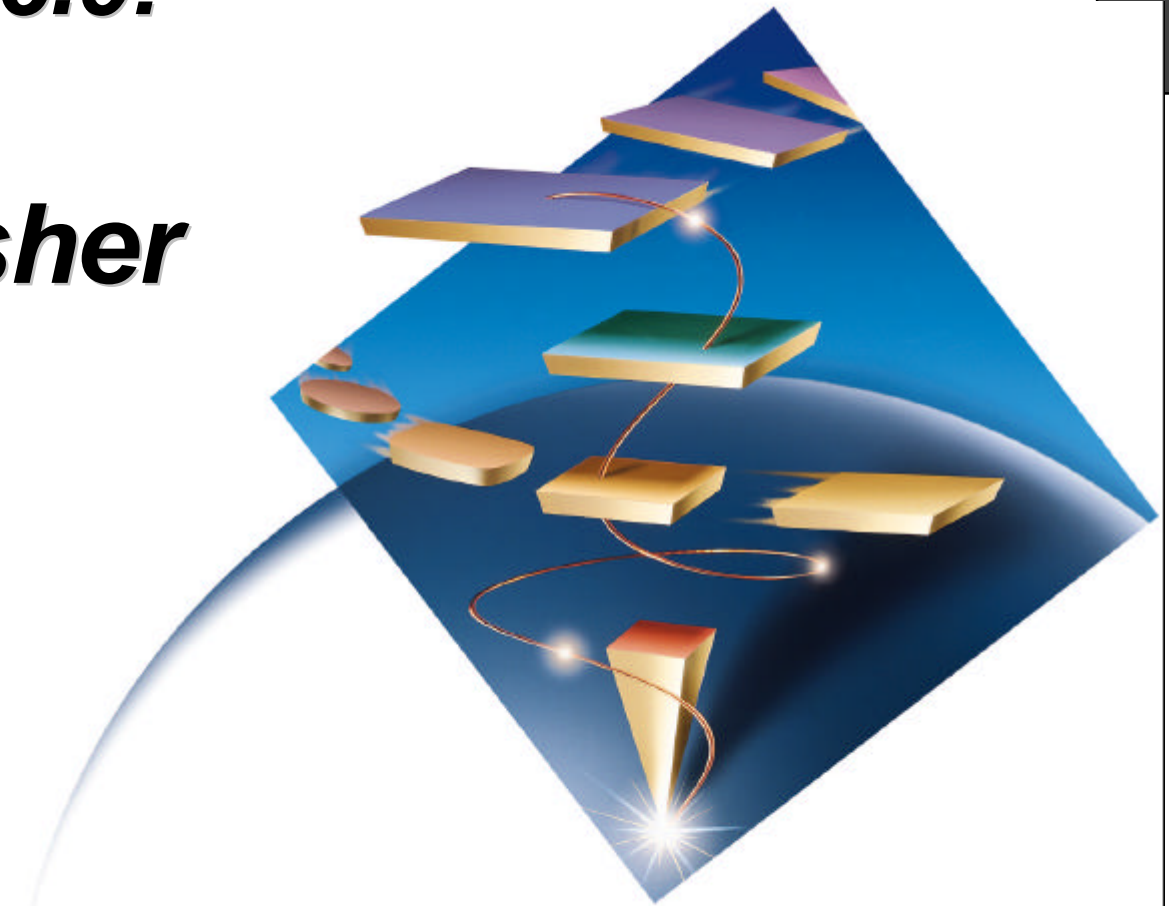


IBM eNetwork Communications Server for Windows NT 6.0:

