IBM @server

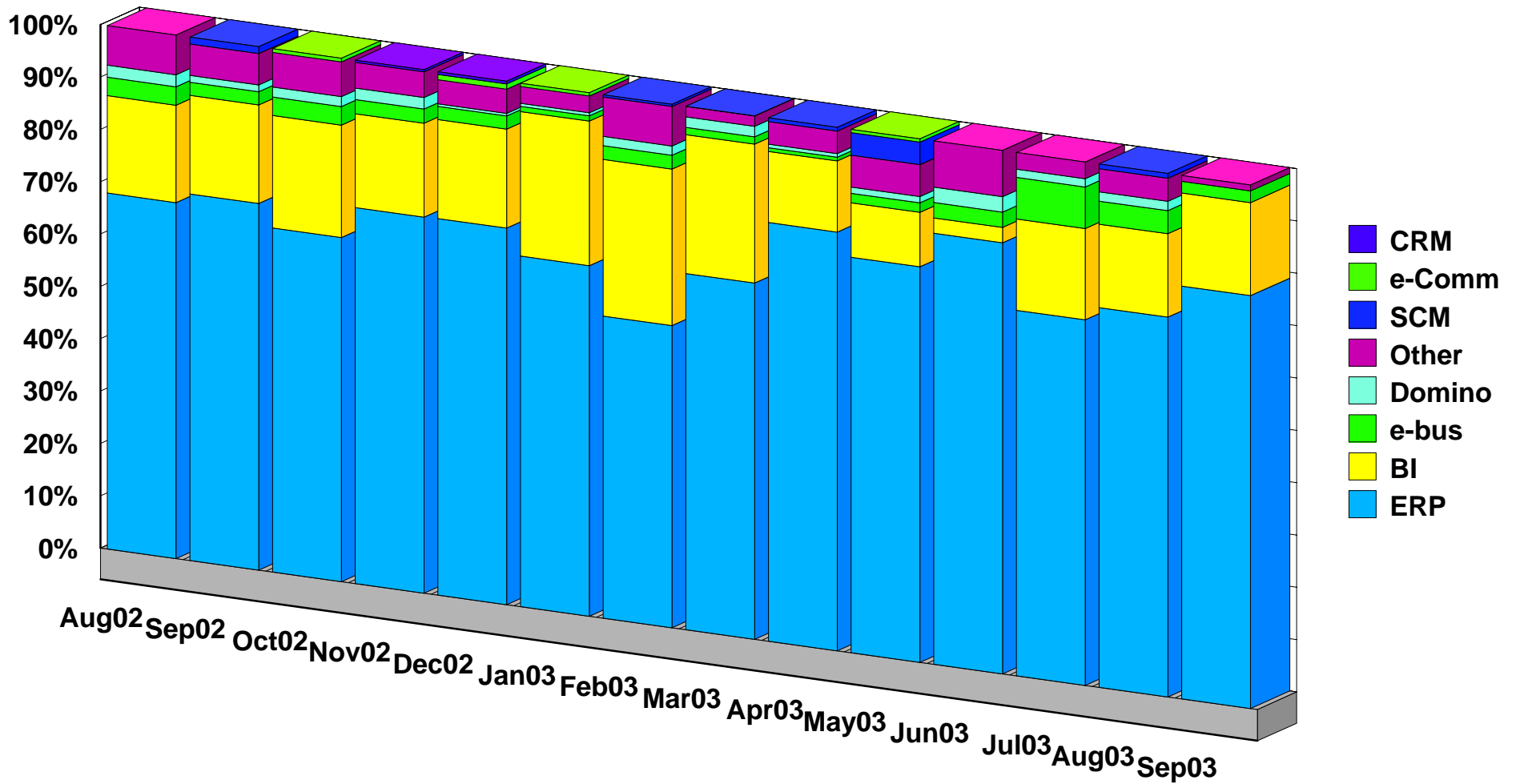# iSeries Developer Roadmap

Initial Words of Wisdom
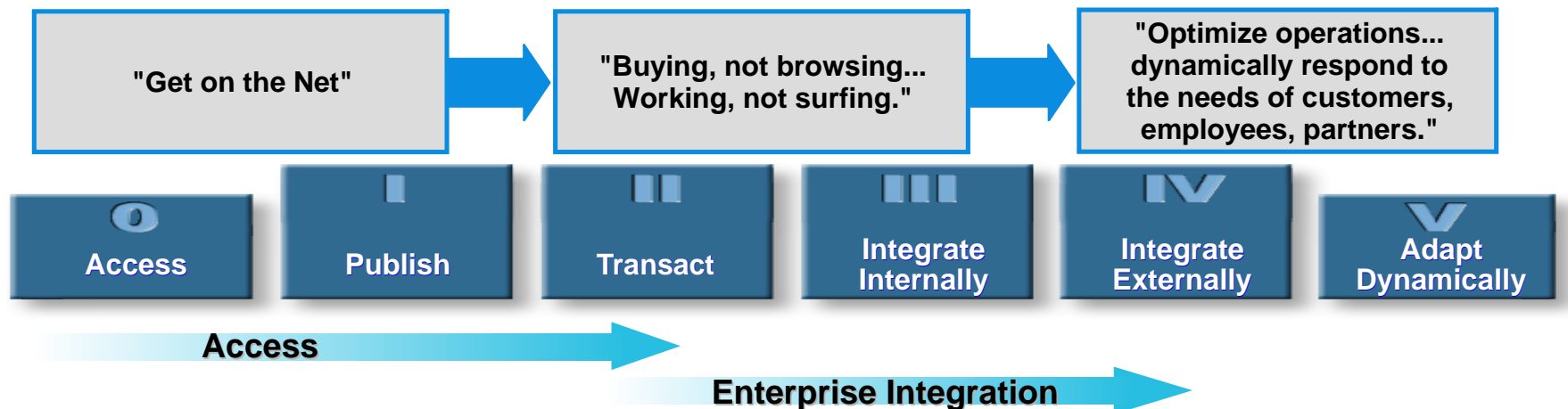

✔ *This is not about "give me Java or give me death"*

✔ *These charts focus on IBM tools but there are many partner solutions as well*

✔ *The worst thing an iSeries shop can do is to do nothing*

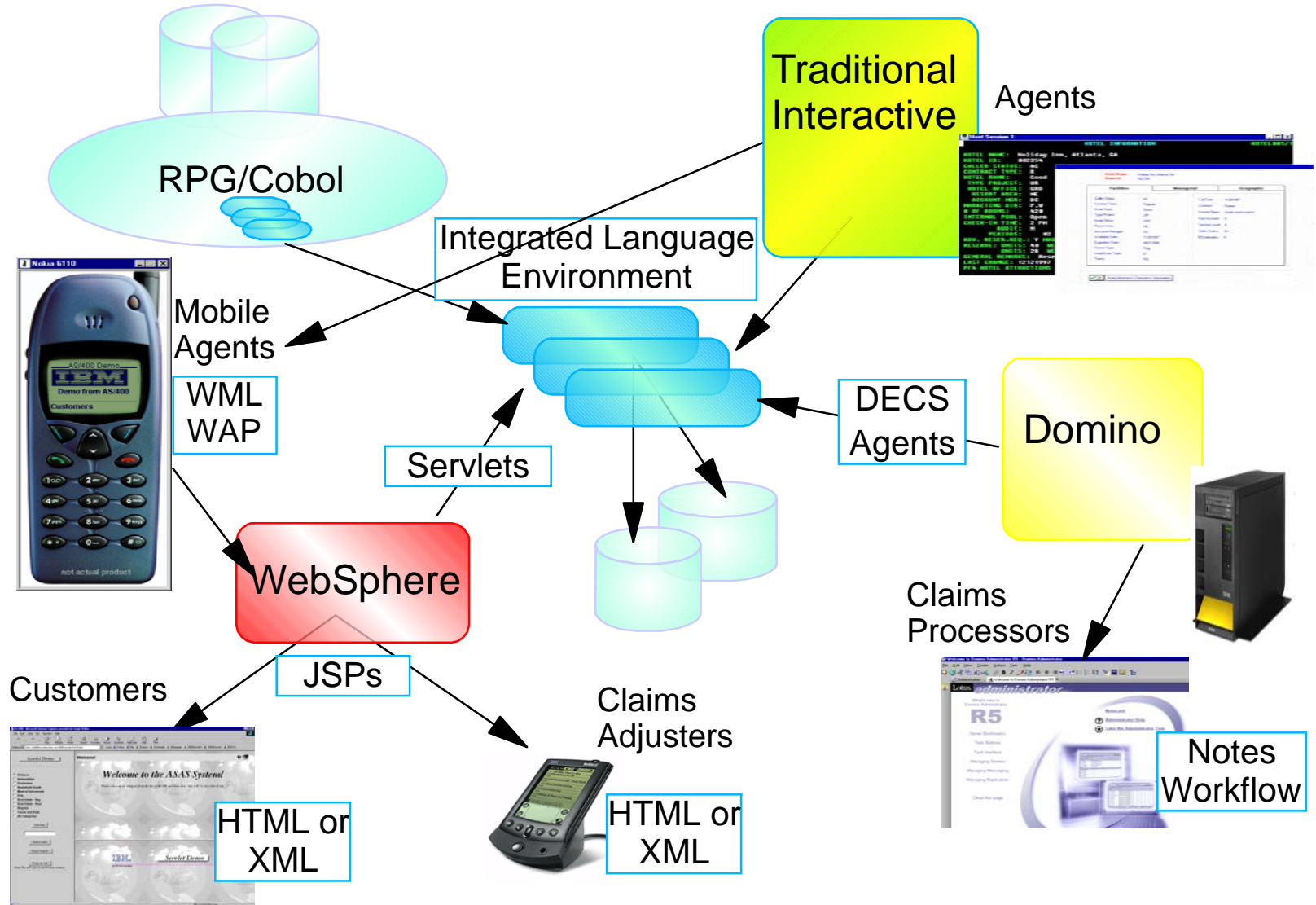# iSeries Applications Today

Phases of e-business Adoption

iSeries customers are demanding that we provide the tools and infrastructure to create the applications of the future...

| "Get on the Net" | "Buying, not browsing... Working, not surfing." | "Optimize operations... dynamically respond to the needs of customers, employees, partners." |

| 0 Access | I Publish | II Transact | III Integrate Internally | IV Integrate Externally | V Adapt Dynamically |

Access →

Enterprise Integration →

iSeries Applications Tomorrow

RPG/Cobol

Traditional Interactive

Agents

Integrated Language Environment

Mobile Agents

WML WAP

Servlets

DECS Agents

Domino

WebSphere

Customers

JSPs

Claims Adjusters

Claims Processors

HTML or XML

HTML or XML

Notes Workflow

The Future Requires Versatility

Today → **Future?**

Integration

Collaboration

Today

- Java
- e-business
- IBM Tools
  - ADTS
- Middleware
- RPG
- COBOL
- Domino
- C/C++

✓ **Server Centric / Thin Client**
✓ **Graphical Interfaces**
✓ **Client Neutral**
✓ **Network Deployed**

Future?

- Java
- Domino
- IBM Tools
  - VA Java
  - WebSphere
  - WDS
- Middleware
  - MQ Series
- e-business
- RPG/COBOL
  - Coexist
- C/C++
  - Deploy investment
- Platform
  - JVM/JDK
  - EJB
  - XML
  - JSPs
- Linux
- Windows
- AIX

Consolidation

The Future Requires New Techologies & Skills

RPG

WebFacing
HTML
JavaScript

J2SE
- Java
- Servlets
- JavaServer Pages

WebServices
- SOAP
- WSDL
- UDDI
- XML

J2EE
- Enterprise JavaBeans
- Java Messaging Services
- Java Connector Architecture

"Get on the Net" → "Buying, not browsing... Working, not surfing." → "Optimize operations... dynamically respond to the needs of customers, employees, partners."

