bm.com

e-business

WebSphere Application Server 5 for iSeries: installation, configuration, and administration

SP04

ITSO iSeries Technical Forum

Aleksandr Nartovich

Redbooks

International Technical Support Organization

F08SP04.PRZ

IBM

1

Objectives

❏ Provide understanding of J2EE specification and application servers

❏ Provide understanding of which WebSphere Application Server editions/products are available on iSeries

❏ Provide understanding of the WebSphere Application Server V5 for iSeries system architecture

❏ Provide understanding of the installation process and initial configuration

Agenda

❏ Introduction to J2EE

❏ Application Server

❏ WebSphere Application Server V5.0 for iSeries

  ⚠ Overview

  ⚠ Terminology

  ⚠ Packaging

  ⚠ Installation

  ⚠ Initial Configuration

  ⚠ Configuring the HTTP Server

  ⚠ Administration tools

  ⚠ Migration

  ⚠ Problem determination

  ⚠ Topologies

Introduction to J2EE

What's J2EE?

Java 2 Platform, Enterprise Edition (J2EE) defines a standard for architecting and developing multi-tier server-based applications. It defines a standard architecture:

- ❑ The application model
- ❑ The platform for hosting applications
- ❑ A compatibility test suite (CTS)
- ❑ A reference implementation

J2EE Editions

These are three editions that make up the Java 2 platform:

- ❏ Java 2 Platform, Micro Edition (J2ME)
  - ⚠ An optimized Java runtime environment targeting
    - ➤ Pagers
    - ➤ Cellular phones
    - ➤ Screen phones
    - ➤ Digital set-top boxes
    - ➤ Car navigation systems
- ❏ Java 2 Platform, Standard Edition (J2SE)
  - ⚠ Java 2 SDK tools
  - ⚠ Runtimes
  - ⚠ APIs for developing applets and applications
- ❏ Java 2 Platform, Enterprise Edition (J2EE)
  - ⚠ A single architecture made up of several technologies
  - ⚠ A comprehensive application programming model
  - ⚠ A compatibility test suite for building enterprise-class server-side applications

F03SP04.PRZ

J2EE Benefits

- ❑ Simplified architecture

- ❑ Portability

- ❑ Integration with existing systems

- ❑ Scalability

- ❑ Off-the-shelf development solutions
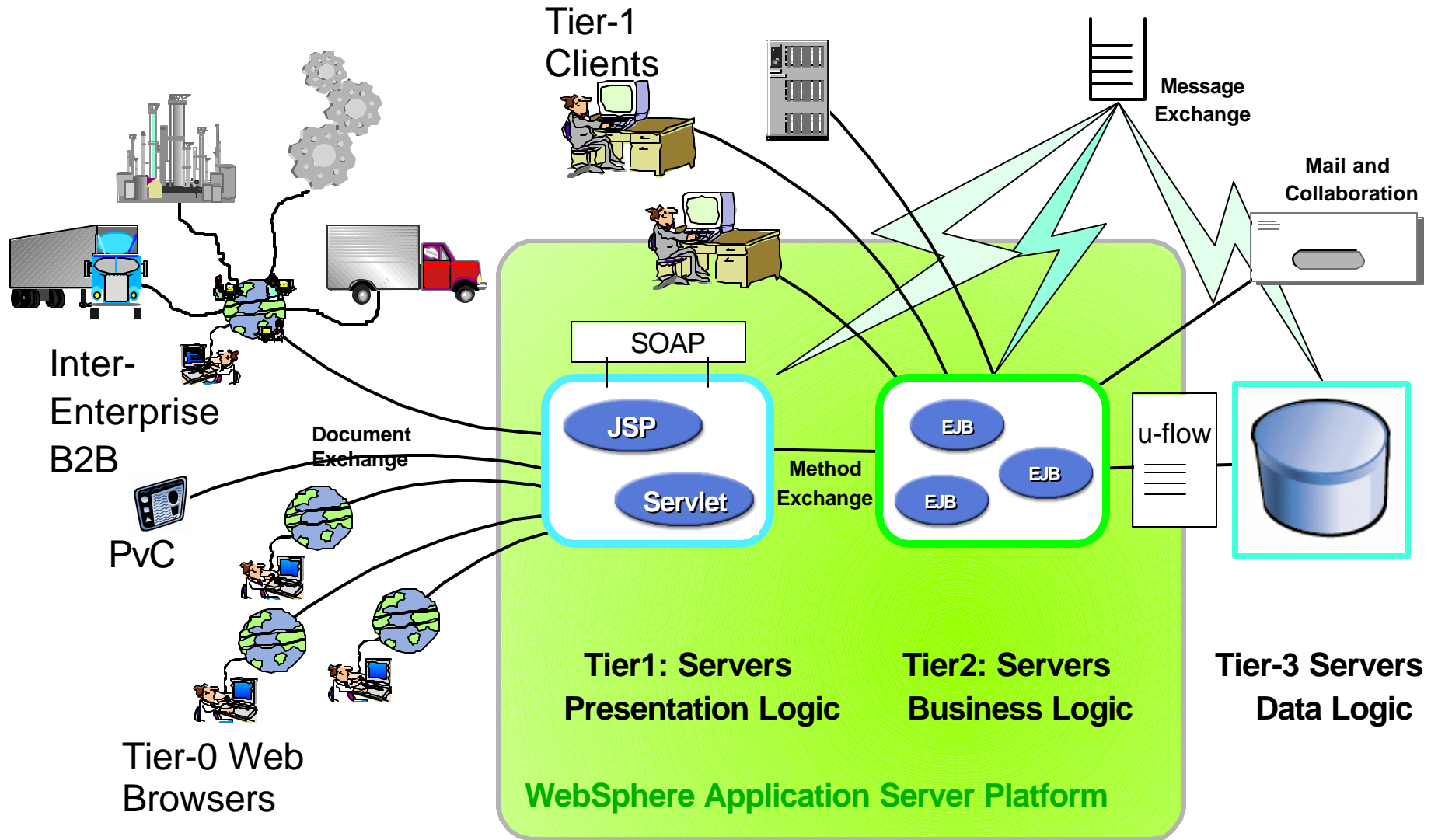
- ❑ Flexible security model

Multi-tier Application Environments

Typically, we divide J2EE applications into three tiers:

- ❑ The first tier contains the presentation logic
  - ⚠ Typically done by a servlet
  - ⚠ JavaServer Page
- ❑ The middle tier contains the business logic
  - ⚠ Servlets
  - ⚠ Enterprise JavaBeans
- ❑ The third tier contains the database and legacy applications
- ❑ Clients typically interface to the application through
  - ⚠ A Web browser
  - ⚠ A Java application
  - ⚠ Pervasive computing device

Multi-tier Application Environment

Tier-1
Clients

Message
Exchange

Mail and
Collaboration

Inter-
Enterprise
B2B

Document
Exchange

PvC

SOAP

JSP

Servlet

Method
Exchange

EJB

EJB

EJB

u-flow

Tier-0 Web
Browsers

**Tier1: Servers
Presentation Logic**

**Tier2: Servers
Business Logic**

**Tier-3 Servers
Data Logic**

WebSphere Application Server Platform

J2EE Containers

Containers provide the runtime support for the application components

- ❑ Containers provide a view of the underlying J2EE APIs to the application components
- ❑ Containers separate J2EE components
- ❑ Containers inject services
  - ⚠ Declarative transaction management
  - ⚠ Security checks
  - ⚠ Resource pooling
  - ⚠ State management

J2EE Standard Services

Standard services include:

- ❑ HTTP and HTTPS

- ❑ Java Transaction API (JTA)

- ❑ Remote Method Invocation/Internet Inter-ORB Protocol (RMI/IIOP)

- ❑ Java Interface Definition Language (Java IDL)

- ❑ Java Database Connectivity (JDBC)

- ❑ Java Message Service (JMS)

- ❑ JavaMail and JavaBeans Activation Framework (JAF)

- ❑ Java Transaction API (JTA and JTS)

- ❑ XML

- ❑ J2EE Connector Architecture

- ❑ Resource managers

J2EE Application Packaging

The assembly process includes:

❑ Selecting files to include in the module
- ⚠ Enterprise beans
- ⚠ Servlets, JavaServer Pages (JSP), files and other Web components
- ⚠ Resource adapter (connector) implementations
- ⚠ Application clients
- ⚠ Other supporting classes and files

❑ Creating a deployment descriptor

❑ Creating an Enterprise Archive (EAR) file

J2EE Enterprise Archive File (EAR)

EAR files include these archives:

- ❑ Web application archives (WAR)

- ❑ Resource adapter archives (RAR)

- ❑ Enterprise JavaBeans (EJB JAR)

- ❑ Application client archives (JAR)

What Is an Application Server?

Application Servers

❑ Extend Web server request handling capabilities

❑ Make dynamic request responses possible

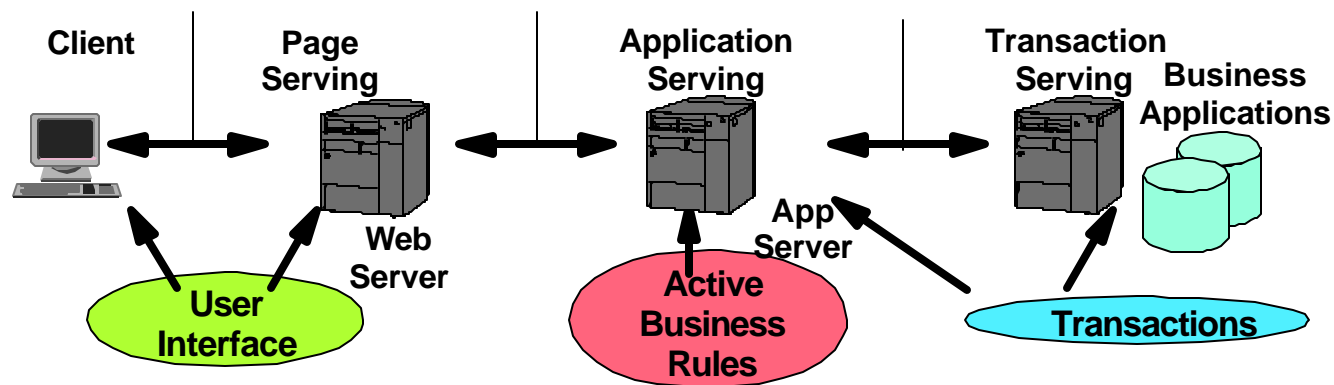# Application Servers (Cont.)