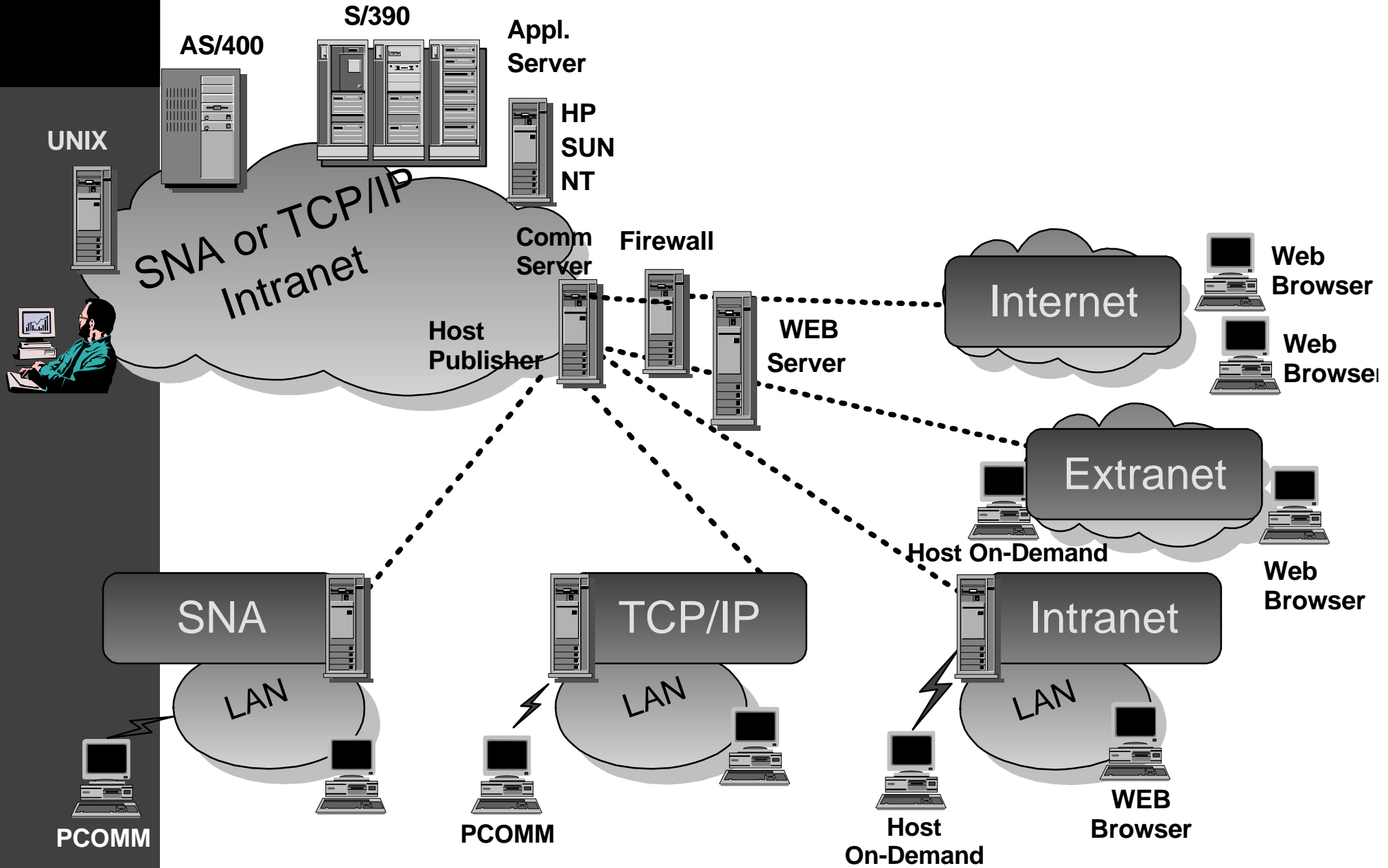
Host Publisher



Agenda

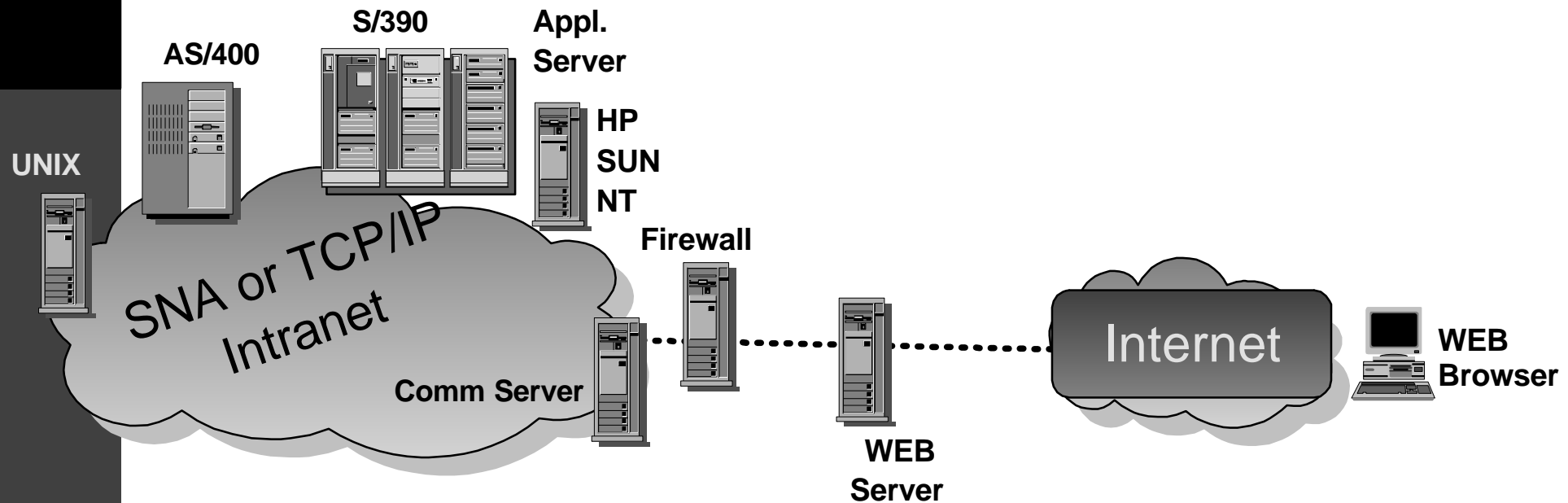
- **Introduction**
- **Host Publisher Components**
- **Back-end Connectivity Examples**
 - ODBC/DB2
 - Java/ActiveX
 - 3270/5250
- **Configuration Decisions**
 - Basic
 - Security
 - Incremental Scalability
 - Fault Tolerance
- **How to Build a Web Page**
- **Positioning, Purchasing, Services**

Host Integration ..A Complete Solution



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Internet Host Integration

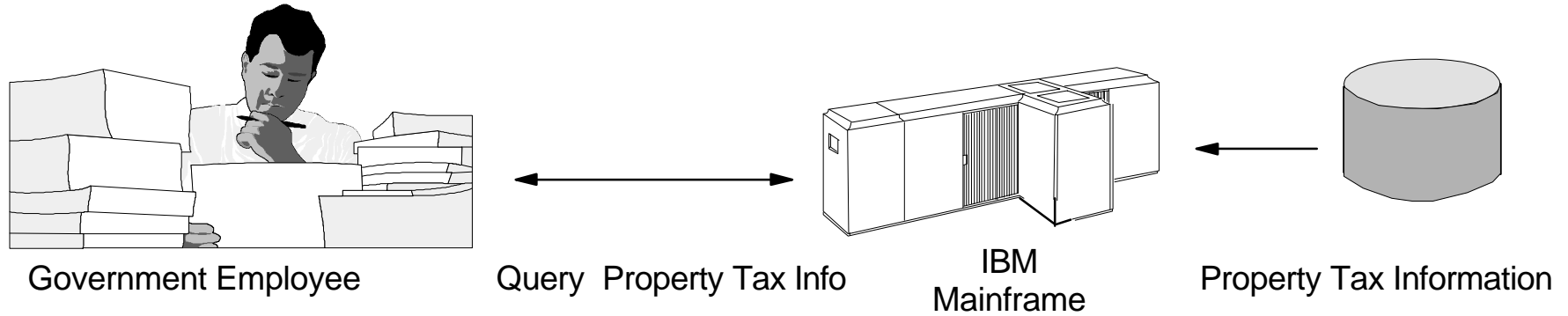


Host Publisher

- ✓ A component of Communications Server for Windows NT V6.0
- ✓ Client support: any Browser
- ✓ Integration of multiple sources of host data presented to web users via a Browser: 3270, 5250, Java, ActiveX, ODBC
- ✓ Extends the reach of mission critical data
- ✓ The ultimate in rejuvenation
- ✓ Bi-directional interface

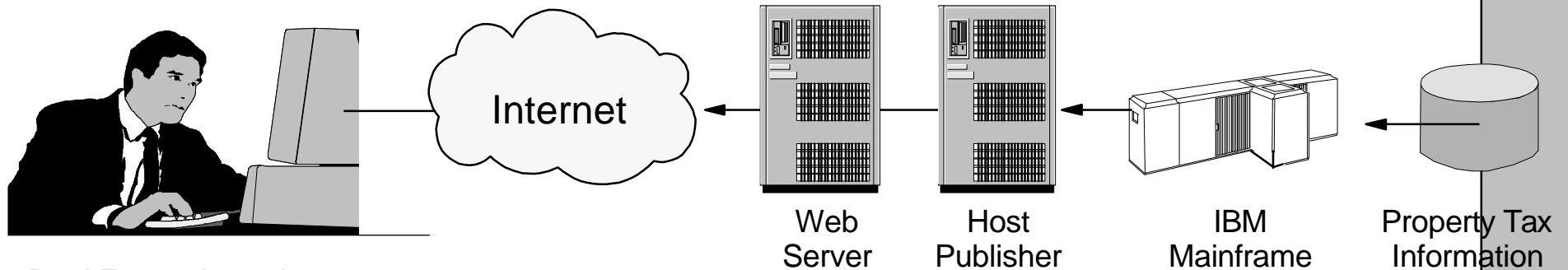
Local Government Example

Current



Reviewing Property Tax Info

Future



Real Estate Agencies
Homeowners

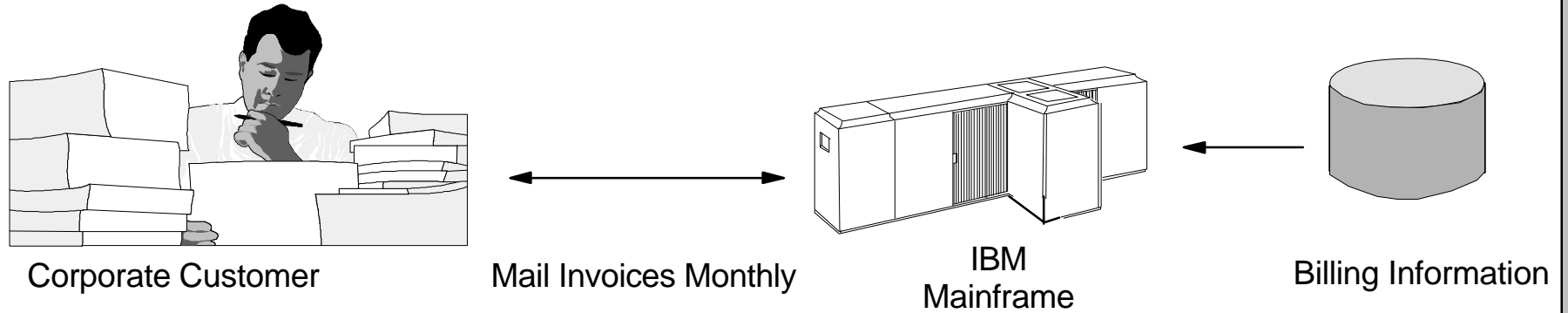
- **Pay delinquent taxes by credit card**
- **Apply for tax refund**