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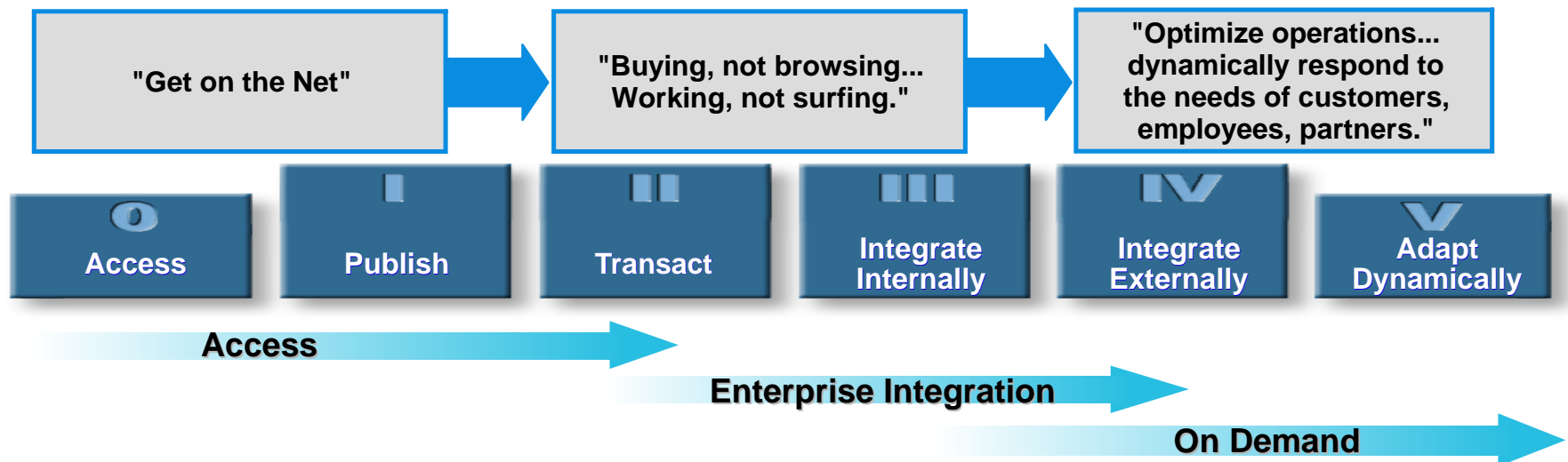
On Demand →

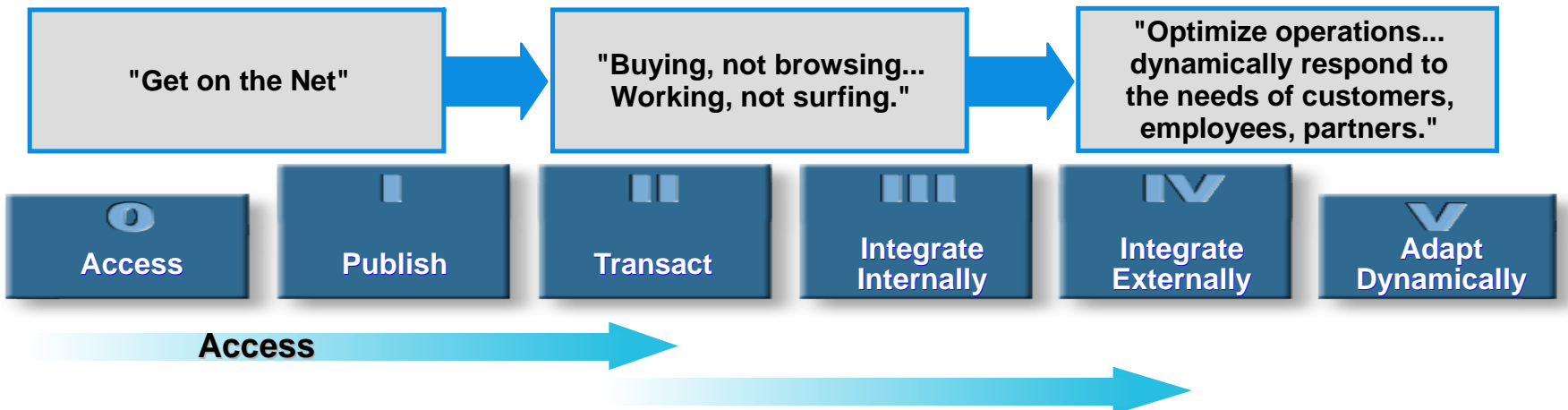# iSeries Customers are Lagging Behind
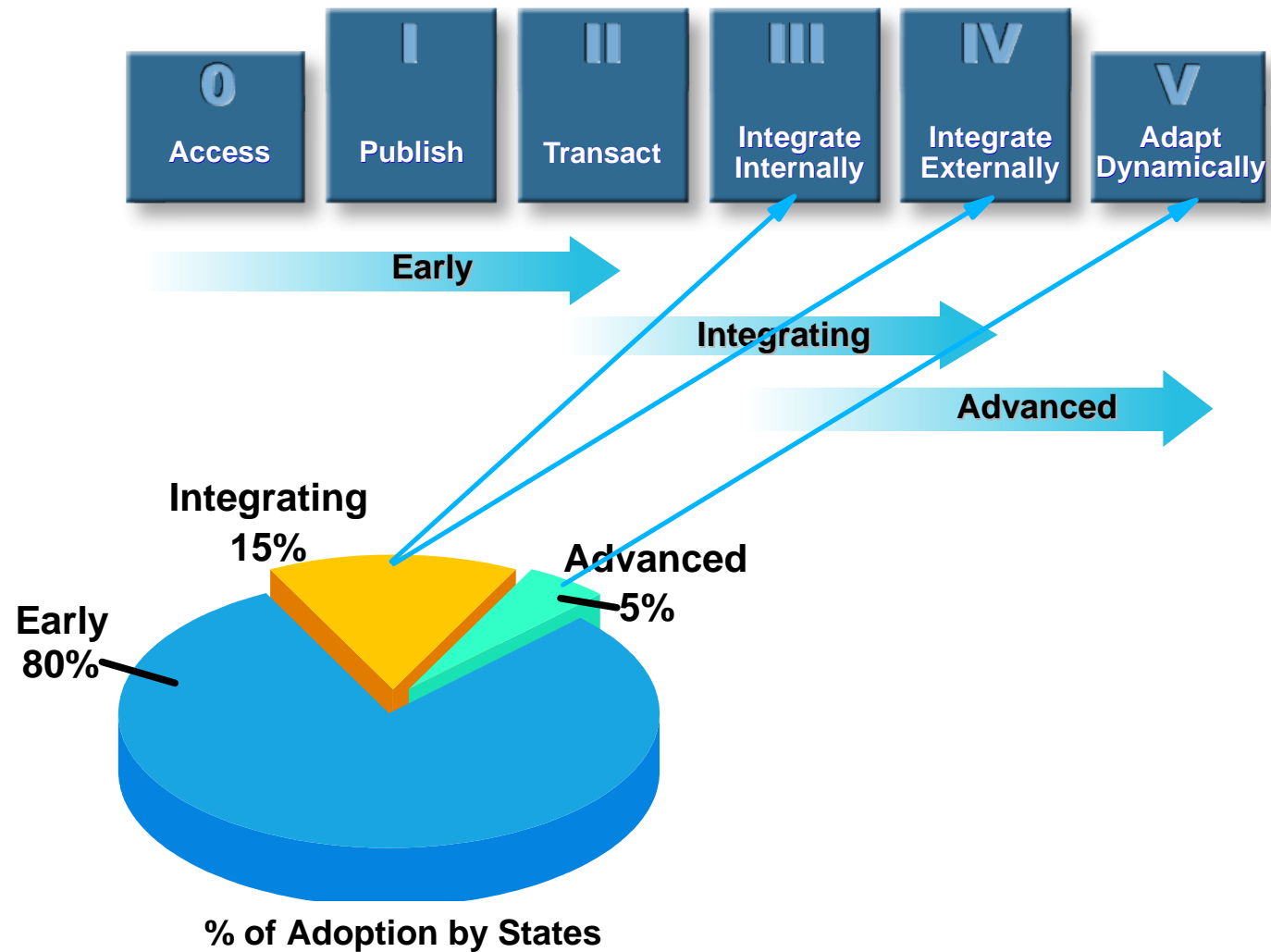
How Do I Do That ???
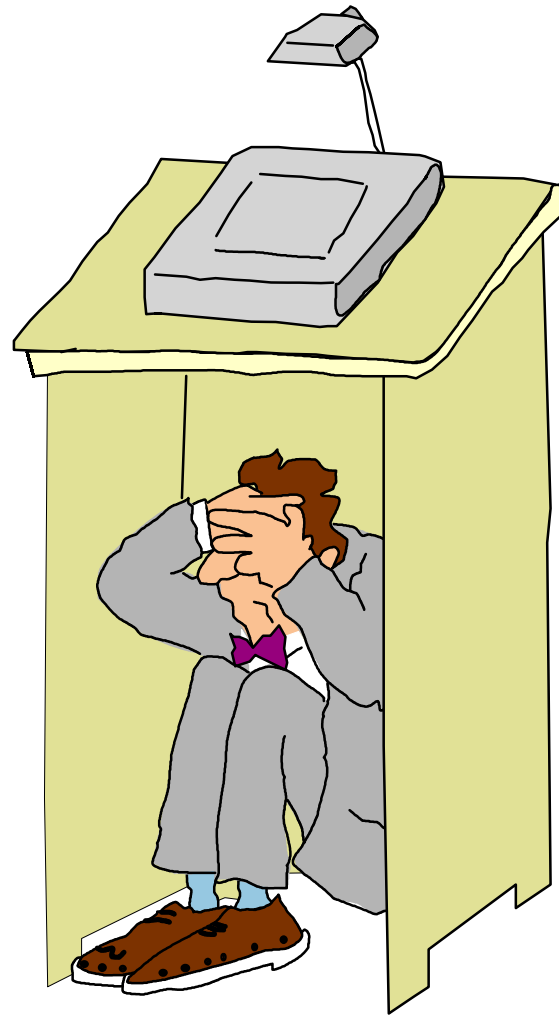
Developers Road Map Points the Way

RSE = Remote System Explorer

	Today	Better Tools	Better User Interface	Better Architecture	Better Solutions	Better Portability	Better Scalability
Existing Customers							
Existing Solution Providers							
New to iSeries							
	5250	**5250**	**5250** / **Web**	**Web**	**Web**	**Web**	**Web**
	RPG	**ILE RPG**	**ILE RPG**	Web Services / **ILE RPG**	Web Services / **Java Logic**	Web Services / **Java Logic**	Web Services / **EJBs**
	PDM	RSE / CODE	RSE / iWA / WebFacing / HATS	RSE / Web Tools / STRUTS	Web Tools / Java Tools	Web Tools / Java Tools	Web Tools / Java Tools / J2EE / EJBs

"Get on the Net" → "Buying, not browsing... Working, not surfing." → "Optimize operations... dynamically respond to the needs of customers, employees, partners."