Application servers:

- ❑ Work with a Web server to manage browser and Java-based client sessions
- ❑ Support server-side business logic (Servlets/JavaServer Pages/EJBs)
- ❑ Connect to backend computing resources for data and transaction processing

Application server benefits:

- ❑ Simplify development and deployment of Web-enabled e-business applications
- ❑ Support connections to legacy data and applications
- ❑ Deliver a set of application deployment and management tools

© 2003 IBM Corporation

WebSphere Application Server V5.0 for iSeries

Agenda

- ❑ Overview

- ❑ Terminology

- ❑ Packaging

- ❑ Installation

- ❑ Initial Configuration

- ❑ Configuring the HTTP Server

- ❑ Administration tools

- ❑ Problem determination
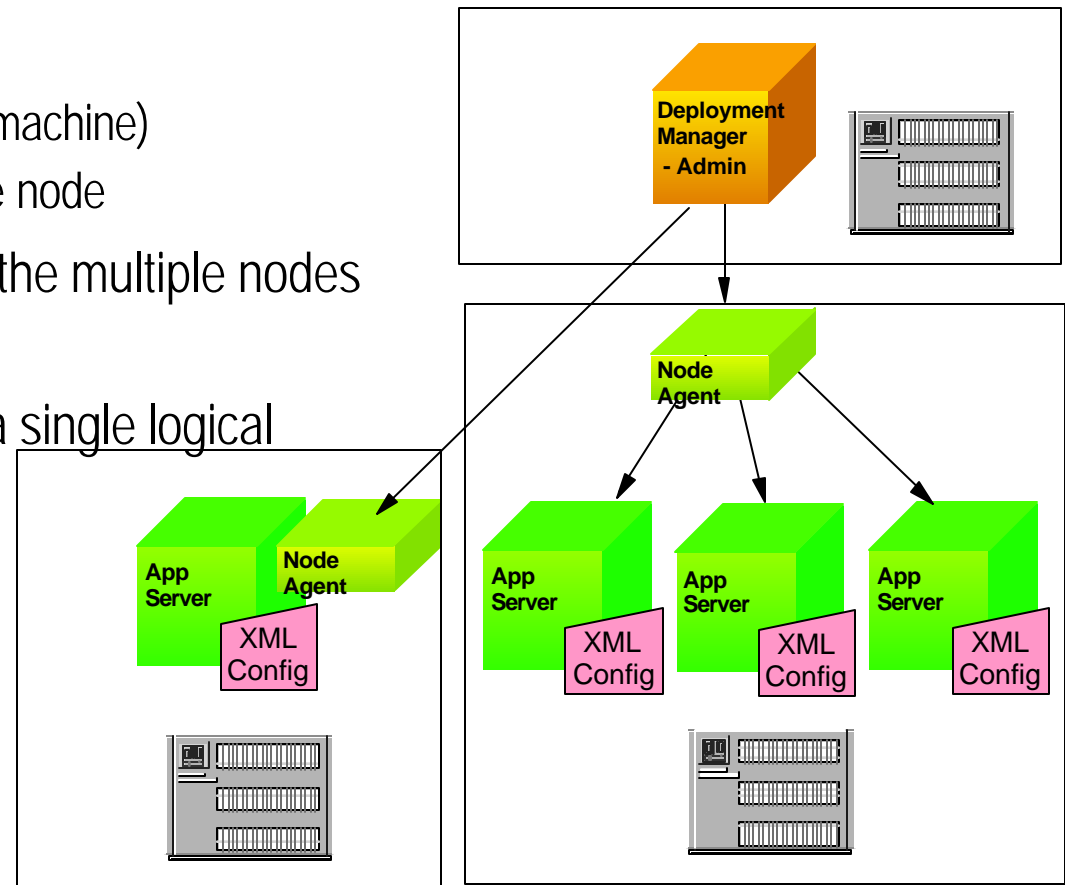
- ❑ Migration

- ❑ Topologies

Major Features

- Full J2EE v1.3 support
  - EJB 2.0, Servlet 2.3, JSP 1.2
  - Integrated, built-in JMS provider
  - Interoperable Naming Service
  - J2EE 1.3 Security: Java 2 Security, JAAS, Enhanced Pluggable Authentication
- JDK 1.3.1
- New administrative model
  - Based on Java Management Extensions (JMX)
  - Provides improved failover capability and high availability
  - User interface enhancements and application management

- Edge Components Integration
- Extensions: Beyond the standard programming model
- Security
- Problem determination and tracing
- Application Assembly Tool
- Enhanced migration tooling
- Enhanced Web Services support
  - Enhanced SOAP support, Private UDDI, and WebServices Gateway
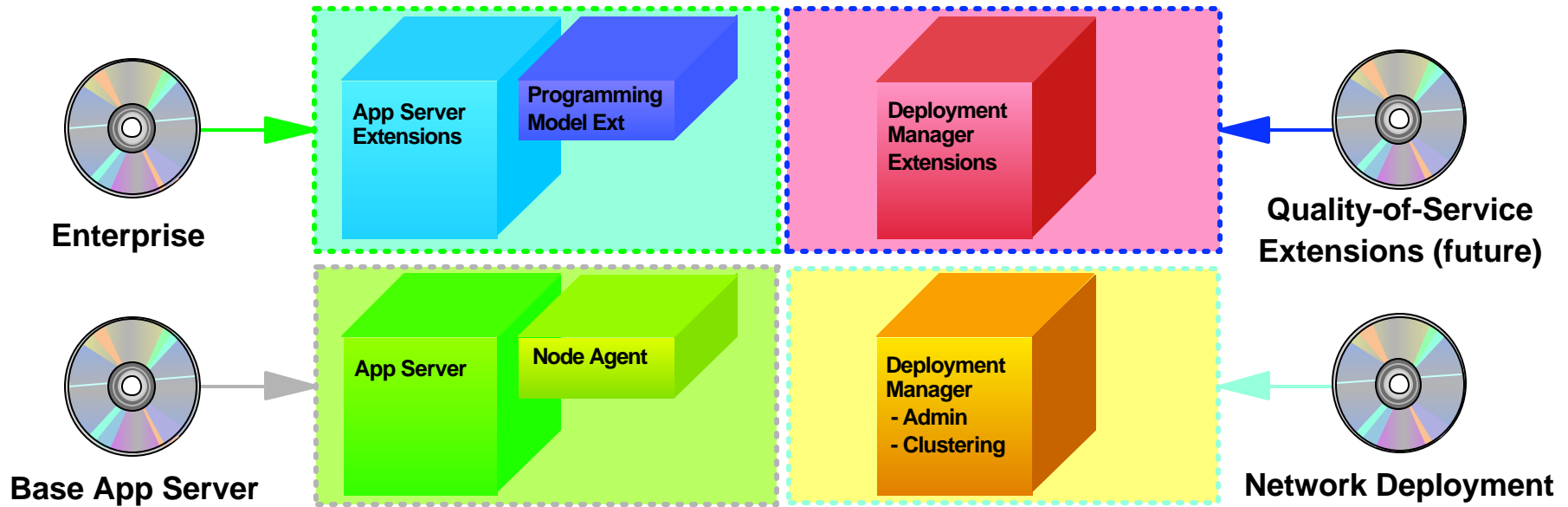- Extended relational DB support

New Terminology

□ **Managed process or server**: Each server runs in its own Java virtual machine (JVM)

  ⚠ Application servers

  ⚠ JMS server

□ **Node agent**

  ⚠ Resides on a single node (physical machine)

  ⚠ Manages the servers running on the node

□ **Deployment manager**: Manages the multiple nodes in a distributed topology

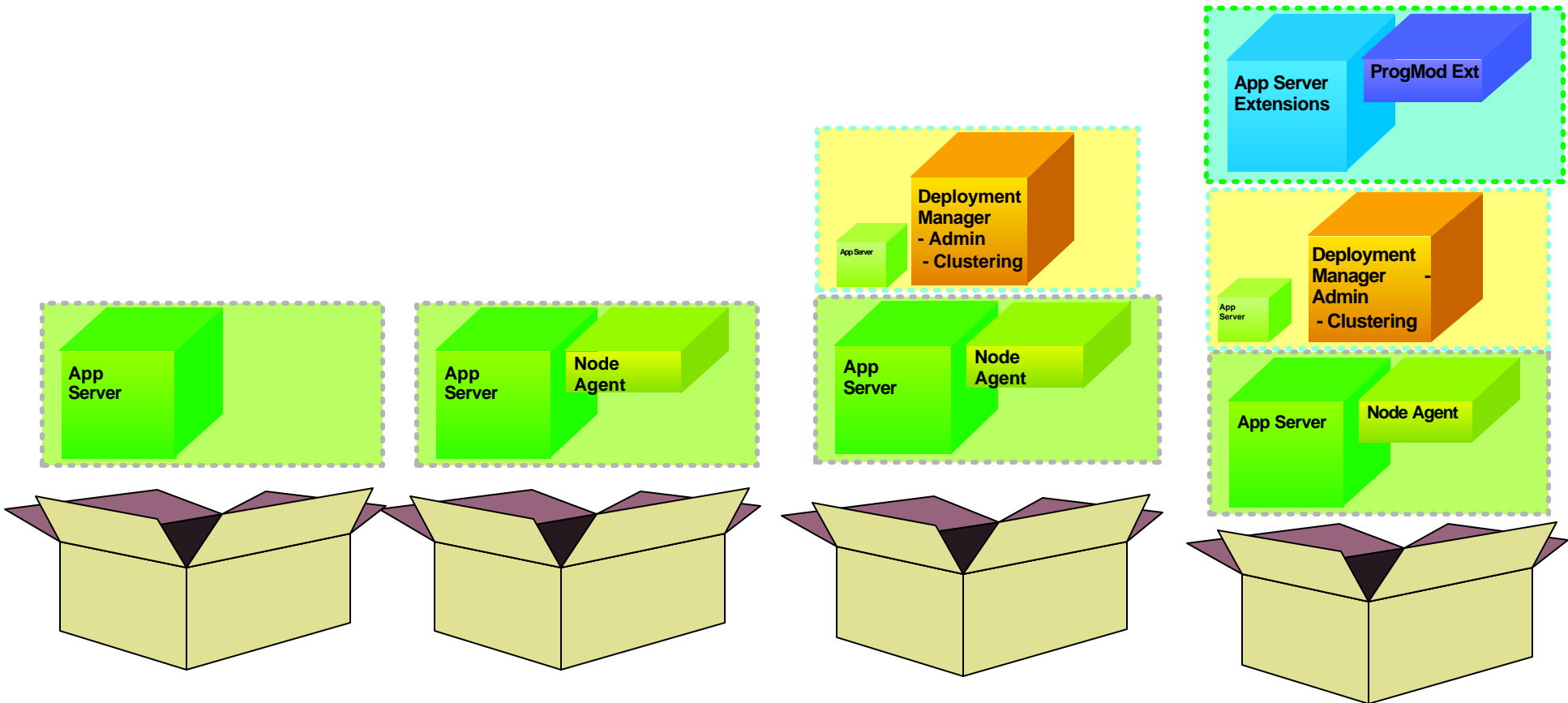□ **Cell**: Network of multiple nodes in a single logical administration domain

