enhanced performance and extends other support such as in the area of Dynamic Host Configuration Protocol (DHCP), improved interfaces with WebSphere products, and additional supported platforms, including Linux and a new release of Sun Solaris - 8, and a new MQSeries Linux client and Java client for S/390.

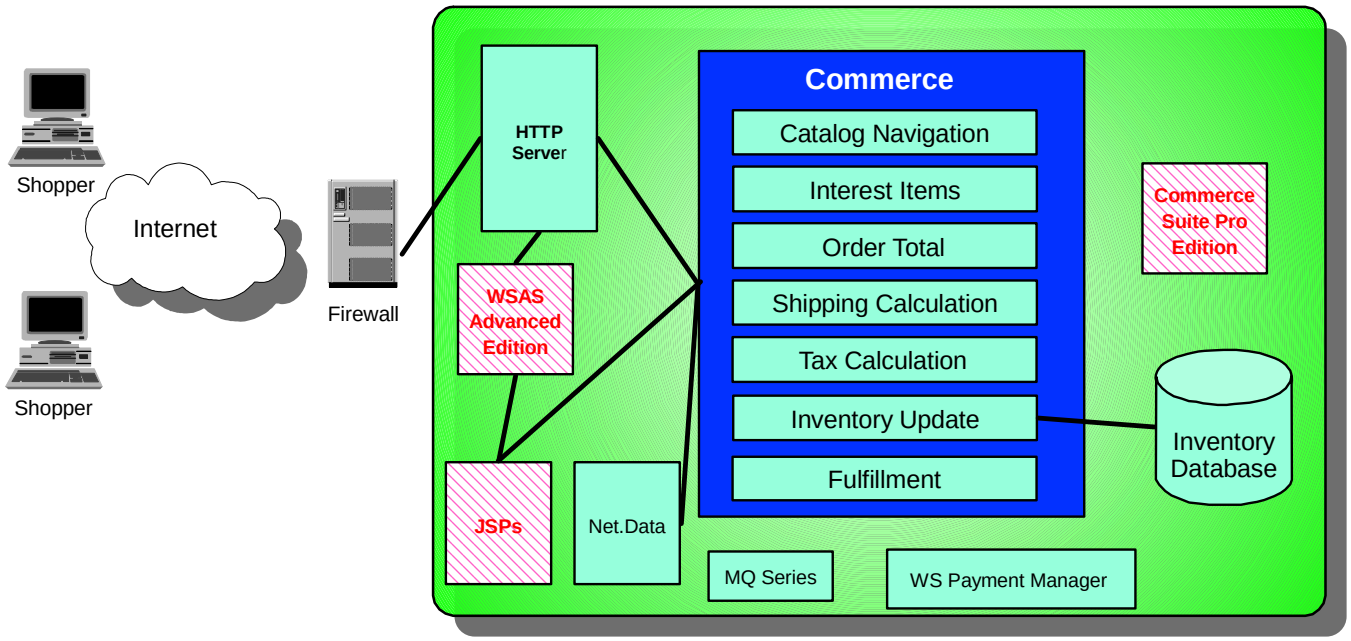
MQSeries for AS/400 gets the benefit of improved performance and better integration with OS/400 security.

**MQSeries Integrator** centralizes and applies the rules for operating your business offering:

- Modularity and reusability
- An open framework, visually programmable
- Transform, rules and routing

# WebSphere Commerce Suite for AS/400 V4.1






- **WebSphere Commerce Suite for AS/400 (V 4.1)**
  - **Additional user facilities: Personalization, Auctioning, Order enhancements, Business Integration**
  - **Additional productivity features: Site creation wizards, Content Management**
  - **Takes advantage of latest Java/JSPs, XML**
  - **Includes:**
    - **Commerce Suite for AS/400 Pro Edition, Commerce Studio, Catalog Architect, Commerce Integrator**
    - **WebSphere Application Server-Advanced Edition and Payment Manager, Blaze Software's Advisor Server, XML4C parser, Hot Media**

# WebSphere Commerce Suite for AS/400

**WebSphere Commerce Suite V4.1**

WebSphere Commerce Suite V4.1 was announced for other platforms in the February/March 2000 time frame with an indication that the AS/400 offering would be coming. Current plans call for the AS/400 offering to be available May/July 2000 (see following notes page). Moving from a Net.Commerce V3.2 should be fairly straightforward, since the APIs remain the same under V4.1.

WebSphere Commerce Suite V4.1 has already received accolades in evaluations by some industry product evaluators. For example, in a February 2000 issue of Network World, Commerce Suite V4.1 got the highest rating against two other vendors. The article indicated 15 other vendors declined to participate in the evaluation.

High level overview summary of WebSphere Commerce Suite for AS/400 V4.1 additions over V3.2

Additional User Facilities:

- Merchandising
  - Associations such as cross-selling, Up-selling, Accessories
  - Packages and Bundling
- Rules based personalization
  - Rules builder/engine
  - Product Recommendations
- Auctions
  - Open cry: bidder names and bids are published during an auction time period ( price bid up
  - Sealed bid: names and bids are confidential
  - Dutch: name and bids are published ( price bid down)

# WebSphere Commerce Suite for AS/400-2



High level overview summary of WebSphere Commerce Suite for AS/400 V4.1 additions over V3.2 cont'd

- Quick Order/Buy
  - Multiple Lists
  - Scheduled Orders
  - Reorders
- Business Integration
  - XML messages
    - Order Create
    - Order Status Update
    - Product Quantity Update
    - New Customer
    - Update
    - Product Price Update

# WebSphere Commerce Suite for AS/400-3



High level overview summary of WebSphere Commerce Suite for AS/400 V4.1 additions over V3.2 continued

Additional Productivity Features:

- Page Designer
  - WYSIWYG style tool
  - Drag and drop dynamic content into JSPs
- Store Creation Wizard
- Store Profile editor
- NC publish/deployment
- Catalog Architect
  - Distributed database support
  - Enhanced XML support
  - for packages and bundles, associations
  - NLV support
  - Integration with Studio and HotMedia design aids
  - Product Recommendations

# WebSphere Commerce Suite for AS/400-4



High level overview summary of WebSphere Commerce Suite for AS/400 V4.1 additions over V3.2 continued

Open, Standards-Based Design:

- JSP Enablement for Catalog Display
  - Net.Data is still supported
- Mass Import - XML support
- LDAP Support
  - OS/400 Directory Services or
  - Domino for AS/400 R5.0 directory server Distributed database support
- X.509 Certificates

Blaze Advisor Rule Server lets multiple customers interact simultaneously across all of a company's systems, while you manage the rules that govern those interactions also simultaneously. It eliminates much of the programming and system downtime associated with adapting changes. See their Blazesoftware.com web site.

# WebSphere Commerce Suite for AS/400-5



**Official Name:** WebSphere Commerce Suite, Pro Edition for AS/400, Version 4.1
**Product Number:** 5798-WC4
**Commerce Suite Supported on Release:** OS/400 V4R5
**Includes:** WebSphere Application Server Advanced Edition
**Net.Commerce Supported on:** OS/400 V4R5 and before
**Minimum Configuration:** 170 #2292 (CPW=220), 512 MB memory
**Pricing:** Software Tier Groups
**Upgrade From Net.Commerce:** Covered by Software Subscription
**Redbooks:**

- SG24-5198-00 Net.Commerce V3.2 for AS/400: A Case Study for Doing Business in the New Millennium

**Migration from Net.Commerce - Considerations:**

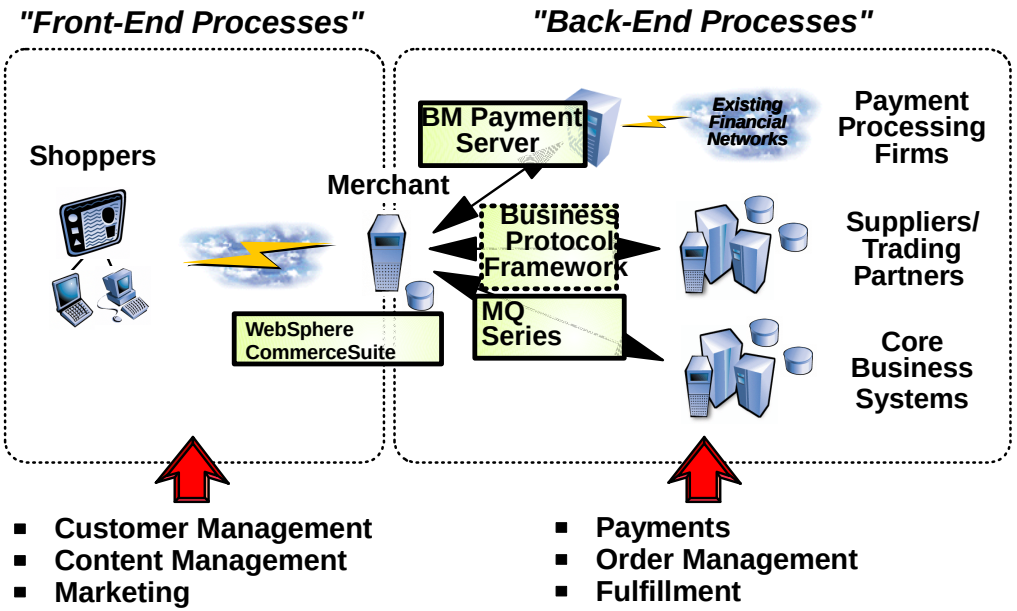
- Migration instructions and utilities will be provided
- Migrate database and config files
- Recompile OFs
- Redesign site to take advantage of new function

# WebSphere Commerce Suite V5.1 (Professional Edition)



## WebSphere Commerce Suite Overview

- Follow-on to Net.Commerce V3.2, WebSphere Commerce Suite 4.1
- Provides a framework for customers to establish effective, high-end B2B and B2C e-commerce web sites
- Includes WebSphere Advanced Edition
- Includes WebSphere Payment Manager




## WebSphere Commerce Suite Pro - Product Information

- New Commerce Servers implementation
- V5.1 has more Java server code (EJBs) and improved function over 4.1 (Migration issues from 4.1 to 5.1)
- All NLVs packaged together
  - As NLVs are ready, refresh single CD image
- Expanded Command Interface

Planned availability - April 2001

# WebSphere Commerce Suite V5.1 (Professional...



WebSphere Commerce Suite V5.1 is now announced and available for iSeries. This product used to be called Net.Commerce and has been available for iSeries for 2 years. WCS Provides a framework for customers to establish effective, high-end B2B and B2C e-commerce web sites. WCS includes copies of both WebSphere Application Server, Advanced Edition as well as WebSphere Payment Manager. V5.1 has more Java server code (EJBs) and improved function over 4.1. WCS 5.1 will be available on April 28, 2001 and the price is approximately 40% greater vs. 4.1. WCS 5.1 can be thought of as a "starter kit" application designed for catalog-based e-commerce web sites. Customers can tailor their e-commerce web sites for their unique requirements.

Enhancements over V4.1 include:

- The new Commerce Servers (described in the next foil)
- A Command Interfaces to these new servers
- Below the Command Interfaces text, you see the JSP and Rules engines and Enterprise Java Servlet run time components and Security Service
- On the left side of the Commerce Servers you see some of the "servlet-type" managers and their "links"
  - Administration Servlet between the Client user Administrator and configuration and management of the Commerce Servers.
  - Command Server Enterprise Java Bean manager between the primary middleware and Java applets or applications and, unique for the iSeries, the IBM Connect for iSeries product. You can see that Client Requisitioners typically communicate through the Java applets or applications.
  - MQ Request Servlet is used for internal routing of data
  - The HTTP Request Servlet, which is used to route business data between the client shoppers

The next foils discuss the new Server components and value-added "add-ons."

# WS Commerce Suite 5.1 Servers ...



| Servers, add-ons | Function Coverage |
|---|---|
| Commerce Server | Online Store |
| Database | Product, store, and customer data |
| Payment Server | Payment function |
| WebSphere App Server | Provides foundation and basic services |
| Catalog Subsystem | Provides catalog navigation, merchandising |
| User Subsystem | User registration, authentication, access control |
| Negotiation Subsystem | Auctions.. several bidding technologies |
| Order Subsystem | Shopping carts, order processing, taxation, etc. |
| Messaging Subsystem | Notification schemes.. e-mail, etc. |
| WCS Accelerator | Campaigns, merchandising, promotions |
| Commerce Analyzer | Business intelligence.. analyze customer behavior |
| Multicultural enablement | Language, currency, taxation, shipping, price, etc. |
| Mass Loader | Utility to populate the WCS database |
| Commerce Studio | Development tools |

# WS Commerce Suite 5.1 Servers ...



The key components of WCSV5.1 include:

- COMMERCE SERVER -- Manages the online store by running a set of processes under WebSphere Application Server, the IBM software platform for e-business
- WEB SERVER -- WCS includes the IBM HTTP Server, but also supports the Lotus Domino WebServer and Netscape iPlanet.
- DATABASE -- Stores all the product, store, and customer data. WCS uses DB2 Universal Database, included with the OS/400 operating system
- PAYMENT SERVER -- Handles payments using WebSphere Payment Manager (optional) for secure transactions.

COMMERCE SERVER provides all store functions, from browsing a product catalog, to placing an order, to maintaining the store. Includes these components:

- WEBSPHERE APPLICATION SERVER:
  - Provides the foundation and basic services for the Commerce Server
  - Includes an Enterprise JavaBeans (EJBs) server that implements EJB components that incorporate business logic
  - Supports multiple platforms, databases, transaction systems, and servlets
  - Provides Java-based gateway, EJB connectivity, and services

# WS Commerce Suite 5.1 Servers ...-2



COMMERCE SERVER continued

- COMMON SERVER RUNTIME: This is a framework in which the commerce application is deployed and executed. This component leverages the run-time services provided by WebSphere Application Server to support commerce server applications. In V5.1, the common server runtime has been completely rewritten using a Java programming model using Java Server Pages (JSPs) and EJBs. In addition, pervasive computing, business intelligence, cookie-less session management (URL rewriting), and ECML support are added in 1 WCS, V5.1. It includes:
  - Programming model
  - Process model
  - Exception handling
  - Transaction control
  - Data access
  - Persistence mode
- SYSTEMS MANAGEMENT -- Reliability, availability, and serviceability for the system. WCS logs messages to notify administrators of abnormal conditions in the system. The diagnostic information lets the administrator determine the cause of the error and rectify the system.
  In addition, WebSphere HTTP Server, and WebSphere Application Server, provide system management tools for configuration, monitoring, and tuning.
- CATALOG SUBSYSTEM -- Catalog navigation, merchandising features, interest lists, and search capabilities. It interacts with the user and order subsystems to obtain information about viewing templates and pricing.
  In V5.1, the catalog subsystem is redesigned with groupings that categorize products, as well as catalog entries for more abstract products such as service offerings or rental agreements. In addition offerings can be associated one-to-another for merchandising purposes such as cross-sells, up-sells, and accessories. Multicultural support has also been added and is addressed in this subsystem.

# WS Commerce Suite 5.1 Servers ...-3



COMMERCE SERVER continued

- USER SUBSYTEM -- Includes user registration, authentication, access control, and session and profile management services. More granular role-based access control and the creation and management of the buyer's user profile are new in V5.1.
- NEGOTIATION SUBSYSTEM (AUCTIONS) -- Merchants can make products available for auction using several auction bidding techniques. In V5.1 wizards, integration with WCS Accelerator is provided.
- ORDER SUBSYSTEM
  - Supports shopping carts, order processing, and management
  - Integrates pricing, taxation, payment, and fulfillment
  - Includes quick-order/buy, scheduled orders, multiple pending orders, and reorders
  - Supports currency and format based on the locale of the requester and enhanced payment manager integration, tax, shipping units, and fulfillment center capability
- MESSAGING SUBSYSTEM -- Common messaging API for different notification schemes such as merchant/shopper broadcast e-mail and order notification through an SMTP server. Also provides asynchronous message delivery through MQSeries.

# WS Commerce Suite 5.1 Servers ...-4



WEBSPHERE COMMERCE SUITE (WCS) ACCELERATOR -- Browser-based user interface that allows all personnel to operate the online store. Included are:

- WEBSPHERE COMMERCE ANALYZER -- Provides a complete business intelligence solution that enables merchants to track and analyze customer behavior and purchase patterns, so promotions/campaigns can be targeted to an individual's needs. Companies use their data to learn more about their customers and prospects. This component provides reports accessible from the WCS Accelerator, that demonstrate comparable success rates of your marketing campaigns, as well as demographic distributions of customers
- Four role-based areas:
  - MARKETING -- The marketing manager uses the marketing tools to monitor, analyze, and understand customer behavior, so that targeted campaigns can be created for a particular customer segment.
  - MERCHANDISING -- Gives the merchandising manager the proper tools to determine the best way to sell products and track customer purchases. The techniques that can be used include direct discounts, grouping products into packages, and using accessorization to sell related products.
  - OPERATIONS -- Lets the store administrator manage the store operations including orders, payments, and fulfillment.
  - CUSTOMER SERVICE -- The customer service representative can update customer information, display customer order status, change passwords, or create orders.

There is MULTICULTURAL ENABLEMENT -- Create a store that can be tailored to fit the needs of an international or culturally diverse customer base. Multicultural site characteristics include language, currency, data format, address, taxation, shipping, catalog content, page content, payment method, and prices. With these features shoppers can select their preferred language and currencies. These preferences are preserved and are preloaded the next time the shopper logs on.

# WS Commerce Suite 5.1 Servers ...-5



There are enhanced tools, which include:

- MASS LOADER -- Allows catalogs to be created and updated. A catalog developer can maintain the product catalog in an XML file and use the Mass Loader utility to populate the WCS database.
- STORE ARCHIVE SERVICES -- Provides a central location and tools for creating, customizing, and maintaining certain operational features of a store. Store development tools focus on helping customers create and customize their stores. Included in WCS is a store model provided in the form of an archive (Zip) file. This store archive file is the encapsulation of a store, including the file and database assets. Using browser-based tools, you can customize this file to meet your store needs. An instantiation utility is provided to convert the archive into a live store on the WCS server. Using the Store Archive Services, you can:
  - Edit general store information with the Store Profile Editor
  - Modify tax and shipping settings
  - Publish the store archive to create a running store

WEBSPHERE COMMERCE STUDIO -- Provides the development tools for WCS. Two versions are available:

- Developer Edition
- Professional Developer Edition

Both versions of WebSphere Commerce Studio contain WebSphere Studio, WCS (development license only) and are available on a Windows NT and Windows 2000 platform. The Professional Developer Edition also contains VisualAge for Java Enterprise Edition, Blaze Innovator, and Blaze Advisor. Components include:

- WEBSPHERE STUDIO, ADVANCED EDITION -- Comprehensive tools environment for building e-business applications.
- VISUALAGE FOR JAVA, ENTERPRISE EDITION -- Integrated visual environment that supports the complete cycle of Java program development. Programmers can easily modify or create Java Beans or EJBs and publish
- them to the Commerce Server. It also provides connectors that allow Java applications to connect with many systems such as SAP R/3.

# WS Commerce Suite 5.1 Servers ...-6



WEBSPHERE COMMERCE STUDIO continued

- BLAZE INNOVATOR -- Business managers can easily create and change business rules without programming. They can define or adjust assessment criteria, pricing, and other dynamic business policies and put them into operation as often and as quickly as the e-business marketplace demands.
- BLAZE ADVISOR BUILDER -- Complete visual development environment for writing, editing, viewing, and testing personalization and e-business rules the logic a company uses to make decisions
- PERFECTPHOTO -- Enhances and manipulates digital images for your Web site
- HOTMEDIA -- This tool kit for creative professionals helps to enrich e-business applications. You can add special effects such as streaming audio, 360 degree views, animations, panning and scrolling, and zoomable multi-resolution images

There are even more additional software capabilities. Additional components for a complete e-commerce solution include the HTTP Server, and WebSphere Payment Manager for on line secure electronic payment. The Payment Manager also includes CyberCash, VisaNet, and SET Secure Electronic Transaction cassettes.

Other software components are:

- MACROMEDIA LIKEMINDS -- Recommendation engine that uses multiple inputs, such as individual clickstream data, purchase history, explicit preferences, and product similarities to make product recommendations for customers. LikeMinds is licensed for the storage of 50,000 profiles. To expand beyond this number, you can order WebSphere Collaborative Profiles, Commerce Suite Edition, providing 250,000 additional profiles.
- SEGUE SILKPREVIEW -- Use this product by Segue Software Inc. to quickly measure the response time of a Web or e-business site. SilkPreview is a trial version Web performance-monitoring tool based on the technology implemented in Segue's SilkPerformer and SilkMonitor.

# WS Commerce Suite 5.1 Servers ...-7



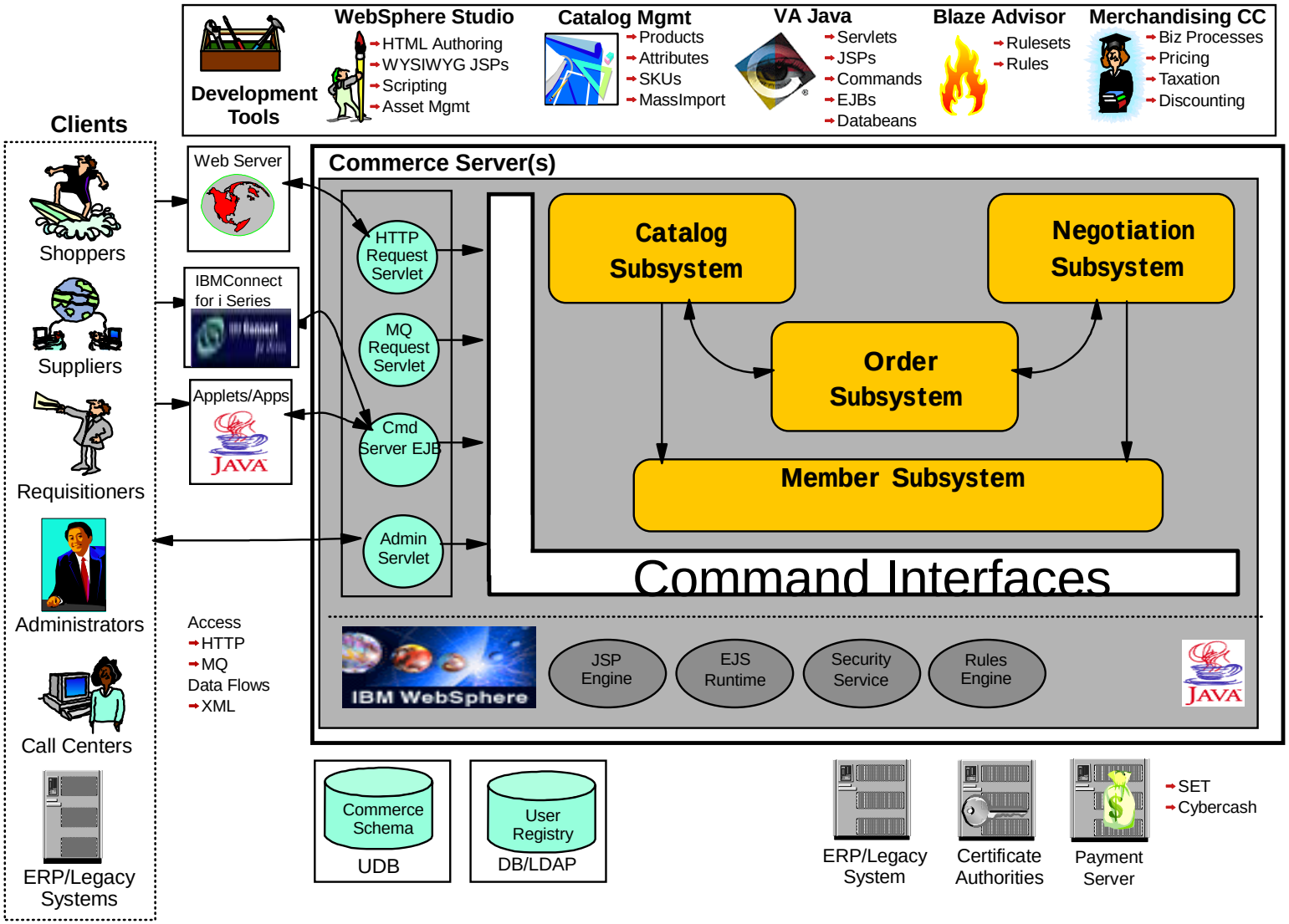
WEBSPHERE CATALOG MANAGER

WebSphere Catalog Manager (WCM), V1.2 is available, and can be purchased separately, to assist WCS customers in the creation and management of their online catalog. The WCM Loader is included in the base code of WCS to facilitate the loading and maintenance of catalog information within the production runtime environment. The WCM Loader function is the only component of the overall WCM product that has been integrated into the base code.

# WS Commerce Suite 5.1 Pictorial







# WS Commerce Suite 5.1 Pictorial



This chart "puts all the WS Commerce Suite 5.1 elements together." At the top use see the development tools we just discussed.

Reading from left to right you see the various clients, such as B2C shoppers, V2B suppliers and requisitioners, administrators and so on. Just to the right of the clients you see the "middleware" components such as an HTTP Web Server, a B2B application such as Connect for iSeries.

These middleware components interact with the various servlet processors (HTTP, MQ series, commands, and Administration).

To the right of the servlet processors you see some of the new Commerce Servers interfaced with through the command interfaces.

At the base of the Commerce Servers you see the WebSphere Application Server with JSP and Rules engines, as well as EJS runtime and Security subcomponents.