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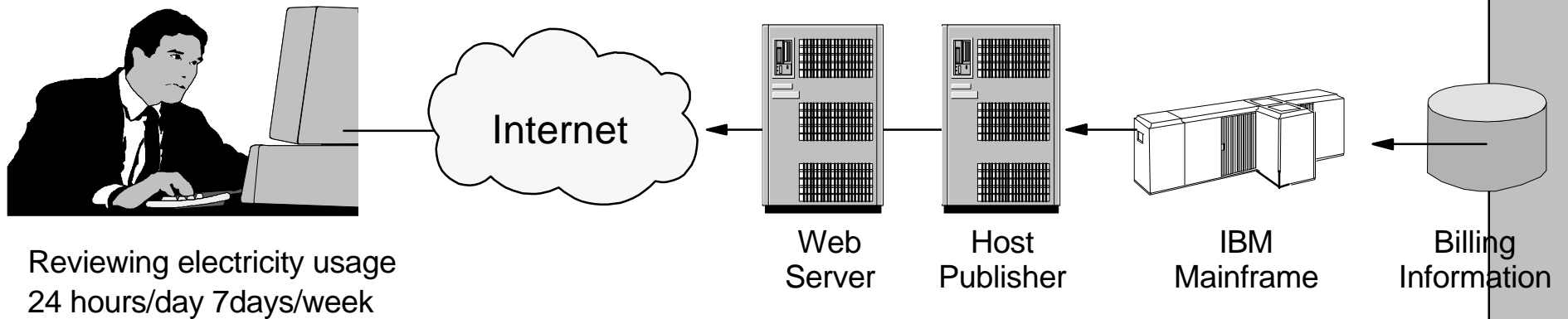
KR090198

Electric Utility Company Example

Current



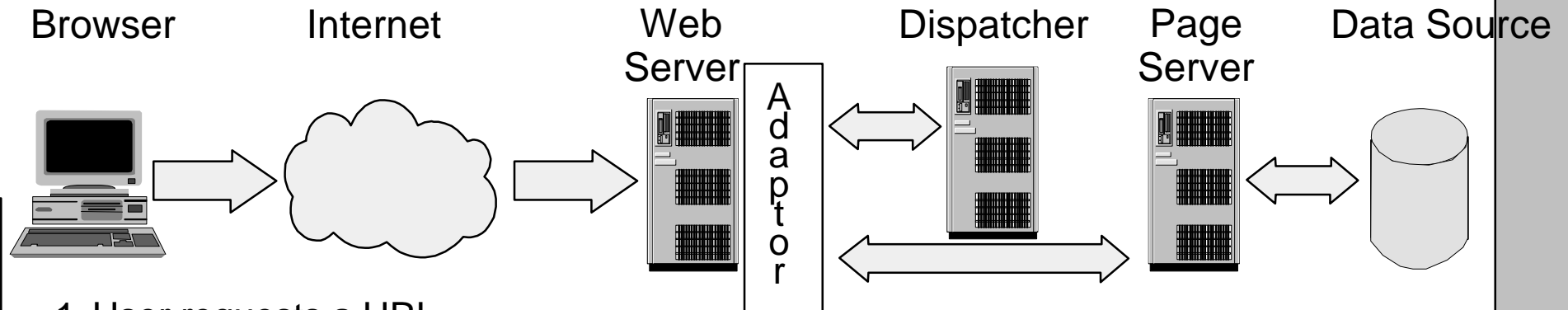
Future



Host Publisher Business Benefits

- **Extend the reach of your business by enabling inter-company projects or contacting new customers on Internet**
- **Establish a competitive advantage by extending sales channels, providing new services and real-time product information**
- **Improve productivity by enhancing aging applications with new front ends or extending real-time access to a mobile workforce**

Flow of an Actual Request



1. User requests a URL -
"http://www.company.com/HostPublisher/Library/Book/companydirectory.dml"
2. Request is routed to the Web Server
3. Adaptor intercepts the request and connects to the Dispatcher to get the location to fulfill the request
4. Once the Adaptor knows a location, it makes the connection to the appropriate PageServer and waits for the request to be fulfilled
5. PageServer invokes the appropriate Library/Book/Page
6. Page is parsed and the dynamic content is executed and placed into the page as HTML
7. Completed page is passed back to the Adaptor and then to the Web Server
8. Web Server hands the finished page to the requesting Browser

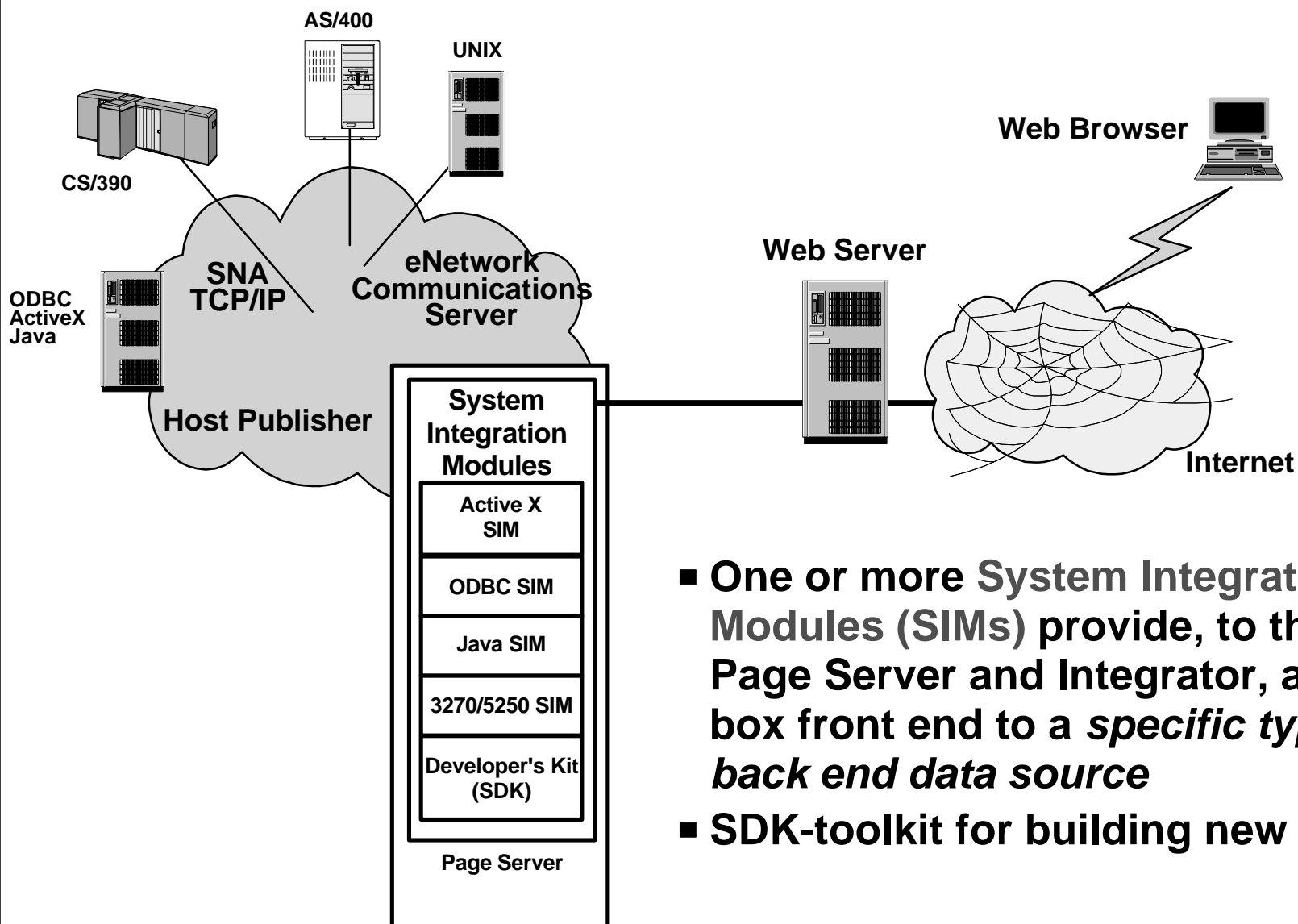
Host Publisher Components

- **Number of software components can be distributed on various machines to provide improved performance and tolerance for failures**
- **Integrator: a tool used to develop web pages with dynamic content**
- **Other components used at runtime to query various sources of back-end data that is used to generate the dynamic page content:**
 - PageServer: supports connections to back-end data sources and serves web page requests directed to it
 - Dispatcher:
 - Directs web page requests from an adaptor to a PageServer that can service that request
 - Provides load balancing and redundancy in multiple PageServer configurations
 - Provides enterprise-level Scalability
 - Adaptor Software
 - Runs as a CGI/NSAPI/ISAPI program on a web server machine
 - Redirects specific web page requests from a web server to a Dispatcher for PageServer processing