Deployment Manager - Admin

Node Agent

App Server Node Agent XML Config

App Server XML Config

App Server XML Config

App Server XML Config

© 2003 IBM Corporation

WAS V5.0: Packaging Modules

Enterprise

App Server Extensions

Programming Model Ext

Deployment Manager Extensions

Quality-of-Service Extensions (future)

Base App Server

App Server

Node Agent

Deployment Manager
- Admin
- Clustering

Network Deployment

These modules will be combined in different product packaging configurations

WebSphere Packaging Scenarios

App Server Extensions

ProgMod Ext

Deployment Manager
- Admin
- Clustering

App Server

Deployment Manager -
Admin
- Clustering

App Server

App Server

App Server | Node Agent

App Server | Node Agent

App Server | Node Agent

WebSphere Application Server Express V5 for iSeries

WebSphere Application Server, Version 5

WebSphere Application Server Network Deployment, Version 5

WebSphere Application Server Enterprise, Version 5

WAS V5.0 Packaging and Features

	IBM WebSphere Application Server Express	IBM WebSphere Application Server, Base	IBM WebSphere Application Server Network Deployment
Application Server	Lightweight version	yes	yes
IBM HTTP Server	Comes with iSeries	Comes with iSeries	Comes with iSeries
Application Client	no	yes	yes
Application Server Toolkit	no	yes	yes
Edge Components	no	no	yes
Deployment Manager	no	no	yes
DB2 Universal Database Edition V7.2	DB2 native to OS/400	DB2 native to OS/400	DB2 native to OS/400
LDAP	Integrated into OS/400	Integrated into OS/400	Integrated into OS/400

WebSphere V5.0 Standards Checklist

Standards	Level	WebSphere 5.0
J2EE	1.3	✓ Fully certified and part of Sun's J2EE list
EJB	2.0	✓ EJB 2.0 and EJB 1.1 support
JDK	1.3	✓ JDK 1.3
Servlet	2.3	✓ Servlet 2.3
JSP	1.2	✓ JSP 1.2
JTS/JTA	1.0	✓ With distributed transactions
JMS	1.0.2	✓ With Native Provider, and MQ plug-in
JDBC	2.0	✓ 2PC across heterogeneous databases
JNDI	1.2	✓ JNDI 1.2 for EJB lookup and CosNaming
RMI/IIOP	1.0	✓ Fully supported
JavaMail/JAF	1.2	✓ Plus Domino support
SSL Security	2.0	✓ JSSE and JCE
XML JAXP	1.0	✓ XML in EJBs
J-IDL/CORBA		✓ IIOP 1.2
J2C	1.0	✓ Bean and container managed
LDAP		✓ SecureWay, iPlanet, ActiveDirectory
HTTP	1.1	✓ Yes, plus across multiple Web servers
SOAP SOAP-SEC	2.2.2 1.0	✓ SOAP support for WebServices. A tech preview is also available
COM/ASP Support		✓ With Java wrapping and proxy
JMX	1.0	✓ JMX pending
XML4J	4.0	✓ XML support
XSL	2.3	✓ XSL parser

Installation

iSeries Requirements

Hardware

Servlets and JSPs only	Applications that contain EJBs
AS/400e server 170 with processor feat 2292	AS/400e server 170 with processor feat 2385
AS/400e server 720 with processor feat 2061	AS/400e server 720 with processor feat 2062
iSeries Model 270 with processor feat 2250	iSeries Model 270 with processor feat 2252
iSeries Model 820 with processor feat 2395	iSeries Model 820 with processor feat 2396
300 CPW with 512 MB of memory per application server instance	460 CPW with 750 MB to 1GB of memory per application server instance

Use the IBM Workload Estimator for iSeries, which you can find on the Web at:
http://www-912.ibm.com/servlet/EstimatorServlet

Important: WebSphere requires the existence of L2 cache and enough memory.

F03SP04.PRZ

iSeries Requirements

Software

Software	Required	Optional	Comments
OS/400 v5.1 or v5.2	yes		Server must be unrestricted *ALLOBJ authority required
JDK v1.3	yes		5722-SS1 option 30
Qshell	yes		Required to use scripts
Host Servers	yes		5722-SS1 option 12
Required PTFs	yes		
HTTP Server		yes	Apache or Domino Require for Servlet and JSPs requests
Digital Certificates		yes	Required for SSL support
Cryptographic Access Provider		yes	Required for SSL use 5722-AC2 (56-bit) or 5722-AC3 (128-bit)
DB2 Query Manager and SQL Development Kit		yes	5722-ST1 - Helpful for developing client application

Workstation Requirements

Administrative environment requires any browser capable workstation that:

❑ Supports HTML V4.0

❑ Supports Cascading Style Sheets

Note: These two features satisfy both the hardware and software requirements for the administrative environment.

Recommended: 128 Mb RAM minimum

Weighing Your Installation Options

Decide which options are required:

- ❑ By default, all products and all options are installed

- ❑ Installing of a subset of products and options is allowed

- ❑ WebSphere Application Server V5.0 for iSeries (5733-WS5) options:
    - ⚠ (Option Base) WebSphere Application Server (Required): Contains the Readme file and other common files for the product
    - ⚠ (Option 1) Client development and run time: Provides client application development and run time support
    - ⚠ (Option 2) Application server run time:
        - ➤ Requires option 1
        - ➤ Provides the application server run time for WebSphere Application Server
    - ⚠ (Option 3) Samples:
        - ➤ Requires option 2
        - ➤ Provides the samples for WebSphere Application Server
    - ⚠ Language option: Denotes the National Language Support (NLS) option for the product

- ❑ WebSphere MQ V5.3 (5724B41) and WebSphere MQ classes for Java and JMS V5.3 (5639C34)

F03SP04.PRZ

Checking for Previous SW Releases

- ❑ Determine whether WebSphere MQ is already installed on your server
  - ⚠ Enter the Display Software Resources (DSPSFWRSC) command on an OS/400 command line
  - ⚠ Look for the product Resource ID 5724B41
    - ➤ If you do not find it, this product has not been installed
    - ➤ If MQSeries for AS/400 is installed, you must migrate it to WebSphere MQ V5.3 for iSeries to use JMS with WebSphere Application Server
    - ➤ Both MQSeries for AS/400 V4.2 (5769MQ2) and MQSeries for AS/400 V5.x (5733A38) are incompatible for use with WebSphere Application Server
    - ➤ To migrate MQSeries for AS/400 to WebSphere MQ V5.3 for iSeries, see the migration instructions (http://www.ibm.com/software/ts/mqseries/library/manualsa/)

- ❑ Determine whether WebSphere MQ classes for Java and JMS V5.3 is already installed
  - ⚠ Enter the Display Software Resources (DSPSFWRSC) command on an OS/400 command line
  - ⚠ Look for product Resource ID 5639C34
  - ⚠ If you do not find it, then this product is not installed
  - ⚠ If MQSeries classes for Java and JMS (5648C60) is installed on your system, you must uninstall it before you install WebSphere MQ classes for Java and JMS (5639C34). To uninstall, enter this command:

```
DLTLICPGM LICPGM(5648C60)
```

Installing WebSphere MQ: Scenarios

What if MQ Series is already installed?

- ❏ If level of MQ installed matches level to be installed, slip install occurs
- ❏ If previous level of MQ is installed, warning is issued and new level of MQ is NOT installed
  - ⚠ Only not installed for product id 5769MQ2 and 5648C60, slip occurs otherwise
- ❏ In all cases WAS is installed unless explicitly skipped (-was -skip true)

Installing WAS: Process Overview

❑ Install the prerequisite software
- ⚠ Verify that iSeries prerequisites are installed
- ⚠ Verify that workstation prerequisites are installed

❑ Install the correct cumulative PTF package
- ⚠ WebSphere Application Server requires a minimum cumulative PTF package level
- ⚠ Verify that the correct cumulative PTF is installed

❑ Install WebSphere Application Server for iSeries

❑ Install the PTFs

❑ Install the workstation tools for WebSphere Application Server

Installation Options

Installation methods:

- ❑ Install spans 2 CDs - user intervention is required
- ❑ From iSeries CD-ROM (requires *ALLOBJ authority) running one of the following options:
  - ⚠ SETUP script in Qshell
  - ⚠ Run Java (RUNJVA) command on an OS/400 command line

  Note: Optional parameters for both methods are included for custom installations.
- ❑ From a workstation CD-ROM using one of the following options:
  - ⚠ Abstract Windowing Toolkit (AWT)
  - ⚠ Silent mode

Installing from the iSeries Server (QShell)

Here is a partial sample of output from the installation process using the QSH command:

```
> cd /QOPT/WEBSPHERE
$
> SETUP
        Loading installation program. Please wait.
        Checking current configuration. Please wait.
        Installing selected options. Please wait.
        Note: This may take up to 120 minutes to complete.
        Product 5724B41: WebSphere MQ V5.3 for iSeries
                (Code: Option Base)
                  Copying stream file to save file.
                  Restoring licensed program.
                (Language: Option Base)
                  Copying stream file to save file.
                  Restoring licensed program.
                (Code: Option 1)
                  Copying stream file to save file.
                  Restoring licensed program.
        Product 5639C34: WebSphere MQ classes for Java and JMS V5.3 for iSeries
                (Code: Option Base)
                  Copying stream file to save file.
                  Restoring licensed program.
                (Language: Option Base)
                  Copying stream file to save file.
                  Restoring licensed program.
                (Code: Option 1)
                  Copying stream file to save file.
                  Restoring licensed program.
        Product 5733WS5: WebSphere Application Server V5.0 for iSeries
                (Code: Option Base)
                  Copying stream file to save file.
                  Restoring licensed program.
                (Language: Option Base)
                  Copying stream file to save file.
                  Restoring licensed program.
                (Code: Option 1)
                  Copying file to the iSeries.
```

Installing from the Workstation (AWT)

IBM WebSphere Application Server V5.0 for iSeries

WebSphere Application Server V5.0 for iSeries (5733WS5)

Code options to install:

- ☑ (Option Base) WebSphere Application Server
  - Status: Required version is currently installed

- ☑ (Option 1) Client development and run time
  - Status: Required version is currently installed

- ☑ (Option 2) Application server run time
  - Status: Required version is currently installed

- ☑ (Option 3) Samples
  - Status: Required version is currently installed

Language option to install:

- ☐ Install Language Parts Only

English (2924)

InstallShield

< Back   Next >   Cancel

Silent Installation

❑ Silent installation is convenient when you need to repeat the same installation process many times.