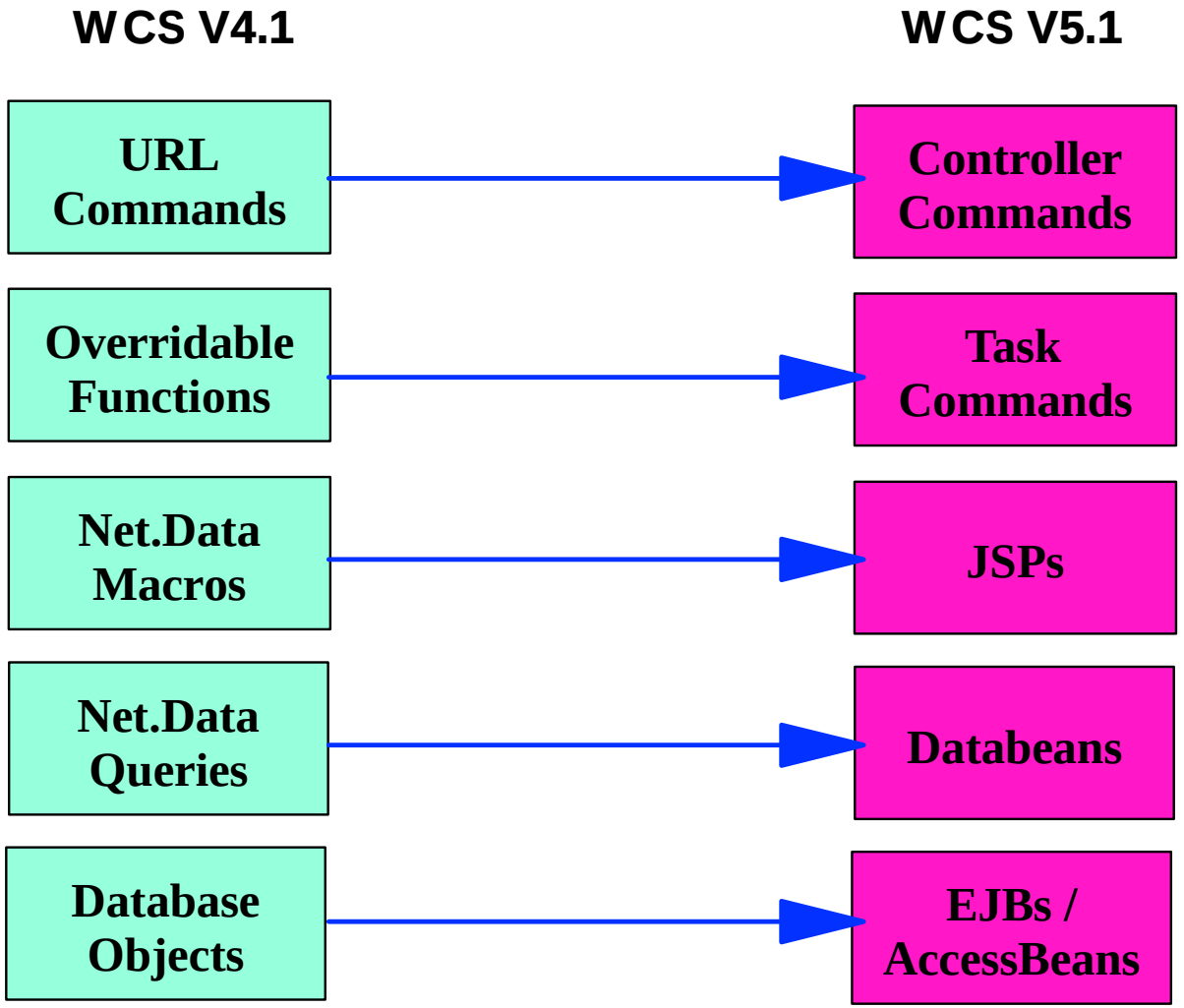
Right underneath the Commerce Servers you see Universal Database/2, LDAP, ERP functions, Certificate Authorities, and Payment Servers

# WS Commerce Suite V4.1 to V5.1

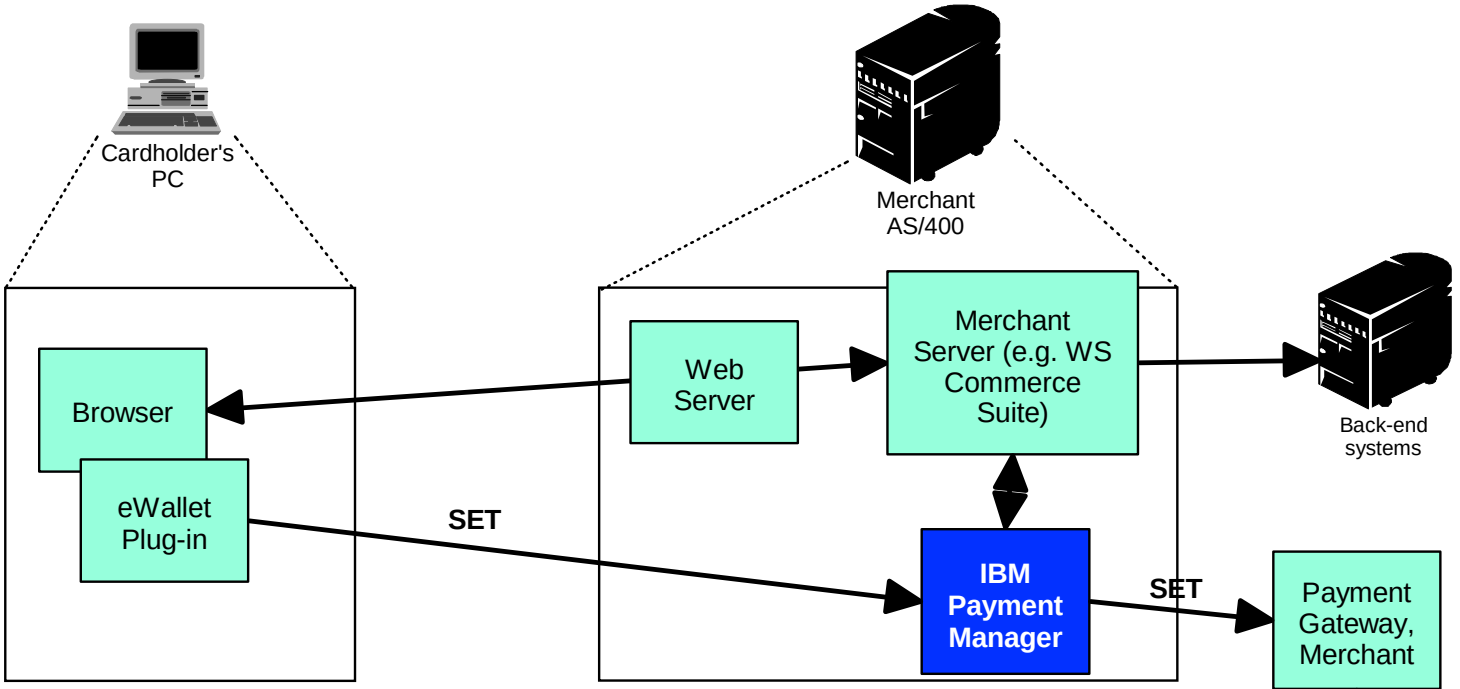


## Straightforward conversion required



# WebSphere Payment Manager for AS/400






- **Payment Manager for AS/400**
  - Serves as an electronic cash register for digital transactions
  - Implements SET protocol as a Payment cassette
  - Implements Cybercash protocol as a Payment cassette
  - Enables use of payment cassettes other than SET and Cybercash
  - Includes a test cassette for testing without a payment gateway
  - Includes a user interface for administration and payment processing
  - Allows multiple merchants to rely on a single Payment Manager
  - Supports multiple Payment Manager instances on a single AS/400
  - Supports configuration-based payment cassette loading
  - Java Servlet Application Programming Interface.

**Version 1.2 , 2.1 available**

# Notes: WebSphere Payment Server for AS/400 IBM @server iSeries

BM WebSphere Payment Manager for AS/400, 5733-PY2, Version 2.1 replaces IBM Payment Server™ for AS/400® (5733-PY1). This release of WebSphere™ Payment Manager provides similar levels of functionality and capability for the AS/400® platform as the product recently released on AIX®, Solaris, and Windows NT™. Effective July 21, 2000, IBM will withdraw from marketing the IBM Payment Server™ for AS/400® (5733-PY1) program

The WebSphere Payment Manager Version 2.1 program can empower merchants to securely manage Internet payments. As the successor to the Payment Server™ product, this new release is ideally suited to:

- Integrate payments into business processes and software such as online catalogs and accounting packages
- Manage credit card, debit card, stored value smart cards, and emerging Internet payment methods
- Multipayment Framework (MPF), the ability to add new payment methods (cassettes) to the system
- Host a payment service for multiple remote merchants

Individual merchants can benefit from:

- Browser-based GUI for remotely managing payments and remote product administration functions
- Ability to select specific payment types (cassettes) from those made available by the Payment Manager administrator
  A cassette is a software component consisting of a collection of Java classes and interfaces that can be installed into e-commerce components to extend their functions. Cassettes are provided for SET and CyberCash. A framework is provided that enables inclusion of other forms of payment.
- Search, with parameters/criteria, for customer transaction and batch data history
- Role-based access controls for granting privilege levels to merchant's employees
- Enable/disable event notification service

Merchants who integrate WebSphere Payment Manager into their business software and business process will be able to:

- Deploy multiple Payment Manager instances as needed to support multiple merchant instances
- Communicate using HTTP command requests and receive XML responses — an industry standard

# Notes: WebSphere Payment Server for AS/400-2

A Hosting service that uses WebSphere Payment Manager will value:

- Ease of adding, modifying, removing, and provisioning remote merchants, including the ability to deploy separately multiple Payment Manager instances in support of multiple merchants
- MPF, the ability to add new payment methods (cassettes) to the system and deploy for merchant use
- Dynamic configuration updating without system disruptions
- A browser-based GUI to securely manage multiple merchants with individual business data privacy, protection, and integrity
- Basic network management support, this product is certified Tivoli® ready
- Multilevel trace capability to enhance serviceability

# Connect for iSeries

# Notes: Connect for iSeries



A few foils ago - WS Commerce Suite 5.1 Pictorial, we showed Connect for iSeries. Now that have completed a discussion of WebSphere e-business host applications and other middleware, such as MessageQueue Series, it is a good time to discuss Connect for iSeries, sometimes also referred to as iSeries Connect.

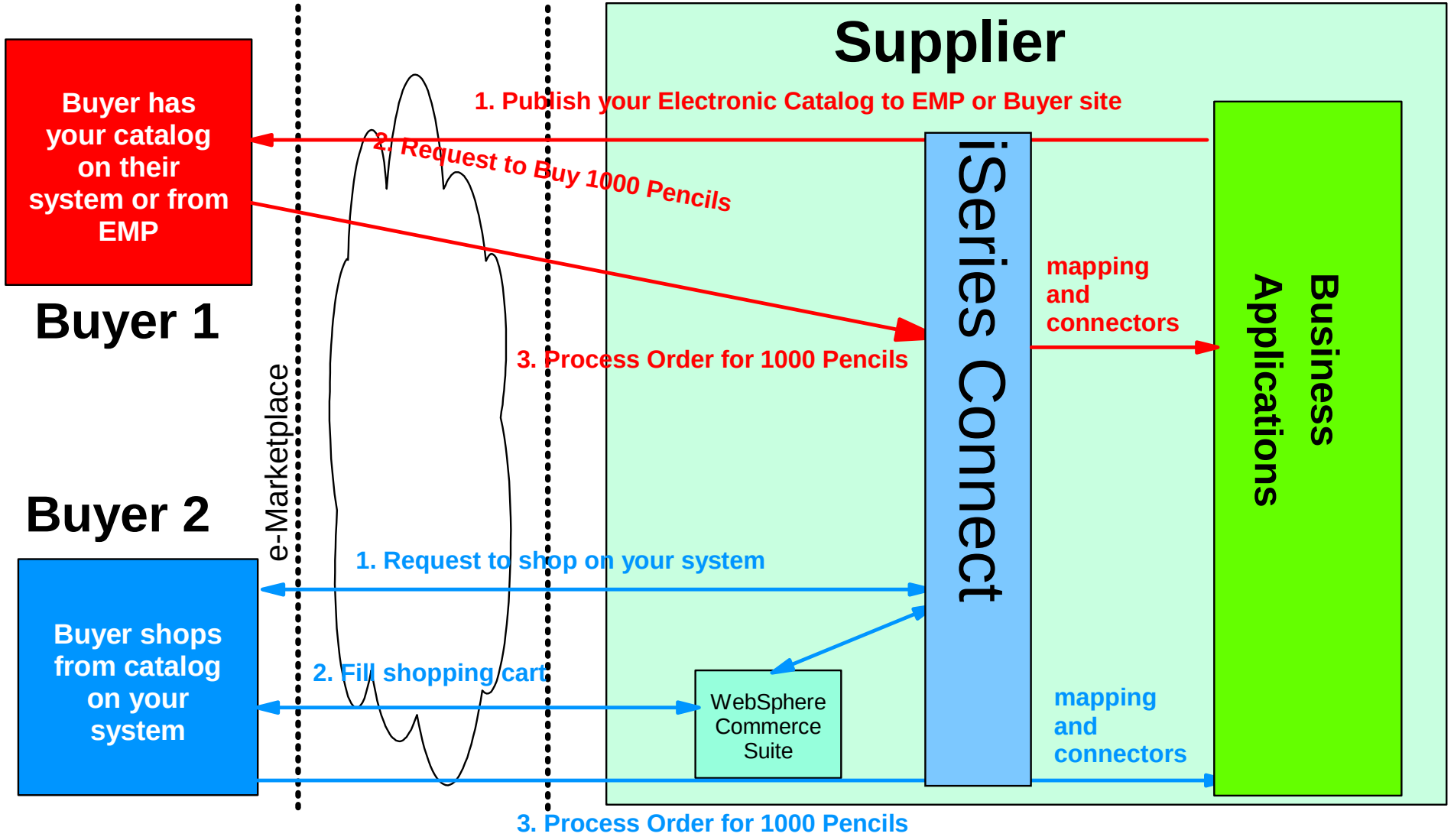
Connect for iSeries was announced October 2000 and Version 1.0 became available February 2001. Version 1.1 announced April 2001 with availability targeted for September 2001.

This section of the presentation summarizes V1.0 support, followed by planned V1.1 support.

# What iSeries Connect does for a Supplier



## *Getting Suppliers into the B2B Network with Buyers*





# Notes: What iSeries Connect does for a Supplier



This foil illustrates where iSeries Connect interfaces to a customer's business applications by making a catalog of their "wares" available, either at:

- an eMarketplace (eMP)
- the Buyer's system
- the Seller's system

In this example you can see IBM's WebSphere Commerce Suite managing the shopping cart and acting as an intermediator between the actual buyer and the iSeries Connect and the seller's business applications.

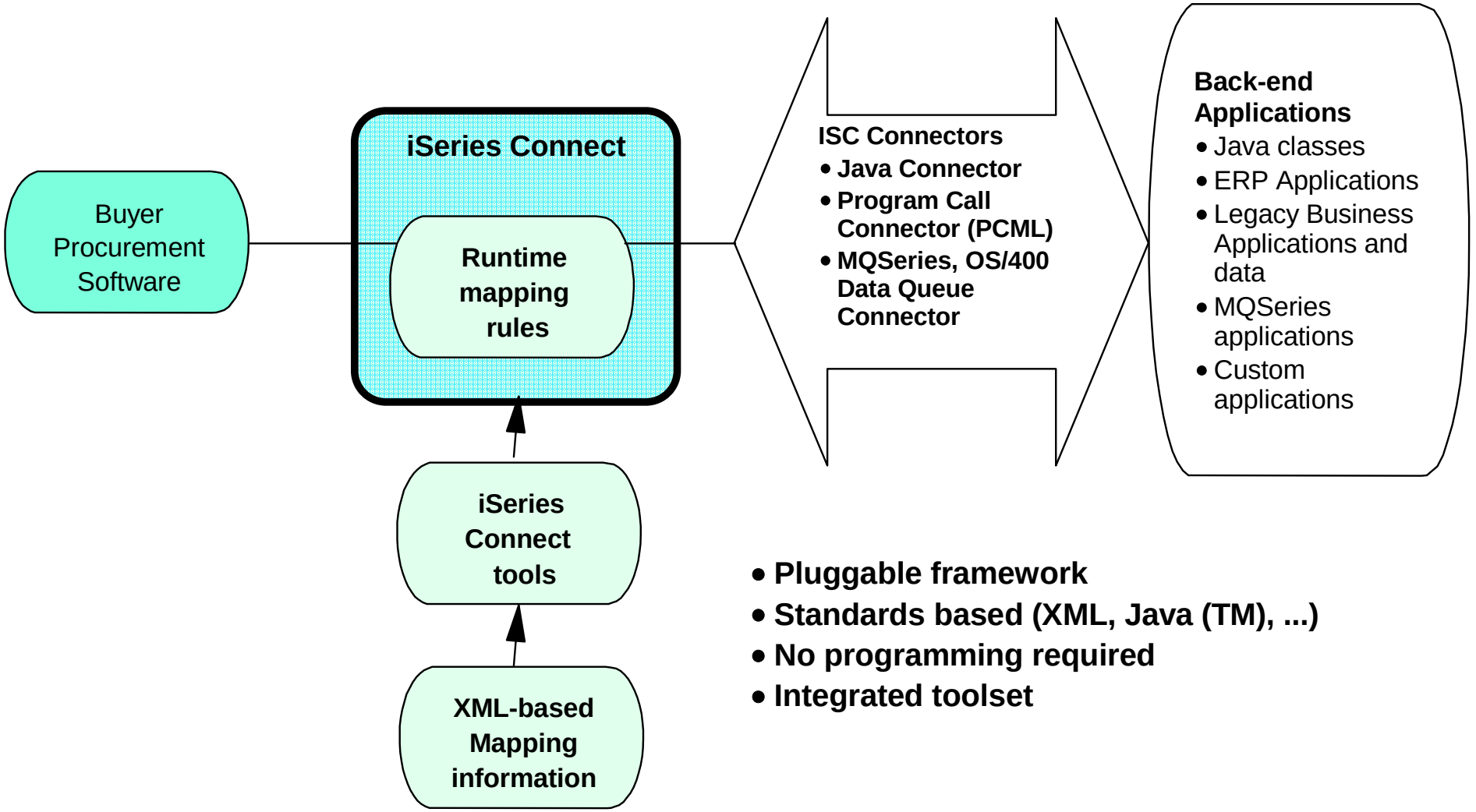
iSeries Connect provides:

- Mappings and Connectors between the XML-based data requirements of the Suppliers and the Host-based applications
- an Electronic Catalog for suppliers:
  - Takes data from DB2 UDB or Integrated File System, allows for augmenting data with external information and creates Electronic Catalog
  - Electronic Catalog can be published to eMP site or buyer site
  - Renders catalog in manner appropriate for eMP connectivity
  - Avoids manual re-keying of product information

- iSeries Connect MQSeries Component
  - Specially licensed version of MQSeries
  - Integrated MQSeries
  - Provide robust and reliable inter-application messaging - "connectors"

# iSeries Connect - Conceptual View






- **Pluggable framework**
- **Standards based (XML, Java (TM), ...)**
- **No programming required**
- **Integrated toolset**

# IBM Connect for iSeries Components



Front-end Gateway Services

- Supports multiple trading partners protocols (initially Ariba cXML) over HTTP
- Authenticates and validates incoming requests

Back-end flow manager

- Routes incoming requests to appropriate connectors (single connector call for initial release)
- Maps fields according to configurable mapping rules

Connectors

- One connector type for each type of program access supported
- Initial support for Program Call, Data Queue, MQSeries queues, Java Methods

WebSphere Commerce Suite Extensions

- Augments Commerce Suite catalog with B2B information
- Registers customer trading partners as shoppers
- Sends shopping cart information to buy-side procurement software for approval

# IBM Connect for iSeries Components-2



MQSeries 5.1

- Provide delivery of B2B messages
- Used to communicate between front-end and back-end components
- Used to integrate with existing back-end applications

Development and Deployment Tools

- Helps develop connector instances, process flows, field mappings
- Information can be developed on one server and deployed on all systems

Catalog Services

- Captures existing DB information into an exportable catalog format
- GUI interface for adding new catalog information to already captured data

Buyer and Supplier Registration

Installation and Configuration Tools

- Ensures required prerequisite hardware and software are installed
- Creates required objects (libraries, directories, queues, logs, ....)
- Configures required components (HTTP server, Application server, Queue server, ...).

# iSeries Connect: Planned Tools Component



Installation tools
- Perform installation consistency checks
- Install B2B LP
- Install B2B tools
- Update B2B registry
- Check the Internet for B2B LP updates

Configure B2B LP
- Configure prerequisites checks
- Select whether to deploy on Domino or HTTP/WAS (if both installed)
- Configure Web Server (HTTP or Domino)
- Configure Web Appl Server (WAS or Domino)
- Configure MQSeries (5.1 license included for use only with iSeries Connect)
- Configure B2B LP resources

Configuration tools
- Wizard to Create "Application Connector Document" (ACD): mapping of parameters into the legacy application
  - Buyer Registration
  - Supplier Registration
  - Catalog management
  - Configure B2B flow for a buyer/marketplace transaction (B2B runtime configuration) (global or instance specific)
- Install B2B tools on PC server or local machine

Wizards for installation and configuration

Simplify catalog publishing

# iSeries Connect: Product Information



Product ID is 5733-B2B Version 1.0 available February 2001

HARDWARE REQUIREMENTS:

- Minimum recommended iSeries 400 server:
  - iSeries Model 270 with processor feature #2250 (Processor CPW = 370)
  - iSeries Model 820 with processor feature #2395 (Processor CPW = 370)
- 512 MB of memory
- Also operates with all earlier RISC hardware models of comparable (370 or higher CPW) performance specifications, running OS/400 Version 4 Release 5

SOFTWARE REQUIREMENTS

- **V4R5** OS/400 and the following install options
- IBM HTTP Server for AS/400 or Domino web serving* (Apache option under HTTP Server for AS/400 (December 2000 availability) will be supported 2H 2001)
- AS/400 Developer Kit (JDK) for Java 1.1.8 and 1.2
- AS/400 Toolbox for Java
- Digital Certificate Manager (5769-SS1 Option 34)
- TCP/IP Connectivity Utilities for AS/400 (5769-TC1)
- Domino for AS/400, 5.0.4 or later (5769-LNT)*
- WebSphere Standard Edition 3.0.2.2 or later (5733-AS3)*
- WebSphere Advanced Edition 3.0.2.2 or later (5733-WA3)*
- Cryptographic Access Provider for AS/400 (5769-AC3)
- WebSphere Commerce Suite V4.1, required if remote catalog is required

*One of these required per server instance. HTTP Server for AS/400 using Apache option is not supported, initially.

# Connect for iSeries V1.1 Overview



Delivery Gateway and Flow Manager can reside on same or different iSeries systems

Additional, updated trading partner protocols

- cXML 1.2, Ariba 7.0
- mXML Metiom currency updates

Multi-step flow processing and additional function in the Flow Manager

- JDBC Database connector maps incoming B2B messages to database tables
- Multiple back-end application or database calls per trading partner request

Enhanced application integration and openness

Enhanced development tools usability and functions

Outbound message support

Enhanced catalog management

WebSphere Commerce Suite 5.1 support

Available September, 2001

# Notes: Connect for iSeries V1.1 Overview



Version 1.1 of iSeries Connect builds on the solid V1.0 foundation, extending functional capability and flexibility. Key additions include:

- More flexible configuration of the Delivery Gateway and Flow Manager components which can now reside on separate iSeries systems as well as the same system
- Additional or enhanced support of trading partner protocols
  - cXML protocol from Ariba
  - mXML protocol from Metiom
- Flow Manager enhancements include:
  - Supporting multiple back-end applications or database calls to be made for a single trading partner request. This allows for much more complex flow processing to specified thus greatly enhancing the flexibility of the product.
  - New JDBC Database connector that maps incoming B2B messages directly to the appropriate database tables
- New outbound message support that enables the OS/400 business application to initiate marketplace responses through an API
- Improved Application Integration and Openness
  - APIs to connect to Registries: Programmable interfaces to both global and instance registries
  - APIs and program exit points that allow calling to/from buyer and supplier registration tools
  - Customization capability for buyer/seller registration screens: Input fields can be tailored for customer specific data
- Improved Tools Functions and Usability
  - Enhanced Business Process Editor tool makes it easier to create Application Connector Documents (ACDs) and multi-step Process Flow Models (PFMs)
  - Enhanced PFM format and runtime metadata to enable JDBC connector and multi-step flows
  - Ability to prime the deploy tool with current metadata to ease redeployment

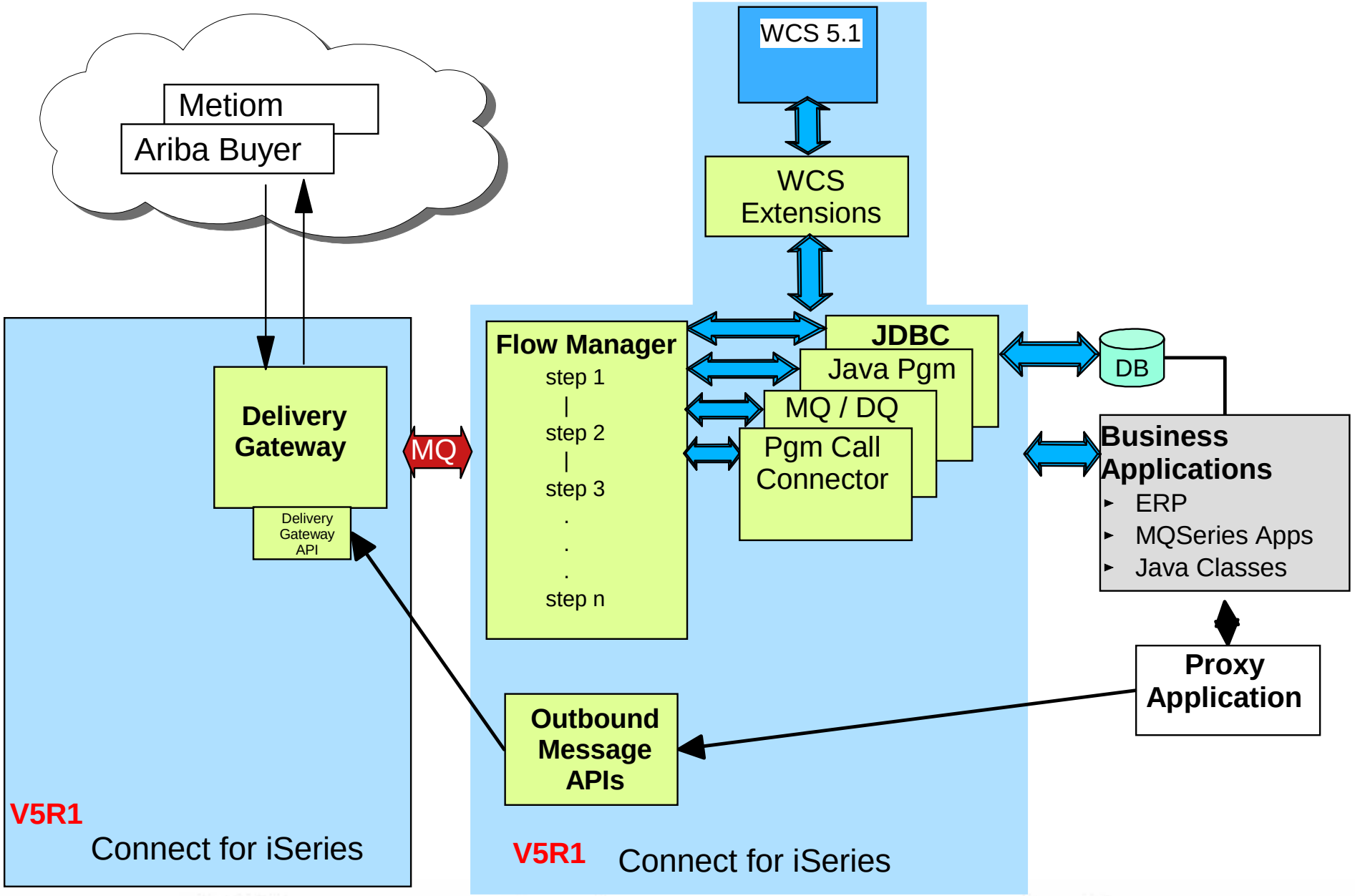
# Notes: Connect for iSeries V1.1 Overview- 2