Host Publisher Components (con't)

- **SIMs for Various Sources of Backend Data**
 - **Java SIM** - allows methods of Java classes to be invoked
 - **ActiveX SIM** - allows ActiveX controls to be invoked
 - **ODBC SIM** - allows various databases to be accessed via SQL, as long as the database client has an ODBC driver
 - **3270/5250 SIM for Accessing 3270 and 5250 hosts** will be made available on the web

Host Publisher Components - SIMs



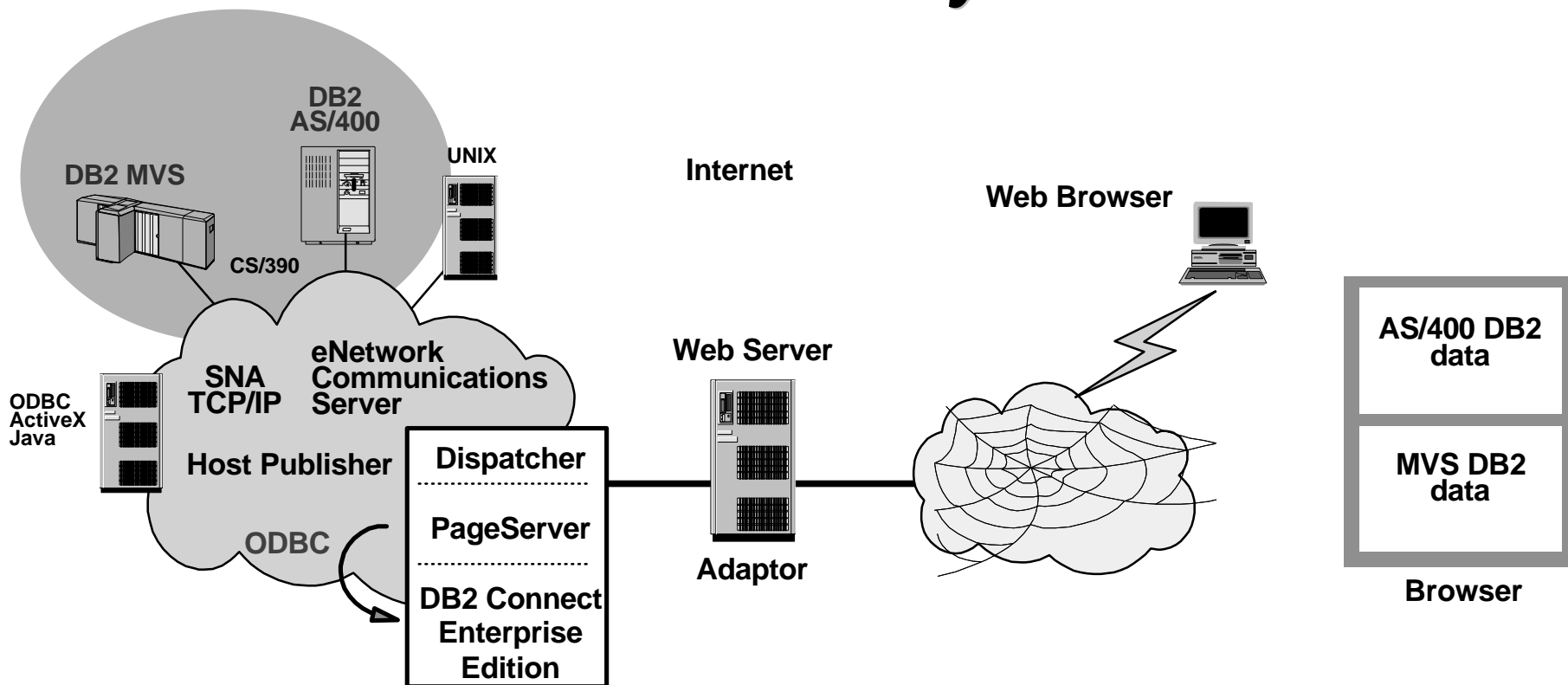
- One or more System Integration Modules (SIMs) provide, to the Page Server and Integrator, a black box front end to a *specific type of back end data source*
- SDK-toolkit for building new SIMs

Host Integration Components - Platform Support

- Various components of Host Publisher are supported on multiple operating systems

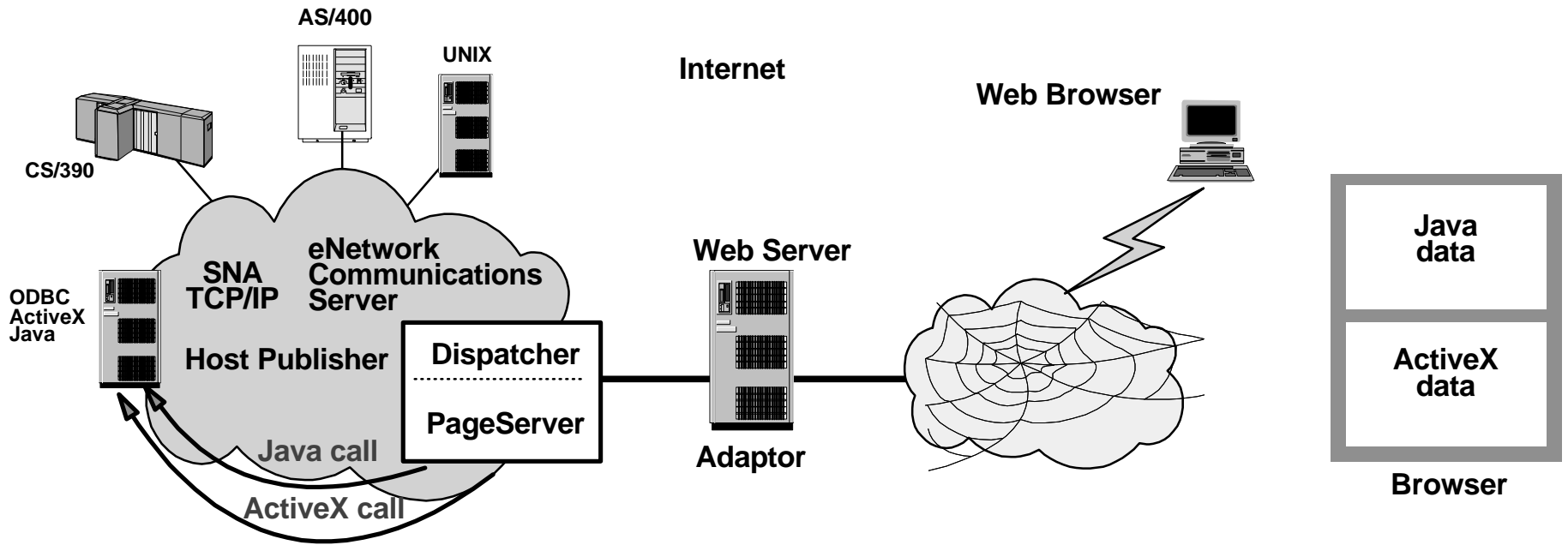
	Windows 95	Windows NT 4.0	DIGITAL UNIX 3.2	Hewlett-Packard HP-UX 10.x	IBM AIX 4.2	Sun Solaris 2.x
Integrator	X	X	-	-	-	-
Adaptor	X	X	X	X	X	X
Dispatcher	-	X	-	-	-	-
PageServer	-	X	-	-	-	-
Monitor	-	X	-	-	-	-
PageTester	X	X	-	-	-	-
ActiveX SIM	X	X	-	-	-	-
Java SIM	X	X	-	-	-	-
ODBC SIM	X	X	-	-	-	-
Host Access SIM	X	X	-	-	-	-