0 Access	I Publish	II Transact	III Integrate Internally	IV Integrate Externally	V Adapt Dynamically

Access

WebSphere Is the Cornerstone for IBM

The leading software platform for e-business on demand

Strengthen Relationships

Enhance customer, partner, employee and supplier user experiences for optimal satisfaction

Business Portals | Business Integration

WebSphere

Foundation & Tools

Optimize Operations

By integrating applications & automating business processes for operational efficiencies & business flexibility

Reduce Business Risk

Rely upon a high-quality foundation to rapidly build and deploy applications for high-performance e-business on demand

Today

- Most iSeries developers still:

  - ► Create or enhance 5250 applications

  - ► Use traditional, host-based development environment (PDM, SEU, SDA, RLU, DFU, & system debugger)

5250

RPG

PDM

Step 1. Better Tools

▪**Move iSeries application development to Eclipse Integrated Development Environment (IDE)**
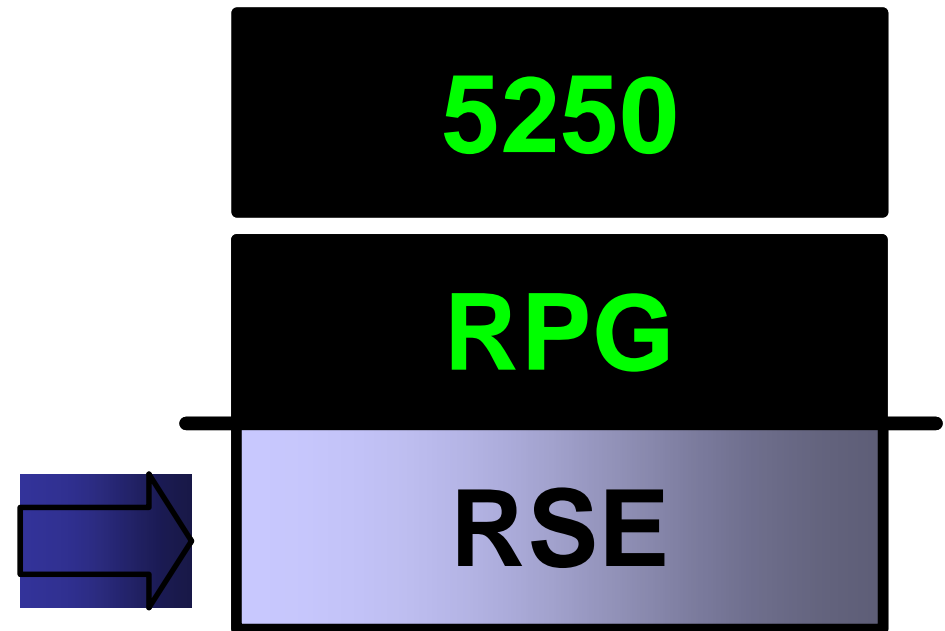
▪**Remote System Explorer (RSE)**

> ►Provides iSeries server access from Eclipse IDE (included in WebSphere Development Studio Client for iSeries)
>
> ►21st century follow-on to PDM, SEU, SDA, RLU, & system debugger

▪**Value Proposition**

> ►Improves productivity over host 3GL tools
>
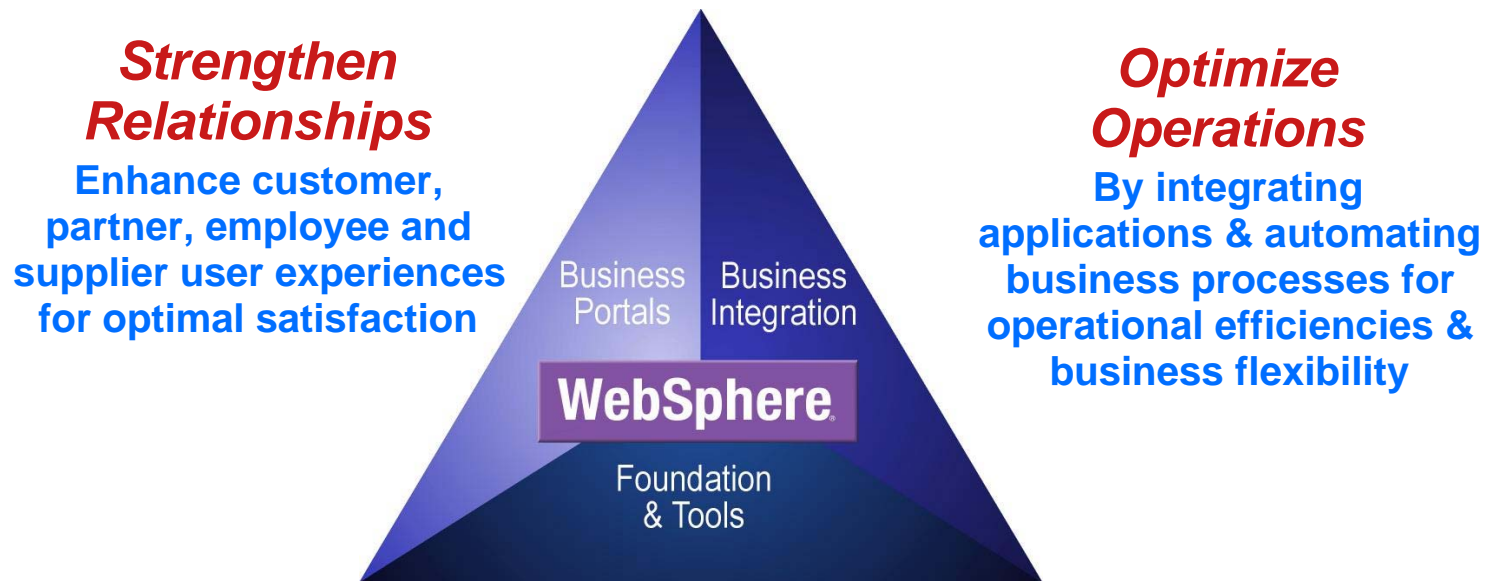> ►Provides easy access to advanced application development tools from IBM & vendors

▪**Education Enablement**

> ►WebSphere Development Studio Client packaging & introduction
>
> ►Eclipse education (how to use)
>
> > –Tool solution developers may be interested in how to extend Remote System Explorer
>
> ►Remote System Explorer education

5250

RPG

RSE

WebSphere on iSeries

The leading software platform for e-business on demand

Strengthen Relationships

Enhance customer, partner, employee and supplier user experiences for optimal satisfaction

Business Portals | Business Integration

WebSphere.

Foundation & Tools

Optimize Operations

By integrating applications & automating business processes for operational efficiencies & business flexibility

WebSphere Development Studio

IBM Software

Reduce Business Risk

high-quality foundation to rapidly build and cations for high-performance e-business on demand

iSeries Tools Progress
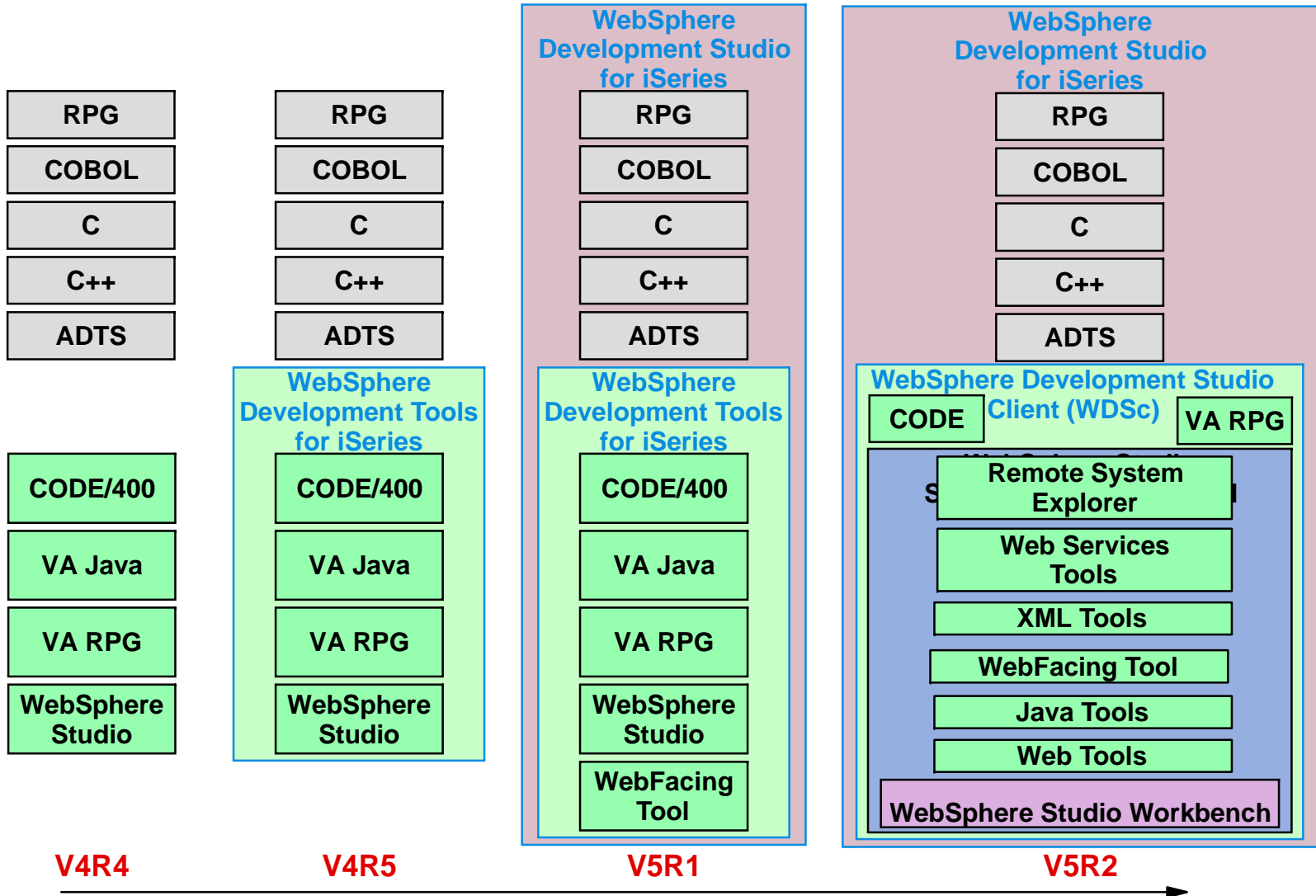
WebSphere Development Studio for iSeries

RPG	RPG	RPG	RPG
COBOL	COBOL	COBOL	COBOL
C	C	C	C
C++	C++	C++	C++
ADTS	ADTS	ADTS	ADTS

WebSphere Development Tools for iSeries

WebSphere Development Studio Client (WDSc)

CODE/400	CODE/400	CODE/400	CODE
VA Java	VA Java	VA Java	VA RPG
VA RPG	VA RPG	VA RPG	Remote System Explorer
WebSphere Studio	WebSphere Studio	WebSphere Studio	Web Services Tools
		WebFacing Tool	XML Tools
			WebFacing Tool
			Java Tools
			Web Tools
			WebSphere Studio Workbench

V4R4 **V4R5** **V5R1** **V5R2**

IBM @**server**

Remote System Explorer - WebSphere Development Studio Client Advanced Edition for iSeries

File Edit Source Compile Navigate Search Project Run Window Help

Remote Systems

- New Connection
- Local
- My iSeries
  - iSeries Objects
    - Work with libraries…
    - Work with objects
    - Work with mem
    - Library list
    - User libraries
    - My Source
      - BBOB.rpgle
      - CUSTBAL.
      - DISPLAYCAR.rpgle
      - GETMAKES.rpgle
      - GETMAKES2.rpgle
      - NEWNAME.rpgle
      - RENTCAR.rpgle
      - RETURNCAR.rpgle
  - iSeries Commands
  - iSeries Jobs
  - IFS Files

Remote Systems | Team

PDM-like tree & table views

Properties

Property	Value
Name	RENTCAR
Number of child…	0
Source	CARDEMO/QRP…
Status	OK
Subtype	SRC

Property sheet

CUSTBAL | RENTCAR

Row 73   Column 42   Replace

```
.....C..........................Extend
006000      C                    IF          (Rent_make = *BL
006100      C                                (%TRIM(Rent_make
006200      C                    EVAL        Make_given = *OF
006300      C                    ENDIF
006400      C                    IF          (Rent_color = *B
006500      C                                (%TRIM(Rent_colo
006600      C                    EVAL        Color_given = *O
            C                    ENDIF

            C* Brute force scan of all records until match
            C                    READ        CARDB
            C                    DOW         (NOT %EOF) AND (
            C                    IF          (Class = Rent_cl
            C                                (Status = 'N')
RNF7503: Expression contains an operand that is not
RNF7030: The name or indicator STATUS is not define
007400      C                    IF          (NOT Make_given)
007500      C                                (Make = Rent_mak
```

Verify program action completed with errors.