- Improved catalog management capabilities : New catalog features allow you to create and publish a subset of a catalog in order to provide categorizations appropriate for particular buyer organizations and customer specific pricing. Catalogs can now be generated from multiple database tables.
- Support of new WebSphere Commerce Suite 5.1

# iSeries Connect V1.1 Application Interfaces







# Notes: V1.1 Application Interfaces



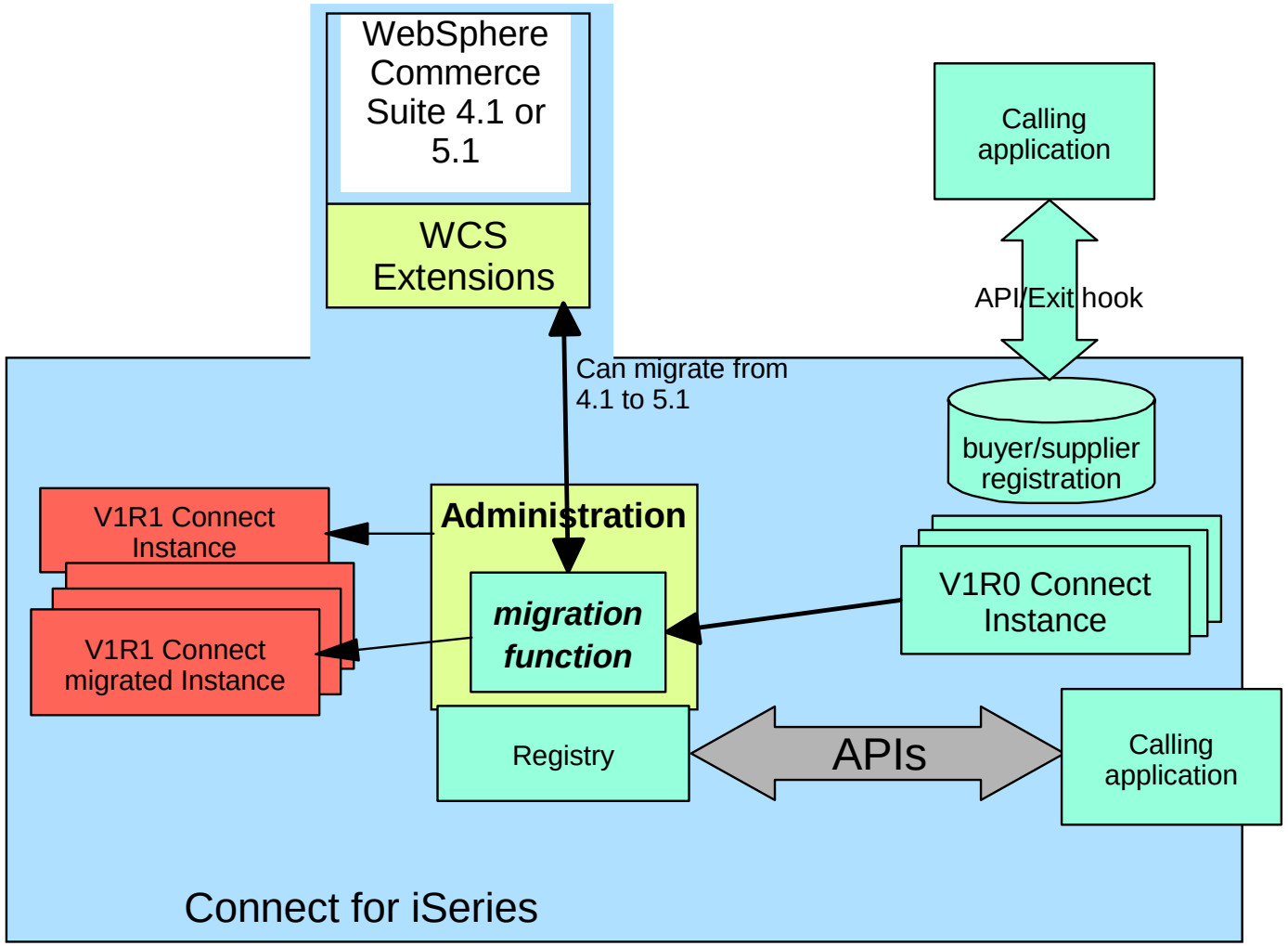
This foil is a pictorial representation of Version 1.1 enhancements including the Delivery Gateway and Flow Manager on separate systems, the updated marketplace protocols, the multi-step Flow Manager, WebSphere CommerceSuite 5.1 and the new JDBC database connector.

Also shown is the usage of the new APIs for outbound messages. Here you can see that a Proxy Application would be written that, after interfacing with the business applications, routes market place responses back to the buyer.

# V1.1 Application Interfaces - 2







# Notes: V1.1 Application Interfaces - 2

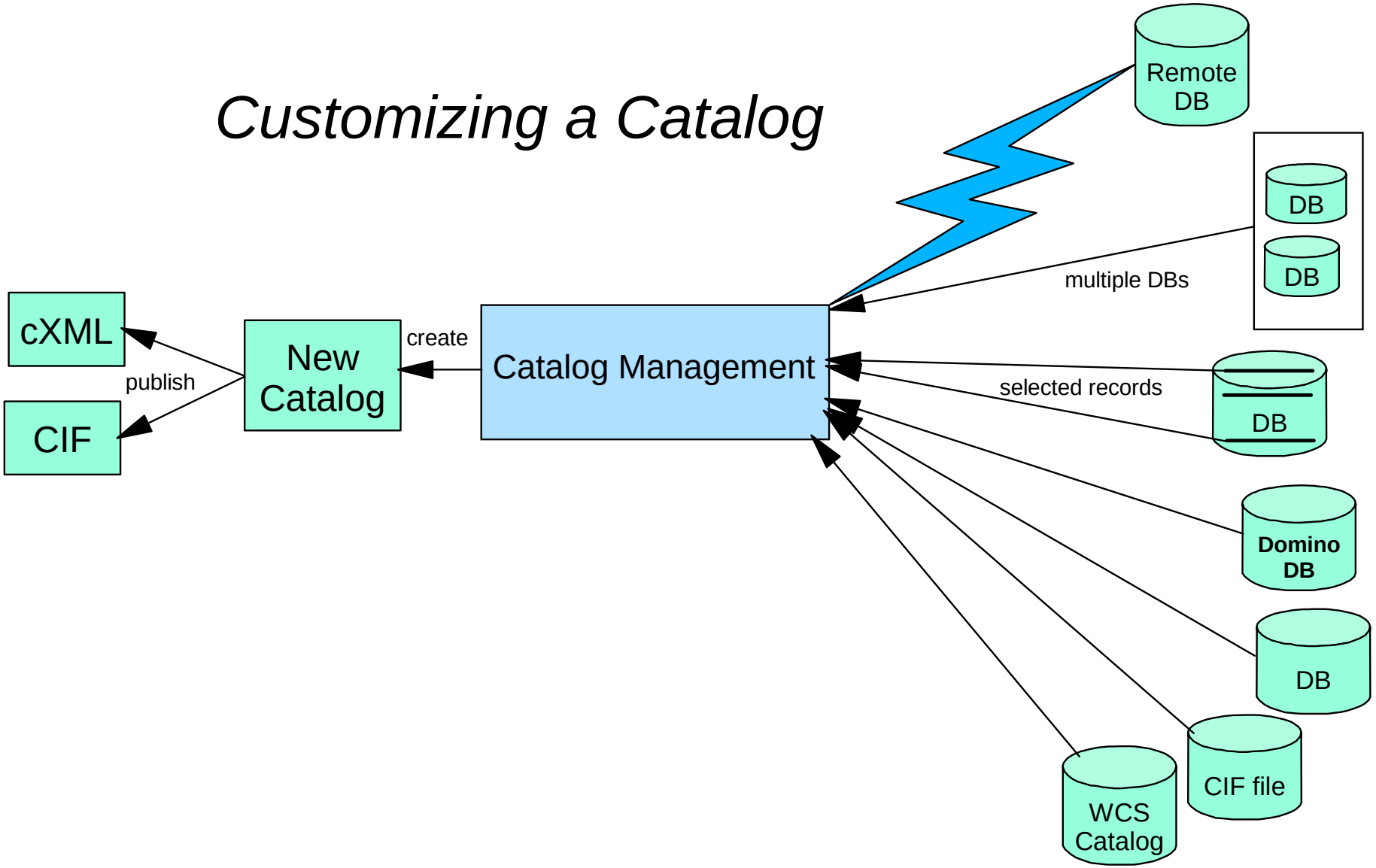


This foil specifically represents:

- Program APIs to global and instance registries
- APIs and exit points to call to or from buyer supplier registration tools
- Customization for buyer/supplier registration screens
- Integrated support for iSeries Connect V1.0 and V1.1 instances, including migrated V 1.0 instances
- Support for WebSphere Commerce Suite 4.1 or 5.1

# V1.1 Application Interfaces - 3





# Notes: V1.1 Application Interfaces - 3

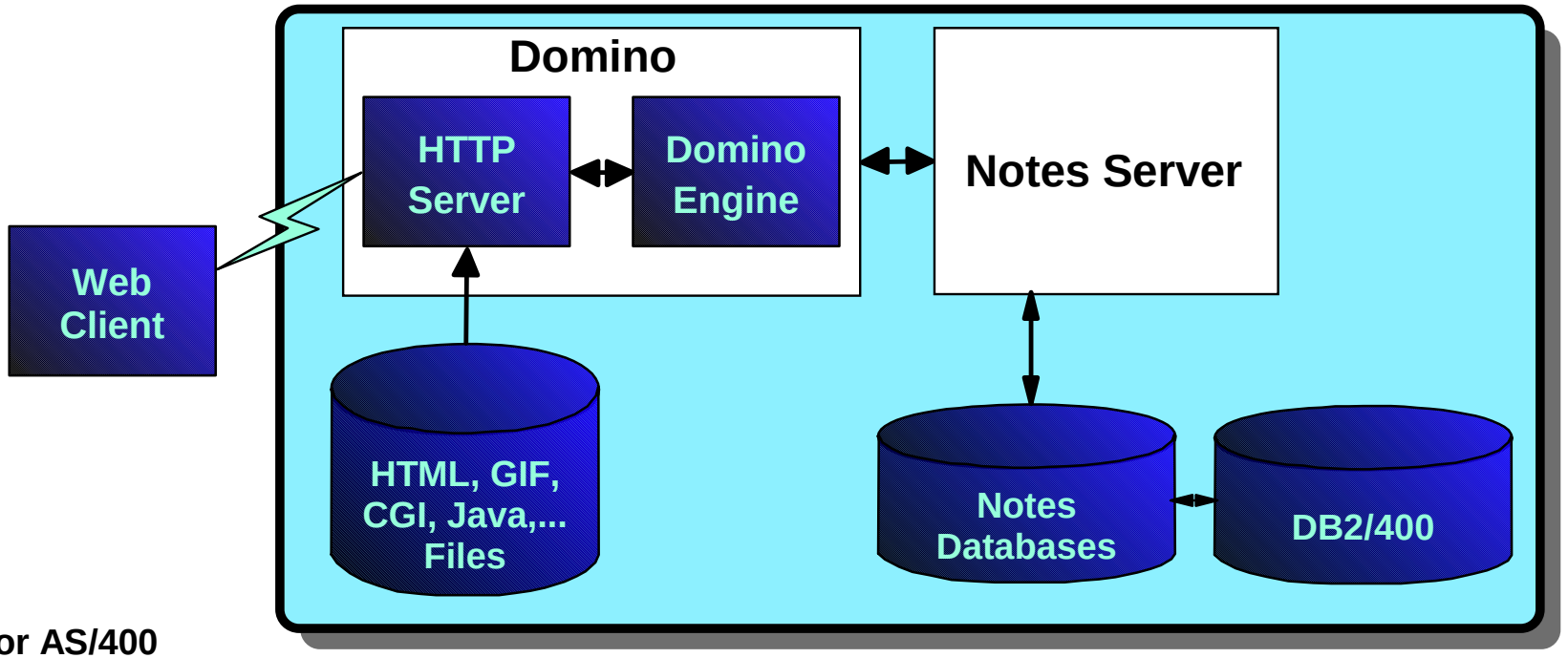


This foil shows enhanced catalog management features which allow you to:

- Create and publish a subset of a catalog in order to provide product categorizations appropriate for particular buyer organizations
- Create a catalog with customer specific pricing
- Generate a catalog from multiple database tables, including a remote database, a Domino database, and other databases
- Generate catalog entries from selected table records

# The Domino for AS/400 Server






**Domino for AS/400**

- Workflow, messaging, groupware and web development
- Built-in application development environment
- LotusScript scripting language
- Programmable object store
- Replication
- Multiple partitioned Domino servers
- Supports HTTP, POP3, IMAP4, SMTP/MIME, NNTP, SSL, LDAP
- Interfaces with HTTP Server for iSeries, WebSphere Application Server under OS/400
- iNotes and can Replace MicroSoft Exchange servers with Domino for iSeries

- V4R5 requires R 5.0x
- R5.0.6a, 5.0.7, 5.0.8, supported
- R5.0.7 is ClusterProven

# Notes: The Domino for AS/400 Server



Domino for AS/400, 5769-NT1 R4.6.x runs on OS/400 V4R3-V4R4. Domino R5.01 runs on OS/400 V4R3-V4R5. Domino for AS/400 R5.0x maintains currency with Lotus Domino updates. As of June 2001 this includes R5.0.5, R5.0.6a, R5.0.7, R5.0.8.

Starting with Domino R5.0.5 the HTTP Server for AS/400, 5769-DG1 for V4R5 and HTTP Sever for iSeries, 5722-DG1 for V5R1 support sharing of the HTTP server functions between OS/400 and Domino.

Domino 5.0.7 has been certified as a ClusterProven(TM) application running on OS/400 V5R1. This means that it has satisfied specific testing of a quick switch over from one iSeries system to another.

The "hot marketing topic" for Domino on AS/400 or iSeries is the capability to replace a Microsoft Exchange server.

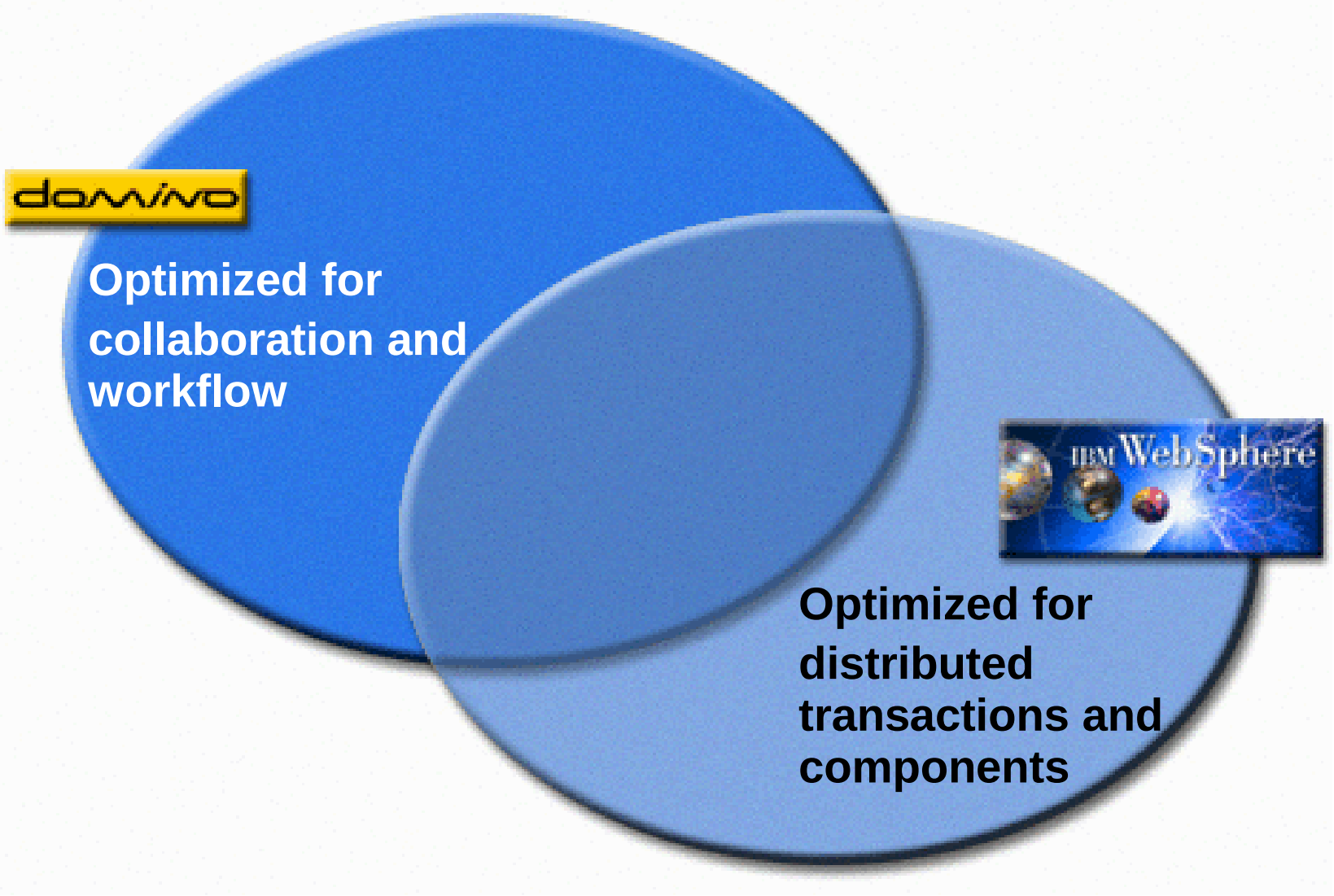
A new Lotus client brand called iNotes is an umbrella that encompasses access to the Domino server with the user's choice of a variety of non-Notes clients. iNotes represents the extension of Domino messaging and collaboration, personal information management (PIM), and off-line services to current Web browsers and Microsoft Outlook clients. Support for Microsoft Outlook and off-line function for these clients are available beginning with Domino for iSeries 5.0.5. Components of the iNotes brand include WebMail, iNotes Access for Microsoft Outlook, Domino Off-line Services, and the newly announced iNotes Web Access. The iNotes licensing model also includes access to Domino mail from standards-based mail clients such as POP3 or IMAP4.

Domino supports online access by browsers and standards-based mail clients. Domino Off-line Services (DOLS) provides off-line functions for WebMail, iNotes Web Access, and iNotes Access for Microsoft Outlook clients via the Lotus iNotes Sync Manager. DOLS and support for Microsoft Outlook clients became available with Domino 5.0.5. iNotes includes the iNotes Sync Manager, which provides browser users with replication and other advanced functions that enable working with Domino e-business applications off-line. A Domino Off-line Services design template allows application developers to off-line enable their Domino applications.

Even with the new iNotes off-line capabilities, the full-function Notes client still offers advantages over a Web browser because it integrates so many disparate data types. For more information about Lotus iNotes, see http://www.lotus.com/inotes.

# WebSphere and Domino





# Notes: WebSphere and Domino

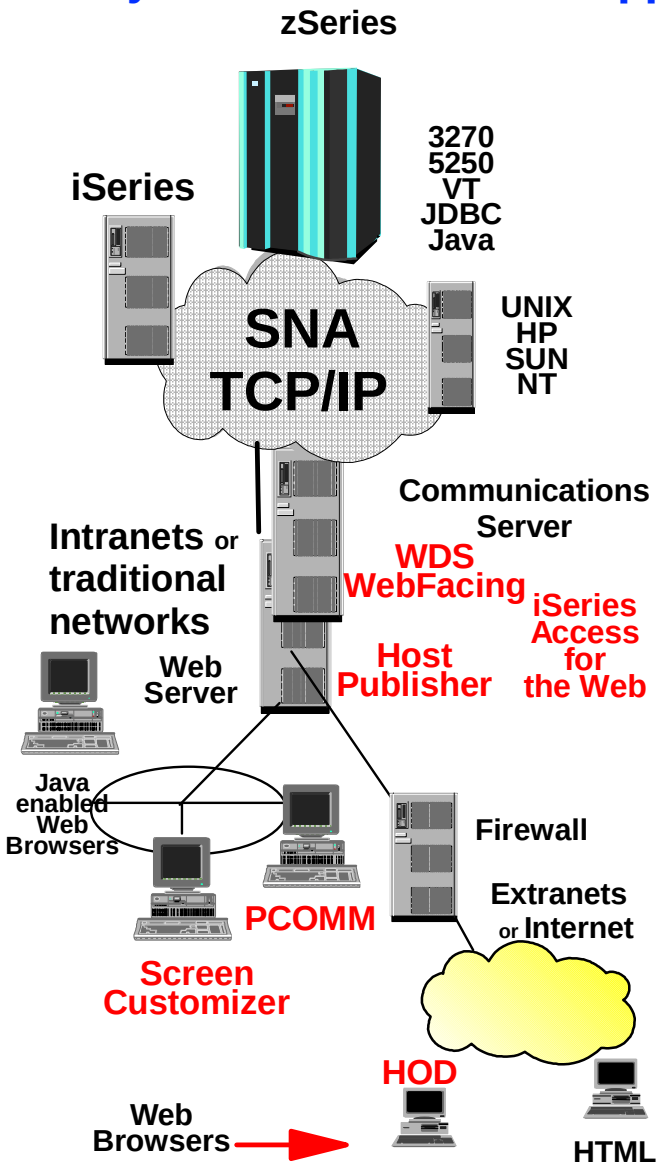


This chart should be used to differentiate the "emphasis" of the WebSphere and Domino in addressing the needs of e-business. It's typical for WebSphere to be used for transaction-based applications, while Domino is used for collaborative-based applications. Customers often use both technologies to best optimize their web-based applications.

# WebSphere Host Integration Family



## Quick way to web-enable host applications




- "Webify" existing applications without reprogramming and extend to new users
- Create new "composite" applications without modification to the original applications
- Connect all key user & network types
  - Personal Communications V5.0 - 5250/3270 Client/server connectivity
  - Host On-Demand V4.0 - 5250/3270 Java emulator support via browser - downloadable
  - Screen Customizer V1.0 - For existing application rejuvenation to a Web graphics interface
  - Host Publisher V2.2 - Extend applications from multiple sources to an HTML Web graphics interface or XML format
  - (Client Access Express) iSeries Access for the Web - OS/400 servlets for 5250 and Data Transfer *
  - WebSphere Dev Studio for iSeries WebFacing - iSeries Extends 5250 applications to browsers
- Do it more securely
- Do it more quickly
- iSeries Configurator and Software Subscription Support Available

* September 2001



# Notes: WebSphere Host Integration Family



This chart highlights The IBM Host Integration Solution Suite of product from IBM's Software Group. More and more companies need to take their host applications that they have been using for years and extend them to employees, partners, suppliers, and customers in a quick and cost effective way. With the IBM Host Integration Solution, businesses can do just that - Web enable those applications without requiring any changes to them and deploy them quickly.

Host Integration allows you to leverage your IT investment and extend existing application and create new composite applications in a quick and secure manner. It truly is a connected e-business solution. IBM offers 4 solution delivery options (with a 5th one from Client Access Express - iSeries Access for the Web coming in 09/2001) - which can be purchased individually or combined in a Host Integration Offering.

**Personal Communication V4.3** is a professional emulation product which provides 5250/3270 and VT emulation support. If you are a user of iSeries client access today, you are using the 5250 emulation code from Personal Communications. This product also ships with a set of Java tools to allow host access. The key difference of this product from the others we will discuss is that this product must be install on the client and does not use any browser technology.

**Host On-Demand V4** provides the power of Java to open the doors to your host data whenever you need it, wherever you need it, straight from your browser. It gives you a secure access to your host data, with TN3270, TN5250, and VT emulation in a single package. In addition a Standard GUI simplifies the user experience for users unfamiliar with host green screen applications.

**Screen Customizer V1**: The drag-and-drop technology of IBM Screen Customizer helps eliminates the need for programming, making it a cost-effective, quick solution that allows you to leverage investments in legacy applications. Screen Customizer automatically converts host screens into graphical presentations, which are easily customizable without programming.

# Notes: WebSphere Host Integration Family-2



**IBM Host Publisher Version 2.2** provides the quickest and easiest way to implement e-business by extending the reach of mission-critical applications to new users across the Internet, requiring no changes to the existing applications. IBM Host Publisher provides the capability to integrate data and services from multiple existing applications into a single Web page, giving end users the appearance of a single new application.

This is the most powerful single Host Integration product based on the range communications/device protocols and databases supported.

The following chart illustrates the power of Host Publisher. Following the Host Publisher section there is a short comparison (Host/Server Access Product Comparisons foil) of all of these tools that should assist in selecting the "right one" for each customer environment.

**iSeries Access for Web** is a servlet that runs on OS/400 Java Virtual Machine (JVM) and generates HTML output to a browser (such as Netscape or Internet Explorer). iSeries Access for Web provides a subset of the capabilities provided in Client Access Express for Windows or IBM Host On-Demand. Its advantage is ease of deployment (no code to install or maintain on the end user workstation).

The Client Access Express presentation has more details.

**WebSphere Development Studio for iSeries** has a component called the WebFacing tool. This tool builds a Web interface to existing 5250 application by having the user convert - at development time, the display file source into JavaServer Pages and Java data beans. Defaults are provided to simplify this process. The JSPs and beans are deployed to the WebSphere Application Server.