Back-End Connectivity - DB2



- 60 day trial license of IBM DB2 Connect Enterprise Edition included in CS/NT 6.0 for Host Publisher access to host DB2 data
- MVS and AS/400 DB2 data is rejuvenated and presented as a consolidated application (HTML page) at web browser
- Can access LAN-based DB2 data using ODBC driver in Client Access Enabler

Back-End Connectivity - Java, ActiveX



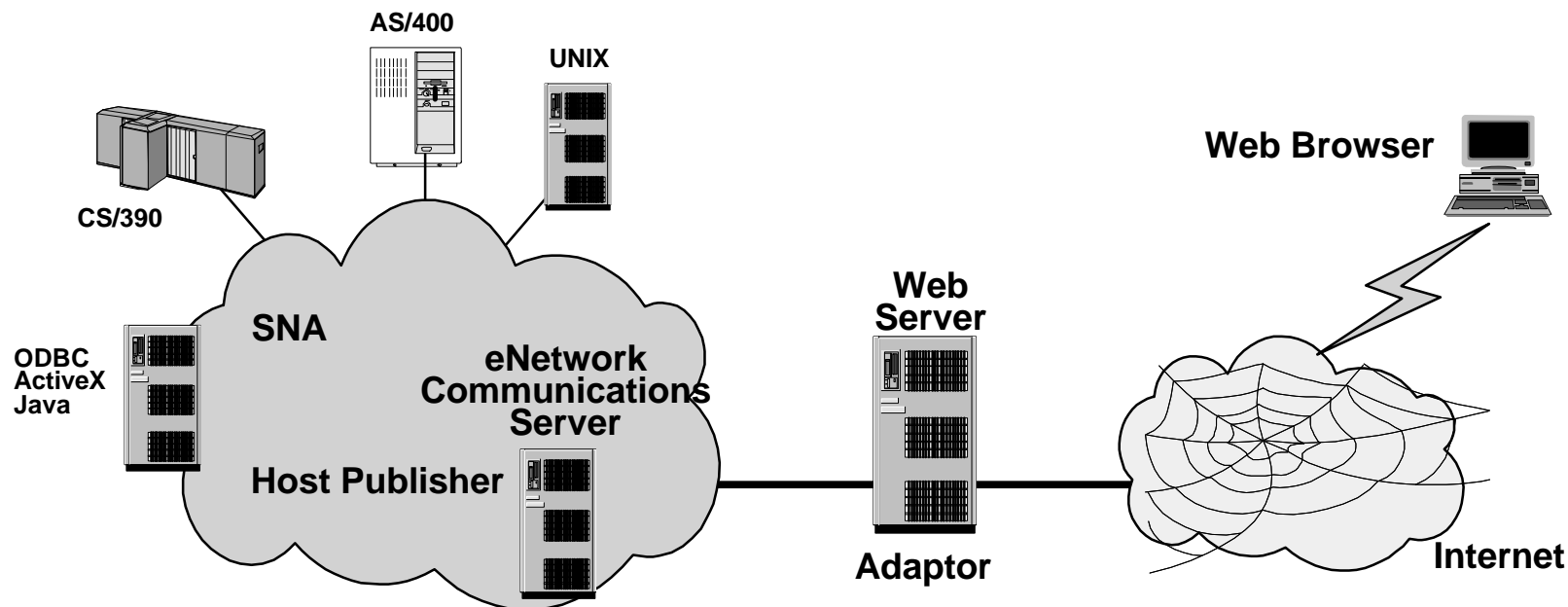
- Java and ActiveX data presented as a consolidated application

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Back-End Connectivity - 3270, 5250



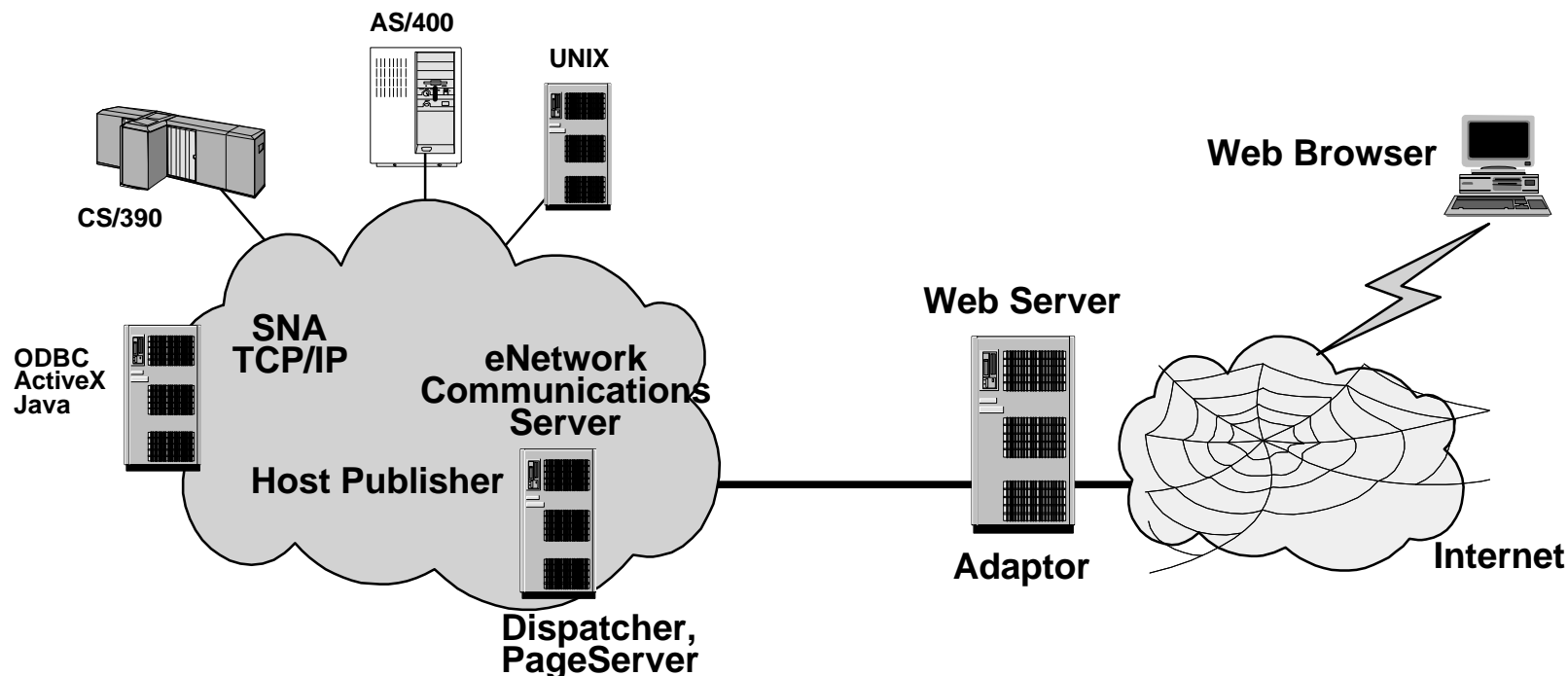
- Data from multiple 3270 and 5250 host "green screens" applications can be combined in a single web page
- Mission critical data can be presented to new users in new ways
- No changes to host applications needed!
- Host On-Demand components used to access back-end host systems via TCP/IP, retrieving data required to fill web page
- download from
<http://www.software.ibm.com/enetwork/commserver/downloads/hostpublisher>