SEU-like editor

Outline

- Global Definitions
  - Files
  - Indicators
  - Fields
    - CLASS : Chara
    - COLOR : Chara
    - MAKE : Charac
    - RETURNEDPLA
- Main Procedure
  - Parameters
- Subprocedures
  - RENTIT : Characte
    - Parameters
    - Local Definition
      - Indicators
      - Fields
        - COUNT
        - CURRE
        - RENT_

Outline view

---

iSeries Error List - <TORAS14M>CARDEMO/QRPGLESRC(RENTCAR)

Error list

ID	Message			...ation	Connection
RNF2120	External descriptions for file CARDB not found; file …	40	5	CARDEMO/QRPGLESR…	My iSeries
RNF7030	The name or indicator RENTDATE is not defined.	30	81	CARDEMO/QRPGLESR…	My iSeries
RNF7030	The name or indicator RETDATE is not defined.	30	82	CARDEMO/QRPGLESR…	My iSeries
RNF7030	The name or indicator STATUS is not defined.	30	73	CARDEMO/QRPGLESR…	My iSeries
RNF7503	Expression contains an operand that is not defined.	30	73	CARDEMO/QRPGLESR…	My iSeries
RNF7503	Expression contains an operand that is not defined.	30	79	CARDEMO/QRPGLESR…	My iSeries
RNF7503	Expression contains an operand that is not defined.	30	80	CARDEMO/QRPGLESR	My iSeries

Tasks | iSeries Table View | iSeries Commands Log | iSeries Error List

---

Extensible by solution developers

WebSphere Studio

WebSphere Studio Application Developer
Build robust J2EE™ applications with Enterprise JavaBean™ (EJB™) Components --
Advanced tools for code generation, performance tuning & best practices --
Relational schema center -- EJB-to-RDB mapping tools

WebSphere Development Studio Advanced Edition for iSeries
WRKSPLF, STRUTS, Build robust J2EE applications with Enterprise JavaBeans

WebSphere Development Studio for iSeries
WebFacing -- CODE -- iSeries extensions to WSSDa

WebSphere Studio Site Developer Advanced
J2EE™ -- Java™ -- Servlets -- JavaServer™ Pages -- XML --
Web Services -- Built in WebSphere Application Server test environment
Database tools -- Integrated Java Development Environment

WebSphere Studio Homepage Builder
WYSIWYG Page editing wizard -- JavaScript™--
Dynamic HTML -- Cascading Style Sheets --
WebVideo Studio -- Advanced image effects

WebSphere Studio Workbench
Common User Interface -- Project Management -- Debugging Services --
Plug-in Services & Tools -- Desktop & Help Frameworks -- Local & Team Resource Management

A single, comprehensive development environment
iSeries Specific or Cross Platform
Common Base

Step 2. Better User Interface

▪**Create Browser-based UI for 5250 Applications**

- ►Nearly instant conversion to Web UIs
  - –At development time for WebFacing (application-by-application)
  - –At runtime for HATS (session-based)
  - –For IBM WebFacing Tool & HATS, refinements can be made in a repeatable manner
- ►No impact to underlying application logic

▪**Value Proposition**

- ►Web User Interfaces offer:
  - –Ease-of-use characteristics & reduced learning curve
  - –Easy access to applications for remote employees, vendors, & partners
  - –Expanded market for solution developer solutions
  - –Elimination of interactive cycles when using WebFacing & new iSeries servers—reduces total cost of solution

▪**Education Enablement**

- ►IBM WebFacing Tool &/or Host Access Transformation Server (HATS)
  - –Plus IBM WebFacing Tool service provider offerings
- ►WebSphere Application Server — Express for iSeries
- ►Introduction to Web application artifacts, architecture, & terms
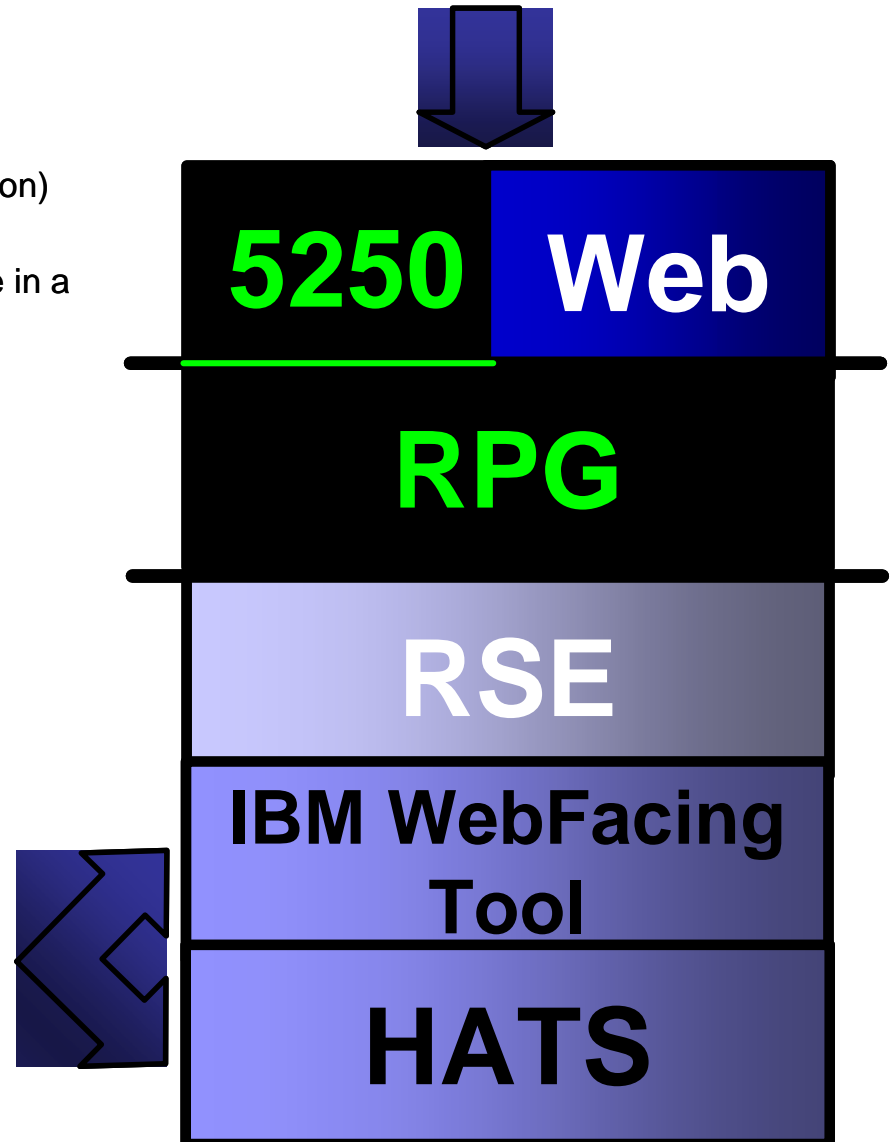
5250 **Web**

RPG

RSE

IBM WebFacing Tool

HATS

WebSphere on iSeries

The lead... ...atform for e-business on demand

WebSphere Portal Server

WebSphere Portal Express

...atisfaction

WebSphere

Business Portals

Business Integration

Foundation & Tools

Optimize Operations

By integrating applications & automating business processes for operational efficiencies & business flexibility

WebFacing Tool (WDSc)

WebSphere Host Integration

R... ...ss Risk
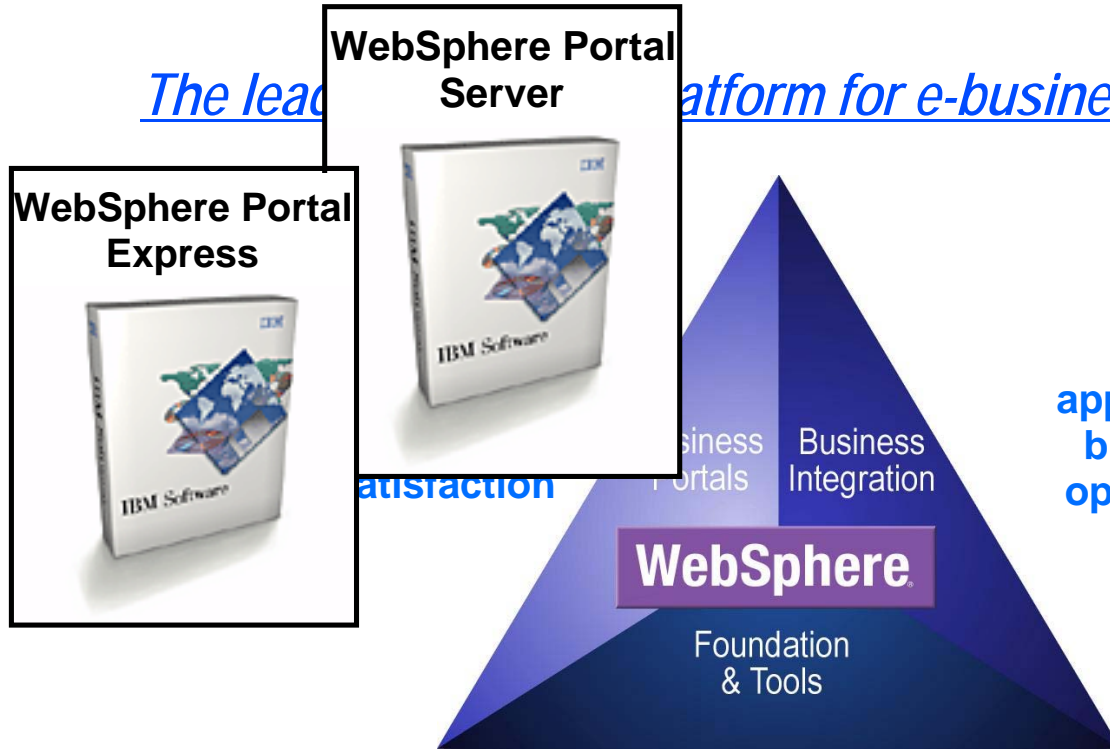
...hig... ...on to rapidly build and ...cat... ...rmance e-business on

Better User Interfaces via Refacing

Original 5250

Integrated

Customized

Refaced

Host Integration Solution

	Registered User	Concurrent User
HIS Cross Platform	$303	$446
HIS for iSeries	$218	$320
HIS Upgrade from HATS LE	$164	$240