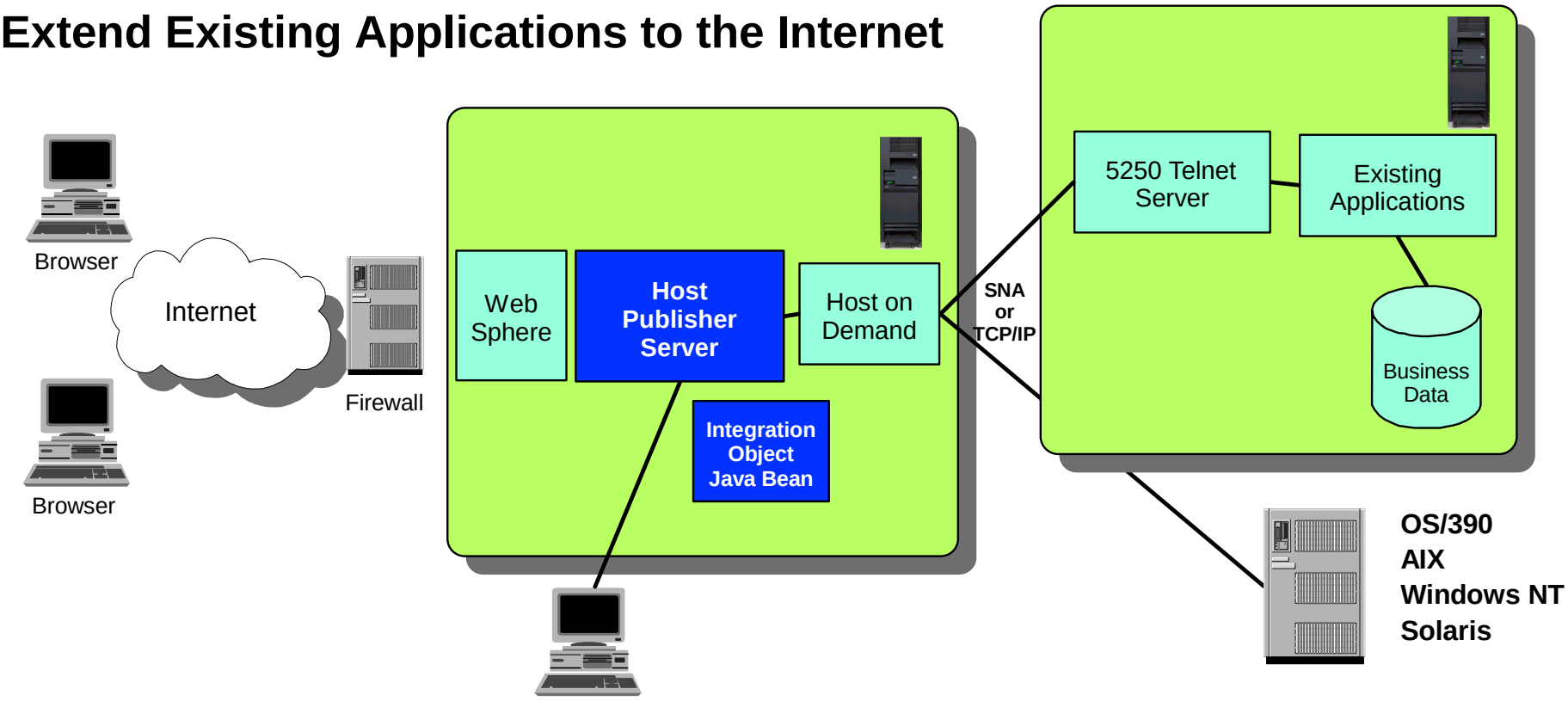
The WebFacing support requires little change to the application's business logic.

The Application Development presentation has more details.

# Host Publisher for AS/400 V2



## Extend Existing Applications to the Internet




- **Host Publisher Studio guides user in creating web-to-host publishing projects**
  - Records host and database interactions, identifies and labels desired data
  - Generates Integration Object (Java Bean) which encapsulates this interaction for use by Host Publisher Server
- **Host Publisher Server is servlet that provides the runtime environment for the Integration Objects and generates HTML for browsers**

**Versions 2.1, 2..2 available**

# Notes: Host Publisher for AS/400 V2



**There is no new OS/400 V5R1 or Host Publisher for AS/400 support in this announcement. However, the April 200 announcements have included a new iSeries Access for Web function as part of V5R1 Client Access Express, 5722-XE1. Planned for September 2001 availability, this support enables a browser, such as NetScape or Windows Explorer to run 5250 emulation and Data Transfer with no Client Access code on the workstation This function requires Host Publisher for AS/400, which will be packaged as part of Client Access Express host code with the September 2001 availability.**

With up to 80 percent of all business data residing on mainframes and other host systems, growing e-businesses need quick, easy and efficient ways to extend data to Web users. IBM Host Publisher lets you implement Web applications such as Web self-service from existing 3270, 5250, Virtual Terminal, Java, and JDBC host applications -- without modifying the host applications. IBM SecureWay Host Publisher V2.1 for AS/400 (5648-D31) provides a quick and easy way to implement e-business applications. With this software, you can extend the reach of mission-critical applications to users across the intranet and Internet without changing existing applications.

SecureWay Host Publisher for AS/400 allows you to integrate multiple sources of host data into a single Web page, giving end users the appearance of a single new application. Host Publisher uses Java technology like JavaBeans, Java Server Pages (JSP), and Java Servlet. Consequently, the existing applications are built in an ILE language. On the AS/400, SecureWay Host Publisher supports applications written for 5250, Java, and databases that provide a JDBC interface, such as IBM DB2 Universal Database, Oracle, and Sybase. It supports any HTML-based browser and does not require any specific Java-enabled browser.

Host Publisher consists of two major components:

- ***Host Publisher Studio*** is a collection of easy-to-use, task oriented, point and click, tools that provide the development environment for creating Host Publisher applications.
- ***Host Publisher Server*** works with the IBM WebSphere Application Server to provide the runtime environment for executing the applications created with the Host Publisher Studio.

You create Web-to-host applications using the Host Publisher Studio, publish them to the Host Publisher Server, and provide access to the final end user.

# Host Publisher for AS/400 V2-2



The Web-to-host applications you build are based on Integration Objects, which are reusable beans for Java that can:

- Automatically establish a connection with a host.
- Accept user input, if required.
- Navigate to and extract data from an application.
- Disconnect from the host and end the connection.

Some key function categories under Host Publisher include:

**Load balancing**

**The load balancing** capabilities of Host Publisher allow you to balance the load of host integration object requests over a group of Host Publisher Servers to provide more predictable performance, easy scalability, and fail over protection. The ability to move from one operating system platform to another allows you to move your workload to a higher capacity platform as demands increase.

**Connection Pools**

To enhance performance, connection pools are provided. These are defined in the Host Publisher Studio. Connection pools are used during runtime to cache connected, logged on, and ready connections to improve response time to end users. A user-defined number of connections are started at the first request, and remain active in the pool for subsequent requests from any user. This eliminates the overhead of establishing a connection, and connecting and disconnecting each host request.

**Object Chaining**

SecureWay Host Publisher supports object chaining. Object chaining allows you to break a complex task into logical subtasks to improve performance and flexibility, and reduce the administration of creating complex Web pages. For example, you might use chaining in a typical 5250 application which uses multilevel menus. A corporate phone directory might have several menus to step you down to the point to list everyone in a particular department. You want to display the office location of someone in the list, return to the department list and select a new name, and display the second person's office location.

Object chaining enables you to break the task into several reusable Integration Objects so that the end-user does not have to navigate back down through the several menus to reach the department list again.

# Host Publisher for AS/400 V2-3



Key function categories under Host Publisher continued:

**Secure connections and encryption**

Host Publisher provides SSL Version 3 for securing the connections for TN5250 and TN3270 communications with AS/400s and S/390s. SSL support provides data encryption and server authentication using signed certificates. The encryption level, included in the SecureWay Host Publisher Version 2.1 consists of up to 128-bit for US/Canada The 128-bit DES version can be exported outside of the US/Canada, subject to limitations, to particular industries (for example banks and insurance Companies).

SecureWay Host Publisher works with WebSphere Standard Edition or Advanced Edition. The ability to reuse Host Publisher Integration Objects within the new Web-based applications built with the WebSphere Application Server tools delivers a non disruptive evolutionary path for customers to enable an investment leverage as Web applications extends into the Web application development projects of the future.

Host Publisher and WebSphere integration summary

IBM WebSphere and Host Publisher software complement each other and deliver a leading-edge solution for both the integration of existing applications and the deployment of new applications within the Internet. WebSphere software focuses on the development and deployment of server-side Java applications, while Host Publisher focuses on extending and integrating existing applications within the Internet. Host Publisher V2 uses WebSphere Application Server Standard Edition as a key component of its runtime environment. Host Publisher V2 includes WebSphere Application Server Standard Edition for platforms that do not already ship WebSphere as part of the operating system.

# Host Publisher for AS/400 V2-4



Host Publisher and WebSphere integration summary continued

Host Publisher generation of reusable Java-based Host integration objects enables the synergy and couples the value with the WebSphere family of products. Host Publisher integration objects can be reused within new WebSphere software applications to provide access to existing host applications for the new applications being developed with WebSphere, thereby enabling customers to leverage their investment in Web-to-host application extension into the new Web-based applications being developed. The WebSphere family of products, notably VisualAge for Java, can be used to easily add new business logic to an existing Host Publisher implementation. Thus providing the flexibility to easily evolve Host Publisher implementations over time using industry standard Java technology development and deployment environments.

In summary, IBM has aligned its strategic Web-to-host e-business solutions on a common technological foundation, centered around Java technology and the Application Framework for e-business. The result is leading-edge solutions for application extension and integration with the Web by the IBM SecureWay Host Integration Solution that can be leveraged by new Web-based application and business logic development and deployment within an IBM WebSphere software implementation.

# Host Publisher for AS/400 V2-5



**Host Publisher V2.2 highlights**

WebSphere Host Publisher V2.2 can enable new uses for existing applications and data. With Host Publisher V2.2, you can combine existing information sources into composite applications for new users, without any changes to the existing applications and data. The business benefits associated with Host Publisher are substantial.

The applications created with the common Host Publisher Studio will run unchanged in all supported operating environments: AIX, Sun Solaris, and Windows NT, and Host Publisher for OS/390 and AS/400, which are available as a separate products. The ability to move from one operating system platform to another will allow you to move your workload to a higher capacity platform as demands increase.

The Host Publisher Studio is a collection of task-oriented, easy-to- use graphical user interfaces that assist the Web application builder in managing and creating Web-to-host projects. It uses task-oriented prompts to guide the user through the creation process, including:

- Recording host and database interactions
- Identifying desired data
- Labeling that data for retrieval

The Studio automatically generates a Java bean, called an Integration Object, which encapsulates the interactions and data retrieval. You can use the Studio to generate a fully customizable HTML Web page for modeling interaction with the Integration Objects and presenting the resulting data. The HTML Web page can be enhanced with Web authoring tools such as, WebSphere Studio, to meet corporate guidelines on style and image. Once the Web page is completed, you can publish it to a Host Publisher Server for production access by end users.

The Host Publisher Studio is provided on a separate CD assembly and runs on Windows 95, Windows 98, Windows NT, and Windows 2000 operating systems.

**Host Publisher V2.2 highlights continued**

**Host Publisher Server**

The Host Publisher Server provides the runtime environment for supporting Web applications created with the Host Publisher Studio. Host Publisher is on a separate CD assembly and works with the IBM WebSphere Standard Edition
and other runtime components such as:

- Connection management
- License monitoring
- Run-time administration
- Log and trace management

The Host Publisher product also includes a separate CD assembly for IBM Network Dispatcher to provide load balancing across multiple Host Publisher Servers. The Network Dispatcher can only be used for the load balancing function for Host Publisher. If you require load balancing for other applications or servers, you must purchase these additional copies separately.

**Remote Integration Objects (RIO)**

WebSphere Host Publisher Remote Integration Object support provides a standard interface for program access to Integration Object data in an XML format. It also provides remote access to Host Publisher server Integration Objects. This enables remote Java applications or applets running on a remote client or server to execute Host Publisher Integration Objects for existing application access as though they were physically running on the Host Publisher server machine. The interface to the Host Publisher Integration Objects is unchanged regardless of whether
the customers Java application is calling it from a remote client or is running on the Host Publisher server.

## Host Publisher V2.2 highlights continued

### XML Gateway

WebSphere Host Publisher provides an XML Gateway for accessing legacy 3270 and 5250 applications and making that application data available to programs in an XML format.

The Host Publisher XML Gateway also provides an HTML Mapper capability that provides a load-and-go HTML entry-level emulator for 3270 or 5250 application access. Without any customization, existing 3270 and 5250 applications can be extended to Web users. This capability is targeted at end users who:

- Need occasional access to the host application
- Consider a native terminal screen look and feel to be acceptable
- Do not yet have Java-capable desktops

For Java-enabled users, IBM's Host On-Demand should be considered to meet their emulation needs.

### WebSphere Studio Professional Edition

The WebSphere Studio Professional Edition is now included as part of WebSphere Host Publisher V2.2. The WebSphere Studio provides all the tools needed for a complete Host Publisher e-business implementation, such as:

- HTML/JSP editing
- New business logic creation
- Site deployment enhancement

You are authorized to install and use up to five copies of WebSphere Studio Professional Edition for every WebSphere
Host Publisher purchased. If you require additional copies of WebSphere Studio Professional Edition, you must purchase these additional copies separately.

## Host Publisher V2.2 highlights continued

### Enterprise-class Functionality

To enhance performance, WebSphere Host Publisher provides connection pools, which are defined in the Host Publisher Studio. Connection pools are used during runtime to cache connected, logged on, and ready connections to improve response time to end users. A user-defined number of connections will be started on demand, and remain active in the pool for subsequent requests from any user. This eliminates the overhead of establishing a connection, and connecting and disconnecting each host request.

WebSphere Host Publisher supports object chaining. Object chaining allows you to break a complex task into logical subtasks to improve performance and flexibility, and reduce the administration of creating complex Web pages. For example, you might use chaining in a typical 3270 application which uses multilevel menus. A corporate phone directory might have several menus to step you down to the point where you can list everyone in a particular department. At this point, you want to display the office location of someone in the list, return to the department list, select a new name, and then display the second person's office location. Object chaining enables you to break the task into several reusable Integration Objects so that the end user does not have to navigate back down through the several menus to reach the department list again.

### Secure Sockets Layer (SSL) Security

Host Publisher provides SSL V3 for helping to secure the connections for TN3270 and TN5250 communications with hosts and AS/400s. The SSL support provides data encryption and server authentication using signed certificates.

The SSL support is now available on a worldwide basis with 128-bit encryption. The encryption level can negotiate to the specific encryption level of the clients (either 128-bit or 40-bit). You should have your IBM representative contact the importing country's Export Regulation Coordinator (ERC) for details.

# Host/Server Access Product Comparisons

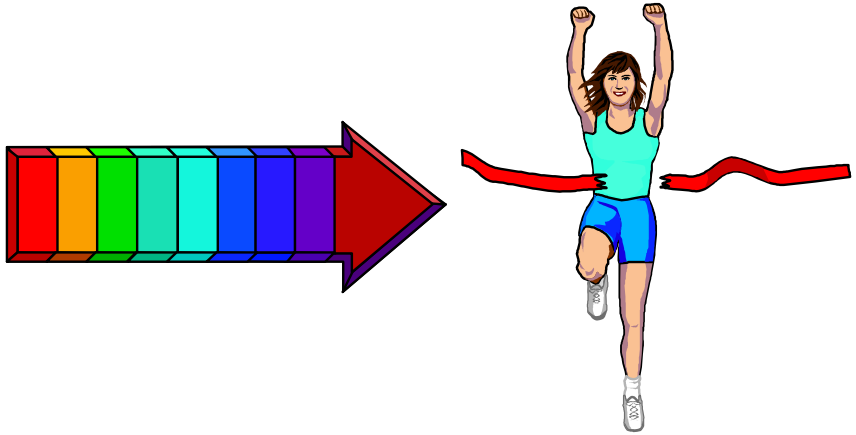


Comparison of IBM Suite of Host/Server Access Products

- iSeries Client Access family of products
- WebSphere Host Integration products

End user products

- Windows-based products
  - AS/400 Client Access Express for Windows
  - IBM Personal Communications
- Browser-based products
  - iSeries Access for the Web
  - WebSphere Host-On-Demand (HOD)



Application Development Tools

- IBM WebSphere Host Publisher server
- WebFacing Tool
- WebSphere Transcoding Publisher
- IBM Screen Customizer
- WebSphere Development Studio for iSeries

# Host/Server Access Product Comparisons



This foil is a good summary of the many end user and programming tools available for iSeries from IBM and gives pointers where each tool is more useful than another tool.

**Comparison of IBM Suite of Host/Server Access Products**

IBM has continually provided many end user, server-access related product choices for its customers, and it has recently been extending its product choices to include more Web-to-host e-business solutions. Some of these product solutions may appear to overlap with other IBM products; however, each solution has a different focus. The following reviews the focus of the products available from IBM.

iSeries Client Access family of products

Client Access products are targeted for customers accessing iSeries and AS/400 systems. The focus of Client Access products is twofold:

- Bring all the power of the iSeries and AS/400 to the end user desktop. Some examples in Client Access Express are Operations Navigator (the OS/400 GUI), an ODBC driver fine-tuned to work with DB2/400, Data Transfer that provides a wizard to create new File Definitions for users uploading data to DB2/400, using built-in AS/400 NetServer function for PC file and AS/400 print serving.
- Tightly integrate the client software into the desktop environment it is running on. Client Access Express is tightly integrated with the Windows desktop. For example, you can change your OS/400 passwords through the Microsoft Windows Password panel, you can create new shortcuts or icons for iSeries connections simply by right clicking on the Windows desktop area, and you can use Operations Navigator Application Administration to

  control what Client Access functions can be used to access your iSeries and AS/400 systems.

IBM Host Integration family of products

The WebSphere Host Integration products support multiple host application environments, including the iSeries, zSeries, and pSeries environments. The Host Integration product set focuses on:

- Providing the same end user look and feel whether running on a Windows 32-bit operating system or another platform. Some examples of this are that IBM Personal Communications runs on Windows 32-bit systems, OS/2, and Windows 3.x. The Host On-Demand product runs in many additional desktop environments such as Linux, Sun Solaris, etc.

# Host/Server Access Product Comparisons-2



**IBM Host Integration family of products continued**

- Providing a common and consistent interface to a variety of servers and host systems.

This family of products provides many tools to enable access to applications and data that reside on midrange servers, enterprise servers, and ASCII hosts. For example, they provide Host Access Beans for Java and the Java Interface for Host Access Class Library (HACL) that can be used to provide an enhanced user interface to existing back-end applications.

**Comparison of Current End User Products**

There are two IBM offerings that are designed to run natively on Windows 32-bit systems:

- AS/400 Client Access Express for Windows provides TCP/IP connectivity to users running Windows 95, 98, Me, NT 4.0, and 2000. Client Access Express has 5250 emulation, access to DB2/400 through its Data Transfer (including Excel add-ins for uploading and downloading data through the spreadsheet interface), and utilizes AS/400 NetServer for working with the OS/400 Integrated File System and printers. It includes a variety of middleware for using and developing client applications to access OS/400 resources via AS/400 ODBC driver, OLE DB driver, and other iSeries enablers such as Data Queues, Remote SQL, and other Remote Command support, as well as Emulator High-Level Language Applications Programming Interface (EHLLAPI) for 5250 applications. It also includes Operations Navigator, the OS/400 GUI, for administering iSeries and AS/400 systems.
- IBM Personal Communications provides TCP/IP and SNA/APPC connectivity to users running Windows 95, 98, NT 4.0, and 2000. Personal Communications provides 3270, 5250, and VT emulation, File Transfer to store PC files on the host, ODBC driver to access any host supporting DRDA. It also provides Host Access Class Library (HACL) and EHLLAPI for working with host applications.

# Host/Server Access Product Comparisons-3



**Comparison of Current End User Products continued**

IBM has two end user products that are designed to run in a browser environment:

- iSeries Access for Web is a servlet that runs on OS/400 Java Virtual Machine (JVM) and generates HTML output to a browser (such as Netscape or Internet Explorer). iSeries Access for Web provides a subset of the capabilities provided in Client Access Express for Windows or IBM Host On-Demand. Its advantage is ease of deployment (no code to install or maintain on the end user workstation). It is designed for users needing either quick or infrequent 5250 access to the iSeries or AS/400 systems, a need to access DB2/400 data, work with OS/400 printers or printer output, and send/receive messages. It is currently in alpha testing and can be downloaded from the web; additional function is being added to this product, and it will be delivered as part of the iSeries Client Access Family product later in 2001.
- WebSphere Host On-Demand (HOD) is an applet that runs on servers with JVM 1.1, and its applet can be downloaded to browsers with JVM 1.1 (such as Netscape or Internet Explorer). HOD is IBM's answer for the Java-based host access through 3270, 5250, and VT emulation and primarily designed to meet the needs of intranet and extranet users. It is for users who are familiar with the original host application screens, users who are considered power users who require a full function customizable emulator. HOD is a good alternative when a user needs extended connection times. It also provides host-to-client file transfer as well as local print capability.

# Host/Server Access Product Comparisons-4



**Programming Tools**

IBM offers a variety of tools to enable host applications to run in a web environment. Some of these are:

- IBM WebSphere Host Publisher server runs on OS/390, OS/400, AIX, Sun Solaris, and Microsoft Windows NT operating environment and enables applications created with its Host Publisher studio to run unchanged in a WebSphere Application Server environment. You can externalize selected portions of an application to the web as well as consolidating pieces of multiple host applications into a single HTML page. These users typically connect periodically for short periods of time and expect typical web response times. This solution requires both a development and runtime investment. No source code is required.
- The WebFacing Tool converts a 5250 host application into a Web GUI application with only minor changes required to the host application source code. This same application can support both the standard 5250 interface as well as the new Web GUI interface. This allows dedicated users to access their applications in the traditional manner as well as providing a Web interface for casual users. This tool allows iSeries and AS/400 developers to extend legacy applications to the Web using existing skills. Most developers will take advantage of the customization capabilities of the WebFacing Tool to enhance the Web interface. This is an 5250-only solution. This solution requires a development time investment and access to the source code.
- WebSphere Transcoding Publisher enables customers to run their existing web applications from hand-held information devices. It brings legacy data from the web and dynamically converts formats and the presentation style of host data to a new breed of personal data assistants. WebSphere Transcoding Publisher made available as a beta in December 2000. V4R5 level support is targeted for mid-2001. V5R1 support will follow that date.
- IBM Screen Customizer can be used to enhance individual Client Access Express, Personal Communications, and Host On-Demand screens with a GUI look and feel. This solution requires a development investment.
- V5R1 WebSphere Development Tools for iSeries consolidates the key AD tools into one host based package. The package includes the following host components: Application Development ToolSet, ILE RPG, ILE COBOL, ILE C/C++. It also includes the following workstation components: WebSphere Studio for iSeries (Professional Edition), VisualAge for Java for iSeries (Professional Edition), Cooperative Development Environment (CODE), VisualAge RPG, and WebFacing Tool (First Edition) as described above.

# Host/Server Access Product Comparisons-5



**Programming Tools** continued

These programming tools offerings complement each other by providing a total IBM solution to allow customers to quickly enable their host applications to the Web.

Web references for more information include:

- Client Access - www.iseries.ibm.com/clientaccess
- iSeries Access for Web - www.iseries.ibm.com/clientaccess/beta/webaccess.htm
- Personal Communications - www.ibm.com/software/enetwork/pcomm
- Host-On-Demand - www.ibm.com/software/webservers/hostondemand
- Screen Customizer - www.ibm.com/software/network/screencustomizer
- Host Publisher - www.ibm.com/software/webservers/hostpublisher
- WebFacing Tools - www.ibm.com/software/ad/wdt400
- Transcoding Publisher - www.ibm.com/software/websphere/transcoding

This topic compared Host/Server Access products. The following Tools section is oriented toward application development without specific attention to "pre-web" applications.

# Tools

# Notes: Tools

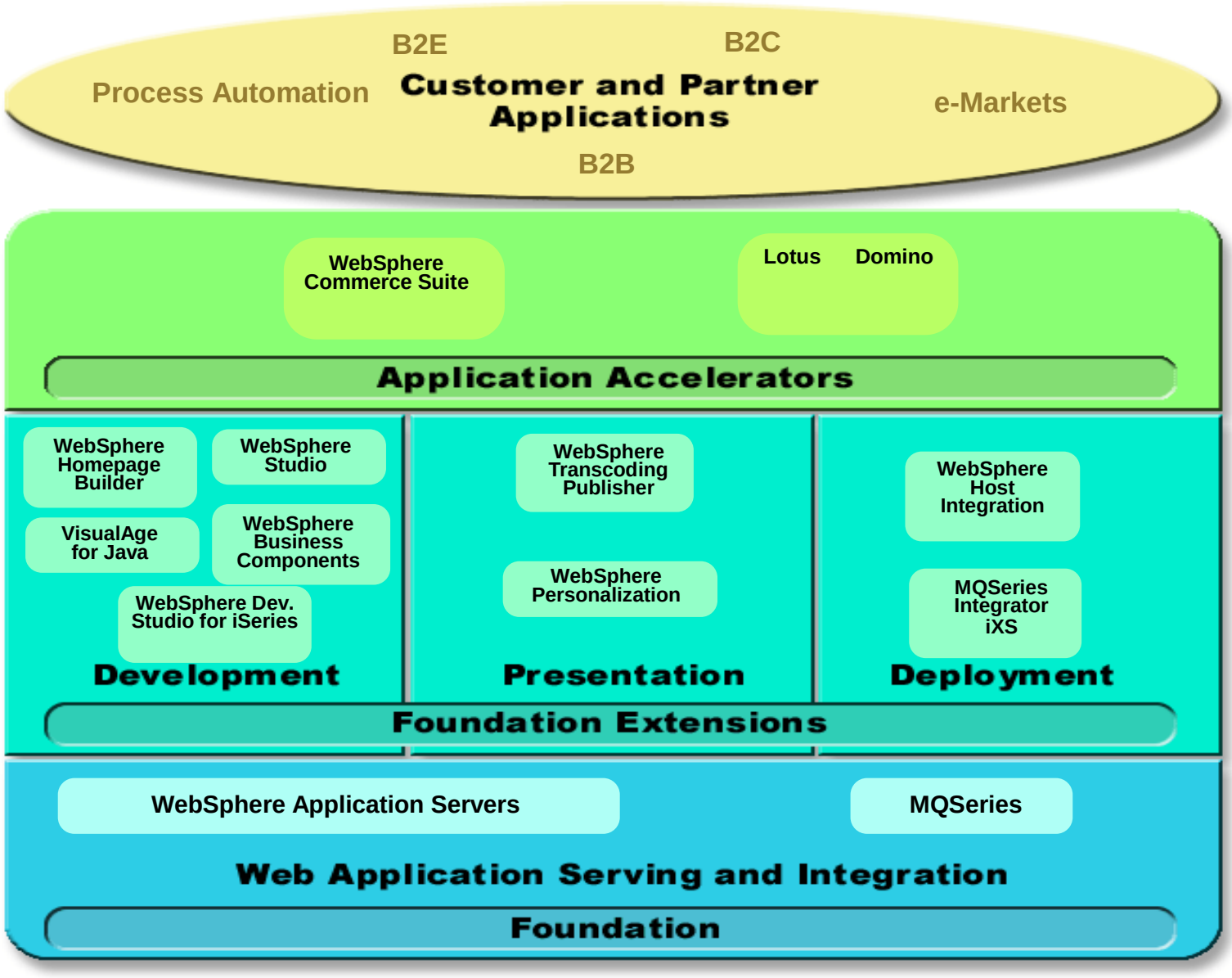


This next section focuses on development tools under the WebSphere family of products, specifically WebSphere Studio and Visual Age for Java. We start with the next foil, which is a graphic of the various products within the WebSphere family.