❑ To use the silent mode to install WebSphere Application Server from a workstation, you need:

- Verify that the host server jobs are started on your iSeries server
- Verify that TCP/IP is started on the iSeries server
- On your workstation, insert a CD into CD-ROM drive and copy the response file to your hard drive
- Edit the options in the response file
- Run the remote installation using the response file:

  ```
  SETUP -option c:\temp\responsefile
  ```

- This mode does not accept interactive installation options. To specify non-default options, you must use the response file

Note: For security purposes, if the host servers were not running prior to installation, you should return your iSeries server to its original state by using the End Host Server (ENDHOSTSVR) command after the installation is complete.

Silent Installation: Response File

Here is the format of the response file that is shipped on the CD-ROM

```
###############################################################
#
#   ABOUT:                  WebSphere Application Server V5.0 for iSeries
#
#   INSTALL TYPE:               Remote workstation silent installation

#   DOCUMENTATION:      Please see the WebSphere Application Server
#                       for iSeries Installation and Initial Configuration
#                       web site for the most up-to-date information:
#
#                              http://www.ibm.com/websphere/iseries/installws5
#
#   USAGE:              SETUP -options <path>\<responsefile>
#
#   IMPORTANT:               All values must be enclosed in double quotes.
#
###############################################################
# Specify silent install
-silent

# Bean property assignments for target iSeries system
-W DestinationBean.system = "YOURSYSTEM"
-W DestinationBean.username ="YOURUSER"
-W DestinationBean.password = "YOURPSSWD"
```

Default install – what happens

❑ WebSphere MQ V5.3 for iSeries (5724B41) is installed

❑ WebSphere MQ Classes for Java and JMS V5.3 for iSeries (5639C34) is installed

❑ WebSphere Application Server V5 for iSeries (5733WS5 *BASE, Option 1, 2, and 3) is installed

❑ Default remote instance for HTTP/client is created

⚠ Instance name: remote

❑ Default WebSphere Application Server instance is created

⚠ Instance name: default

What if you don't want to install MQ Series?

❑ Local install

⚠ Specify -wmq -skip true -wmqjava -skip true for install parameters

❑ Remote install

⚠ Deselect the MQ products on the appropriate install screens

WAS V5 ND installation

❏ Network Deployment, out of the box, consists of two installs and three basic steps

⚠ WebSphere Application Server V5.0

⚠ WebSphere Application Server Network Deployment V5.0

❏ Installation steps:

⚠ First you install Base option

⚠ Second you install ND

⚠ Third you add the default instance of the Base install to the ND cell managed by the ND default instance

Note: You can run WAS V5 Base and ND on the same iSeries.

WAS V5 ND install: 2 methods

Two methods for installing

❑ InstallShield V4.5.3 used for both methods

❑ Single CD install

❑ Remote install from Windows workstation

⚠ JDK for installing shipped on install CD

⚠ AWT install uses GUI

➤ On iSeries, STRHOSTSVR SERVER(*ALL)

➤ On Windows, double-click setup.exe on CD-ROM drive

➤ GUI displays and walks you through install

✔ Default options selected for you, deselect to change

⚠ Silent install uses response file

➤ On iSeries, STRHOSTSVR SERVER(*ALL)

➤ On Windows invoke setup.exe from CD-ROM drive:

SETUP -options responsefile

where responsefile is the response file you have created

➤ Sample responsefile with default values located on install CD in root directory

© 2003 IBM Corporation

WAS V5 ND install: 2 methods (cont.)

❑ Local install from OS/400

⚠ JDK 1.3 (5722JV1 Option 5) required for install

⚠ RUNJVA CLASS(SETUP) from OS/400 command line

RUNJVA CLASS(SETUP) CLASSPATH('/QIBM/ProdData/OS400/jt400/lib/jt400Native.jar:
/QOPT/WEBSPHERE/OS400:/tmp/WebSphere/WS5INSTALL.JAR')
PROP((os400.runtime.exec QSHELL) (java.version 1.3))

⚠ SETUP script from QShell

➤ STRQSH

➤ cd /QOPT/WEBSPHERE

➤ SETUP

⚠ See Install and Initial Configuration documentation for details on all possible installation parameters

WAS V5 ND default install – what happens?

- Default install - what happens
  - WebSphere MQ Classes for Java and JMS V5.3 for iSeries (5639C34) is installed
  - WebSphere Application Server Network Deployment V5 for iSeries (5733WS5 *Base, Option 5) is installed
  - Default Network Deployment instance is created
    - Instance name: default
    - Server name: dmgr
- What if you don't want to install MQ Classes for Java?
  - Local install
    - Specify -wmqjava -skip true for install parameters
  - Remote install
    - Deselect the MQ product on the appropriate install screen

Installing Program Temporary Fixes

Install the PTFs:

- ❑ This is a required step prior to starting WebSphere Application Server
- ❑ You must install all prerequisites before you install the WebSphere Application Server PTFs

	V5R1	V5R2
WAS V5 Base	SF99243	SF99245
WAS V5 ND	SF99244	SF99246

- ❑ WAS group PTF <u>also includes</u> the following group PTF:
  - ⚠ SF99098 - IBM HTTP server group PTF
  - ⚠ SF99169 - Java group PTF
  - ⚠ SF99502 - DB2 group PTF
- ❑ Check the WebSphere Application Server Web site for the correct PTF

(http://www.ibm.com/eserver/iseries/software/websphere/wsappserver/services/service.htm)

WAS V5 Base: Product Layout

❑ Product library: `QEJBAS5`

❑ Product subsystem: `QEJBAS5`

❑ Product job description: `QEJBJOBD`

❑ Product job queue: `QEJBJOBQ`

❑ Product class: `QEJBCLS`

❑ Product message file: `QEJBMSGFS5`

❑ Runs in *BASE storage pool (system pool 2 on WRKSYSSTS) by default

❑ Product IFS root: `/QIBM/ProdData/WebAS5/Base`

❑ User data IFS root: `/QIBM/UserData/WebAS5/Base`

❑ Embedded Msg Publish and Subscribe Root product directory:
  `/QIBM/ProdData/WebAS5/wemps`

❑ Embedded Msg Publish and Subscribe user configuration and files root directory:
  `/QIBM/UserData/WebAS5/wemps`

WAS V5 ND: Product Layout

❑ Product library: `QEJBAS5`

❑ Product subsystem: `QEJBASND5`

❑ Product job description: `QEJBNDJOBD`

❑ Product job queue: `QEJBNDJOBQ`

❑ Product class: `QEJBNDCLS`

❑ Product message file: `QEJBMSGFS5`

❑ Runs in *BASE storage pool (system pool 2 on WRKSYSSTS) by default

❑ Product IFS root: `/QIBM/ProdData/WebAS5/ND`

❑ User data IFS root: `/QIBM/UserData/WebAS5/ND`

Installing the Workstation Tools

The workstation components include:

- ❑ Administrative scripting tool (wsadmin)
- ❑ Application Assembly Tool (AAT)
- ❑ Enterprise bean deployment tool (ejbdeploy)
- ❑ ANT utilities (ws_ant)
- ❑ Tivoli Performance Viewer (formerly Resource Analyzer)
- ❑ Log analyzer (waslogbr)

Note: Installing the workstation components are optional. The administrative console for WebSphere Application Server is accessed from a Web browser and does not require installation of any workstation components.
The workstation components come on a separate CD.

Preparing the iSeries for WAS

Creating Initial Configuration

To create the configuration, you perform these steps:

- ❑ Configure the software license information
- ❑ Set the SQL server jobs
- ❑ Verify and configure TCP/IP

Configuring Software License Information

After you finish the installation process and before you start the WebSphere Application Server environment, you must set the usage limit from the Proof of Entitlement (POE) or invoice:

- ❏ It is based on the Proof of Entitlement (POE)
- ❏ Update the usage limit using the WRKLICINF command

    Note: Entering any number that exceeds the purchased limit violates the IBM

    purchase agreement.

- ❏ Update Threshold (THRESHOLD) with *USGLMT and press Enter

    Note: Do not leave the threshold limit set to zero.

Setting the Usage Limit


```
Session A - [24 x 80]                                                    _ | 8 | X |
File  Edit  View  Communication  Actions  Window  Help

                      Change License Information (CHGLICINF)

       Type choices, press Enter.

       Product identifier . . . . . . . . > 5733WS5        Identifier
       License term . . . . . . . . . . > V5              Vx, VxRy, VxRyMz, *ONLY
       Feature  . . . . . . . . . . . . > 5050            5001-9999
       Usage limit  . . . . . . . . . .   *NOMAX          0-999999, *SAME, *NOMAX...
       Threshold  . . . . . . . . . . .   *USGLMT         0-999999, *SAME, *CALC...
       Message queue  . . . . . . . . .   *NONE           Name, *SAME, *NONE, *OPSYS
         Library  . . . . . . . . . . .                   Name, *LIBL, *CURLIB
                   + for more values

       Log  . . . . . . . . . . . . . .   *NO             *SAME, *NO, *YES

                                                                             Bottom
       F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
       F24=More keys

MA      a                       MW                                         09/037
     Connected to remote server/host rchasm27 using port 23
```

F03SP04.PRZ

Setting the SQL Server Jobs

Using IBM Developer Kit for Java? Use the Change Prestart Job Entry (CHGPJE) command as shown in this example:

```
CHGPJE SBSD(QSYSWRK) PGM(QSQSRVR) MAXJOBS(*NOMAX)
```

Note: If *NOMAX is not appropriate, specify an integer value for the MAXJOBS parameter.

Verifying and Configuring TCP/IP

❑ Verify that TCP/IP address and LOOPBACK interface are active

❑ Verify your TCP/IP host name

❑ Start TCP/IP

❑ Verify that the server's IP address is associated with the host name by running the ping command:

```
ping hostname
```

Verifying and Configuring TCP/IP (Cont.)

❏ Verify your TCP/IP host name

❏ Run IPTest Java utility

```
RUNJVA CLASS(IPTest) CLASSPATH('/QIBM/ProdData/WebAS5/Base/bin')
```

Note: The class name parameter that you specify for CLASS (IPTest) is case-sensitive.