HATS

Host Publisher

Screen Customizer

Integration

Host on Demand

Presentation

Emulation

Personal Communications
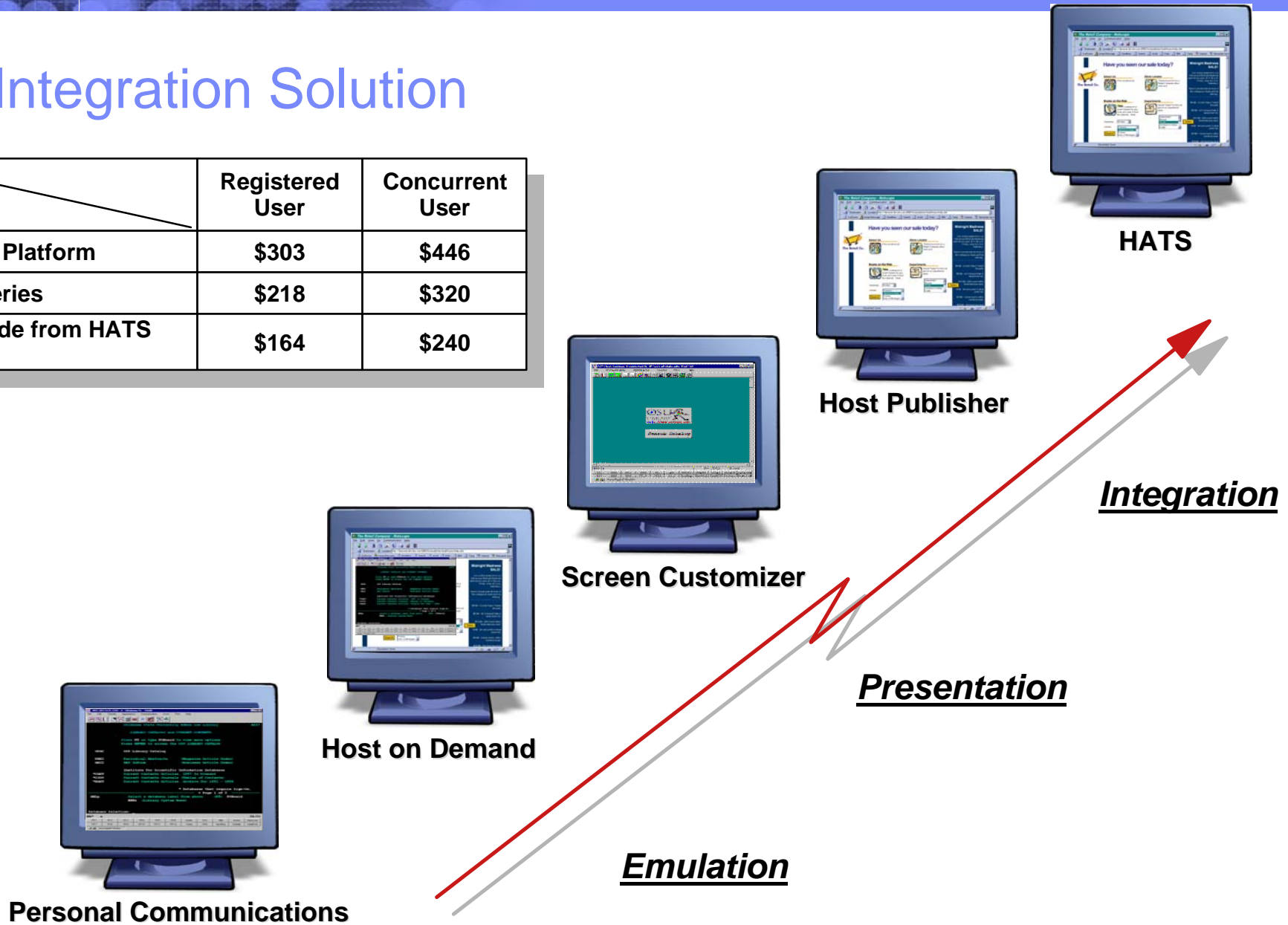
Host Integration Solution includes WebSphere App Server and WSAD

Portal Integration

- *Functionality*
  - **Browser based** - Single point of access
  - **Single Sign On** - Global access
  - **Portlets** - Windows to all major applications
  - **Access** - Secure, filtered access to corporate data

- *Business Value*
  - Funnel and filter to the overwhelming information
  - Make better decisions when you have the right information
  - Provide a common "desktop" with the proper tools that different jobs require
  - Removing stovepipe applications and departments
  - More Effective experience

Step 3. Better Architecture

- **Create new iSeries e-business solutions**
  - ► Using Web & Web services tools in WebSphere Development Studio Client
    - – RPG / COBOL / SQL for business logic
    - – iSeries Web Tools to generate other
- **Value Proposition**
  - ► Properly architected new Web applications offer:
    - – Easier maintenance / reuse of business logic
      - • Respond to increasing demands
    - – Quicker support for multiple interfaces: Web, phone, ...
    - – Faster support for B2B via Web services
  - ► iSeries Web Tools offer:
    - – Focus on business logic, not J2EE plumbing
    - – Reuse SDA skills in Web page development
- **Education Enablement**
  - ► Introduction to e-business
    - – Web application artifacts, architecture, terms
    - – Introduction to Struts framework for Web applications
    - – Introduction to Web services
  - ► Tools
    - – iSeries Web, Struts, Web services (including iSeries Program Call wizard)
  - ► WebSphere Application Server education

Web

Web Services

RPG

RSE

iSeries Web tools
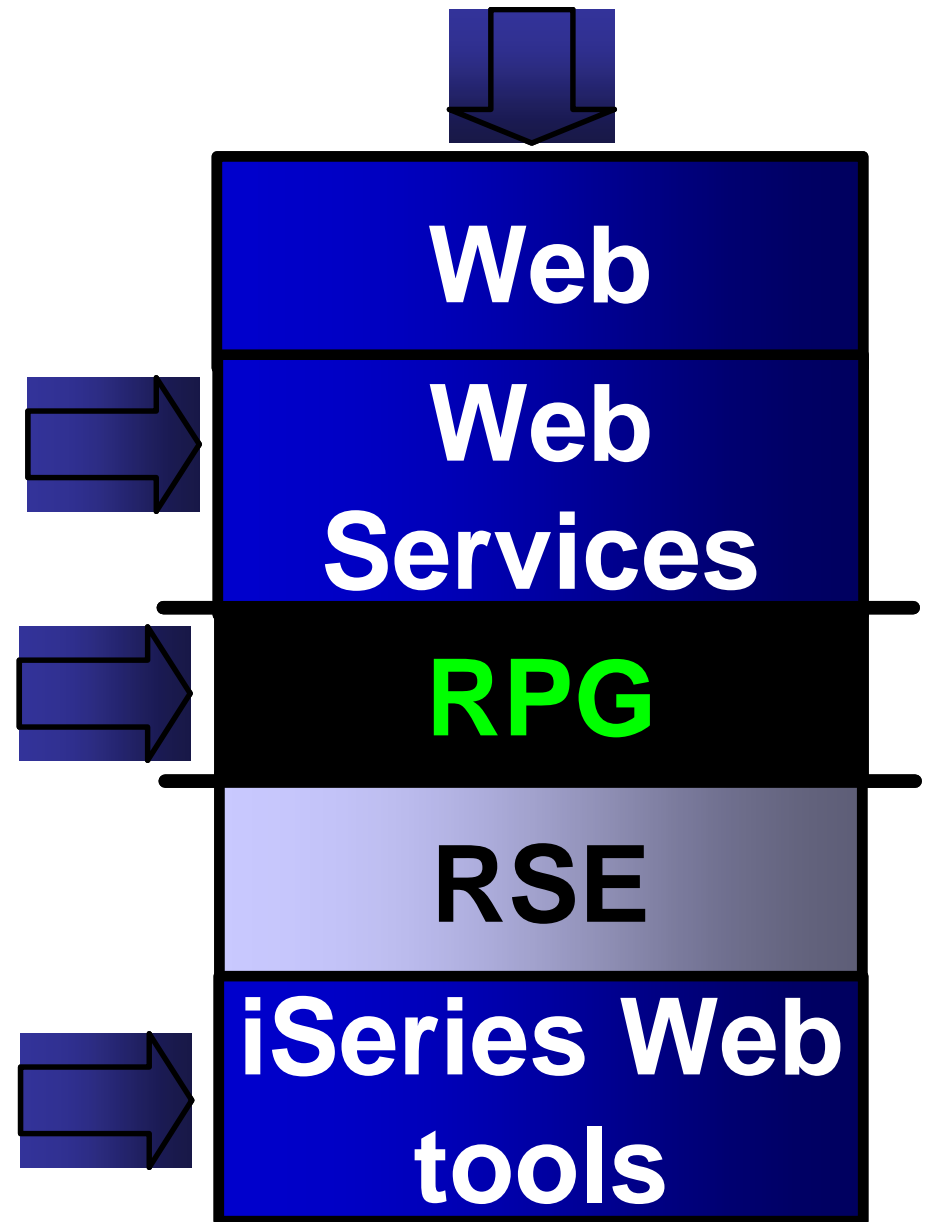
WebSphere on iSeries

The leading software platform for demand

Strengthen Relationships

Enhance customer, partner, employee and supplier user experiences for optimal satisfaction