# WebSphere Platform Support for iSeries





# Notes: WebSphere Platform Support for iSeries



This picture represents IBM Framework for e-business and includes Software Group (SWG) products in the appropriate category. In the Foundation area, WebSphere Application Server and MQSeries are listed. In the Foundation Extension area, SWG products are listed in the areas of development, presentation and deployment. Domino and WebSphere Commerce Suite are listed in the Application Accelerator area. ISV applications are listed at the top, many of them leveraging one or more of the SWG products listed below.

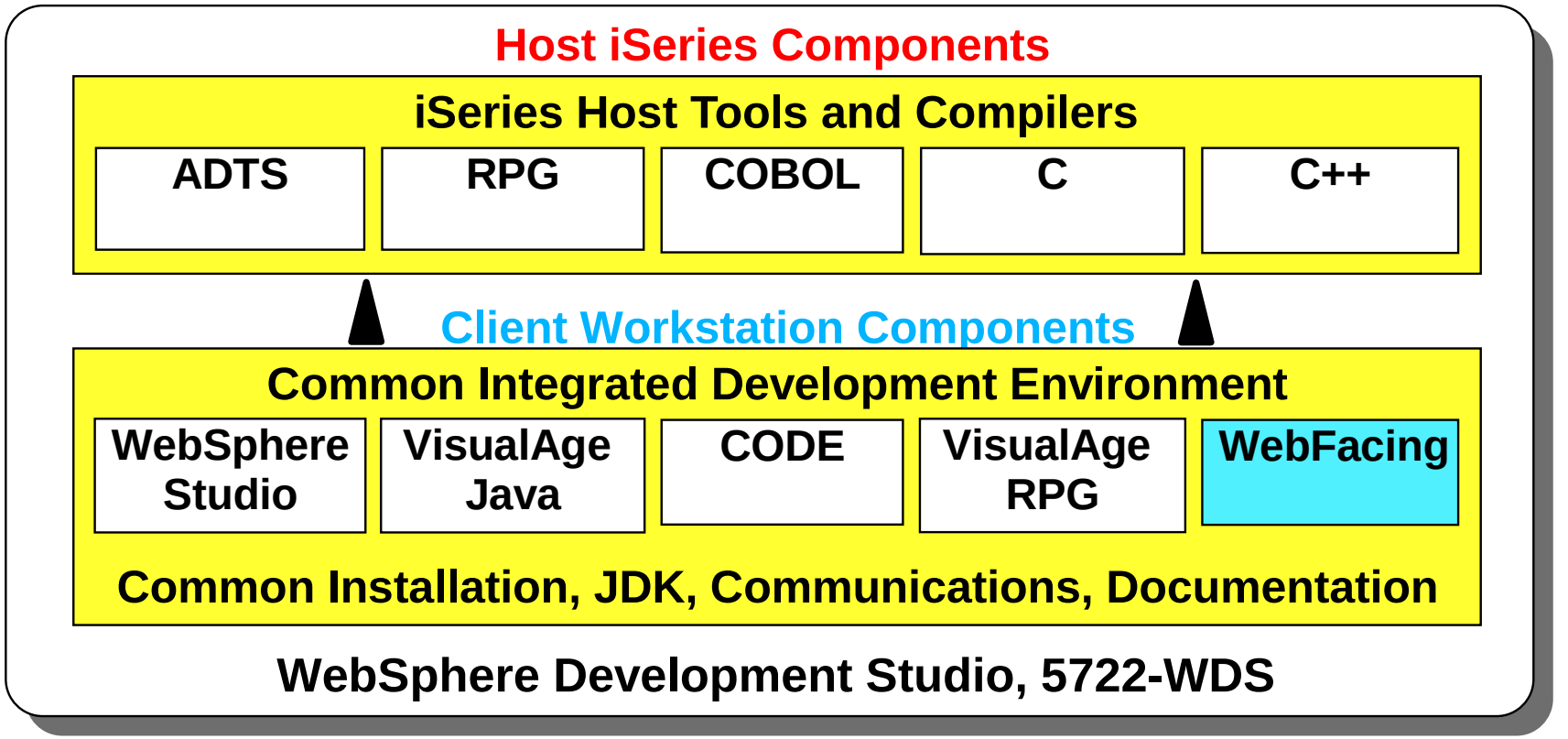
In previous sections we have already discussed members of the WebSphere family of products, such as WebSphere Application server, WebSphere Commerce Suite, WebSphere Transcode Publisher, MessageQueue Series..

In the following foils we discuss most, but not all of the other WebSphere products shown in this graphic.

# WebSphere Development Studio for iSeries






A single toolset for *all* iSeries application developers

Common launch pad, project definition and maintenance

New WebFacing tool extends 5250 applications

Discontinue individual products in V4R5, V5R1

IBM WebSphere

www.ibm.com/software/ad/wdt400

# WebSphere Development Studio for iSeries



This is a graphical representation of what the WebSphere Development Studio for iSeries offers and indicates the individual products are no longer available.

Packaging the array of development tools for Websphere-based applications running with OS/400 is a great idea for expediting web application development and deployment. There are Host-centered capabilities and a set of client workstation centered capabilities.

Note: WebSphere Development Studio for iSeries is also being made available on OS/400 V4R5, as product number 5769-WDS. While the individual components do not have V5R1 functions, the Host and Client software packaging for 5769-WDS is very similar to 5722-WDS described in the Application Development presentation.

See the April 2001 announcement letters for WebSphere Development Studio for iSeries, V4R5 and V5R1.

The WebFacing tool adds another "5250 to Web browser interface tool" that needs to be considered as it is "for free" with 5722-WDS.

See the foil Host/Server Access Product Comparison, which includes a discussion of the WebFacing tool.

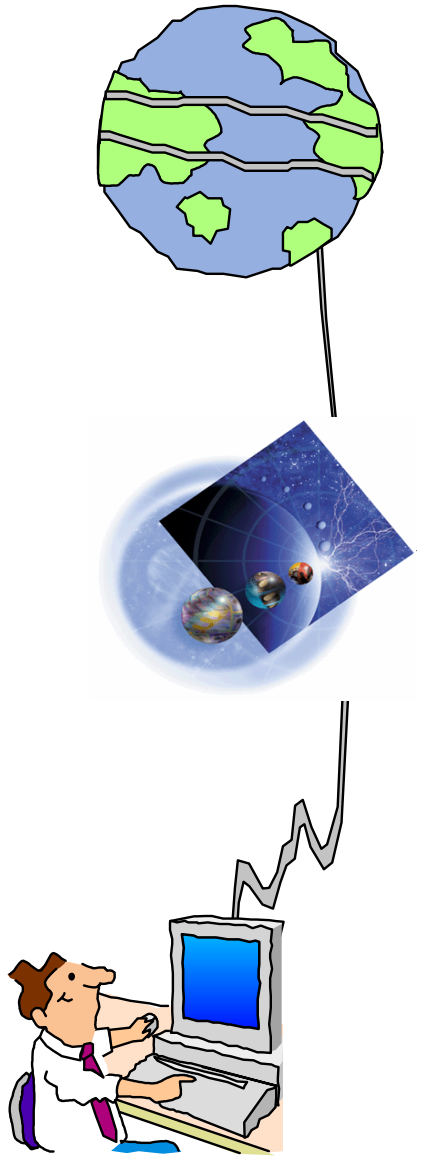
 

# WebSphere Studio Standard Edition



## Full Development Environment for Web

- Create and manage Web Projects
  - Group all files related to the Website
  - Check-in and Check-out files
  - Publish project to web server
  - Register any tool for any file type
  - Page Designer: WYSIWYG editing of HTML, JSPs
  - Wizards
- Integration with VA Java
  - Read classes, beans, Servlets from VA Java
  - Write classes, beans, Servlets to VA Java
  - Publish Website to VA Java for testing purposes



# WebSphere Studio Standard Edition



WebSphere Studio (WSS) is IBM's standard client workstation development tool for the creation of Web based user interfaces with the following characteristics:

- Uses HTML and JSPs: creates standard Java objects therefore portable to any Java environment
- Fully integrated management of Web projects
- Limited change control management
- A WYSIWYG editor for creating browser interface

It is integrated with VisualAge Java:

- Can use objects created with VA Java
  - classes, beans and Servlets
- Objects created with WSS can be used in VA Java also
- Can publish Website to VA Java for testing purposes

## iSeries-Unique Support in Studio

- DSPF-like Palette Parts in Page Designer
  - HTML+JavaScript controls
  - Smart entry fields, labels, buttons, subfile, etc.
  - SmartGuides to generate JSP code to set attributes
- Program-call SmartGuide Framework
- Easy steps to the Web:
  - Describe *PGM/*SRVPGM inputs and outputs
  - Generate output:
    - HTML Form prompting for input
    - JSP to display output
    - Java Bean to call *PGM or *SRVPGM (using Common Connector Framework, the new standard for Java-to-existing connections)
    - Servlet to glue it all together
  - Use PageDesigner to iterate generated output
- Simplifies iSeries Deployment and Testing

# WebSphere Studio with Affinity



iSeries programmers have different expectations about coding for the browser. They want to do specific iSeries functions - things that display files usually do.

Affinity to iSeries was created to allow traditional programmers to easily create these traditional functions ... fill in the blanks, answer the prompts and under the covers, we'll build the HTML or the JSP.

Also, the Affinity support can be used a publishing facility ... SmartGuides to assist in publishing the newly created user interface to the Web.

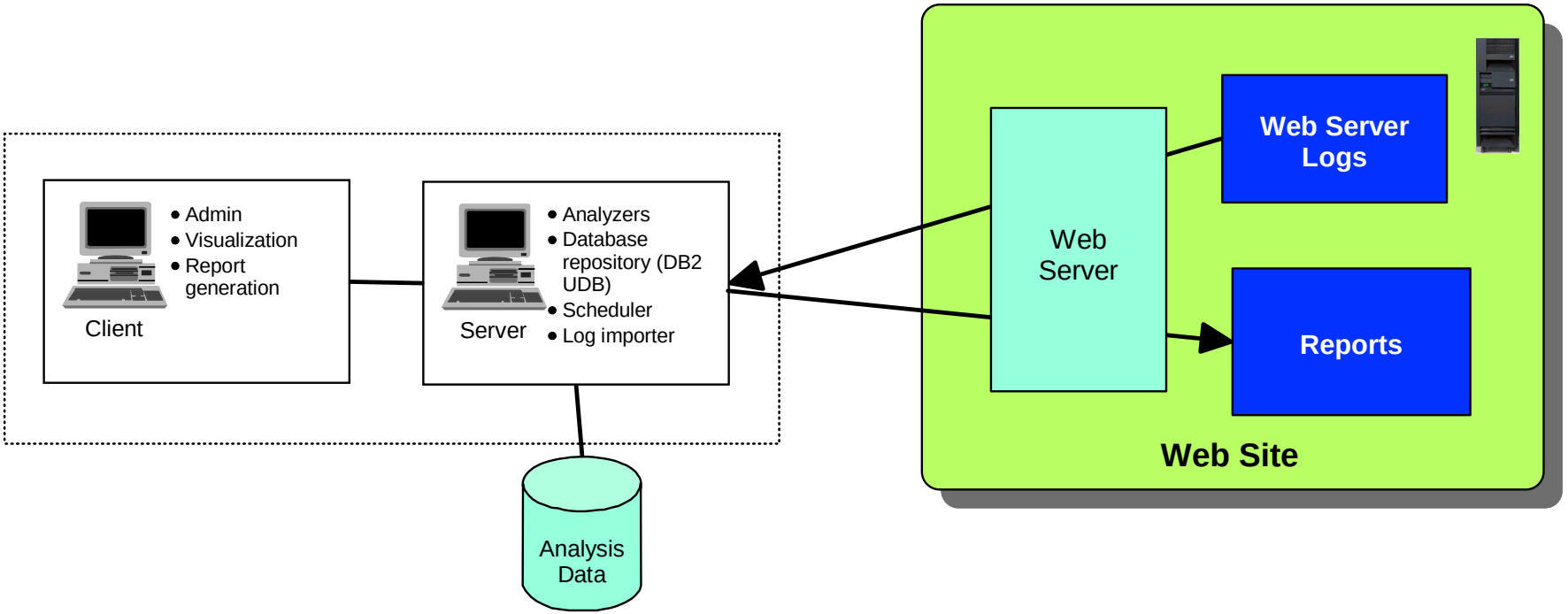
And, there are other functions.

The next foil give an example of some WebSphere Studio windows.

# WebSphere Site Analyzer






- **Site analysis component of WebSphere Application Server**
  - Packaged with WebSphere Advanced Edition 3.0/3.5
  - Provides analysis of your web site and its customers
    - Site content and structural analysis by category (hierarchical view)
    - Analysis of dynamic content (Servlets, JSPs)
    - Predefined, customizable reports
    - HTTP log usage analysis and visitor analysis
    - tasks can be scheduled
  - Client portion runs on Win32 platforms
  - Server (database) portion runs on WinNT, AIX, Solaris
  - Will analyze log files from OS/390 or AS/400

# Notes: WebSphere Site Analyzer



Site Analyzer is the WebSphere version of a graphical product that analyzes web site performance and traffic patterns. The tool runs on the "analyzer workstations" that have accessed web server log information.

You need to periodically turn on HTTP serving logging to determine such things like:

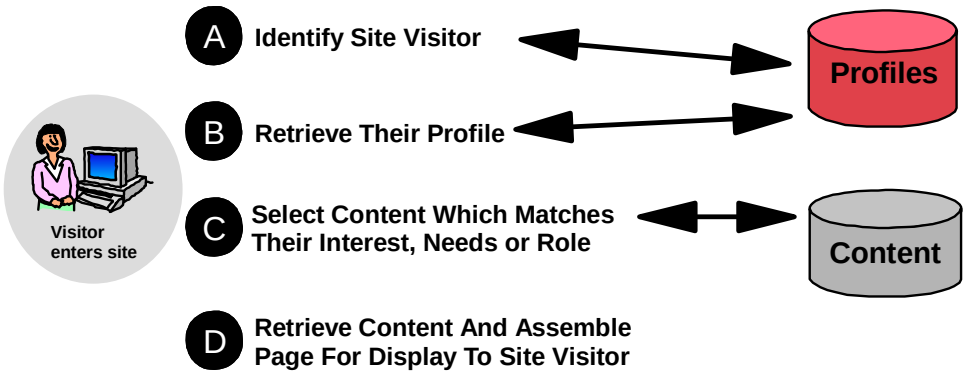
- Most frequently accessed web pages
- Peak activity time periods of requests to the server - highest hits per second
- Average response times
- Average number of characters transmitted

Analyzing these metrics can help you understand how to improve performance on the most popular web pages or plan for an upgrade to a faster system.

One WebSphere family member we do not a have foil on in this presentation is "Performance Pak." This Software Group product provides tools for caching, load balancing, and Web site replication "outside" of similar support within an HTTP Server or WebSphere Advanced Edition. It looks like some kind of caching support under this product's heritage will appear on the AS/400 in late 2000.

# WebSphere Personalization V3.5






## Easy to use tools

- Graphical tool for the creation and editing of business rules
  - Integrated in WebSphere Studio Advanced Edition
    - Build a page as you do today in Studio
    - Create a rule using a graphical editor
    - Publish page and rule to server

## Matchmaking

- Rules engine
- Recommendation engine

## Access to profiles & content

- Resource Engine
  - Allows the site owner to define and manage the users and content on which the rules and recommendation engine operate
  - Graphical tool for creating hierarchical groupings of profiles and content
  - Adapter for making DBs of profiles and content accessible to personalization system

# WebSphere Personalization V3.5



Personalization is targeting Web content to meet a user's needs and preferences. The elements of personalizing a web site are as follows:

- Identify the visitor (via a cookie or user logon).
- Retrieve their profile which contains the data elements that describe what interests them, their role in an organization or other parameters that best describe them to the business
- Based on the profile make a decision about what content to display to them.
- Assemble the personalized web page using the retrieved content.

The WebSphere Personalization package contains support for two personalization technologies:

- Rules-based personalization enabled by WebSphere Personalization 3.5 (runs on iSeries platform)
- Collaborative filtering enabled by LikeMinds Personalization Server 5.0 (for Solaris, Windows NT and Windows 2000)

For a rules-based personalization solution, the business manager defines a set of business rules that determine which Web content is displayed for a particular user. Developed by IBM, the WebSphere Personalization rules-based technology is tightly integrated into the WebSphere Application Server programming model and scalability architecture. Rules-based personalization is used across a wide spectrum of Web applications, such as employee self-service sites, business partner extranets and customer self-service sites.

The collaborative filtering technology employs recommendation engines that use advanced statistical models and other forms of intelligent software to extract trends from the behavior of Web site visitors. This approach adapts to changing trends in visitors' interests without creating new business rules. The Macromedia LikeMinds collaborative filtering technology is highly scalable and can be exploited by WebSphere applications using the LikeMinds Personalization Server Java APIs.

# VisualAge for Java - Professional Edition




Award winning Java development environment

Modern Integrated Development Environment (IDE)

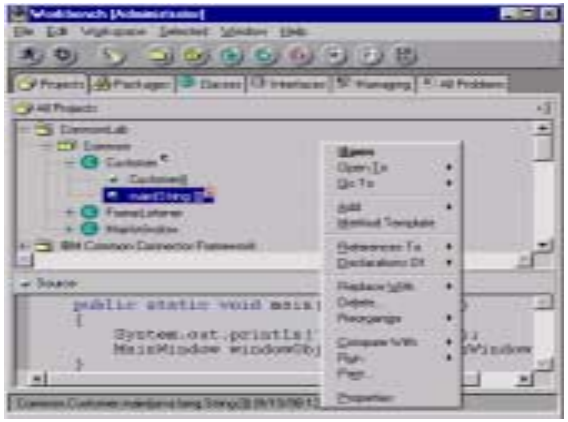
- Edit, browse, search, debug, ...

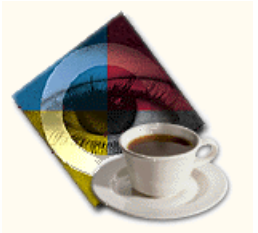
Code generation "builders":

- VisualAge Builder for WYSIWYG "construction by parts"


Enterprise ToolKit

- Toolbox for Java built-in
- Remote Export/Compile/Run/Debug
- DSPF-to-Swing Import Tool
- Program-Call SmartGuide
  - Generates Java Bean for calling *PGM object from GUI
- DSPF-like Formatting Beans
- DFU-like Beans
- PDM-like Beans



# VisualAge for Java - Professional Edition



VisualAge for Java is IBM's award winning Java development environment.

Recognized within the Java development community as a fully-integrated environment, full function debug capability (will debug Java pgms along with RPG, COBOL, etc. - on multiple platforms). VisualAge for Java creates full suite of Java applications including browser applications

Enterprise ToolKit:

- Has special features for the creation of iSeries-like functions ... DFU fields, subfile SmartGuide, etc.
- Also has Java ToolBox included

VisualAge for Java includes the following:

- The ability to export Java class and source files to the AS/400 server.
- The ability to develop Java code that is optimized for the AS/400 server.
- Two SmartGuides - one that assists in converting existing display files into Java code, and another which assists with AS/400 program calls.
- Beans which can be used for accessing and formatting your AS/400 data.

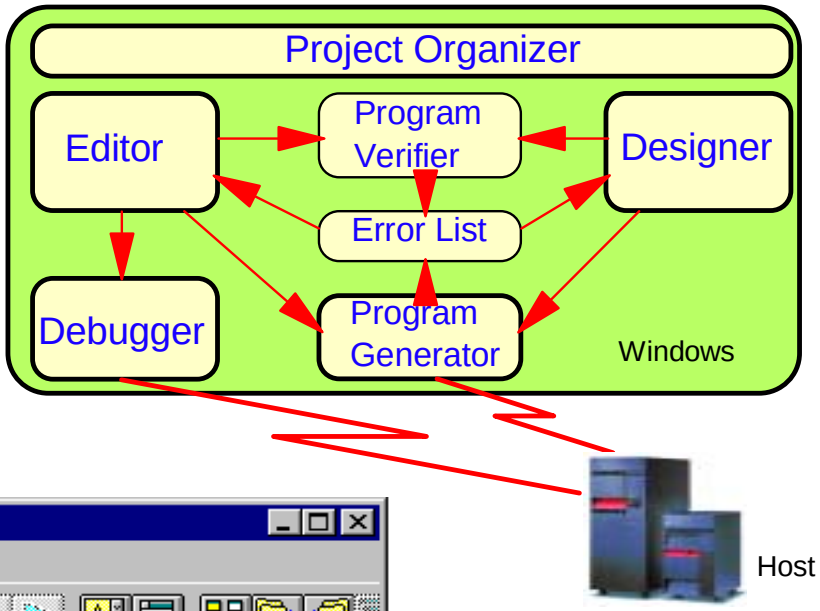
# CODE

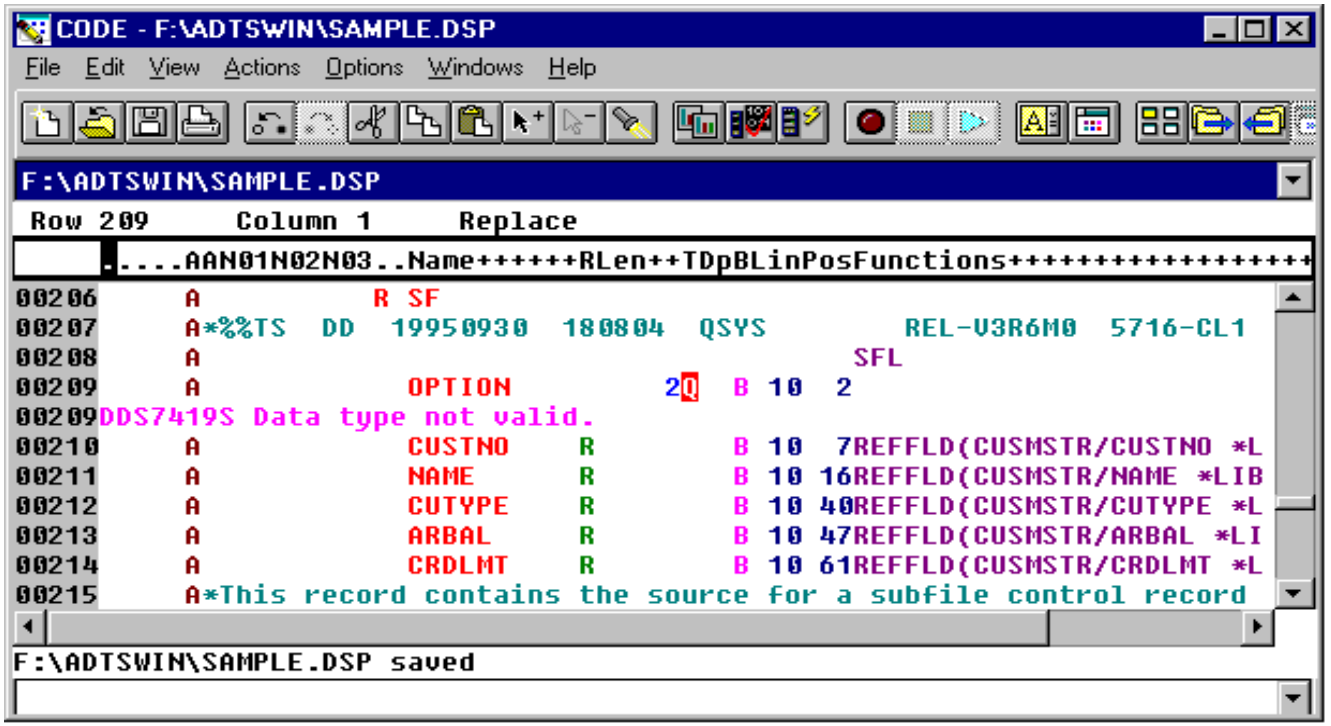


GUI based editor, screen designer, debugger

For traditional application code

Now Supports Java





# CODE



CODE

- For the creation and maintenance of traditional applications - RPG, COBOL, etc. to run on iSeries machine
- Developer's environment is graphical and on the workstation
- Applications coded and maintained on the PC, then uploaded to the iSeries for compilation and execution

Three main components under control of CODE organizer (like PDM support)

- 1. editor
- 2. WYSIWYG screen design tool .. will generate DDS under the covers
- 3. Debug capability ... graphical front end to the system debug capability - multi-windowed so can see source while watching contents of variables and watching application execute

The latest releases of CODE support the editing of Java within the CODE editor.