IPTest Java

```
                              Java Shell Display


   Local Address:  9.9.11.11
   Local Name:  MYHOST.MYHOME.AAA.COM
   All addresses for MYHOST.MYHOME.AAA.COM
          9.9.11.11
   Java program completed
```

Start/Stop WAS instance

Starting a WAS instance

❑ STRSBS QEJBAS5/QEJBAS5

⚠ Starts the default instance

⚠ QEJBAS5 subsystem contains an autostart job entry for job SERVER1

⚠ QEJBJOBD contains the request data parameter to start the default instance

```
QSYS/CALL PGM(QEJBAS5/QEJBSTRSVR) PARM('-instance'
'/QIBM/UserData/WebAS5/Base/default' '-server' 'server1')
```

❑ From OS/400 command line

```
SBMJOB CMD(QSYS/CALL PGM(QEJBAS5/QEJBSTRSVR)
PARM('-instance' '/QIBM/UserData/WebAS5/Base/default'
'-server' 'server1')) JOB(SERVER1) JOBD(QEJBAS5/QEJBJOBD)
JOBQ(QEJBAS5/QEJBJOBQ) USER(QEJBSVR)
```

❑ startServer script

⚠ Use if the subsystem is already started:

```
STRQSH
$ /QIBM/ProdData/WebAS5/Base/bin/startServer
```

⚠ No parameters needed if starting the default server for the default instance

Starting an additional instance

- startServer script
  - Use if the subsystem is already started
    - STRQSH
    - /QIBM/ProdData/WebAS5/Base/bin/startServer -instance instanceName [servername]
  - Must specify the -instance parameter
  - [servername] only needs to be specified if the server name is different from the instance name.
    - Server name IS case sensitive
  - The server name is a standalone parameter (no -optionname value syntax)
  - Examples:
    - `startServer -instance ITSO`
    - `startServer -instance ITSO ITSOserver`
- From OS/400 command line

```
SBMJOB CMD(QSYS/CALL PGM(QEJBAS5/QEJBSTRSVR)
PARM('-instance' '/QIBM/UserData/WebAS5/Base/ITSO'
'-server' 'ITSOserver')) JOB(ITSOserver)
JOBD(QEJBAS5/QEJBJOBD) JOBQ(QEJBAS5/QEJBJOBQ)
USER(QEJBSVR)
```

© 2003 IBM Corporation

Stopping an application server

- ❑ stopServer script
  - ⚠ To stop only the default server (server1)
    - ➤ STRQSH
    - ➤ $ /QIBM/ProdData/WebAS5/Base/bin/stopServer server1
  - ⚠ To stop a server for a non-default instance
    - ➤ STRQSH
    - ➤ $ /QIBM/ProdData/WebAS5/Base/bin/stopServer -instance instancename servername
  - ⚠ For example,
    - ➤ stopServer -instance ITSO ITSOserver
- ❑ ENDSBS SBS(QEJBAS5) DELAY(600)
  - ⚠ Stops all servers running in the subsystem
  - ⚠ Generally best to specify controlled ending, but...
- ❑ ENDJOB JOB(nnnnnn/QEJBSVR/SERVER1) DELAY(600)
  - ⚠ Stops the default server (server1) for the default instances
  - ⚠ Generally best to specify controlled ending

Start/Stop Common Problems

❑ Case sensitivity of server name

⚠ Native code is not case sensitive so JVM is created

⚠ native_stdout.log contains error

[1/18/03 16:07:03:161 UTC] abd76523 WsServer E WSVR0004E: The server name, FSTEWART, is not a valid name.

[1/18/03 16:07:03:192 UTC] abd76523 WsServer E WSVR0009E: Error occurred during startup

❑ Typo in server name

⚠ Joblog contains error

Message . . . . :   WebSphere application server not started.

Cause . . . . . :   The application server configuration file /QIBM/UserData/WebAS5/Base/fstewart/config/cells/S105VM2M_fstewart/nodes/S10 5VM2M_fstewart/servers/FSTEqadsk/server.xml is not valid. The reason code is 8.

Start/Stop Common Problems (Cont.)

❑ Port conflicts

⚠ SystemOut.log file contains error

⚠ If transport (web container) port conflict

[1/18/03 16:25:10:064 UTC] 5c4941ab WebContainer E SRVE0146E: Failed to Start Transport on host , port 9080. The most likely cause is that the port is already in use. Please ensure that no other applications are using this port and restart the server.

com.ibm.ws.webcontainer.exception.TransportException: Failed to start transport HTTP: java.net.BindException: Address already in use.

⚠ If name service port conflict.

[1/18/03 16:31:23:163 UTC] af308a47 NameServerImp E NMSV0011E: Unable to start bootstrap server using port 8880. Verify that no servers or other processes are already using the bootstrap server port. Also verify that the bootstrap server is being started with a user ID which has sufficient (e.g., root, Administrator) privileges.

org.omg.CORBA.INTERNAL: CREATE_LISTENER_FAILED_4 minor code: 1229066326 completed: No

NOTE: "user ID which has sufficient privileges" does not apply to iSeries

⚠ If SOAP port conflict

[1/18/03 16:38:20:945 UTC] 36f11b16 JMXSoapAdapte W ADMC0015W: SOAP connector failed to start with exception: Address already in use.

[1/18/03 16:38:20:984 UTC] 36f11b16 SecurityCompo E SECJ0007E: Error during security initialization. The exception is java.lang.RuntimeException:

⚠ So they are all different - to fix a port conflict use chgwassvr script

Creating Initial Configuration

Initial Configuration: Overview

- ❑ Start the WebSphere Application Server default instance

- ❑ Verify the WebSphere Application Server environment has started

- ❑ Start the administrative console

- ❑ Configure the virtual host

- ❑ Regenerate WebSphere plugin information

- ❑ Configure an HTTP server instance

- ❑ Start the HTTP Server instance

© 2003 IBM Corporation

Verifying the WAS environment started

❑ When server is started, message is issued indicating admin port - also in joblog in ready message (PF1 to see second level help text)

© 2003 IBM Corporation

Configuring the Virtual Host

To update Host aliases table, perform these steps:

- ❑ Connect to the administrative console using a Web browser
- ❑ Expand **Environment -> Manage Virtual Hosts**
- ❑ Click **default_host** in the right frame
- ❑ Click **Host Aliases**, and the settings for default_host are displayed
- ❑ In the Host Name list, click the asterisk in the row that has a Port of 80
    Note: The host names are set to "*" when you install WebSphere Application Server.
- ❑ Specify the correct port number for your HTTP server

Updating a Virtual Host

Configuring the Virtual Host (Cont.)

Virtual Hosts > default_host > Host Aliases >
*

An alias is the DNS host and port number used by a client to form the URL request of a Web Application resource (such as a servlet, JSP, or HTML page). For example, it is the "myhost:8080" portion of http://myhost:8080/servlet/snoop. When no port number is specified, the default port 80 is used. [i]

Configuration

General Properties

Host Name	*	[i] The IP address, DNS host name with domain name suffix, or just the DNS host name, used by a client to request a Web application resource (such as a servlet, JSP, or HTML page).
Port	7708	[i] The port for which the Web server has been configured to accept client requests. Specify a port value in conjunction with the host name.

Apply OK Reset Cancel

Enter your port value here

Click OK

F03SP04.PRZ

© 2003 IBM Corporation

66

Configuring the Virtual Host (Cont.)

❑ Click **OK** and click **Save**

❑ Update the master configuration (click **Save**)

❑ Regenerate the WebSphere plug-in

❑ Restart WebSphere Application Server

❑ Restart the HTTP instance, if needed

Make sure you save the changes

Message(s)

⚠ Changes have been made to your local configuration. Click Save to apply changes to the master configuration.

ℹ The server may need to be restarted for these changes to take effect.

Virtual Hosts >

default_host

Configuration for enabling a single host machine to resemble multiple host machines. Each virtual host has a logical name and a list of one or more DNS aliases by which it is known. ℹ

Configuration

General Properties	
Name * default_host	ℹ Specifies a logical name used for configuring Web applications to a particular host name. The default virtual host is suitable for most simple configurations.

[Apply] [OK] [Reset] [Cancel]

WebSphere Status ℹ < Previous   Next >   December 6, 2002 9:21:13 AM UTC ♻

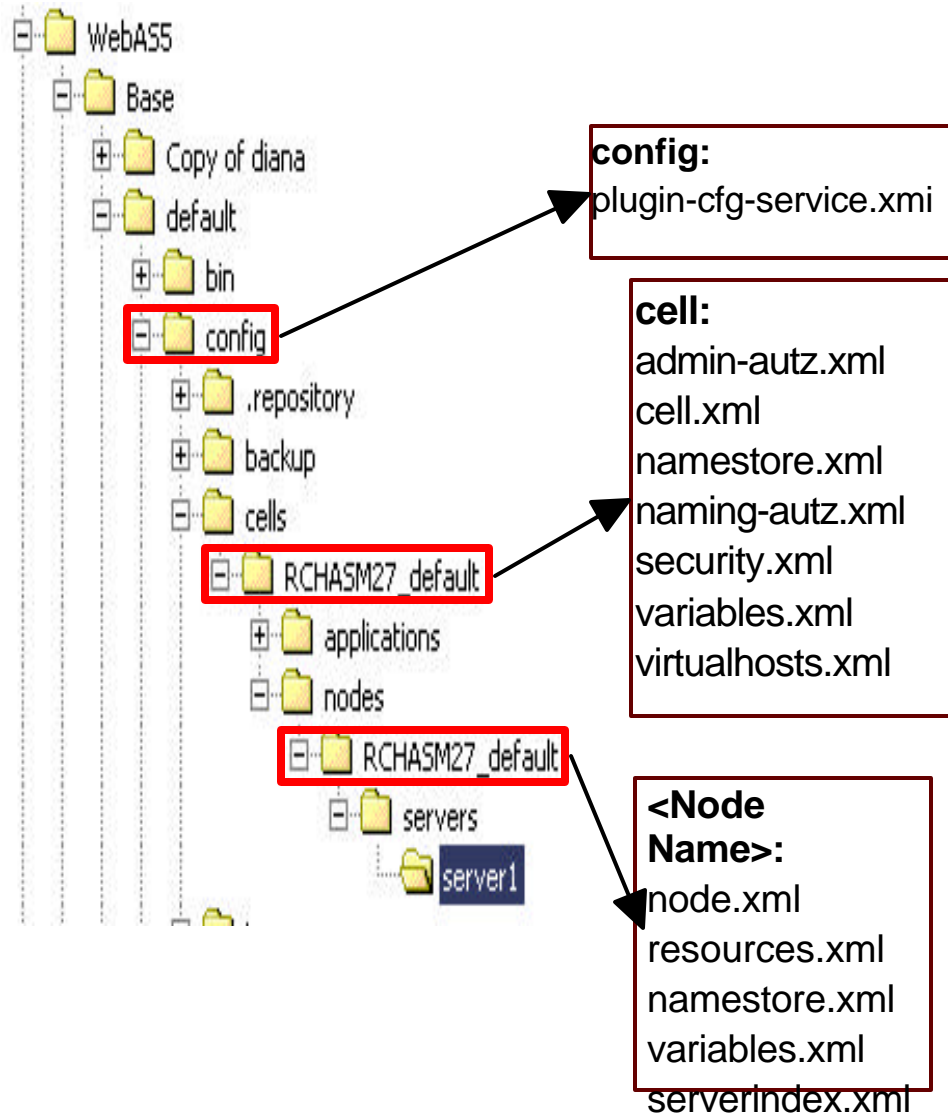| WebSphere Runtime Messages				Clear All
Total All Messages:11	🔴 : 3 new, 3 total	⚠ : 6 new, 6 total	ℹ : 2 new, 2 total	

⊞ Preferences

Configuration Repository

❑ Configuration data for WebSphere 5.0 are XML documents

⚠ Arranged in a set of cascading directories under <was_root>/config directory.