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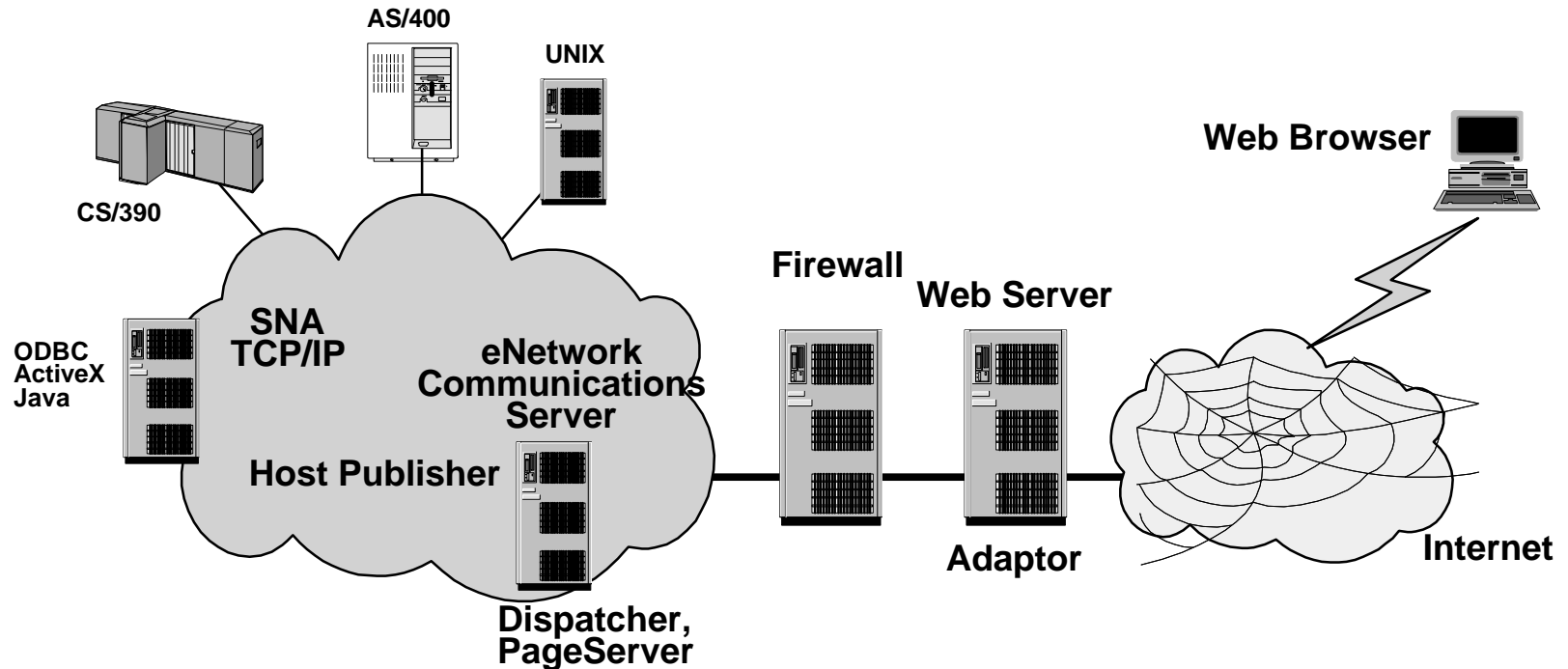


Configuration Decisions - Basics



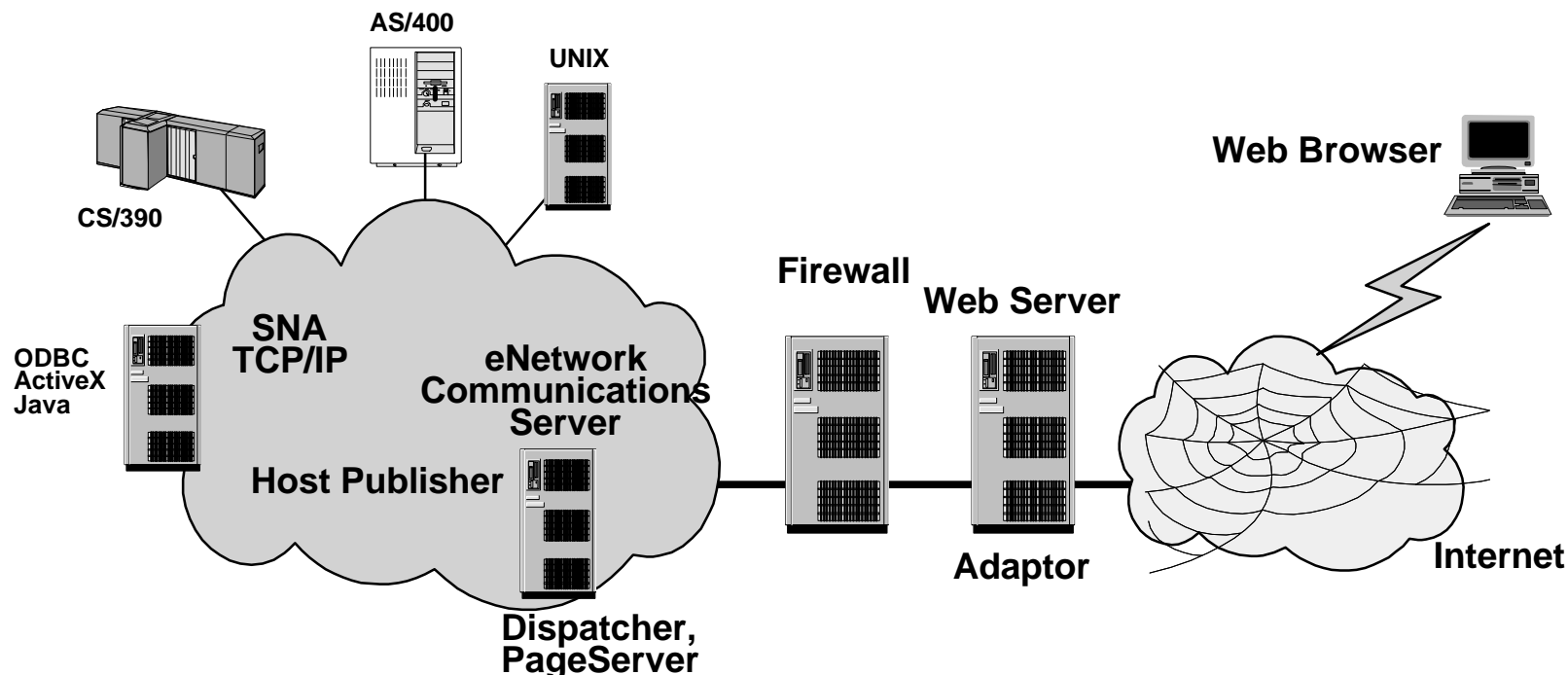
- Low page request rate: Web server, adaptor, Dispatcher and PageServer may all be on single machine
- Higher page request rate: Isolate web server from rest of Host Publisher environment so 1 machine runs Dispatcher/PageServer and 1 machine runs web server with good performance in both places

Configuration Decisions - Security



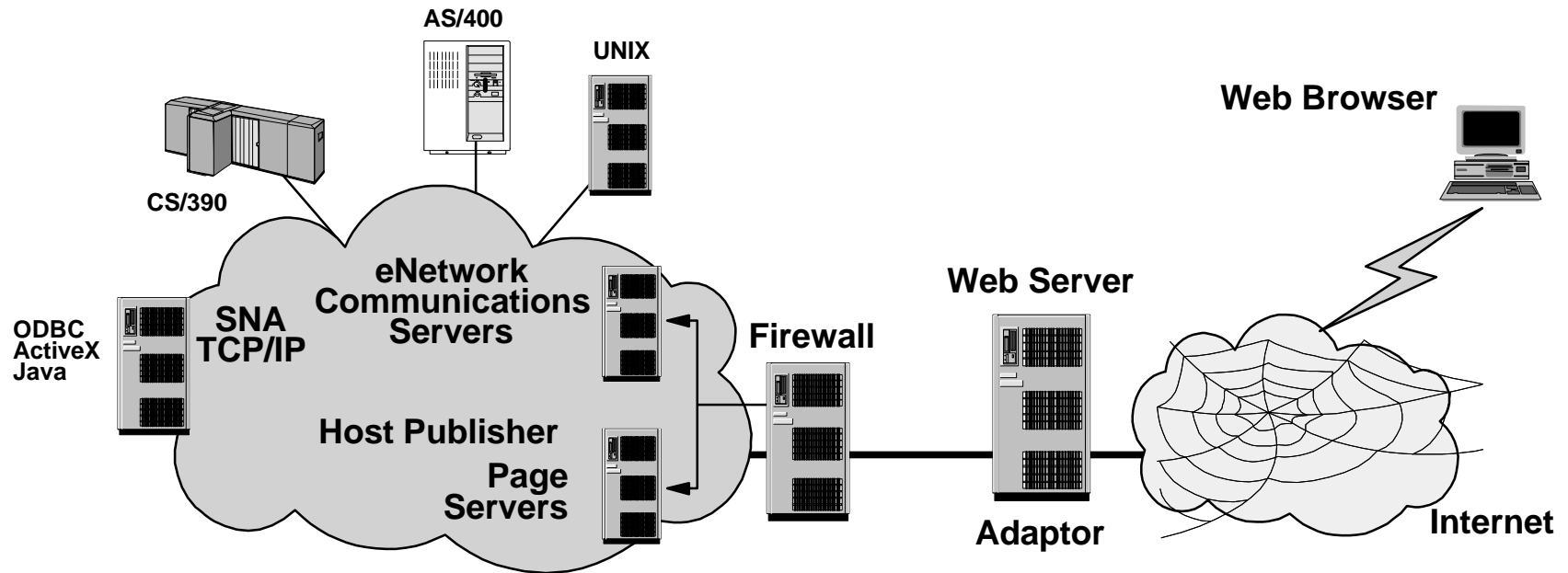
- Web server supported separate from other components
 - Allows placement of web server on the Internet (the unsecured side of a firewall)
 - Other Host Publisher components along with applications and data are kept securely behind the firewall
 - Internet end-users are not allowed to pass through the firewall and into secured network
 - Application requests are forwarded to the Dispatcher by the web server adaptor