Business Portals

Business Integration
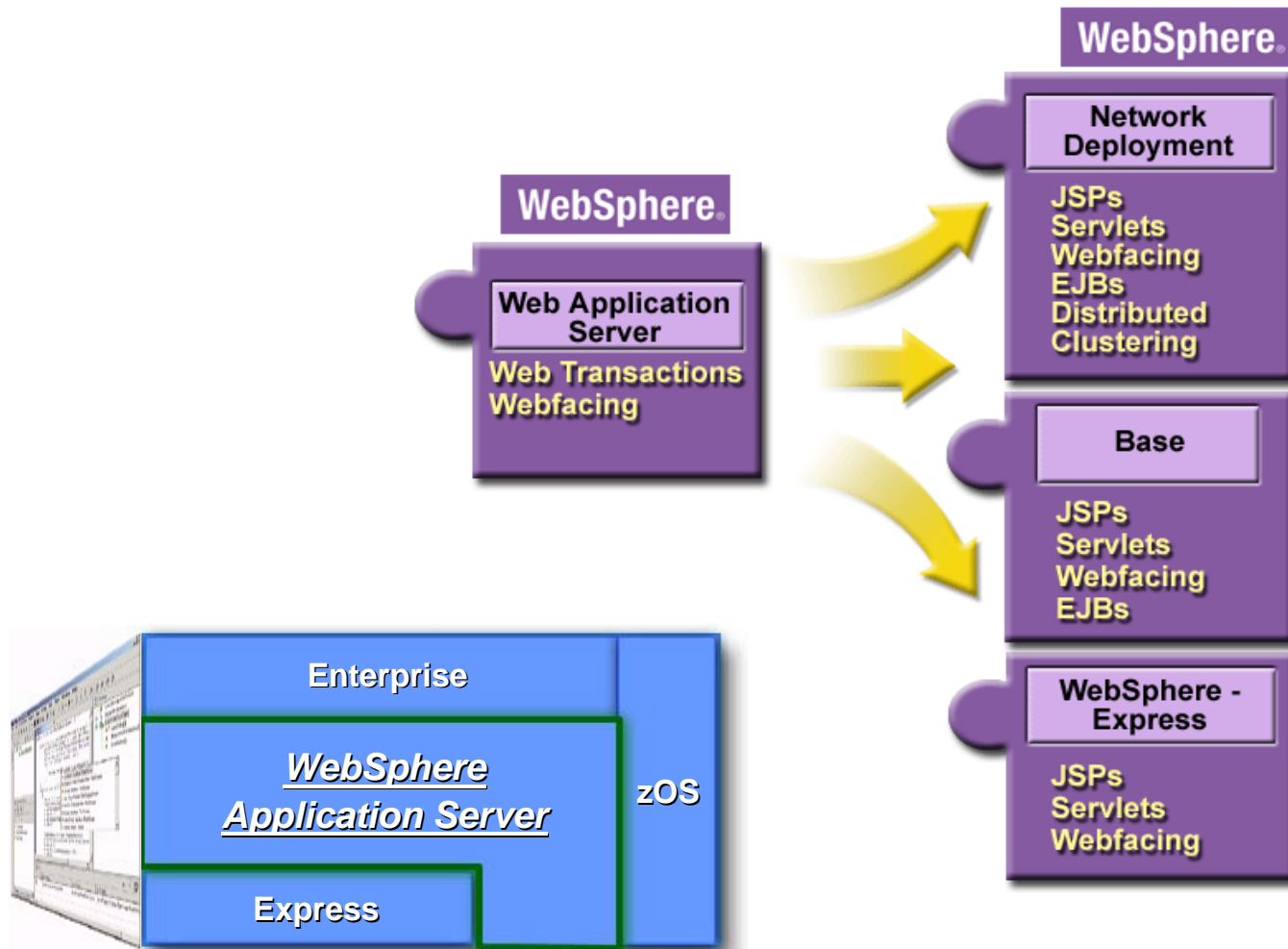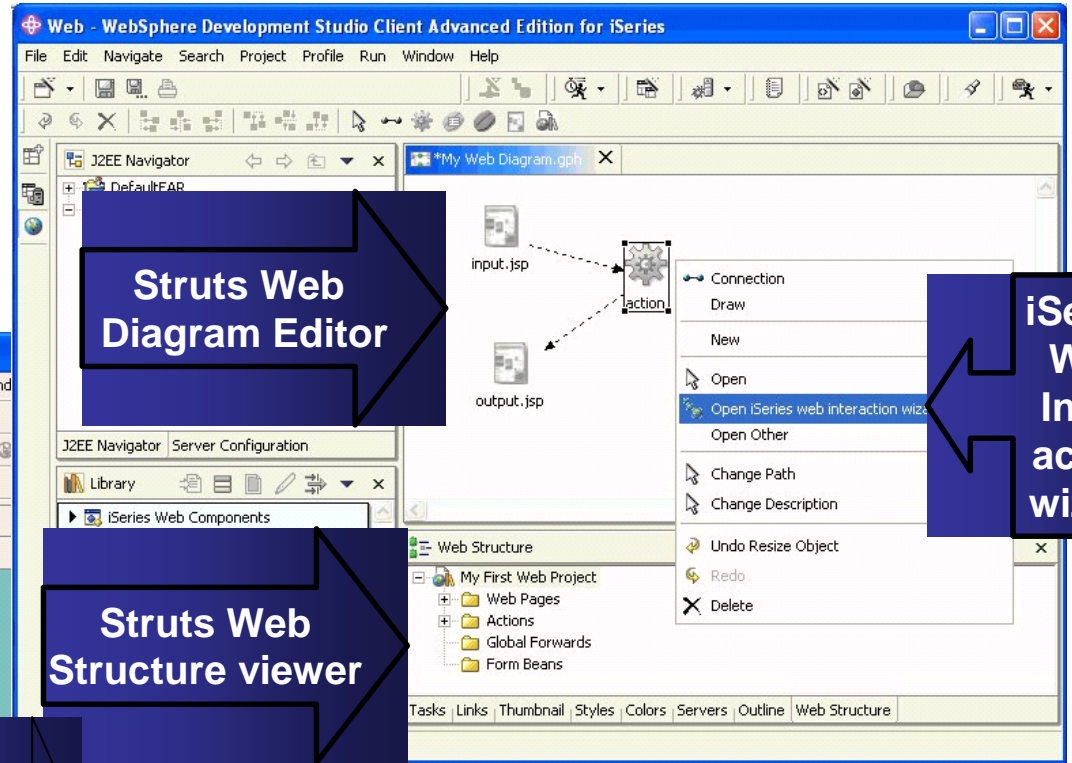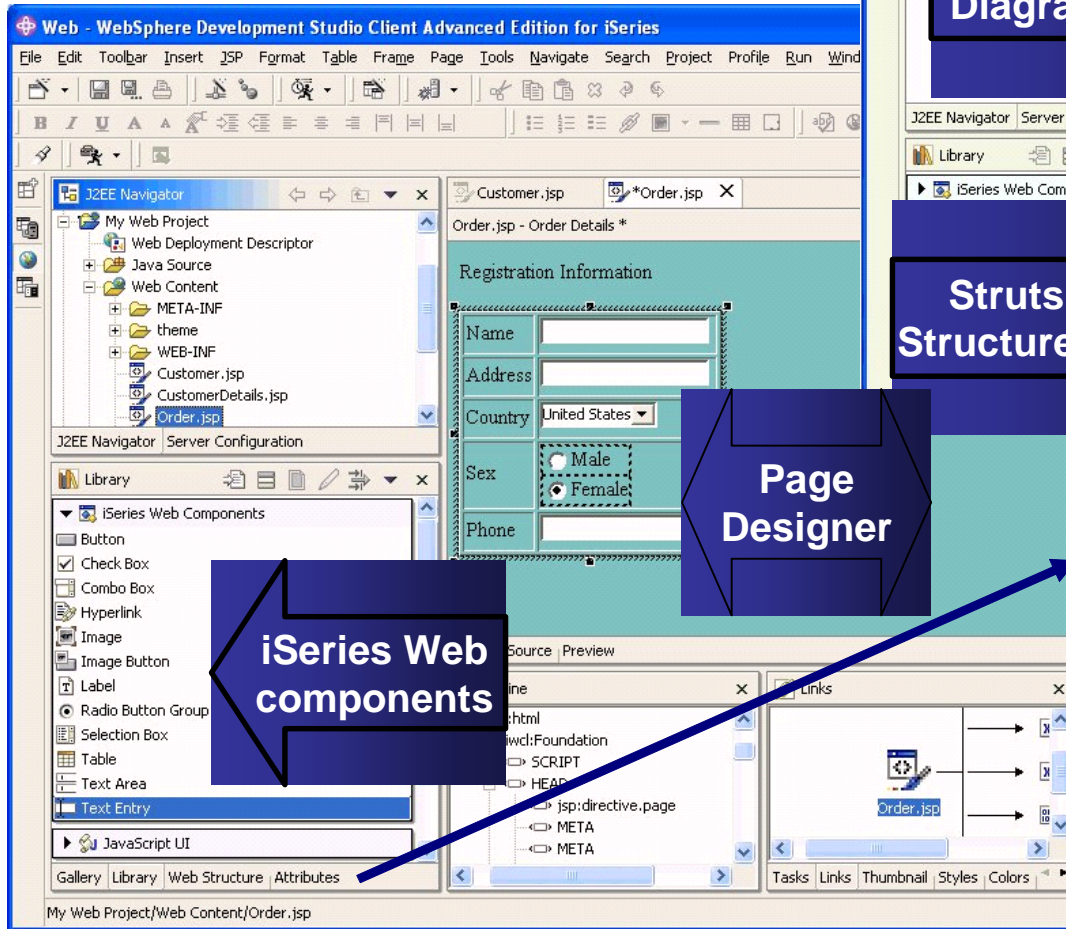
WebSphere

Foundation & Tools

WebSphere MQ Express

WebSphere MQ

operation busin

Reduce Business

Rely upon a high-quality foundation deploy applications for high-perform demand
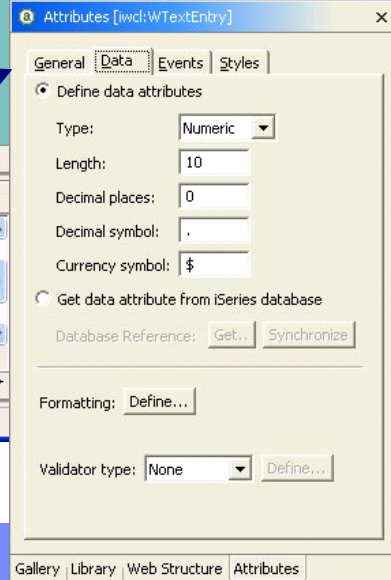
WebSphere Application Server

WebSphere Application Server Express

WebSphere Application Server 5.0

iSeries Web Tools

Struts Web Diagram Editor

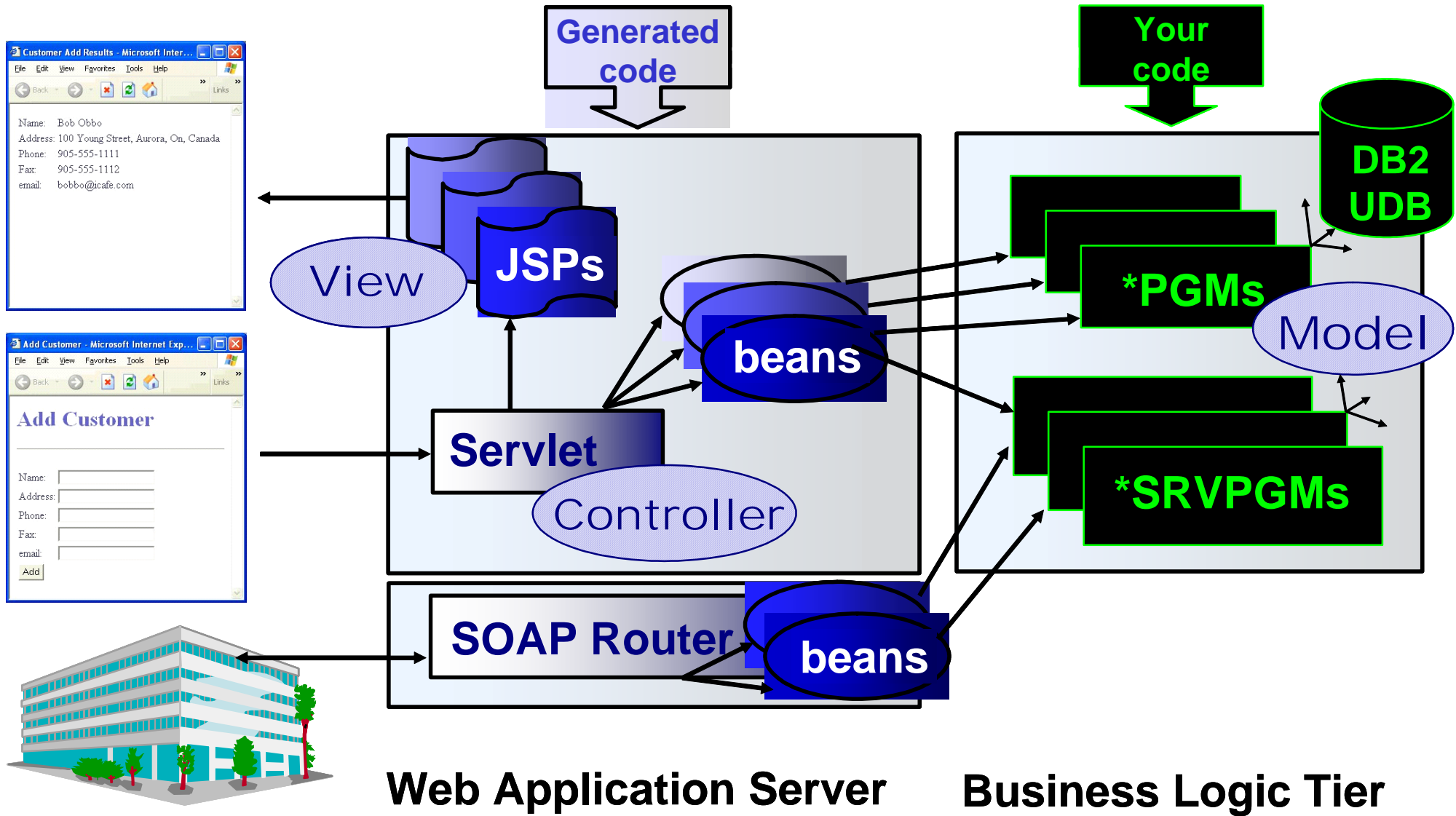**iSeries Web Interaction wizard**

Struts Web Structure viewer

Page Designer

iSeries Web components

Attributes for iSeries text entry

Architecture of "Better Architecture"

Even Better Architecture with Struts

Generated code

Your code

xlatable msgs

JSPs

View

DB2 UDB

Action

***PGMs**

Action Servlet

Model

Struts config file

name
address
...