❑ There are three tiers: cell, node, server

❑ Each directory contains several documents related to different parts of the system. For example:

⚠ The node level directory typically contain documents that defines

➤ Resources available on the node (resources.xml)

➤ Variable substitution values to use for processes on that node (variables.xml)

❑ Admin client programs are used to modify configuration settings

⚠ Web Based Admin (adminconsole)

⚠ WebSphere Scripting (wsadmin)

Repository Configuration (Cont.)

WebAS5
Base
Copy of diana
default
bin
config
.repository
backup
cells
RCHASM27_default
applications
nodes
RCHASM27_default
servers
server1

config:
plugin-cfg-service.xmi

cell:
admin-autz.xml
cell.xml
namestore.xml
naming-autz.xml
security.xml
variables.xml
virtualhosts.xml

<Node Name>:
node.xml
resources.xml
namestore.xml
variables.xml
serverindex.xml

Some documents with same filename at different levels of the configuration hierarchy are logically combined.

<u>Scope</u>: Local scope overrides the higher level definition. In the case of conflicting definitions, the "most specific" value takes precedence. For example,

❑ If an identical entry exist in files at the cell and node level (like a variable defined in both, cell and node level variables.xml files), entry in the node level will override the entry in the cell level

IBM HTTP Server Configurations

WAS and HTTP Servers on iSeries

❏ IBM HTTP Server for iSeries
  ⚠ IBM HTTP Server (powered by Apache) (V5R1)
  ⚠ IBM HTTP Server (powered by Apache) (V5R2)
  ⚠ IBM HTTP Server (original): Not supported

❏ Lotus Domino Web server

Configuring an HTTP Server Instance

Application server

Client
HTTP

HTTP
server

Plug-in

Application
server
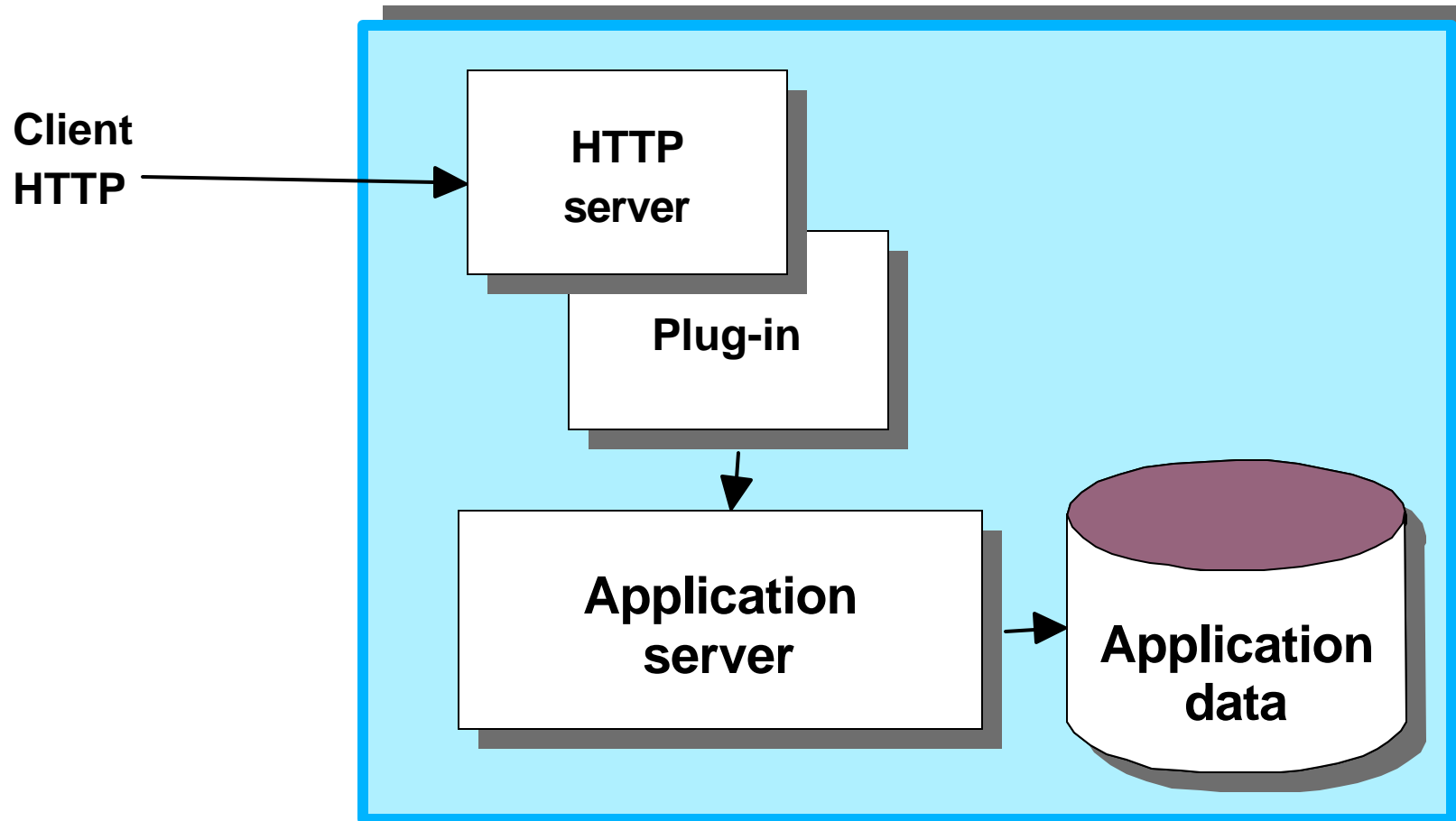
Application
data

IBM HTTP Server (powered by Apache)

V5R2

Configure HTTP Server to communicate with WebSphere Application Server:

- ❑ Start the *ADMIN server instance.

- ❑ Create a new HTTP server instance.

- ❑ Configure the HTTP server instance.

Creating a New Instance of HTTP Server

❏ Open this URL in your browser:

> http://your.server.name:2001/

❏ Enter a valid iSeries user ID and password

❏ Select **IBM HTTP Server for iSeries**

❏ Select the **Setup** tab

❏ Expand **Tasks and Wizards**

❏ Select **Create New HTTP Server**

❏ Follow the wizard

© 2003 IBM Corporation
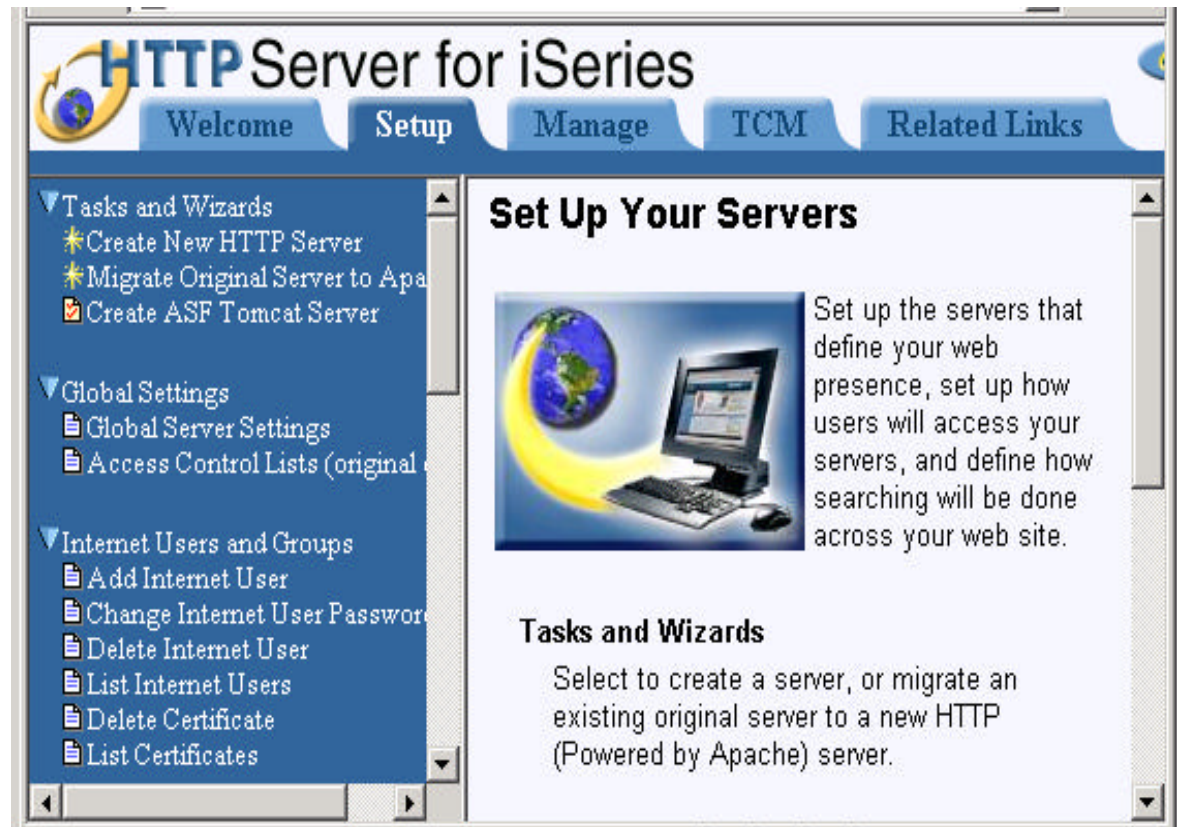
Enabling WebSphere Support

After the HTTP server instance is created, enable your server to work with WebSphere Application Server:

❑ Expand Server Properties

❑ Select **WebSphere Application Server**

❑ Select the version of WebSphere Application Server to configure

❑ Select the instance name from the pull-down menu

❑ Click **OK** to write changes to configuration

　　Note: You should see a page similar to the following example.
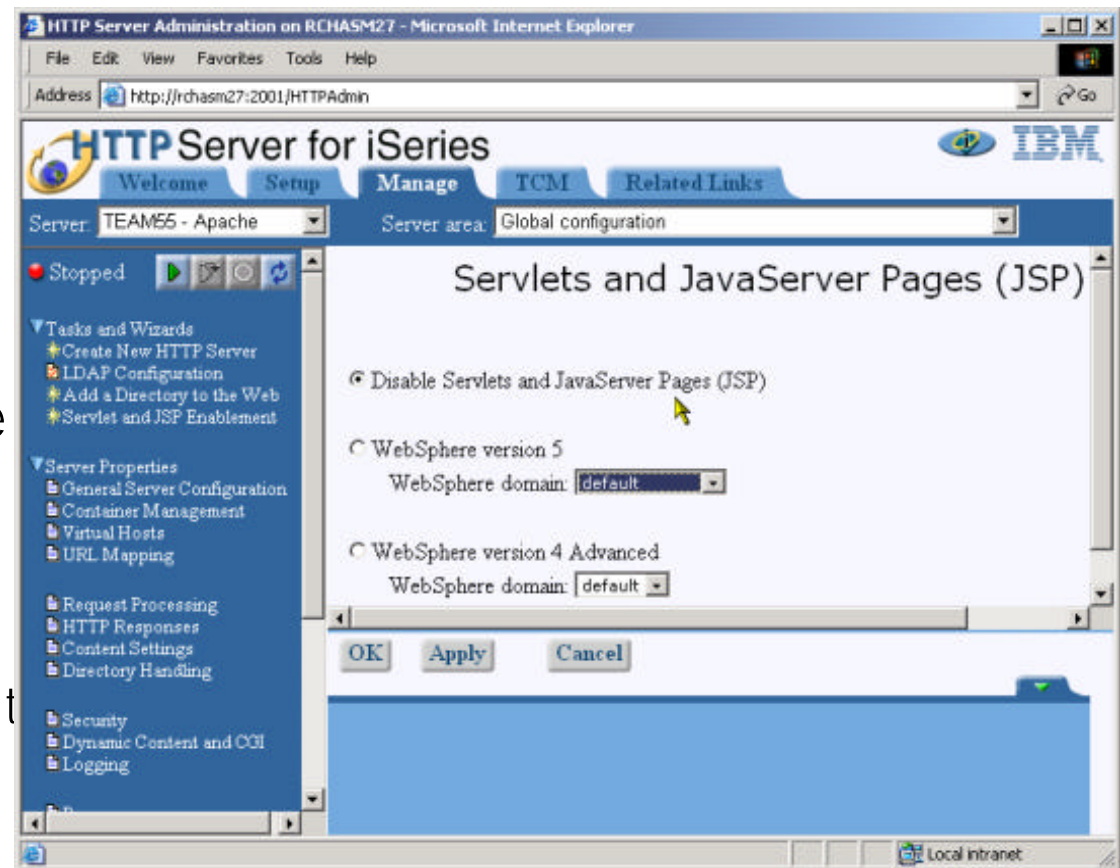
Sample Configuration File

HTTP Server Administration on RCHASM27 - Microsoft Internet Explorer

File   Edit   View   Favorites   Tools   Help

Address   http://rchasm27:2001/HTTPAdmin

HTTP Server for iSeries — IBM

Welcome   Setup   **Manage**   TCM   Related Links

Server: TEAM55 - Apache   Server area: Global configuration

Stopped

Tasks and Wizards
  Create New HTTP Server
  LDAP Configuration
  Add a Directory to the Web
  Servlet and JSP Enablement

Server Properties
  General Server Configuration
  Container Management
  Virtual Hosts
  URL Mapping

  Request Processing
  HTTP Responses
  Content Settings
  Directory Handling

  Security
  Dynamic Content and CGI
  Logging

  Proxy
  System Resources

Display Configuration File

HTTP server: TEAM55

Selected file: /www/team55/conf/httpd.conf

```
1   <Directory /QIBM/ProdData/WebAS5/Base/WSsamples/>
2       Allow from all
3       Order allow,deny
4       Options None
5   </Directory>
6   Alias /WSsamples/ /QIBM/ProdData/WebAS5/Base/WSsamples/
7   LoadModule ibm_app_server_http_module /QSYS.LIB/QEJBAS5.LIB/QSVTIHSAH.SRVPGM
8   WebSpherePluginConfig /QIBM/UserData/WebAS5/Base/Team55/config/cells/plugin-cfg.xml
9   # Configuration originally created by Apache Setup Wizard Thu Nov 21 10:56:19 UTC 2002
10  Listen *:6656
11  DocumentRoot /www/team55/htdocs
12  ServerRoot /www/team55
13  DefaultType text/plain
14  Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes -IncludesNoExec -Index
```

Close   Refresh

Done   Local intranet

© 2003 IBM Corporation

Verifying the Installation

Verifying the Installation

Verify the WebSphere Application Server installation

- ❑ Invoke the Install verification script
- ❑ Invoke an example browser-based application

ivt Script Output

```
                                QSH Command Entry

 $
> /QIBM/ProdData/WebAS5/Base/bin/ivt -instance default
 IVTL0095I: defaulting to host AS07.ITSOROCH.IBM.COM and port 9080
 IVTL0010I: Connecting to the WebSphere Application Server AS07.ITSOROCH.IBM.COM on port: 9080
 IVTL0015I: WebSphere Application Server AS07.ITSOROCH.IBM.COM is running on port: 9080


 IVTL0050I: Servlet Engine Verification Status - Passed

 IVTL0055I: JSP Verification Status - Passed

 IVTL0060I: EJB Verification Status - Passed

 IVTL0070I: IVT Verification Succeeded

 IVTL0080I: Installation Verification is complete
 $

===>




 F3=Exit   F6=Print F9=Retrieve F12=Disconnect
 F13=Clear F17=Top  F18=Bottom  F21=CL command entry
```

Hit Count Sample Output

© 2003 IBM Corporation

Administrative Tools

Administrative Tools

❏ Administrative Console

❏ Scripting with wsadmin

❏ Automating build and deployment using ANT

❏ QShell Scripts

WebSphere 5.0 Admin Console Overview

❑ Browser based Admin Console was introduced in the WebSphere 4.0 AEs

❑ In WAS 5.0, Browser based Admin Console is expanded to manage entire Cell.

❑ Admin Console is standard J2EE 1.3 Web application

  ⚠ The Admin Web Application loads, edits and updates the configuration (XML) files.

❑ Supported Browser :

  ⚠ Microsoft Internet Explorer 5.0, 5.5, 6.0 (or later)

  ⚠ Netscape Navigator 4.7.x (varies by platform)

  ⚠ Netscape 6.1 Browser is not supported, but is expected to work

How does it work?

❑ The Admin Web Application runs within an Application Server instance on a node.

❑ Browser access the Admin Web Application

❑ Perform configuration/operational changes
  ⚠ http://<hostName>:9090/admin

App Server1

Admin Web
Application

User
Enterprise
Application

Load
Save
Edit

Configuration
(XML files)

EAR files

Node
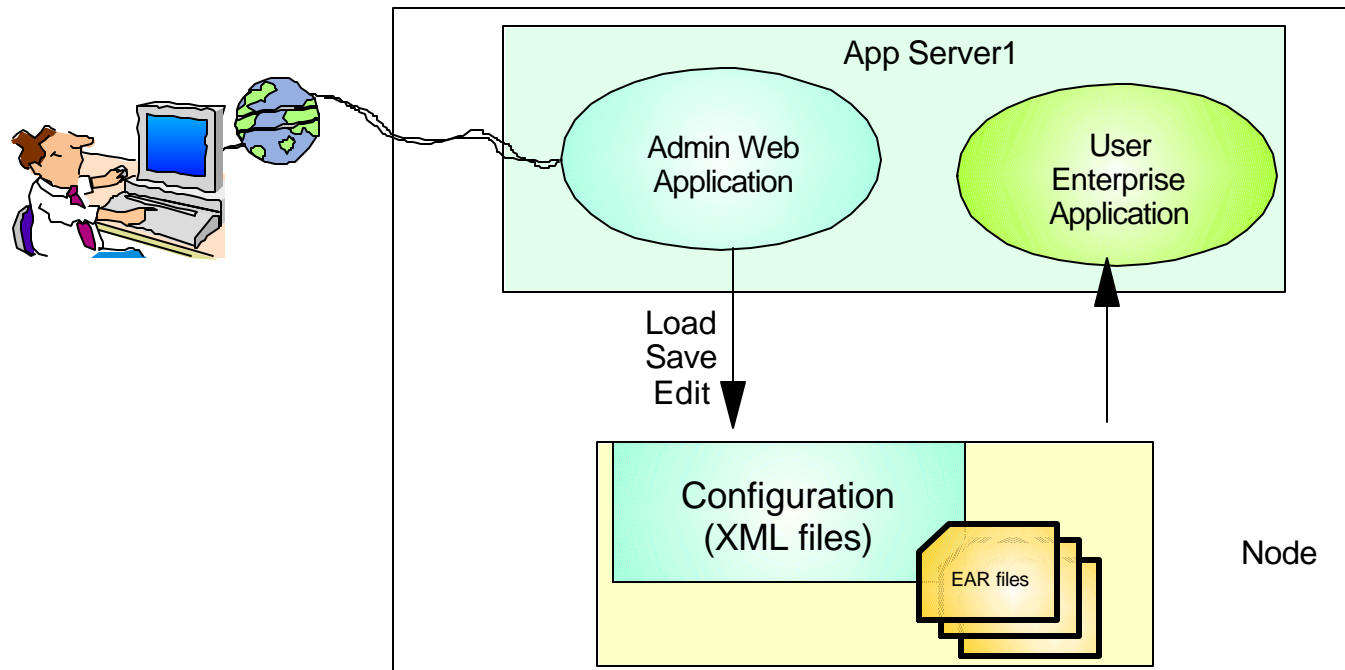
Standalone Single Server

Starting the Admin Console

❑ Admin Console Application gets installed during WAS 5.0 installation.

❑ Start the server process on which the Admin Console application is installed
  ⚠ In the case of Base Application server, issue: startServer server1

❑ Access via web Browser "http://<hostname>:9090/admin/"

❑ No Password is required if the Global security is disabled

❑ UserName is used to track and save user-specific configuration data.
  ⚠ Will be able to recover from unsaved previous session changes.
  ⚠ user Workspace : <was50-user-root>/wstemp/USER/workspace

Login

User ID: [   ]

The user id does not require a password, and does not need to be a userid o
user in the local user registry. It is only used to track user-specific changes tc
configuration data.

[OK]

Login

Another user is currently logged in with the same user name. Select from the
following options:

◉ Logout the other user with the same user name. You will be allowed to
   recover changes that were made in the other user's session.

○ Return to the login page and enter a different user name.