Security - (continued)



- Typical security mechanisms available through web can be used to control authentication and access to existing applications including
 - Secure Socket Layers (SSL) for data encryption between browser and web server as well as authentication
- Available security mechanisms deployed for host application systems remain available to control access and authorization
 - For example, with IBM System/390⁷ Servers, the predominant security mechanisms are RACF⁷ and ACF2

Configuration Decisions - Incremental Scalability



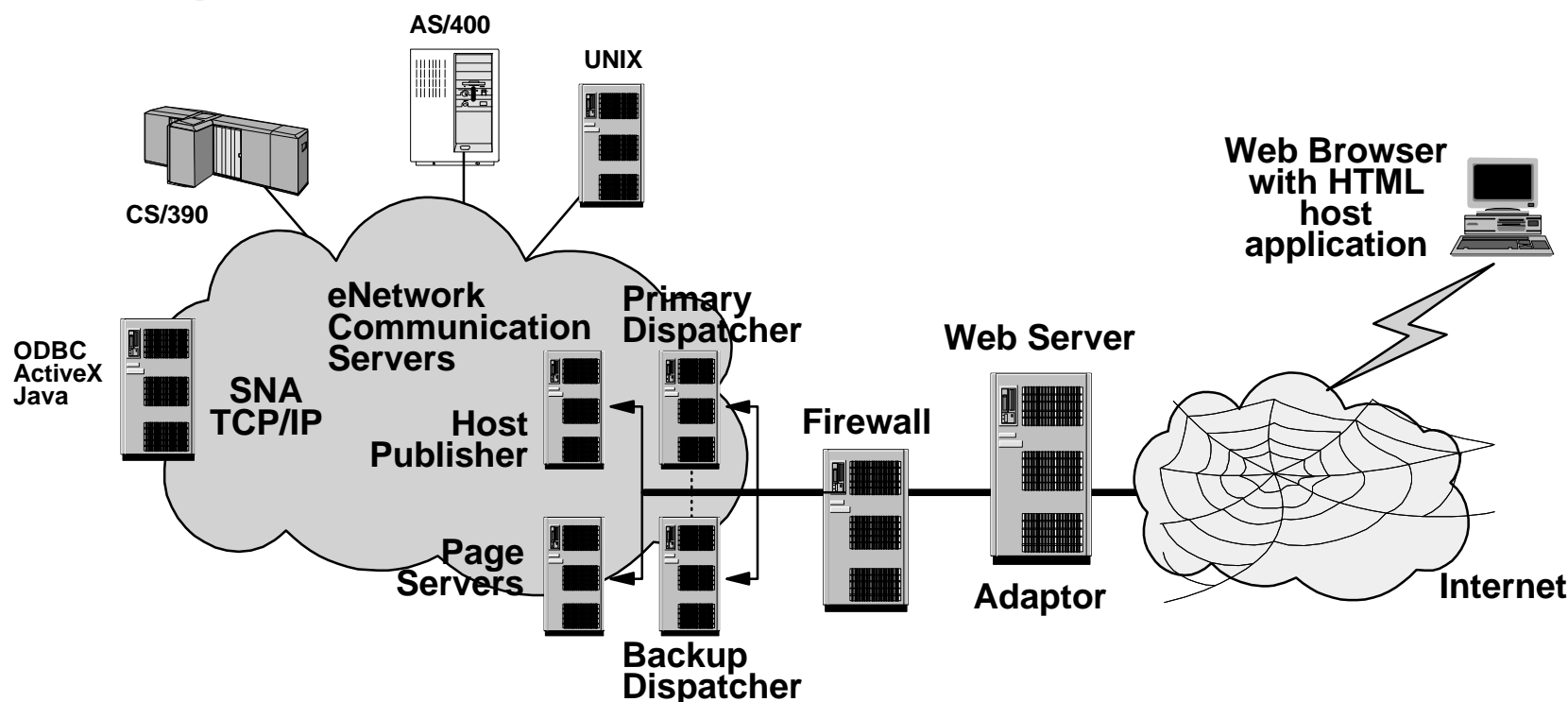
- If not able to serve enough pages then add a second PageServer
- Multiple PageServers also provide redundancy
- When running with multiple PageServers you can have dispatcher on one of PageServers, but for performance improvement move Dispatchers off PageServer
- If low numbers of long transactions, then moving Dispatcher to another machine makes less of a difference

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Configuration Decisions - Fault Tolerance



- Must have at least one Dispatcher, even if there is only one page server
- Can add secondary Dispatcher for fail-over protection
- Option:
 - Primary dispatcher run on machine 1, secondary Dispatcher runs on PageServer
 - When hot standby occurs both Dispatcher and PageServer run on same machine
 - Some performance implications but only a temporary situation
- Dispatcher runs on Windows NT as an NT service

Performance Considerations - End-user Response Time

- Each PageServer can have "X" threads running so if multiple requests for same page are received simultaneously they can all be fired off at once
- End-user does not need to wait for serial processing and associated response time delay
- Decision on how many threads to define is made at config. time
 - NT has a max of 256 threads
 - 5 threads is default
 - Load testing application (Page Tester software) should be done to determine optimum number of threads

Performance Considerations - Caching

■ Page Caching

- Takes data rendered into web page and saves in cache
- If someone else asks for same page then it is taken out of cache
- Good when data doesn't change often, e.g. catalogs can preload pages which have high hits
- Flexibility to refresh cache at user determined intervals
- Reduces transaction rates and gives immediate response time

■ Connection Cache

- For ODBC and 3270/5250 access
- Pool of connections open to data sources
- Can specify that all requests serialize on connection cache (so if 25 connections in pool and in use then 26th request waits for open connection)
- Or can specify that once initial "X" connections in use than an "X+1" connection is created

How to Build a Web Page

- **The key is the integrator!!**

- An administrative tool used at configuration time
- Develops web pages with dynamic content
- Defines connectivity to existing applications via SIMs
- Creates HTML templates called integration objects to reference dynamic data
- Exposes a common interface for all SIMs, along with specific dialog for unique SIMs
- Provides a graphic interface used to configure an *integration* object

How to Build a Web Page

- **Integration objects act as a data source for dynamic content pages**
 - Is like a transaction that accesses a specific type of back-end data
- **HTML tags called *dynatags* refer to integration objects**
- **Dynatags specify how data returned from back-end data source is used to generate HTML tags**
- **Example that allows customer address to be filled in dynamically on web page:**

```
<P>  
Customer address: <B><DYNATEXT COMPONENT="My Data" ITEMS=My Customer  
MAXCOUNT=1></B>  
</P>
```