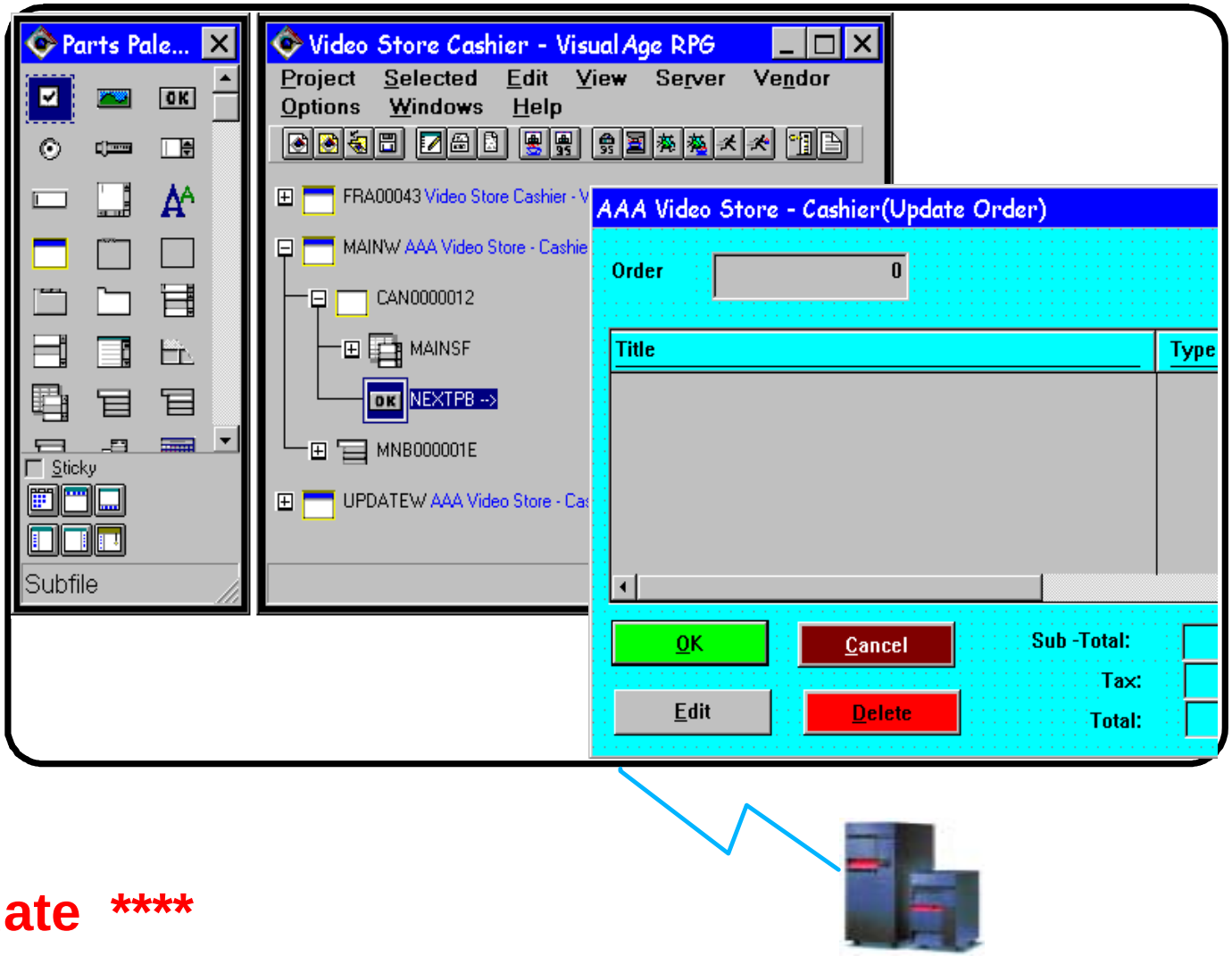
 

# VisualAge RPG



## VisualAge for RPG

- Rapid prototyping
- Uses 3GL skills
- RPG with GUI
- modular programs/ moving to parts




****** Latest Update ******

**Enter RPG code - produce Java source!!!**

# VisualAge RPG



VisualAge RPG

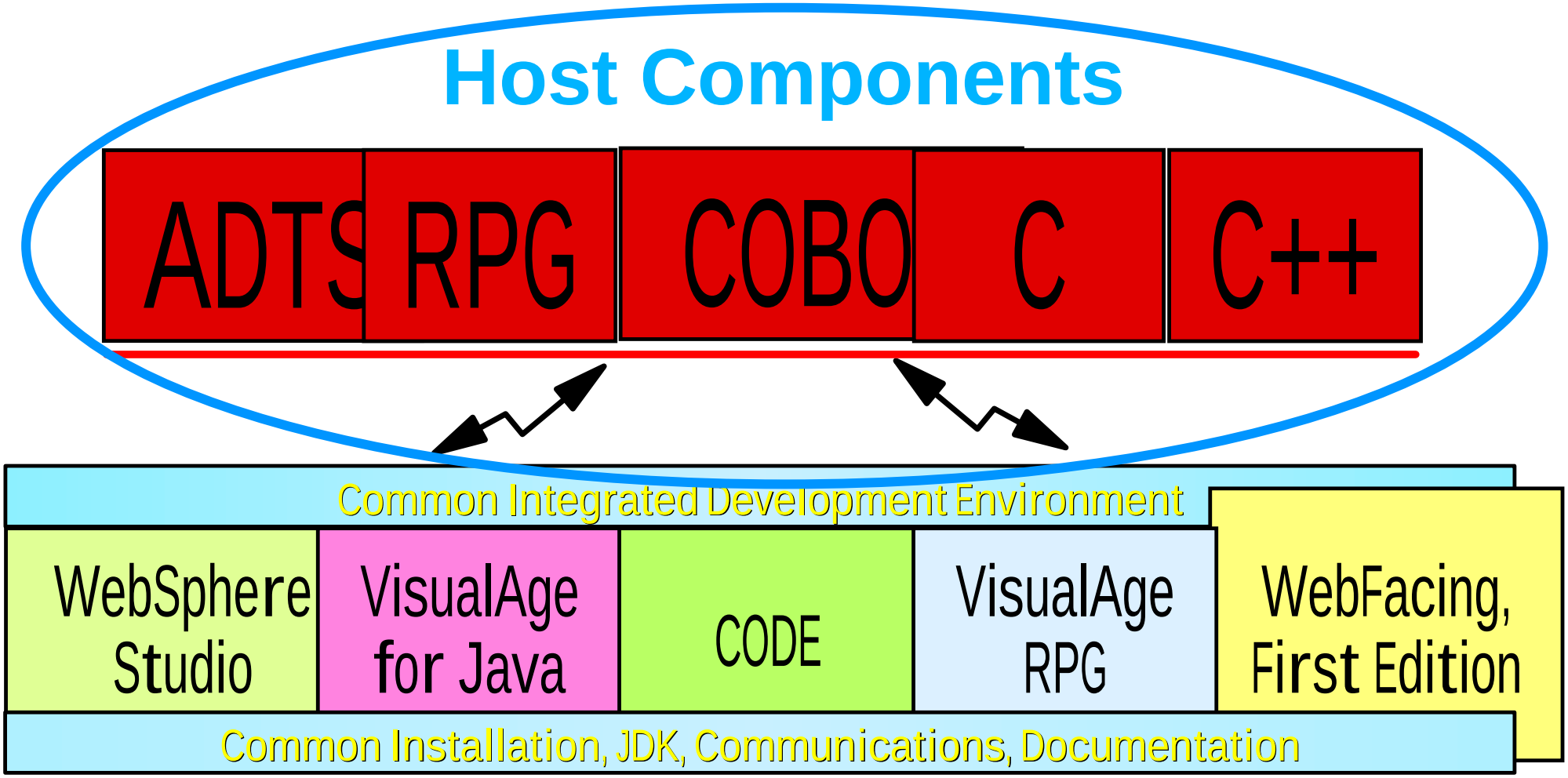
This moves the RPG IV compiler from the iSeries server and onto the workstation for development.

Provides a graphical user interface builder to:

- Build client applications or client server applications using RPG on a PC
- Has the capability to generate Java source from the RPG code.
- When design is complete can generate Java source code
  - Move Java source code to any platform, issue the Java command to compile and it should execute
  - We recommend to do this when want to create applets ... not so much for full applications

# WebSphere Development Studio: Host







# ILE RPG Compiler

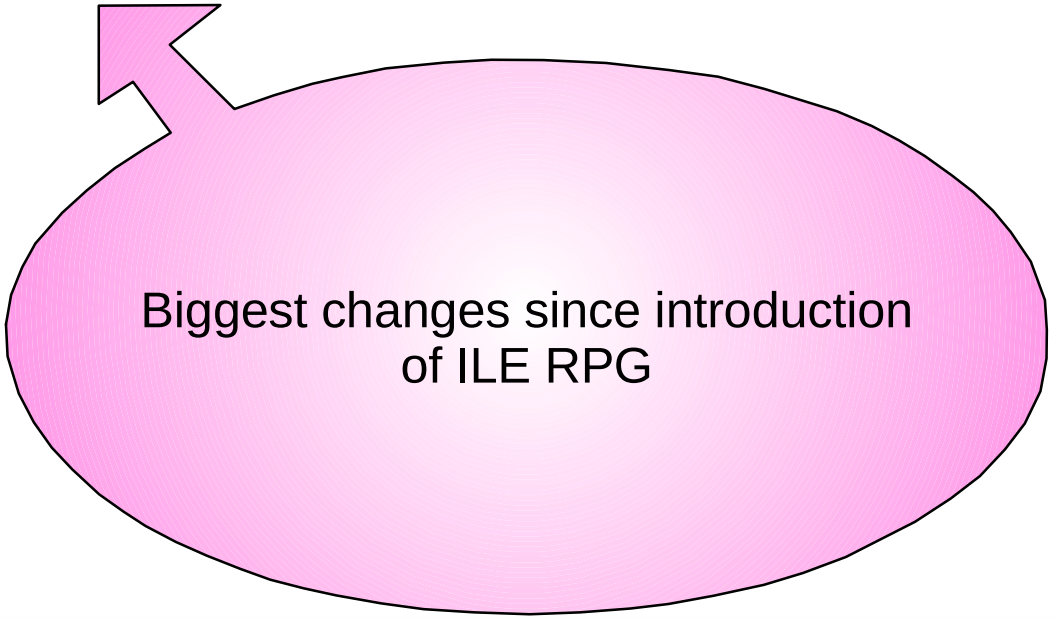


Improved support for calls between Java and ILE RPG using the Java Native Interface (JNI)

New built-in functions

Free Form calculations

Several other enhancements





# ILE RPG Compiler



Improved support for calls between Java and ILE RPG using the Java Native Interface (JNI):

- A new data type: Object
- A new definition specification keyword: CLASS
- The LIKE definition specification keyword has been extended to support objects.
- The EXTPROC definition specification keyword has been extended to support Java procedures.
- New status codes.

New built-in functions:

- Functions for converting a number into a duration that can be used in arithmetic expressions: %MSECONDS, %SECONDS, %MINUTES, %HOURS, %DAYS, %MONTHS, and %YEARS.
- The %DIFF function, for subtracting one date, time, or timestamp value from another.
- Functions for converting a character string (or date or timestamp) into a date, time, or timestamp: %DATE, %TIME, and %TIMESTAMP.
- The %SUBDT function, for extracting a subset of a date, time, or timestamp.
- Functions for allocating or reallocating storage: %ALLOC and %REALLOC.
- Functions for finding an element in an array: %LOOKUP, %LOOKUPGT, %LOOKUPGE, %LOOKUPLT, and %LOOKUPLE.
- Functions for finding an element in a table: %TLOOKUP, %TLOOKUPGT, %TLOOKUPGE, %TLOOKUPLT, and %TLOOKUPLE.
- Functions for verifying that a string contains only specified characters (or finding the first or last exception to this rule): %CHECK and %CHECKR
- The %XLATE function, for translating a string based on a list of from-characters and to-characters.
- The %OCCUR function, for getting or setting the current occurrence in a multiple-occurrence data structure.
- The %SHTDN function, for determining if the operator has requested shutdown.
- The %SQRT function, for calculating the square root of a number.

# ILE RPG Compiler



A new free-form syntax for calculation specifications. A block of free-form calculation specifications is delimited by the compiler directives /FREE and /END-FREE

You can specify the EXTFILE and EXTMBR keywords on the file specification to control which external file is used when a file is opened.

Support for qualified names in data structures:

- A new definition specification keyword: QUALIFIED. This keyword specifies that subfield names will be qualified with the data structure name.
- A new definition specification keyword: LIKEDS. This keyword specifies that subfields are replicated from another data structure. The subfield names will be qualified with the new data structure name. LIKEDS is allowed for prototyped parameters; it allows the parameter's subfields to be used directly in the called procedure.
- The INZ definition specification keyword has been extended to allow a data structure to be initialized based on its parent data structure.

Enhanced error handling: three new operation codes (MONITOR, ON-ERROR, and ENDMON) allow you to define a group of operations with conditional error handling based on the status code.

Other enhancements have been made to this release as well. These include:

- You can specify parentheses on a procedure call that has no parameters.
- You can specify that a procedure uses ILE C or ILE CL calling conventions, on the EXTPROC definition specification keyword.
- The following /DEFINE names are predefined: *VnRnMn, *ILERPG, *CRTBNDRPG, and *CRTRPGMOD.
- The search string in a %SCAN operation can now be longer than string being searched. (The string will not be found, but this will no longer generate an error condition.)
- The parameter to the DIM, OCCURS, and PERRCD keywords no longer needs to be previously defined.
- The %PADDR built-in function can now take either a prototype name or an entry point name as its argument.
- A new operation code, ELSEIF, combines the ELSE and IF operation codes without requiring an additional ENDIF.

See the Application Development presentation for more details on RPG, COBOL, C, and C++ for V5R1.

# Security

# AS/400 Hardware Cryptography



## *Hardware Cryptography*
## *IBM 4758-xx Cryptographic Coprocessor for AS/400*

- **170, 7xx: #4800**
- **270, 8xx: #4801, #4802**


Configured through browser interface to V5R1 ADMIN server

- Provides the tamper-responding secure key storage capabilities required by advanced financial applications operating over public data networks
  - Banking/ATM PIN code encryption
  - Designed to meet FIPS 140-1 level 4 key protection standard
- APIs available for business partners to develop financial (including debit card) applications
- Requires one of the Cryptographic Access Provider LPPs (5769-ACx) to authorize the key length
- Offloads computationally-intensive cryptographic processes from the main processors
- **Can perform V5R1 SSL for improved secured throughput**
- **Can store V5R1 Digital Certificate Private Key**

# Notes: Cryptographic Coprocessor



The next page of notes describes the hardware capabilities.

New for V5R1 is the capability to optionally configure SSL to use the cryptographic coprocessor and, or place the Digital Certificate key into the cryptographic coprocessor.

Additionally the number of 4801/4802 cards attached to a single system has increased from 3 up to 8.

# Notes: Cryptographic Coprocessor-2



The PCI Cryptographic Coprocessor ( feature numbers #4801 and #4802 with V4R5) is compatible with IBM's Common Cryptographic Architecture (CCA). OS/400 Option 35 CCA Cryptographic Service Provider is required along with one of the AS/400 Cryptographic Access Provider licensed program products (LPP) -- 5769-AC1, 5769AC2, 5769-AC3:

Both Option 35 and the LPP are no-charge.

The #4801/#4802 obsolete the #4800 PCI Cryptographic Coprocessor made available in August 1999. If you have a #4800 installed on a 6xx, Sxx, or 7xx and migrate to an 8xx your #4800 must be replaced with a #4802. The #4801/#4802 are faster than the #4800 and have improved secure algorithm support.

Application services provided by the Coprocessor include:

- Data encryption using Tripe-DES (Data Encryption Standard)
- Digital signature generation/verification using RSA public-key
- cryptography
- Data integrity checking using MD5 and SHA-1 secure hash algorithms
- Financial PIN support for ATM (Automatic Teller Machine) networks
- Basic SET (Secure Electronic Transaction) block operations
- Secure storage of keys in a Federal Information Processing Standard
- (FIPS) 140-1 Level 3 tamper resistant module

#4801 can be installed in the 820, 830, and 840 system units, or attached #5074, #5075, or #5079 expansion towers. It can also be installed in the 270.

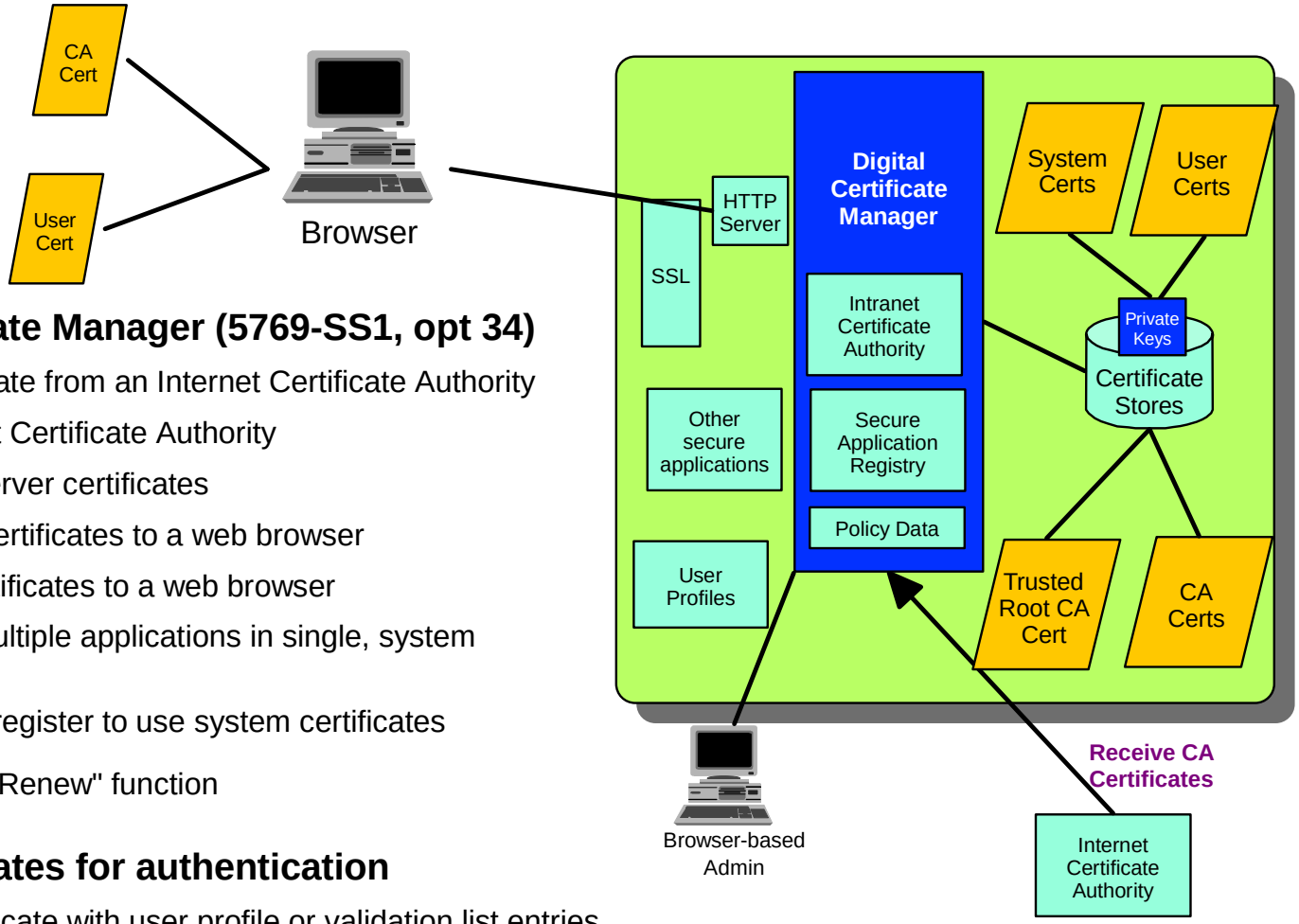
#4802 can only be installed on the 8XX models via one of the migration towers.

For more information, visit:

- .http://www.ibm.com/security/cryptocards

# Digital Certificate Manager






## Digital Certificate Manager (5769-SS1, opt 34)

- Receive a certificate from an Internet Certificate Authority
- Set up an intranet Certificate Authority
- Sign client and server certificates
- Distribute client certificates to a web browser
- Distribute CA certificates to a web browser
- Certificates for multiple applications in single, system certificate store
- Applications can register to use system certificates
- Client certificate "Renew" function

## Accept certificates for authentication

- Associate a certificate with user profile or validation list entries
- Can be exploited by SSL enabled applications: HTTP, LDAP, Management Central, Client Access Express, Telnet, Java applications

# Notes: Digital Certificate Manager



Digital Certificates are the key to the future of secure Internet computing. Certificates are required for servers, clients and even individuals. The AS/400 Digital Certificate Manager (DCM) makes distributing and managing these certificates in an intranet environment easy. DCM can be used to set up a limited Certificate Authority that can be used to sign client and server certificate requests and allows client certificates to be distributed to a user's browser. These certificates can then be used for client authentication.

In V4R4, DCM was enhanced to provide a system-wide certificate store that can be used to store certificates for various server applications. Server applications can then register with DCM for certificate management services. Once registered, DCM provides a graphical interface to associate certificates from the certificate store with registered applications. This level of integration between SSL, certificates and the applications that use them is unprecedented in the industry.

Starting with V4R4 AS/400e uses a single certificate store instead of multiple key ring files. Existing key ring files from V4R3 may be migrated to a key database file. Additionally with V4R4, two new storage mechanisms were provided - User key store and System key store.

Interface to the DCM is via a web browser connected to the OS/400-provided ADMIN HTTP server instance. DCM support is the no charge option 34 of OS/400 5769-SS1.

**Note**: If you create certificate stores on a V4R5 system and want to ship the associated file to a V4R4 system, you must apply V4R4 PTF SF57928 to the V4R4 system. If you install V4R5 on a system with certificate store files created on a previous release, the certificate store file is automatically converted to the required format. If you are on a V4R4 system with the PTF installed you must open each certificate store certificate to have the conversion automatically performed.

If you do not have the PTF installed on your V4R4 system and transport a certificate store file from V4R5 to your system, you get a "database version is invalid" message when you attempt to use the certificate store file on your V4R4 system.

# Web Security - Kerberos Authentication Service



- Network Authentication Service as PTF in V4R5
  - Provides APIs to verify the identity of a user in a network
  - Directed toward single sign-on for multi-tier applications using industry available interfaces
  - Is an implementation of Kerberos (TM) Version 5, Generic Security Service API, and many of the de facto Kerberos protocol APIs
  - Interoperate with other security features provided on Windows 2000 and other operating systems
  - Available on V4R5 and delivered via PTF:
    - SF63662
    - for more information: www.ibm.com/eserver/iseries
- Kerberos V 5 support (follow-on to V4R5 SF63662) integrated into V5R1 under Directory Services (LDAP V3.2) configuration

Network Authentication Service provides APIs to verify the identity of a user in a network. Application programs can use these APIs to authenticate a user and securely pass on his identity to other services on the network. Once a user is known, separate functions are needed to verify the user's authorization to use the network resources.

Network Authentication Service APIs are an implementation of:

- Kerberos(TM) Version 5 protocol as defined by RFC 1510
- Generic Security Service (GSS) Application Program Interface (API) defined in RFCs1509, 1964, and 2078
- Many of the de facto standard Kerberos protocol APIs prevalent in the industry today

The OS/400 implementation is designed for interoperability with authentication, delegation, and data confidentiality services compliant with these RFCs such as Microsoft's Windows 2000 Security Service Provider Interface (SSPI) APIs.

The component is available V4R5 via PTF SF63662.

For V5R1 Kerberos authentication is integrated with Directory Services (LDAP V3.2) configuration under Operations Navigator. Select Network --> Servers --> TCPIP --> Click Properties of a Directory Server.

To use the new **Kerberos** page to specify settings that enable your LDAP directory server to use Kerberos authentication. Kerberos is a network authentication protocol that uses secret key cryptography to provide strong authentication to client/server applications. To enable Kerberos authentication, you must have one of the Cryptographic Service Provider products (5722AC2 or 5722AC3) installed on your AS/400. You must also have a default Kerberos realm specified in the system's Kerberos configuration file.

# Notes: Web Security - Kerberos Authentication-2



When the OS/400 directory server uses Kerberos authentication, the Kerberos principal name used by the server is in the form *service-name/host-name@realm*, where the service name is LDAP, the host name is the fully qualified TCP/IP name of the system, and the realm is the default realm that is specified in the system's Kerberos configuration. For example, if a system in the *acme.com* TCP/IP domain was named my-as400 and had a default Kerberos realm of ACME.COM, the LDAP server Kerberos principal name would be *LDAP/my-as400.acme.com@ACME.COM.*

Refer to the following Web site for information:

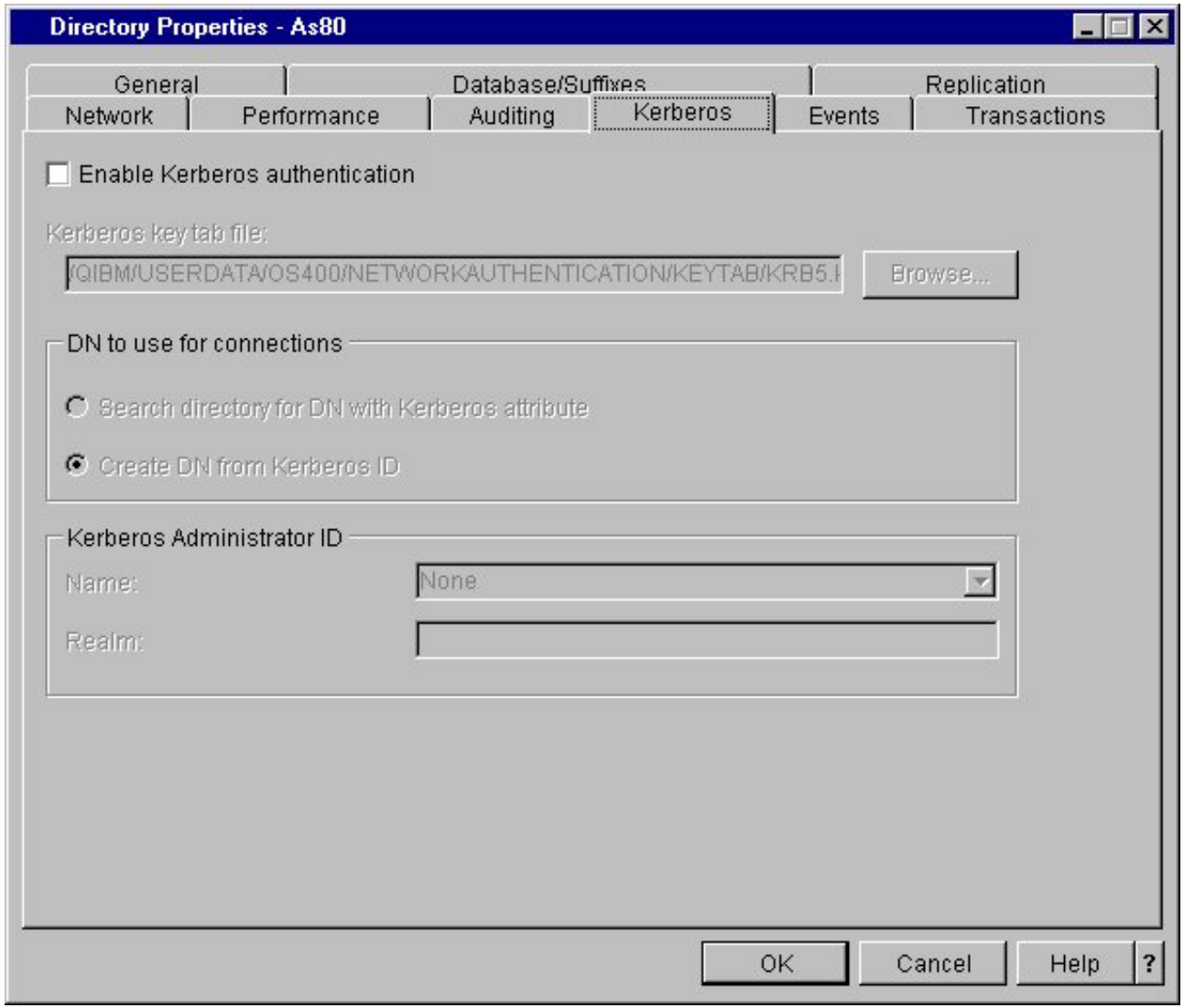
- http://www.ibm.com/eserver/iseries or
- **http://www-1.ibm.com/servers/eserver/iseries/software/v4r5ptfs.htm**

See the next foil for sample Operations Navigator "Kerberos page."