form beans

Controller

***SRVPGMs**

SOAP Router

beans

Web Application Server   **Business Logic Tier**

http://jakarta.apache.org
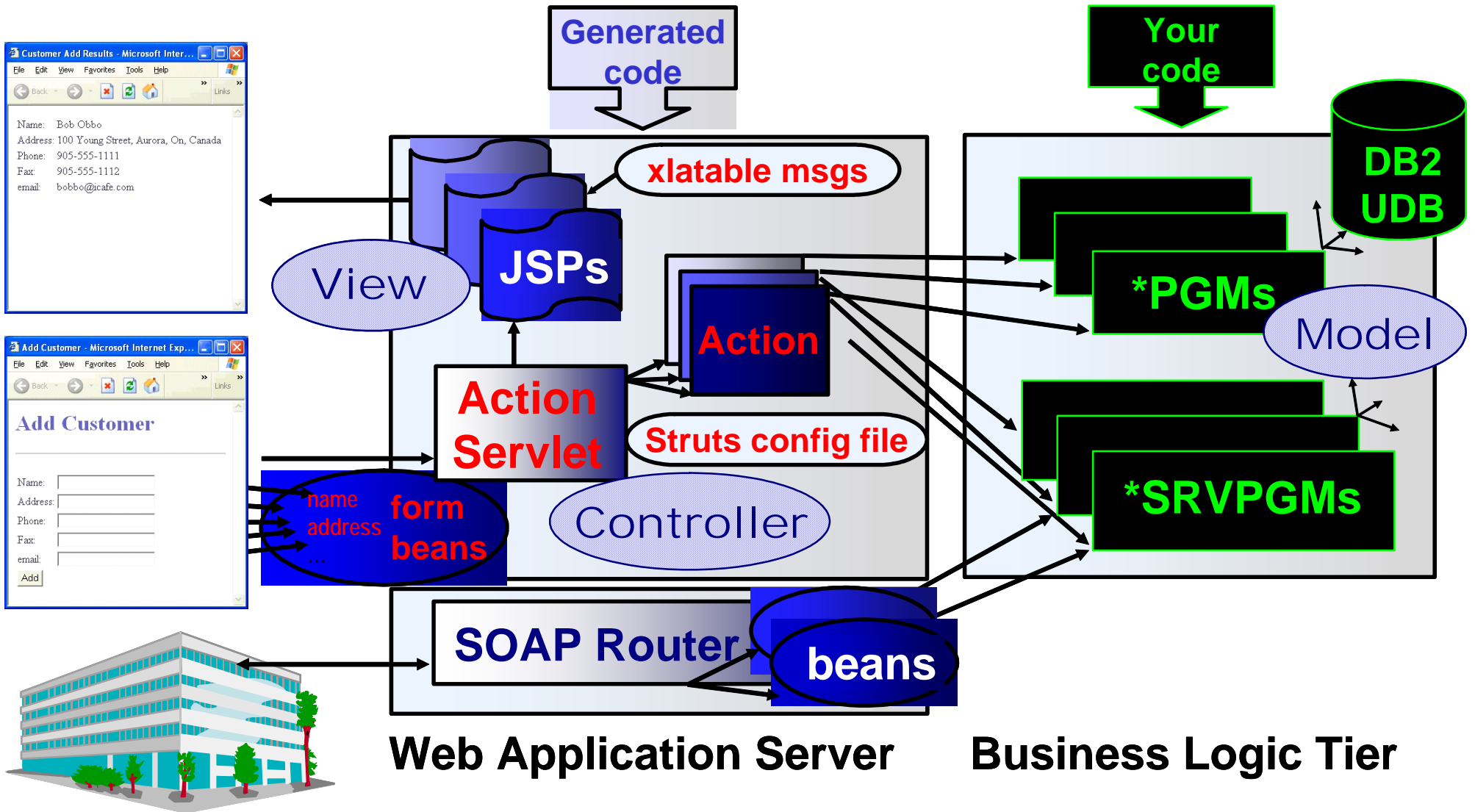
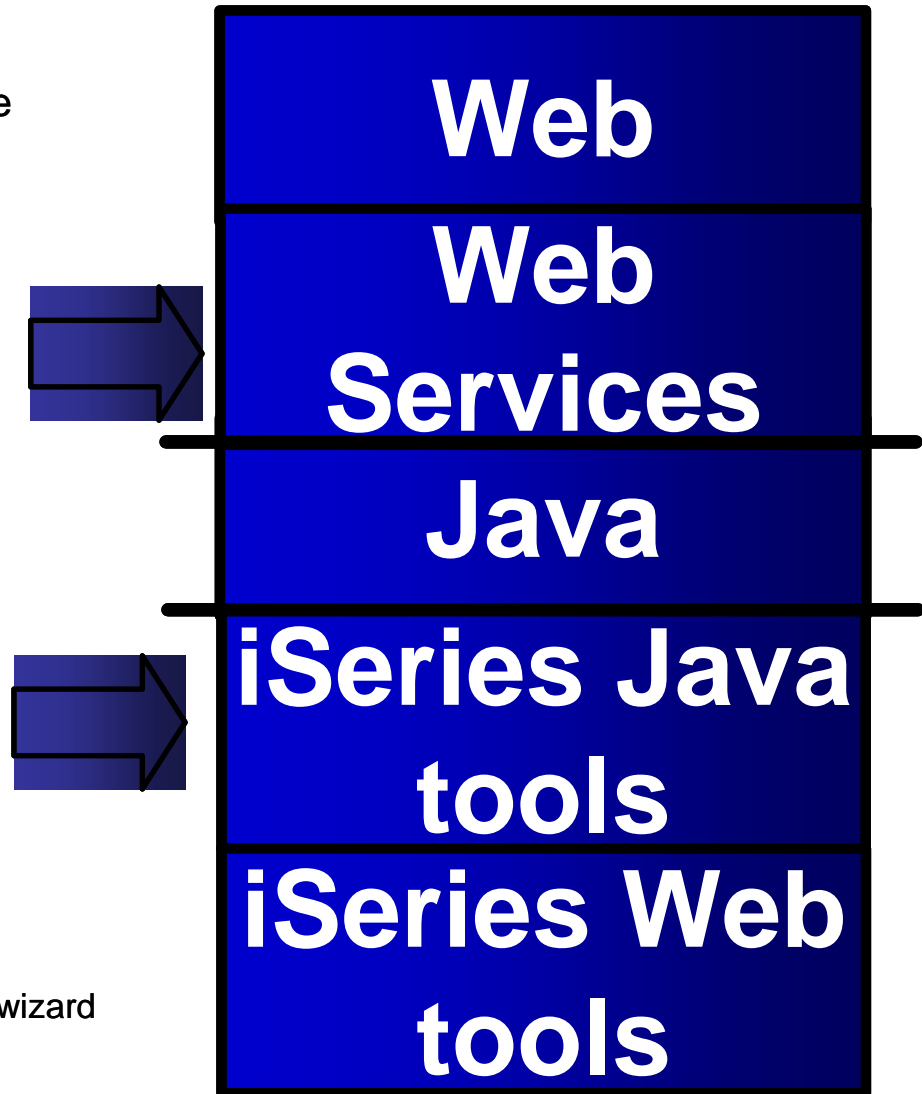# Step 4. Better Portability

- **New e-business Solutions**
  - ►Using Java, Web, & Web services tools in WebSphere Development Studio Client
    - –Even business logic is written in Java (not EJBs, though)
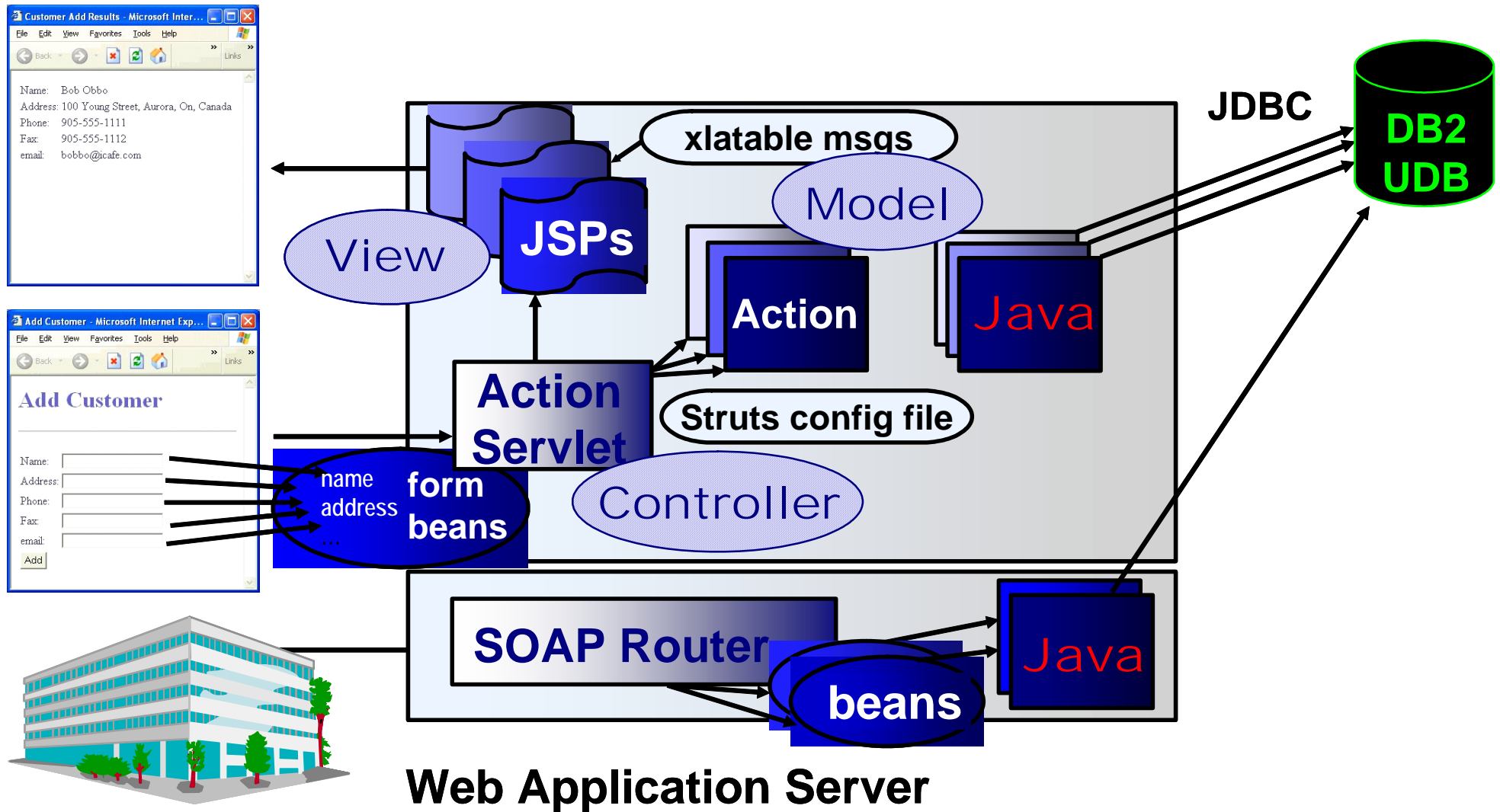- **Value Proposition**
  - ►Allows developers to create e-business solutions
    - –Object oriented & portable
  - ►Expand market for solution developers solutions
- **Education Enablement**
  - ►Java
    - –Introduction, Advanced, IBM Toolbox for Java, OO
  - ►Detailed e-business (including Java code)
    - –How to write servlets & JSPs, JavaScript, HTML
    - –Struts, including Struts actions
    - –Web services, XML parsing
  - ►Tools
    - –Eclipse Java tools & iSeries extensions
    - –iSeries Web, Struts, Web services, & iSeries Program Call wizard
  - ►WebSphere Application Server
    - –Beyond WebSphere Application Server - Express