Integrator Screen Shot - ODBC

The screenshot shows the 'db2 - Host Publisher Integrator' application window. The title bar includes 'File Edit View Page Tools Help'. The main interface is divided into several sections:

- Left Panel:** A tree view showing a folder 'db2' containing a sub-folder 'rsample' with files 'employee', 'insert', 'update', and 'test'. Below this is an 'Integration Objects' list with entries for 'employee's Integration Object', 'insert's Integration Object', 'test's Integration Object', and 'update's Integration Object 2'.
- System Integration Module:** A dropdown menu set to 'ODBC Databases'.
- ODBC Database Name:** A dropdown menu set to 'RSAMPLE'.
- SQL Query Editor:**
 - Buttons for 'Enter SQL' and 'Edit SQL'.
 - Fields for 'SELECT', 'FROM', 'WHERE', and 'ORDER BY'.
 - The 'SELECT' field contains 'TNME, PHONENO, EMPNO, WORKDEPT, SALARY'.
 - The 'FROM' field contains 'EMPLOYEE'.
 - A dropdown menu is open next to the 'FROM' field, listing tables: DEPARTMENT, EMP_ACT, EMP_PHOTO, EMP_RESUME, **EMPLOYEE** (highlighted), ORG, PROJECT, SALES, STAFF, and TEST.
- Retrieve Section:**
 - Radio button selected for 'All Rows'.
 - Radio button for '1 row(s) at a time'.
- Connection Section:**
 - Radio button selected for 'Use the following:'.
 - Fields for 'ID:' (containing 'nt565') and 'Password:'.
 - Radio buttons for 'Use connection from Data Connection Cache' and 'Prompt Client for ID and Password'.

At the bottom of the window, there are tabs for 'Integration Object', 'State', and 'Exceptions'. A footer message reads 'For Help, press F1'.

Integrator Screen Shot - HTML

db2 - Host Publisher Integrator

File Edit View Page Tools Help

db2

- rsample
 - employee
 - insert
 - update
 - test

Integration Objects

- employee's Integration Object
- insert's Integration Object
- test's Integration Object
- update's Integration Object 2

```

<body>

<h1>employee</h1>

<p>
Any Introductory text or other information can go here.
</p>

<table border=1>
<tr>
<th>LASTNAME</th>
<th>FIRSTNAME</th>
<th>PHONENO</th>
<th>EMPNO</th>
<th>WORKDEPT</th>
<th>SALARY</th>
</tr>

<dynablock>
<tr>
<td><dynatext component="employee's Integration Object" items=LASTNAME maxcount=-1></td>
<td><dynatext component="employee's Integration Object" items=FIRSTNAME maxcount=-1></td>
<td><dynatext component="employee's Integration Object" items=PHONENO maxcount=-1></td>
<td><dynatext component="employee's Integration Object" items=EMPNO maxcount=-1></td>
<td><dynatext component="employee's Integration Object" items=WORKDEPT maxcount=-1></td>
<td><dynatext component="employee's Integration Object" items=SALARY maxcount=-1></td>
</tr>
</dynablock>

</table>
</body>
</html>
HTML / Preview / Cache /
    
```

For Help, press F1

Web Page with Integrated ODBC Data

db2 - Host Publisher Integrator

File Edit View Page Tools Help

db2

- rsample
 - employee
 - insert
 - update
 - test

Integration Objects

- employee's Integration Object
- insert's Integration Object
- test's Integration Object
- update's Integration Object 2

Employee Table

Selecting employee table from DB2 Sample Database

LASTNAME	FIRSTNAME	PHONENO	EMPNO	WORKDEPT	SALARY
HAAS	CHRISTINE	3978	000010	A00	52750.00
THOMPSON	MICHAEL	3476	000020	B01	41250.00
KWAN	SALLY	4738	000030	C01	38250.00
GEYER	JOHN	6789	000050	E01	40175.00
STERN	IRVING	6423	000060	D11	32250.00
PULASKI	EVA	7831	000070	D21	36170.00
HENDERSON	EILEEN	5498	000090	E11	29750.00
SPENSER	THEODORE	0972	000100	E21	26150.00
LUCCHESSI	VINCENZO	3490	000110	A00	46500.00
O'CONNELL	SEAN	2167	000120	A00	29250.00
QUINTANA	DOLORES	4578	000130	C01	23800.00
NICHOLLS	HEATHER	1793	000140	C01	28420.00
ADAMSON	BRUCE	4510	000150	D11	25280.00
PIANKA	ELIZABETH	3782	000160	D11	22250.00

HTML Preview Cache

For Help, press F1

Host On-Demand and Host Publisher Positioning



■ Host On-Demand:

- Primary solution for intranets where
 - Users connect for extended periods of time
 - Fast response times are important to maximize productivity
 - Users are familiar with the native terminal interface (host green screens)
 - Users have Java enabled browsers
 - Platform versions (e.g. browser, Java level) are generally well controlled

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Host On-Demand and Host Publisher Positioning (Con't)



■ Host Publisher:

- Primary solution for Internet where:
 - Large numbers of users connect for short periods of time
 - End-users are familiar with web response time
 - Users are not familiar with green screens and the location of input fields
 - Java-enabled browsers can not be assumed
 - Access requirements surpass 3270 and 5250 access and include Java, ActiveX and ODBC
 - Support is required for many browser types and versions

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Host On-Demand and Host Publisher Positioning - Summary



- One size does not fit all
- All large customers will need both Host On-demand and Host Publisher solutions to meet their web-to-host needs
- IBM has a best-of-breed solution in both categories

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Purchasing a Host Integration Solution Three Options



Standalone product purchase

1. Purchase Communications Server for Windows NT V6.0 as quoted in announcement 298-256 dated July 21, 1998

- Server: \$995 suggested retail price
- Client Access License (CAL) \$69
- Host Publisher CAL: \$119
- Upgrade pricing and Passport Advantage discounts available

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Purchasing a Host Publisher Solution

■ CSNT Licensing Terms

– Server

- Each Host Publisher PageServer requires a base license for Communications Server
- A Communications Server license also entitles you to deploy an unlimited number of certain Host Publisher components; Dispatcher, Adaptor and Integrator on any supported platform

– User

- One Communications Server Host Publisher Access License (CAL) is required to be purchased for each concurrent user. In addition to authorizing the user to access multiple sources of host data via host Publisher, this license entitles the user to use any other Communications Server function, e.g. TN server, SNA Gateway, etc.

Purchasing a Host Integration Solution Three Options



Host Integration Solution

- Single pricing structure with one price per user

2. Registered user license (legacy and intranet usage)

- Announcement 298-195 dated June 16, 1998
- License required for every employee
- Software components include:
 - Communications Server
 - Personal Communications
 - Host On-Demand

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Purchasing a Host Integration Solution Three Options



Host Integration Solution

3. Concurrent user license (extranet and Internet)

- Announcement 298-353 dated September 22, 1998
- License required for each concurrent user
- Software components include
 - Communications Server
 - Host On-Demand
 - Firewall

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eNetwork Services "proof of concept"

- **IBM trained experts analyze whether your enterprise applications are suitable for web enablement**

- **includes:**
 - up to 5 days of services
 - strategy
 - design
 - planning
 - implementation

- **register at <http://www.software.ibm.com/enetwork/services/>**

- **all for \$5000 (USD) plus travel and living (offer valid through 12/31/98)**

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For More Information...

- **IBM eNetwork Communications Server for Windows NT Host Publisher white paper:**
 - http://www.software.ibm.com/enetwork/commserver/library/whitepapers/white_csnt_hostpub.html
- **Aberdeen Group paper: Selecting Web-to-Host Solutions That Enable Security and Control**
 - http://www.software.ibm.com/enetwork/library/whitepapers/white_aberdeen.html
- **Zona research, Inc. paper; The Emergence of the Host Access Web Server**
 - http://www.software.ibm.com/enetwork/library/whitepapers/white_zona.html
- **SG24-5232 Communications Server for Windows NT redbook**
- <http://www.enetwork.software.ibm.com/enetwork/commserver/hostpublisher/>