# Directory Services: Sample Kerberos Window







# iSeries Network Security Scenarios

# Notes: iSeries Network Security Scenarios



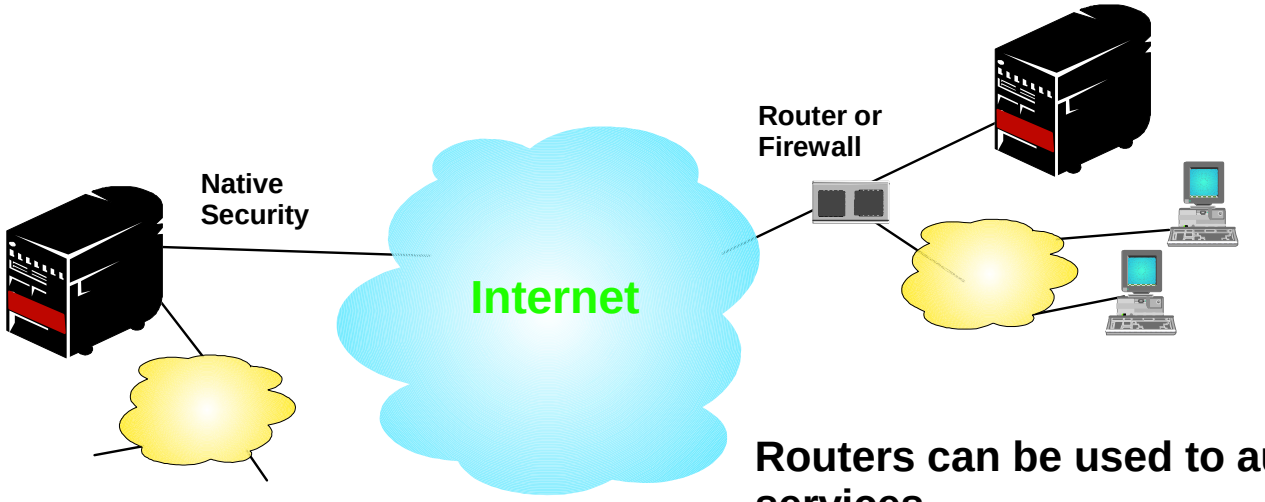
The next set of foils give examples of using AS/400 TCP/IP-based "security tools" to implement security for various network topologies. Each scenario gives a high level picture of the network typology, the security goals, and the "set up requirements" to achieve the goals.

Before the scenarios begin, the first foils highlight the AS/400, network router, and firewall TCP/IP-based security functions that will be used in the scenarios. Some of these functions can be used on either the AS/400, router or firewall. Other functions can be used on only one or two of these of these network components.

At the end of the security section, there is a foil summarizing the status of AS/400 firewall support. If you have Firewall for AS/400, 5769-FW1 installed, you must review this foil.

# iSeries Network Security Solutions






**iSeries natively supports many firewall services**

- IP Packet Filtering
- Network Address Translation
- HTTP Proxy serving
- Socks serving (planned)
- SSL
- Mail Relay
- Domain Name System
- Virtual Private Network
- Logging

**Routers can be used to augment iSeries services**

- IP Packet Filtering
- Network Address Translation
- HTTP Proxy serving

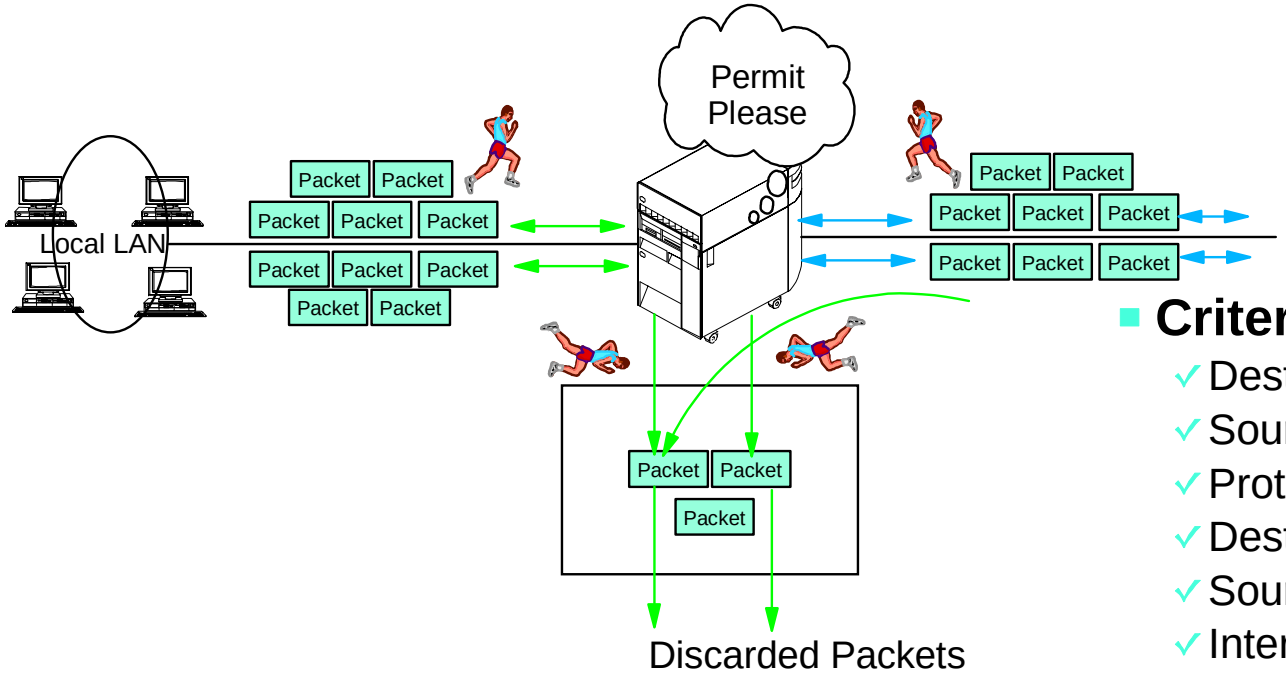
**Firewalls can provide a full complement of services**

- IP Packet Filtering
- Network Address Translation
- HTTP Proxy serving
- SOCKS serving
- SSL
- Mail Relay
- Domain Name Services
- Virtual Private Network
- Logging and monitoring

# OS/400 IP Packet Filtering



- **Selectively blocks IP traffic based on information in the IP packet header**
- **Based on predefined set of filter rules**
- **Prevents undesirable or unneeded traffic**
- **Includes Network Address Translation (NAT)**
- **Graphical User Interface for defining rules**




- **Criteria**
  - ✓ Destination IP address
  - ✓ Source IP address
  - ✓ Protocol (TCP, UDP, ICMP)
  - ✓ Destination port (e.g. 80=HTTP)
  - ✓ Source port
  - ✓ Interface
  - ✓ Direction (inbound, outbound, both)
  - ✓ Forwarded or local
- **Action**
  - ✓ Permit / Deny

# Notes: OS/400 IP Packet Filtering



This foil give some details on IP Packet Filtering as packet filtering is an underlying component of most security implementations.  packet filtering can be specified for any combination of  sender address, receiver address, and application (Telnet, etc.) being communicated with.

The scenarios start on the next foil.

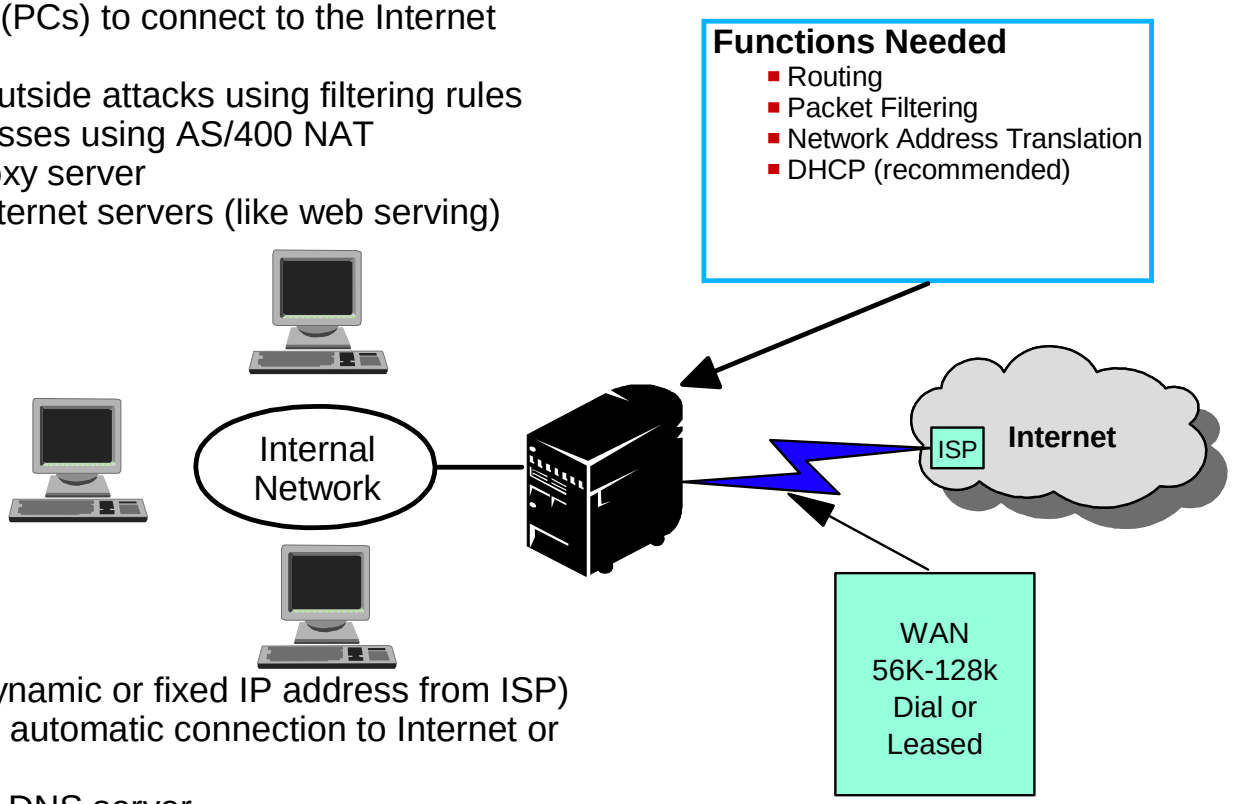
 

# Packet Filtering Gateway using OS/400



## Goals

- Use AS/400 as dial up connection to your ISP
- Allow multiple internal hosts (PCs) to connect to the Internet through the AS/400
- Protect internal hosts from outside attacks using filtering rules
- Hide internal hosts' IP addresses using AS/400 NAT
- Use AS/400 as an HTTP proxy server
- AS/400 does not host any internet servers (like web serving)



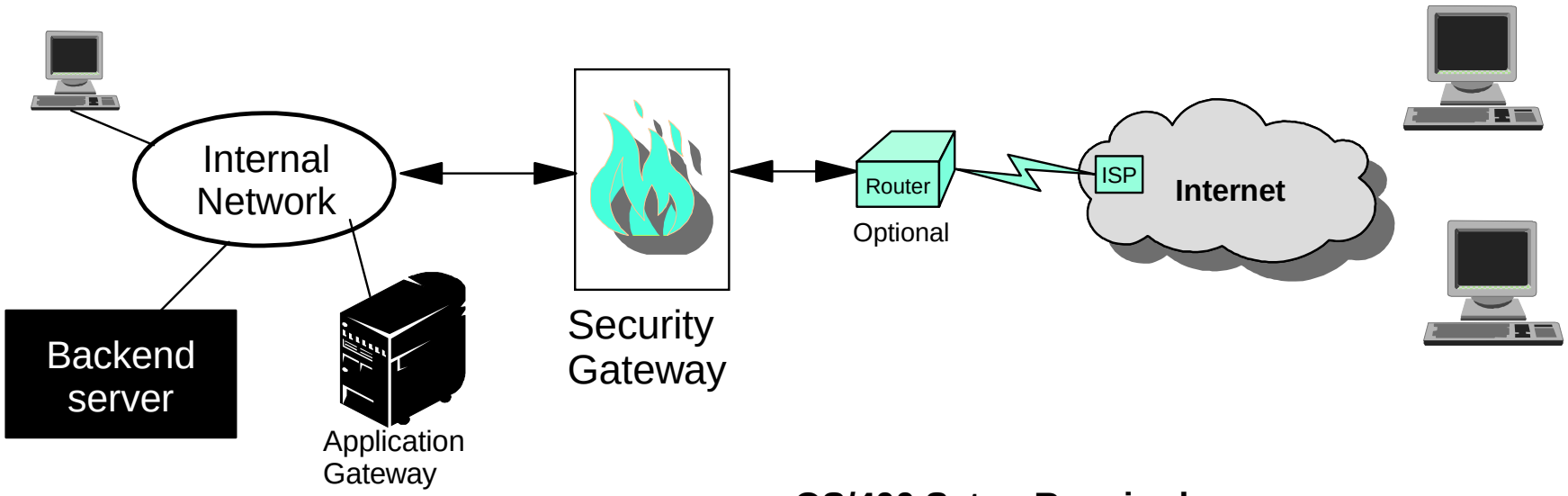

## Setup Required

- Configure PPP connection (dynamic or fixed IP address from ISP)
- Configure Dial-on-demand for automatic connection to Internet or manual startup
- Configure address of external DNS server
- Configure DHCP server on the router
  - Specify starting and ending IP addresses to use
- Configure Packet Filtering Rules
  - Deny all incoming packets that are not response from NAT
- Configure NAT for full masquerading
- Configure internal PCs to accept IP address from DHCP server

# Screened Subnet Architecture



## With OS/400 as an internal Web Application Server




**Goals**

- Use OS/400 as Internet Webserver
- Use OS/400 as internal DHCP server
- Protect OS/400 with Packet Filtering
- Use OS/400 as DNS forwarder
- Use OS/400 as a Proxy server

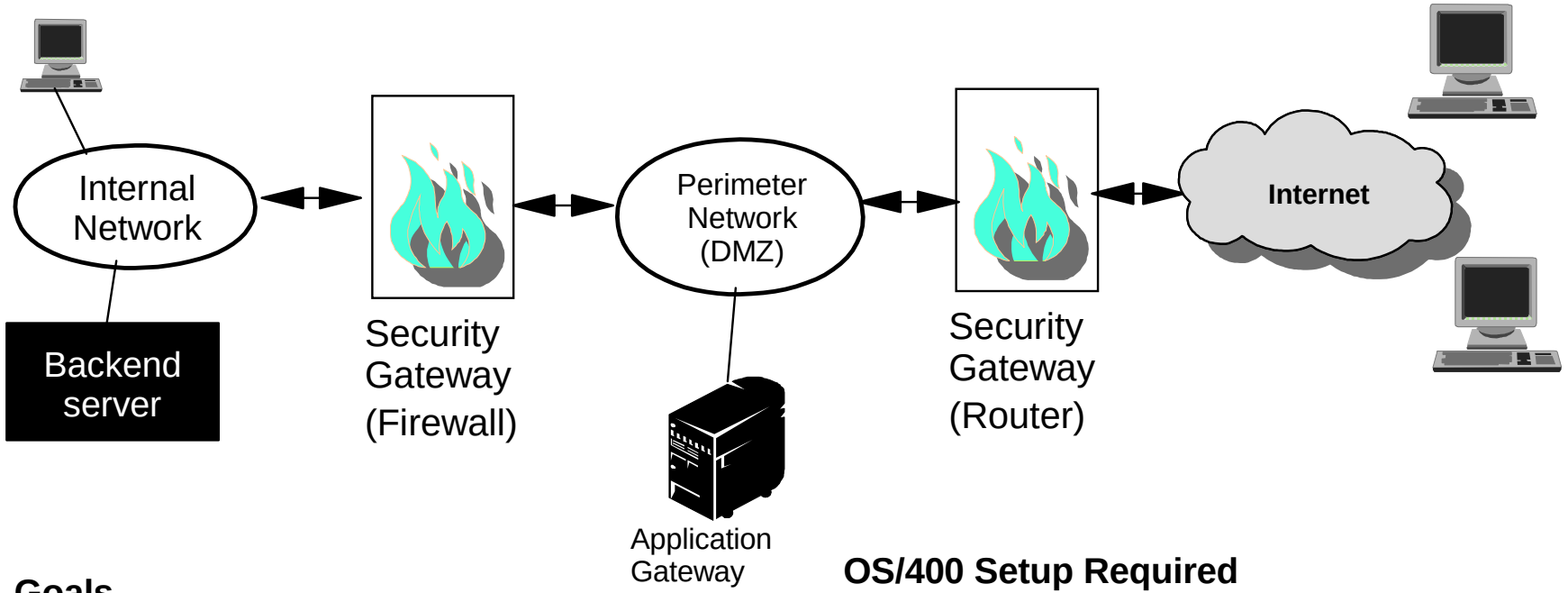
**OS/400 Setup Required**

- Configure TCP/IP connections to intranet, security gateway and router
- Configure packet filtering to only accept internet traffic from firewall
- Configure DHCP server and DNS forwarder
- Configure HTTP server
- Configure Proxy server
- Optionally configure FTP server, WebSphere Application Server, VPN

# Screened Subnet Architecture



## With OS/400 as perimeter Web Application Server




**Goals**

- Use OS/400 as perimeter web application server
  - Web server
  - Proxy server
- Configure OS/400 to protect itself using packet filtering

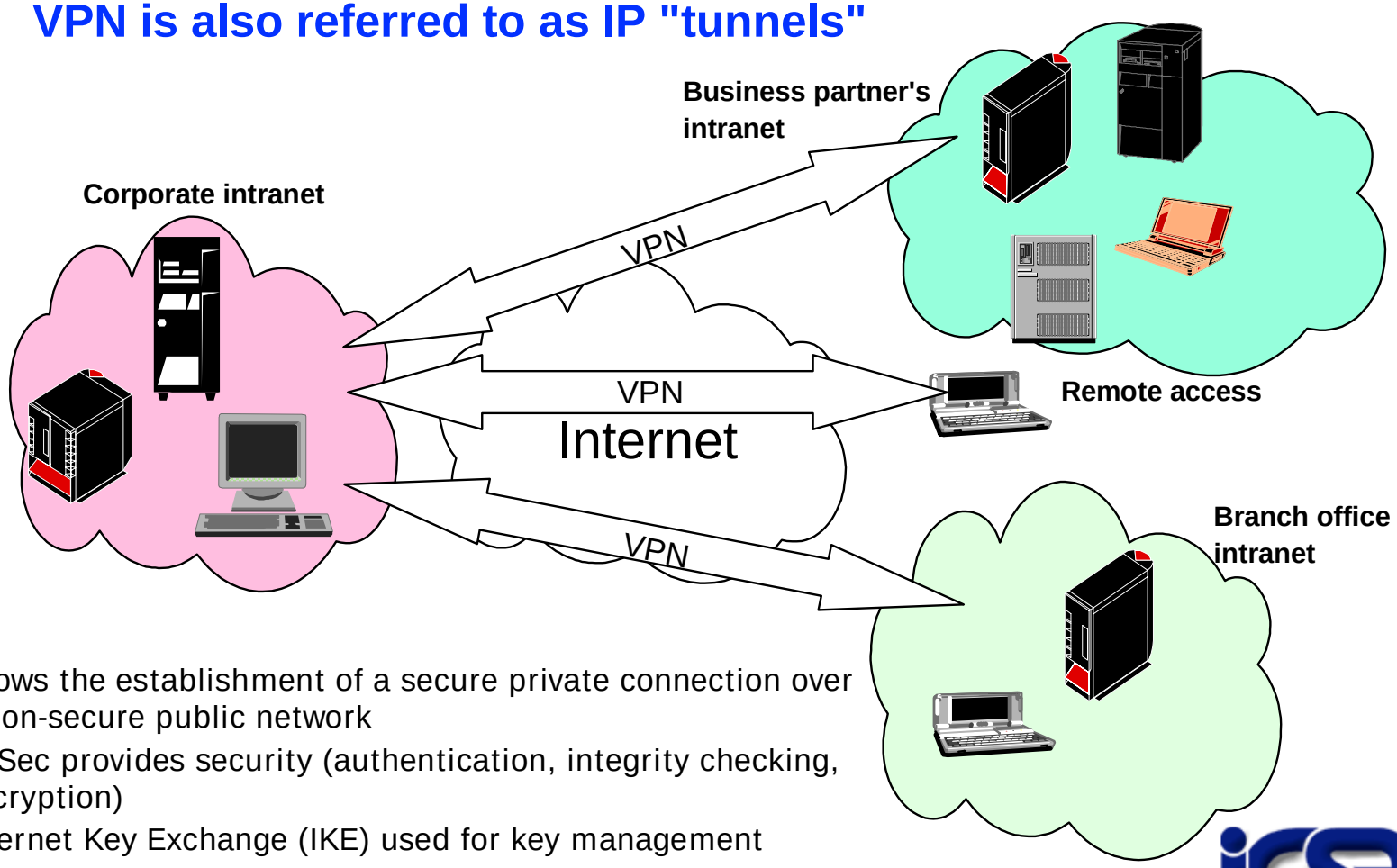
**OS/400 Setup Required**

- Configure connections to internal and external security gateways
- Set up packet filtering rules to only accept internet requests from external gateway
- Set up Webserver and Web Application Server
- Set up HTTP Proxy server
- Optionally set up FTP server

# OS/400 Virtual Private Network



## VPN is also referred to as IP "tunnels"




- Allows the establishment of a secure private connection over a non-secure public network
- IP Sec provides security (authentication, integrity checking, encryption)
- Internet Key Exchange (IKE) used for key management
- Layer 2 Tunneling Protocol (L2TP) used to extend PPP connections to destination network
- Distant LANs can be connected together over the Internet, which can provide substantial savings
- No modifications are required to applications

* ICSA Certified IPSec

# Notes: VPN



VPN is another highly desirable function because it enables secure exchange of data over a public network, thus minimizing communications costs. However, configuring VPN on any server and client typically requires reliance on an expert - someone who has done VPN before and lived to tell about it!