Web

Web Services

Java

iSeries Java tools

iSeries Web tools

Better Portability

Step 5. Better Scalability

- **Create Highly Scalable e-business Solutions**
  - ► Using J2EE, EJB, Java, Web, & Web services tools
- **Value Proposition**
  - ► Create portable, J2EE-compliant solutions for
    high-volume, high-transaction-rate, e-business environments
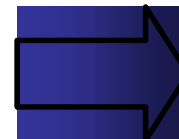- **Education Enablement**
  - ► J2EE
    - – Enterprise JavaBeans (EJBs), Message Driven Beans (MDBs)
    - – J2EE services (e.g., JMS)
    - – J2EE security, LDAP, JNDI
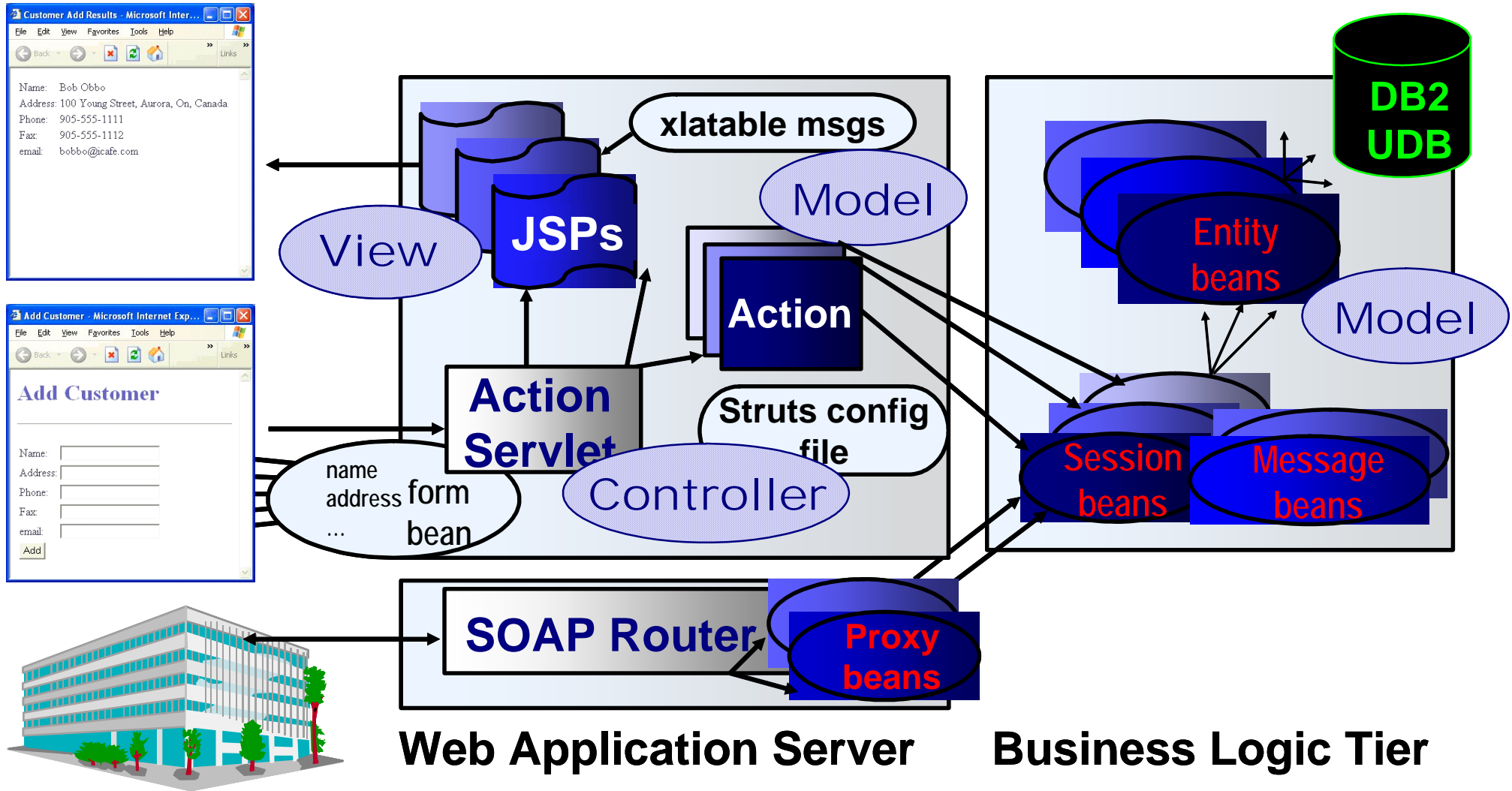 - ► Tools
    - – Eclipse Java tools, J2EE tools, & iSeries extensions in
      WebSphere Development Studio Client
    - – Tools: iSeries Web, Struts, Web services
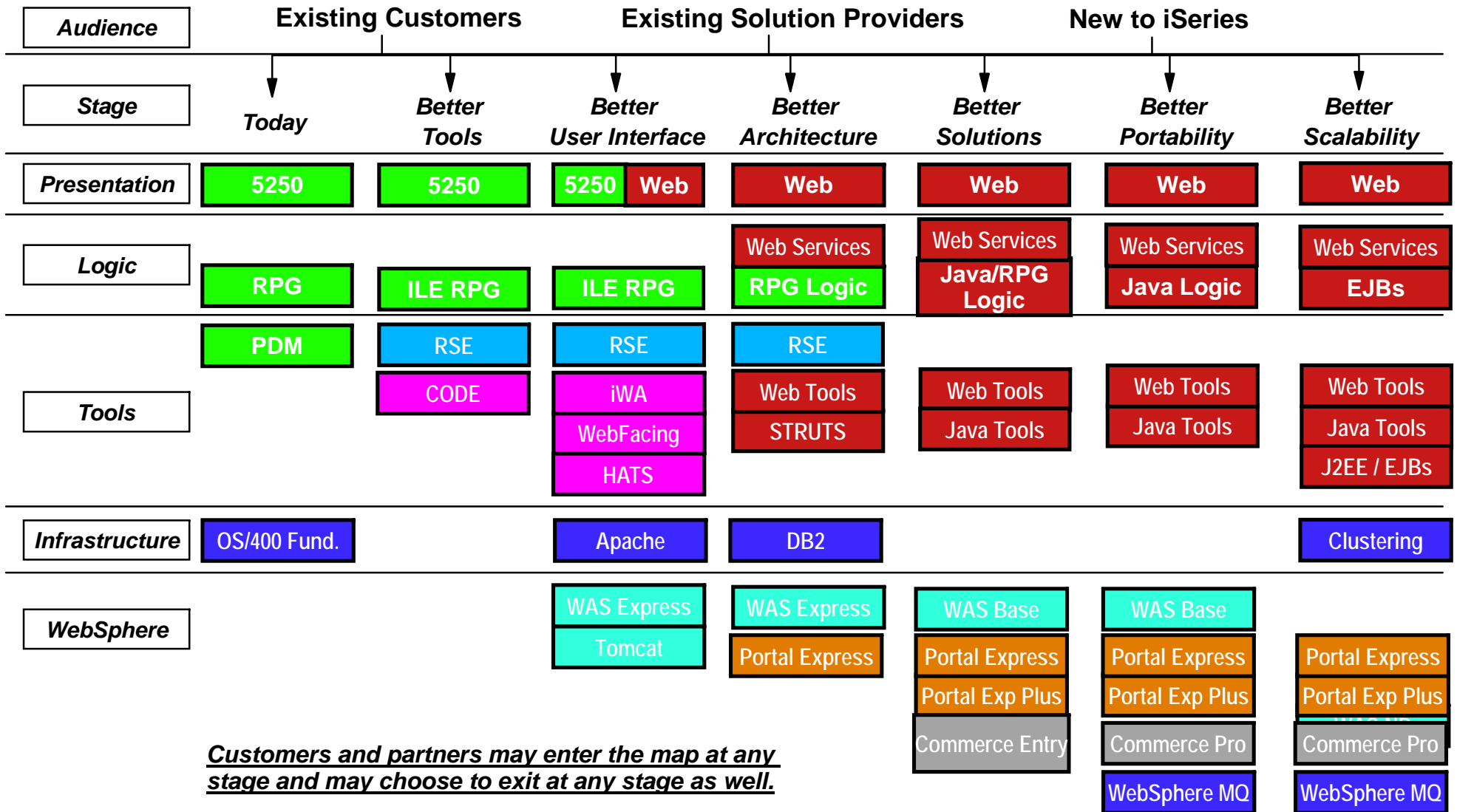   (including iSeries Program Call wizard)
  - ► WebSphere Application Server V5.0 & ND

Web

Web Services

EJBs, MDBs

iSeries Java tools

iSeries Web tools

EJBs, J2EE tools

Better Scalability

Web Application Server   **Business Logic Tier**

Developers Road Map

Audience	Existing Customers		Existing Solution Providers		New to iSeries		
Stage	Today	Better Tools	Better User Interface	Better Architecture	Better Solutions	Better Portability	Better Scalability
Presentation	5250	5250	5250 / Web	Web	Web	Web	Web
Logic	RPG	ILE RPG	ILE RPG	Web Services / RPG Logic	Web Services / Java/RPG Logic	Web Services / Java Logic	Web Services / EJBs
Tools	PDM	RSE / CODE	RSE / iWA / WebFacing / HATS	RSE / Web Tools / STRUTS	Web Tools / Java Tools	Web Tools / Java Tools	Web Tools / Java Tools / J2EE / EJBs
Infrastructure	OS/400 Fund.		Apache	DB2			Clustering
WebSphere		WAS Express / Tomcat	WAS Express / Portal Express	WAS Base / Portal Express / Portal Exp Plus / Commerce Entry	WAS Base / Portal Express / Portal Exp Plus / Commerce Pro / WebSphere MQ		Portal Express / Portal Exp Plus / Commerce Pro / WebSphere MQ

Customers and partners may enter the map at any stage and may choose to exit at any stage as well.

RSE = Remote System Explorer

http://www.ibm.com/servers/eserver/iseries/roadmap/index.html

Search

Home | Products & services | Support & downloads | My account

Products > Servers > Education > Roadmaps > iSeries Roadmaps

→ Select a country

← Servers

Education

· What's New

· On-line Education

· Classroom

· Redbooks/Workshops

· Roadmaps

· Media

· Events

· Certification

· IBM Scholars Program

· Contact Campus

Related links:

IBM Training

PartnerWorld

IBM @server Technical Support

IBM TotalStorage

The **Campus**

Your source for IBM @server™ and TotalStorage® education

iSeries Developer Roadmap

Better Architecture

After mastering Better Tools in the WebSphere Development Studio and applying Better Interfaces, this is the first step along the road to J2EE implementation that involves developing new business logic.

To achieve a Better Architecture, an understanding is needed of fol products and technologies:

- **Writing modular callable Code**
  A general understanding of separating business logic from Integrated Language Environment (ILE), DB2 features, SQL smaller modular reusable components offers the flexibility extendable and extensible application.
- **Developing a Web Application**
  A general understanding is needed of Java Beans, servlets JavaServer Pages and their purpose in a Model, View, Cont architecture.
- **STRUTS**
  Using a proven open framework for application architecture template that is reusable for all your application needs.

Fast path

← iSeries
  Technical Skills
  Education Home

→ Better Tools

To learn more about database

Face-to-Face Learning

Enroll in course S6145 - DB2 UDB for iSeries (1 day)

Enroll in course - DB2 Performance workshop

Web-based Learning

Register for - DB2 UDB for iSeries online courses

Documentation, Redbooks, white papers, etc.

IBM Solutions Enablement Web site - DB2 UDB for iSeries

Explore - DB2 UDB for iSeries white papers

Return to top of page

From iSeries Home Page

Hardware

Small to Medium Enterprises

Models
800, 810

Features
Silicon-on-insulator (SOI) processors; support for multiple operating environments, Web modernization, dynamic logical partitioning, 5250 Online Transaction Processing (OLTP); WebSphere-Express for iSeries, and e-business and data management tools

Processors
1-Way, 2-Way

Processor performance
300-2700 CPW

Memory (maximum)
16 GB

Disk (maximum)
14 TB

Medium to Large Enterprises

Models
825, 870, 890

Features
POWER4 processors, support for multiple operating environments, On/Off Capacity on Demand, WebSphere Express - for iSeries, 5250 Online Transaction Processing (OLTP), dynamic logical partitioning, support for Windows servers, e-business and data management tools, and Linux

Processors
3/6-Way, 5/8-Way, 8/16-Way, 16/24-Way, 24/32-Way

Processor performance
3600-37400 CPW

Memory (maximum)
256 GB

Disk (maximum)
144 TB

Greenstreak II

GREENSTREAK
ENHANCE. MODERNIZE. EXPLOIT.

Need directions?

iSeries

→ iSeries Developer roadmap

Special report

iSeries: Three in one

Websphere
Web Serving

→ See the full details

Questions?