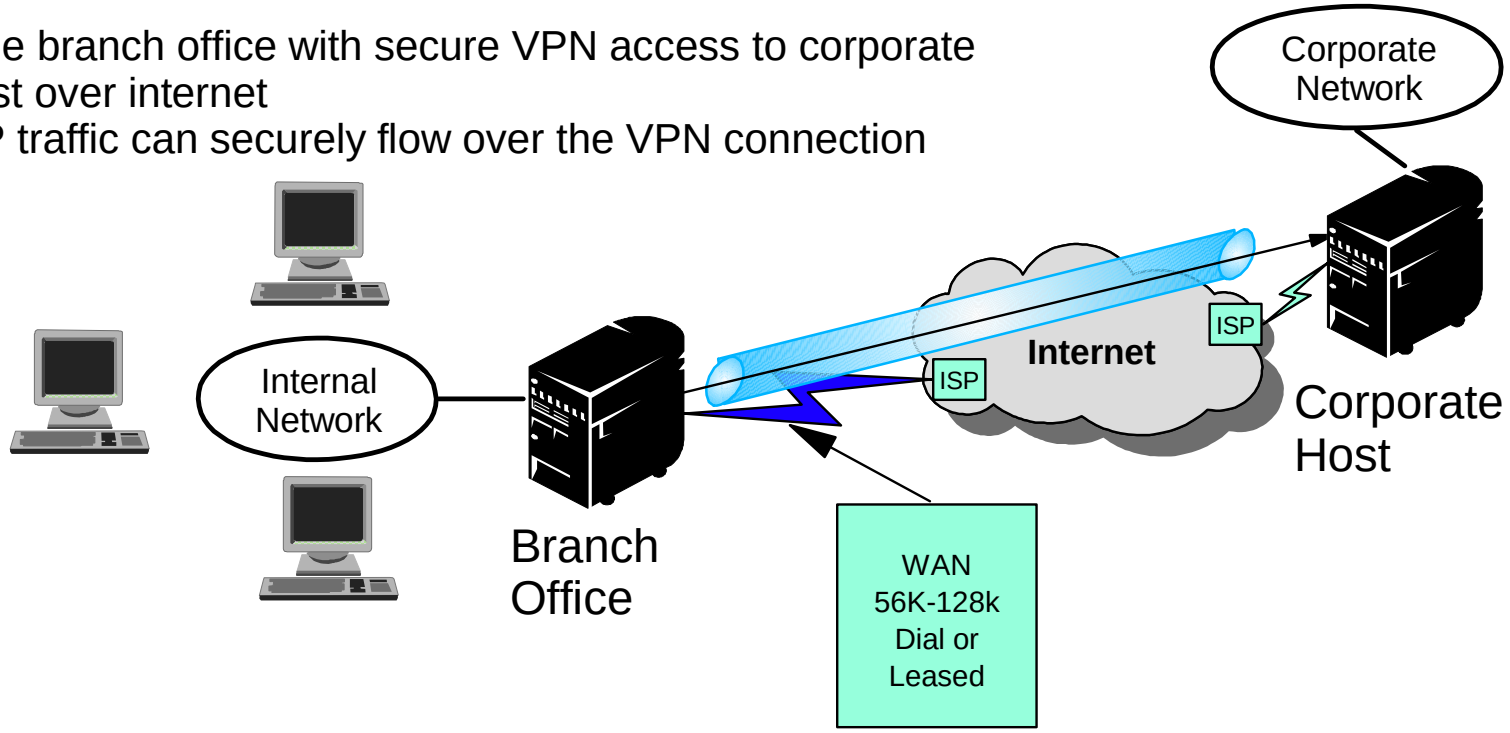
 

# Packet Filtering Gateway with VPN branch office



## Goals

- Provide branch office with secure VPN access to corporate host over internet
- Any IP traffic can securely flow over the VPN connection

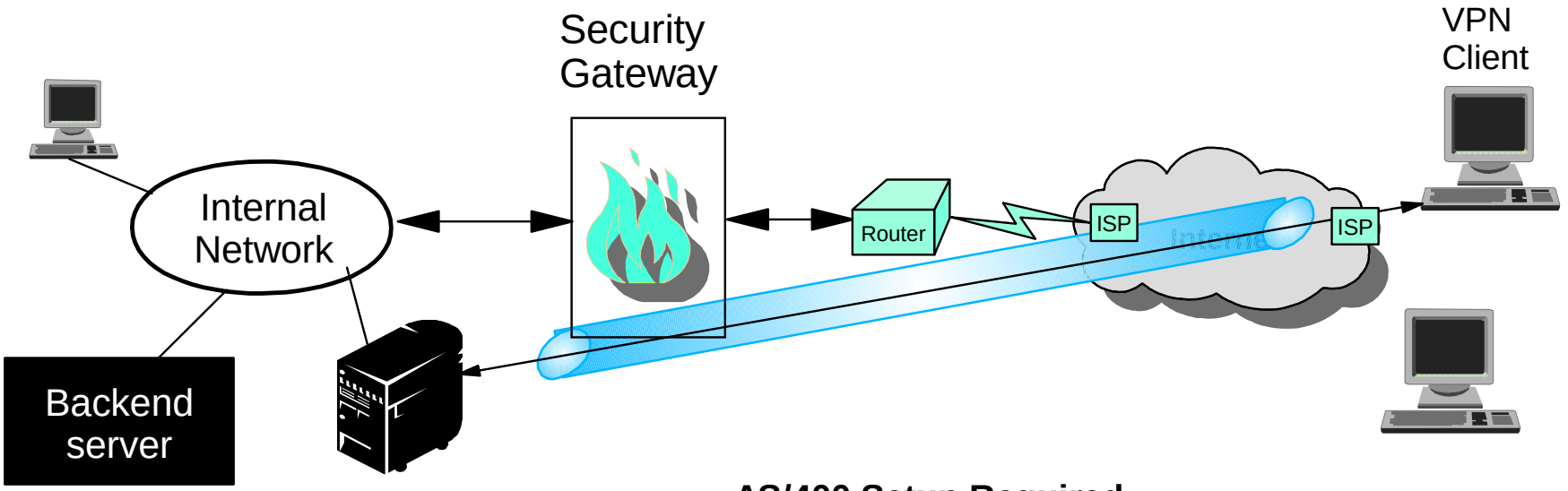



## Setup Required

- Use the Virtual Private Networking New Connection Wizard to configure:
  - Key policy (Authentication and encryption algorithms to use for key exchange (IKE))
  - Data policy (Authentication and encryption algorithms to use for data exchange (IPSec))
- Use the VPN Configuration GUI to customize any values set by the Connection Wizard
- Use the IP Packet Security GUI to configure corresponding IP filter rules (IKE PERMIT, IPSEC)

# Remote client VPN access to OS/400 internal Web Server






**Goals**

- Allow remote users (from home or while traveling) to access the internal web server through a VPN connection
- Client's IP address is dynamically assigned by ISP
- Ensure connection provides authentication and encryption
- Allow remote client to have same privileges as internally attached clients

**AS/400 Setup Required**

- Install appropriate VPN software on remote client (e.g. WinVPN)
- Use the AS/400 VPN New Connection Wizard to configure:
  - Key policy
  - Data policy
- Use the VPN Configuration Gateway to Dynamic IP Users Wizard to list authorized users' fully qualified domain names
- Use the IP Packet Security GUI to configure corresponding IP filter rules (IKE PERMIT, IPSEC)

# AS/400 Firewall for AS/400



IBM announced on 2/15/00 that Firewall for AS/400 (5769-FW1) will be withdrawn from marketing in December 2000. Software service ends 5/31/2001.

V4R5 is the last OS/400 release that will support 5769-FW1 and that support has restrictions:

- 5769-FW1 support is withdrawn for all releases as of May 31, 2001
- 5769-FW1 requires an Integrated Netfinity® Server or older Integrated PC Server that supports running IBM OS/2. The following INS/IPCS features support OS/2 at 333 MHz. The 200 MHz servers not listed below continue to support OS/2 (and thus 5769-FW1) but they are no longer marketed.
  - Feature #2865 for system model 720
  - Feature #2866 for system models 170, 250
  - Feature #2868 for system model 150
  - Feature #6618 for system models 730, 740
- Integrated xSeries (Netfinity®) Servers FC 2790 (8xx models) and FC 2890 (270) do not support OS/2. To run 5769-FW1 on 8xx servers requires #2865 or #6618 be installed in a migration tower.

# AS/400 Firewall for AS/400-2



For planning information for migrating from IBM Firewall for OS/400:

- http://www.as400.ibm.com/firewall
- redbook *All You Need to Know When Migrating from IBM AS/400 Firewall for AS/400*, SG24-6152
- redbook *AS/400 Network Security Scenarios: A Practical Approach*, SG24-5954

# V4R5 e-business Software Packaging



Add-on Products

LPP 5769-FW1
IBM Firewall for AS/400%
- Send Mail Proxy

% Supported until **May 31, 2000,** on OS/2 INS only

LPP 5722-DG1
Lotus Domino for AS/400
- Workflow
- HTTP serving with Domino Applications

LPP 5769/5722-B2B
IBM Connect for iSeries (2/01)
-Small to Medium B2B

LPO 5733-WA2/WA3
IBM WebSphere Application Server Advanced Edition V3.0, 3.02, 3.5
- Servlet Engine
- Java Server Pages
- Enterprise JavaServer

o LPO 5798-NC2
IBM Net.Commerce for AS/400 - V3

o 5798-WC4
WebSphere Commerce Suite Pro Edition 5.1 (includes IBM WebSphere Payment Manager for AS/400 V2.2)

o LPO 5733-PY2
IBM Payment Manager for AS/400 V2.1
- SET, CyberCash payment serve for merchant use

o WebSphere Host Publisher V2.2 for AS/400 (5648-D31)

P/N 0783859, ...
o IBM MQSeries for AS/400, V5.1, V5.2

o IBM MQSeries Integrator for AS/400, V5.1.1

LPP 5722-AC2,-AC3) (no charge)
Advanced Crypto 1,2,3
- 56(2),128(3) bit encryption
- MD5, SHA hash
- language neutral
-required for SSL

Base

**OS/400 (SS1)**
- TCP/IP
- NFS
- BOOTP
- TFTP
- DHCP
- Native VPN

**SS1 install options**
**option 31**
- DNS
**option 32**
- Directory Services (LDAP V3.2)
**option 34**
- Digital Certificate Manager (required for SSL)
**option 33 (additional cost)**
- Port App Sol'ny (required for DDNS)

**SS1 install options**
**option 35**
- Hardware Crypto card

**No charge LPP TC1**
- TCP/IP utilities

No charge LPP DG1
IBM HTTP Server for AS/400
- HTTP server
- Admin Server
- Net.Data
- Caching Proxy
- Search Engine replaces Net.Question
- Apache option, V4R5, V5R1

No charge LPP AS1
IBM WebSphere Application Server Standard Edition 2.0x, 3.0x, 3.5
- Servlet Engine
- Java Server Pages

No charge LPP NC5
NetQuestion
- Single Byte Search engine
No formal support in V4R5

# Additional Vendor Value-based e-business Applications on AS/400

# Business Partner, ISV Software Disclaimer



The material included in this presentation regarding third parties is based on information obtained from such parties. There may also be other third party offerings unintentionally omitted in this presentation. This presentation does not constitute an expressed or implied recommendation or endorsement by IBM of any third-party product or service over another.

The intention here is to demonstrate some of the successful e-business application environments running under OS/400.

# iSeries Solution Team B2B Team Members




www.iseries.ibm.com/ btob/partner/

www.iseries.ibm.com/ developer/solution team/

## ASP

- Advanced BusinessLink
- Butler & Curless
- EXTOL
- Harbinger
- Kingland Systems Corp
- NSC, Inc.
- PBM Ltd
- Rippe & Kingston

## SCM

- Computer Associates Int
- Manhattan Associates
- Renaissance
- Networks Unlimited AG
- Synquest

## e-commerce

- Advanced BusinessLink
- BinaryTree.com
- Butler & Curless
- CommerceQuest, Inc.
- Computer Associates Int
- eOne Group
- EXTOL
- Gimlet Management Cons
- Halcyon
- Harbinger
- IBS AB
- I/Net
- Ironside Technology
- Jacada, Inc.
- LDF
- Kingland Systems Corp
- LANSA, Inc.
- Magic Software
- Michaels, Ross & Cole, Ltd
- Nexgen
- REAL Information Systems
- REAL Solutions Group
- ROI
- SEAGULL
- Strategic Business Systems
- Sundata Pty
- Syntax.net
- VeriSign Payment Services

## CRM

- Analytical Solutions, Inc.
- IBS AB
- Bytware, Inc
- Clear Technologies
- Infinium
- InfoManager
- Para Research, Inc.
- Relavis
- Teleflex
- The Edwards Group
- Vormittag Associates
- xChange

## BI

- Coglin Mill Pty Ltd
- D2k, Inc.
- DataMirror
- Dimensional Insight
- EXCEL DATA A/S
- IBM
- InfoManager
- Information Builders
- ShowCase Corp
- ShowBusiness
- Silvon Software, Inc.
- Vanguard
- Vision Solutions

# Notes: iSeries Solution Team B2B Team Members

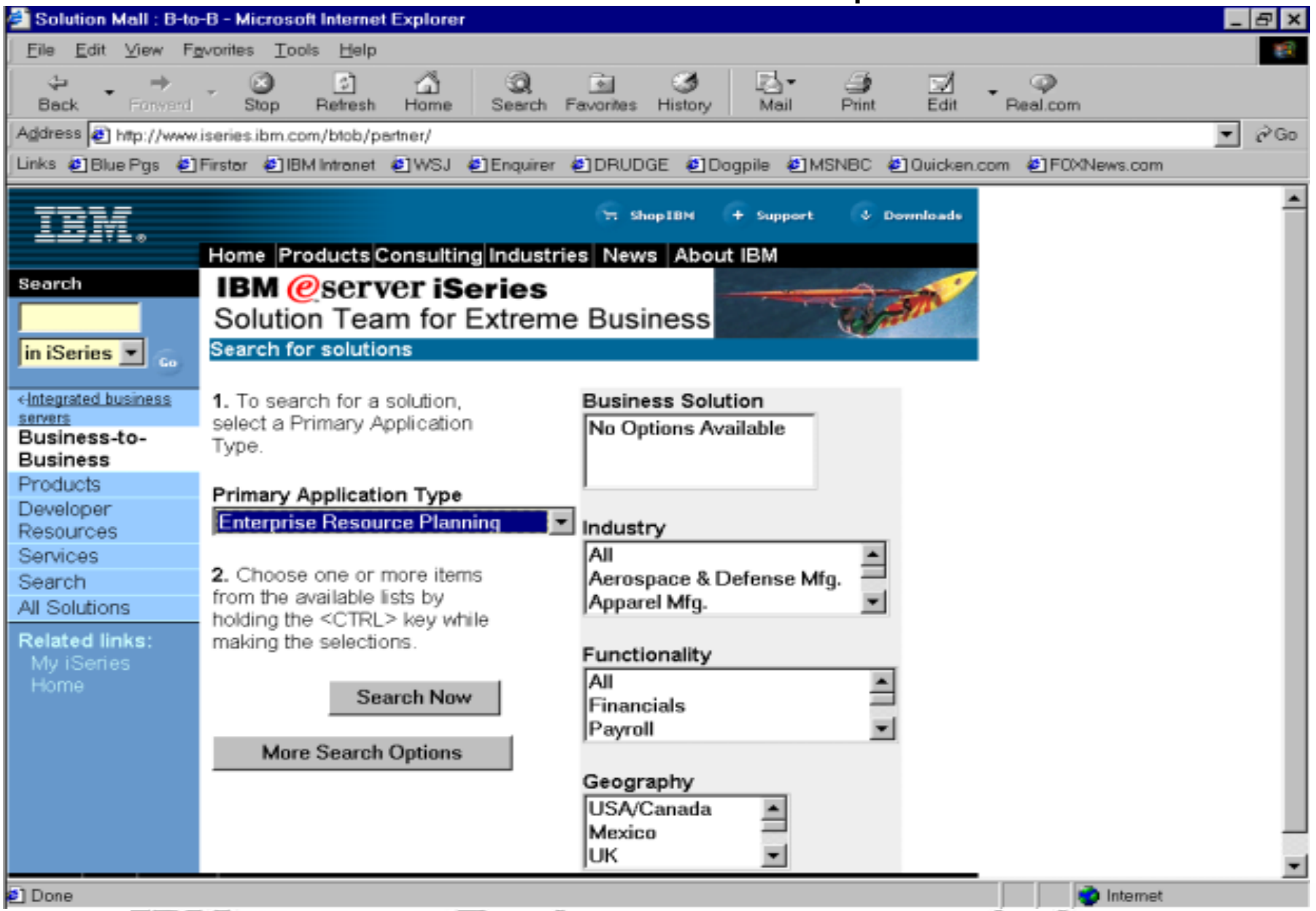


In 2000, we formed a program where ISVs and Tool providers could nominate their companies to be a part of the B2B Solution Team. The URLs for this program are listed on the chart and the companies who qualified in each category are also listed. This chart should be used as excellent proof that existing applications, enablers and solutions exist for iSeries in the area of B2B computing. Each of these companies had to have both a product as well as a successful customer reference to be considered for this program.

# iSeries Solution Team - Solution Mall



**www.ibm.com/eserver/iseries/btob/partner/**





# Notes: iSeries Solution Team - Solution Mall



Our Solution Mall lists all of the companies who qualified for the Solution Team. The URL listed at the top of the chart will get you to the mall. Once on the mall, you select the type of solution you're interested in, the appropriate industry and functionality needed and the geography you're in. The results of this inquiry will deliver a customized list of products and vendors who should be able to help your customer solve their e-business need.

# iSeries Custom Technology Center



*Custom Development Services!*

- Native e-business Solutions using WebSphere, Servlets, JSPs, CGIs, HTML
- Modernizing Legacy Applications to Take Advantage of e-business Technologies (B-to-B)
- Native Java Programming
- Native Domino Solutions
- Native MQSeries
- Application Port Assistance
- Client/Server Development including Network Station
- Database Applications
- TCP/IP and Sockets Application Development
- Advanced Technology Implementation
- RPG, COBOL, ILE C Programming

*Contact:* *Mark Even 507-253-1313 even@us.ibm.com*
*Pete Cornell 507-253-4955 pcornell@us.ibm.com*
*Ray Harney 507-253-0920 harney@us.ibm.com*

*(EMEA) Eric Aquarrone CTC_EMEA1@fr.ibm.com*

# Notes: iSeries Custom Technology Center



The Custom Technology Center in Rochester can be use for "fee-based" iSeries services. There is a tremendous amount of skill in the center and many customers have used this resource to pilot their e-business application. The new news is that this center has now expanded to EMEA and customers can contact Eric Aquarrone at the eMail listed to get access to this new resource in EMEA.

# iSeries e-business & B-to-B Strengths



## Integrated e-business Infrastructure

- Optimized Java Environment
  - Reliable, robust & scalable
  - Portable applications
- Security
- Database
- Ease of Management

## Scalability (24-way)

## Industry Leader in Performance

- TPC-C, VolanoMark, SPECjbb2000, NotesBench

## Application Portfolio

- Integration with LOB Applications

## Reliability and Availability

- Less than 3 hours of unscheduled downtime per year

## WebSphere Brand Support

- WebSphere Application Server
- WebSphere Commerce Suite
- WebSphere Payment Manager
- WebSphere Development Studio
- WebSphere Host Integration Suite
- WebSphere Personalization

## iSeries Solutions, Offerings & Services for B-to-B

- Products
- Services
- Education
- Technical Support
- Solutions & Enablers

## B-to-B Solutions & Enablers

- Over 100 available
- IBM Connect for iSeries
- 3rd Party Options

# Notes: iSeries e-business & B-to-B Strengths



Summary of iSeries e-business & B2B strengths.

# Appendix

# References and Resources for WebSphere & Java



## References

- http://www.as400.ibm.com/developer/java/solutions/jjem.htm
- HMV Media
- Oriental Trading
- Welch Foods
- RealXpress
- Famous Footwear

## Performance Estimator

- http://as400service.ibm.com/estimator/

## Web Sites

- AS/400 WebSphere site
  - http://www.as400.ibm.com/websphere
- PartnerWorld for Developers, AS/400
  - http://www.as400.ibm.com/developer/websphere/
- IBM Learning Services
  - http://www-3.ibm.com/services/learning/us/
- IBM WebSphere site
  - http://www-4.ibm.com/software/webservers/
- ITSO Redbooks
  - http://www.redbooks.ibm.com/
- Rochester Custom Technology Center
  - http://www.as400.ibm.com/Service/welcome_3.htm
- AS/400 Technical Support
  - http://as400service.ibm.com/
  - http://www.as400.ibm.com/tstudio/

## Redbooks & Red Pieces

- Building AS/400 Applications for WebSphere Advanced (SG24-5691-00)
- Introduction to Enterprise JavaBeans for AS/400 (SG24-5192-00)
- Web enabling AS/400 Applications with WebSphere Studio (SG24-5634-00)
- Building AS/400 Applications with WebSphere Standard Edition 2.0 (SG24-5635-00)
- Building AS/400 C/S Apps with Java (SG24-2152-02)
- Building AS/400 Internet-based applications with Java (SG24-5337-00)

# iSeries e-business & B-to-B Resources



## Marketing Deliverables:

- Mach 1 e-business Sales CD
  - Presentations, white papers, contacts
  - Top B-to-B Q's & A's
- iSeries B-to-B Presentations
  - Introduction to B-to-B & Connect for iSeries
  - V5R1 e-business Overview
    - Introduction to Java, XML, WebSphere and WebSphere Commerce Suite
- iSeries B-to-B Sales Guide
  - iSeries B-to-B web site & document
  - iSeries Roadmap for B-to-B included
- Printed brochure (.pdf)
  - IBM & 3rd Party Solutions & Enablers
- iSeries Connect spec sheet
- Extreme Team Solutions Mall
- B-to-B References

## Web Resources:

- www.ibm.com/eserver/iseries/
  - btob - external deliverables & product information
  - services - consulting services information, availability, provider network
  - education - IBM courses relevant to e-commerce and b-to-b
  - developer/btob - ISV offerings for b-to-b within the Global Solutions Directory
  - developer/tools - ISV tools for b-to-b
- www.ibm.com/server/
  - sales - b-to-b and related presentations & internal deliverables
  - support - technical support

***New iSeries B-to-B Consultant White Paper Available From Summit Strategies***

# References and Resources for e-commerce



## References

- www.as400.ibm.com/casestudies/EBIZ
- Experience Art (Net.Commerce)
- Wolfermans (Net.Commerce)
- LogoAthletic (Net.Commerce)
- ICON Health & Fitness (Net.Commerce)
- Vans Shoes (Net.Commerce & Payment Server)
- Duck Head Apparel (Net.Commerce)
- Tucker Rocky (Net.Commerce)
- Ontario University (Net.Commerce)
- Resolution (Net.Commerce)
- Electro Land (Net.Commerce)
- Plus many more references

## Web Sites

- AS/400 e-business Site
  - www.as400.ibm.com/ebusiness/
- AS/400 e-commerce Site
  - www.as400.ibm.com/ebusiness/ecommerce.htm
- IBM WebSphere Commerce Suite Site
  - www-4.ibm.com/software/webservers/commerce/
- IBM Payment Manager Site
  - www-4.ibm.com/software/webservers/paymgr/
- AS/400 Technical Support
  - http://as400service.ibm.com/
  - http://www.as400.ibm.com/tstudio/

## Redbooks and RedPieces

- AS/400 e-commerce: Net.Commerce , SG24-2129-00
- Net.Commerce V3.2 for AS/400: A Case Study for Doing Business in the New Millennium, SG24-5198-00

## Additional Electronic Payment Options

- ROI, Signio, CISoft, I/NET

## Additional Electronic Commerce Options

- Ironside, Binary Tree, IP/400, Magic Software, LANSA/Aspect, I/NET, Kingland Systems, & more

## Performance Estimator

- http://as400service.ibm.com/estimator/

## ISV e-commerce Solution Web Sites

- www.signio.com
- www.cisoft.com
- www.roiconnect.com
- www.inetmi.com
- www.ironside.com
- www.binarytree.com/ezmerchant
- www.ip400.com
- www.magic-sw.com
- www.lansa.com
- www.kingland.com

# References and Resources for AD Tools



## References

- AD references sorted by application type and platform
  - http://www.ibm.com/software/ad/solutions

## Web Sites

- iSeries Tools Network
  - www.ibm.com/iseries/developer/tools
- IBM AD Web Site
  - http://www.ibm.com/software/ad
- VisualAge RPG and CODE/400
  - http://www.ibm.com/software/ad/varpg
- VisualAge for Java
  - http://www.ibm.com/software/ad/vajava
- WebSphere Studio
  - http://www.ibm.com/software/ad/webservers/studio
- VisualAge Developer Domain
  - http://www.ibm.com/software/vadd

## White Papers Available

- Making Java Smoother and Easier - VisualAge for Java by DH Andrews Group
  - http://www.as400.ibm.com/developer/tools/documents/visualage.pdf
- Java and AS/400 Perfect Together by DH Andrews Group
  - http://www.as400.ibm.com/conslt/perfect.htm
- Application Modernization by DH Andrews Group
  - http://www.as400.ibm.com/developer/tools/documents/final_addir.html
- PartnerWorld for Developers, AS/400 White Paper site
  - http://www.as400.ibm.com/developer/tools/documents/index.html

# References and Resources for WebSphere Host Integration



## References

- CMS Manufacturing
- Renaissance Cruises
- Norton Manufacturing
- Torrington Company

## Redbooks

- IBM Host On-Demand
  - (SG24-2149)
- IBM Web-to-Host Integration Update
  - (SG24-5237)
- IBM Host Publisher
  - (SG24-5385)

## White Papers - Available on Web

- SecureWay Software Host Integration: A Fast, Flexible and Uncompromising Web-to-Host Solution
- IBM SecureWay Host Publisher, Version 2 G325-3937
- IBM SecureWay Host Publisher and IBM WebSphere software
- IBM Host Integration Solution Products: Extending AS/400 Applications for e-business by DH Andrews Group

## Web Sites and Marketing Information

- IBM Host Integration Solution
  - http://www.ibm.com/software/webservers/hostintegration
  - Brochure - G325-3785
- IBM Host Access Client Package V1.0
  - http://www.ibm.com/software/network/hostaccess
  - Brochure - G325-3475
- IBM Personal Communications V5.0
  - http://www.software.ibm.com/network/pcomm
  - Brochure - G325-3475
- IBM WebSphere Host On-Demand V5.0
  - http://www.ibm.com/software/webservers/hostondemand
  - Brochure - G325-3738
- IBM Screen Customizer V2.0
  - http://www.ibm.com/software/network/screencustomizer
  - Brochure - G325-3917
- IBM WebSphere Host Publisher V2.2
  - http://www.ibm.com/software/webservers/hostpublisher
  - Brochure - G325-3987

## Education

- IBM Global Campus - E4480
  - Web-to-Host Integration with Host On-Demand, Screen Customizer, and Host Publisher

# MQSeries References and Resources



## Quick Facts

- 350 of IBM's top 500 customers use MQSeries
- 7,000 customers
- 350 independent software vendors offer MQSeries-based services and products
- 66% of Top 100 North American and European banks use MQSeries
- 70 out of top Fortune 100 companies as customers.
- Leadership share of 1999 Message Oriented Middleware market according to WinterGreen Research.
- Many analysts describe MQSeries has the De-facto messaging standard
- Strong interest from major analysts such as Gartner, IDC, Yankee and Ovum.
- 2,000 people with an MQSeries Certification working from > 650 different companies worldwide.
- Customer experience > 250 million messages a day
- MQSeries support provided for Oracle, Sybase, Infomix, and SAP
- Even Microsoft ships an adapter to interface with MQSeries

## Web Sites

**Business Integration:**

**www.ibm.com/big**

**SmithKline:**

**www.ibm.com/software/ts/mqseries/solutions/smithk/html**

**MQSeries Home Page:**

**www.ibm.com/software/ts/mqseries**

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| AS/400e | DB2 | Domino |
| IBM | OfficeVision | OS/400 |
| Integrated Language Environment | Net.Commerce | Net.Data |
| PowerPC | PowerPC AS | SanFrancisco |
| Host on Demand | Screen Publisher | Host Publisher |
| PCOM | WebSphere Commerce Suite | Payment Manager |
| WebSphere | WebSphere Standard Edition | WebSphere Advanced Edition |
| MQSeries | MQSeries Integrator | Host Integration Series |
| WebSphere Development Tools for AS/400 | VisualAge for Java | VisualAge for RPG |
| CODE/400 | DB2 UDB for AS/400 | HTTP Server for AS/400 |
| iSeries | | |

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