○ Return to the login page and wait for the other user with the same user
   name to logout.

[OK]

WebSphere 5.0 Administrative Console

© 2003 IBM Corporation

wsadmin

- ❑ Command line administrative tool
- ❑ Alternative to admin console
- ❑ Replaces wscp, XMLConfig, SEAppInstall and DrAdmin from previous releases
- ❑ Issue interactive commands or specify a script file to be executed
  - ⚠ Uses the Bean Scripting Framework (BSF), which supports a variety of scripting languages to configure and control WebSphere Application Server
  - ⚠ JACL is currently the only supported scripting language
- ❑ wsadmin.properties file in [instance_dir]/properties has many defaults set
  - ⚠ wsadmin tools uses this file at startup to determine connector port and host

wsadmin (Cont.)

- wsadmin always looks for 2 properties files from which it loads properties:
  - wsadmin.properties file in [instance_dir]/properties has many defaults set
  - wsadmin.properties file in /home/QEJBSVR
    - This file is not shipped in this directory for iSeries (this directory isn't created also)
- wsadmin script also takes a -p propertiesfile parameter
  - Allows user to override properties in wsadmin.properties and to add additional properties
  - If multiple users are invoking wsadmin on a single instance, should use this parm to specify property file which overrides the validation output and trace output properties
- Can be run remotely - but no app install/uninstall
- wsadmin syntax is not exactly intuitive
  - "Do by example" works well
  - Many examples shipped in documentation

wsadmin - How does it work?

❏ Wsadmin acts as an interface to Java objects for access by scripts
  ⚠ Objects communicate with MBeans (JMX management objects)

❏ Objects perform different operations
  ⚠ AdminConfig
    ➤ Create or change the WebSphere configuration
  ⚠ AdminApp
    ➤ Install, modify, or administer applications
  ⚠ AdminControl
    ➤ Work with live running objects and perform traces and data type conversion
  ⚠ Help
    ➤ Display general help information and details about which MBeans are running

❏ Separation between Configuration and Control

Script → wsadmin

AdminApp → MBean
AdminConfig → MBean
AdminControl → MBean
Help → MBean

© 2003 IBM Corporation
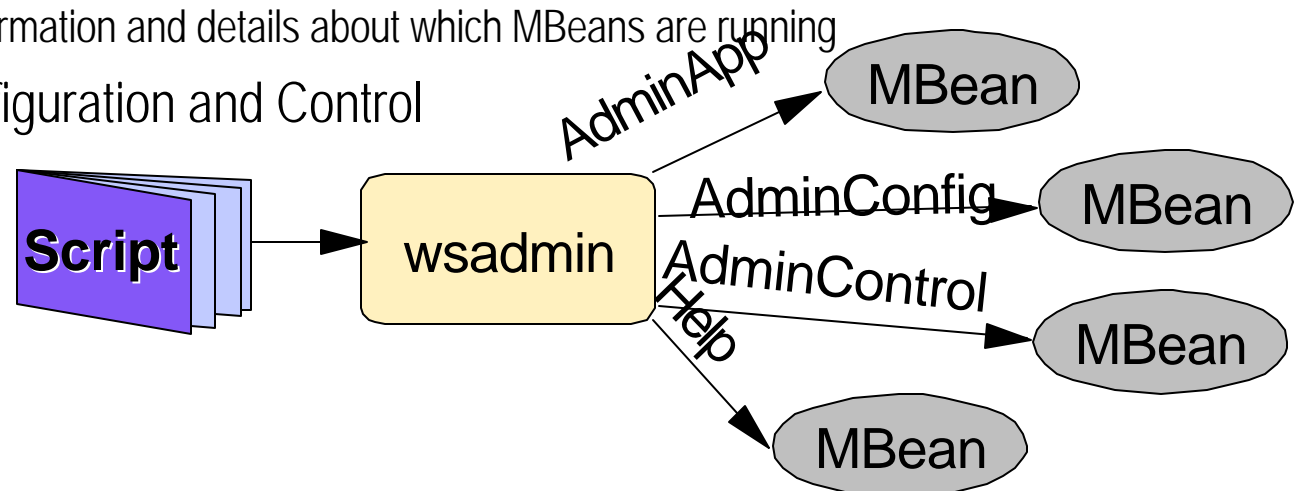
QShell Scripts

- ❏ iSeries ships the non-GUI scripts that are shipped for all platforms

- ❏ Any script that puts up a GUI must be obtained through workstation install

- ❏ iSeries ships additional scripts for instance management, changing server ports, and displaying instance information

- ❏ Script basics:
  - ⚠ Scripts located in /QIBM/ProdData/WebAS5/Base/bin
    - ➤ Except for samples scripts: buildSamples, installSamples
      - ✔ Located in /QIBM/ProdData/WebAS5/Base/samples/bin

- ❏ Most scripts use com.ibm.ws.bootstrap.WSLauncher class to invoke the actual Java class for script
  - ⚠ WsLauncher expects ws.ext.dirs JVM system property to be set and uses it to set the classpath for the WAS custom classloader and then that classloader is used to load WAS jars for script class

QShell Scripts (Cont.)

❑ Script basics cont'd

⚠ All scripts invoke setupCmdLine script in [was_install-root]/bin

  ➤ Product setupCmdLine script also invokes instance specific setupCmdLine script ([user_install-root]/bin/setupCmdLine

    ✔ If -instance is not specified, default instance used

❑ Almost all of the scripts take an optional -instance parameter - for most help does not show -instance parameter.

⚠ Documentation on scripts in iSeries documentation center does show -instance parameter.

⚠ From main documentation page:

Administration->Administrative Tools->Qshell scripts

  ➤ The above link covers most scripts

❑ Generally use -help parameter on scripts to view syntax/usage statement

Starting and Stopping server on Base Application Server

- startServer -instance <instanceName> <serverName> options
  - <server> is the name of the configuration directory of the server you want to start.
  - example: `startServer -instance default server1`
    - reports job information to command prompt.
    - logs in file /QIBM/UserData/WebAS5/Base/default/logs/server1/SystemOut.log
  - Creates a new JVM to run the server process

- stopServer -instance <instanceName> <serverName> options
  - example: `stopServer -instance default server1`
  - By default, the stopServer utility does not return control to the command line until the server completes shutting down.

Other Command Line Tools

- ❑ crtwasinst
  - ⚠ Create a WebSphere Application Server instance

- ❑ chgwassvr
  - ⚠ Change port values for the specified application server
  - ⚠ Enable/disable JMS for the specified application server

- ❑ dumpNameSpace
  - ⚠ Displays JNDI namespace and entries

- ❑ ivt (Installation Verification Tool)
  - ⚠ Syntax: ivt -instance <instanceName>   (ivt -instance MyInstance)

- ❑ JspBatchCompiler
  - ⚠ Pre-compile JSPs in a web module

- ❑ syncNode
  - ⚠ Forces synchronization between the node and the Deployment Manager

- ❑ versionInfo
  - ⚠ Provides IBM WebSphere Application Server Version Report. Syntax:- versionInfo

- ❑ serverStatus
  - ⚠ Retrieves server status. Syntax:- serverStatus <server name>

Migration and Coexistence

Considerations

Planning

❑ Systems Management

⚠ The Administrative Console is browser-based

⚠ WebSphere Application Server Network Deployment is required to provide equivalent multi-node functionality of a WebSphere Version 3.5 or 4.0 domain

⚠ For Network Deployment environments

➤ Determine where to install WebSphere Application Server Network Deployment

➤ Plan for the appropriate hardware prerequisites

Coexistence

If you have a previous version, you must plan to copy the configuration and applications of the previous version to the new version

- ❑ Migration does not uninstall the previous version

- ❑ Version 5 can coexist with the earlier versions

- ❑ There are several combinations of migration and coexistence that you can select:
  - ⚠ Migrate only
  - ⚠ Coexist only
  - ⚠ Migrate and coexist

Migration Support

❑ Base support is provided:
  ⚠ For Version 3.5.3 and later
  ⚠ For Version 4.0 and later
  ⚠ All products must be on same iSeries

❑ With multiple instance, must migrate one instance at a time
  ⚠ Each instance must migrate to a unique 5.0 instance

❑ Migrate to base instance
  ⚠ If migrating to ND, then addNode after migration

Basic Steps

❑ Start instance to migrate from

❑ Invoke WASPreUpgrade from Base product bin directory

- For 3.5, WASPreUpgrade does the following:
  - ➤ Exports configuration (XMLConfig)
  - ➤ Copies application and configuration directories to specified backup directory
- For 4.0, WASPreUpgrade does the following:
  - ➤ Exports configuration (XMLConfig) for AE
  - ➤ Copies application and configuration directories to specified backup directory (for AE and AEs)

❑ Stop instance migrating from

❑ Start WAS V5.0 instance

❑ Invoke WASPostUpgrade script

❑ Perform additional configuration and manual migration

Interoperability

Interoperability provides a mechanism to run nodes in a mixed version environment

- ❑ This enables incremental version upgrade

- ❑ Domains can be upgraded independently

- ❑ Domains can interoperate with one another

Problem Determination

Log Files

❑ System.out/System.err log files
  ⚠ [inst_dir]/<instanceName>/logs/<servername>/SystemOut.log
  ⚠ [inst_dir]/<instanceName>/logs/<servername>/SystemErr.log
  ⚠ Java System.out and System.err streams are redirected to these files
  ⚠ All WebSphere runtime messages go to these files

❑ IBM Service log
  ⚠ [inst_dir]/<instanceName>/logs/activity.log
  ⚠ Binary file containing WebSphere runtime messages from all server in an instance
  ⚠ View using Log Analyzer (workstation GUI tool) or *showlog* script

❑ Web server plug-in log
  ⚠ [inst_dir]/<instanceName>/logs/http_plugin.log
  ⚠ Contains messages from Web server plugin
    ➤ Default log level is error
    ➤ Valid values are Trace, Warn and Error
  ⚠ Location and log level specified in plugin-cfg.xml file

© 2003 IBM Corporation

Activating Traces on a Running Server

Click the Runtime tab

Configuration | **Runtime**

General Properties

Save Trace	☐ Save runtime changes to configuration as well
Trace Specification	*=all=disabled

Go to select component(s) to trace

[Modify]

Trace Output	○ Memory Buffer
	Dump File Name [ ]
	Maximum Buffer Size [8]
	[Dump]
	⊙ File
	File Name [$(LOG_ROOT)/server1/trace.log]
	[View]

In-memory buffer (faster)

Buffer size in thousands of entries

Dump to file when you are done

Direct trace to file while tracing (slower)

[Apply] [OK] [Reset] [Cancel]

F03SP04.PRZ

Selecting What Needs To Be Traced
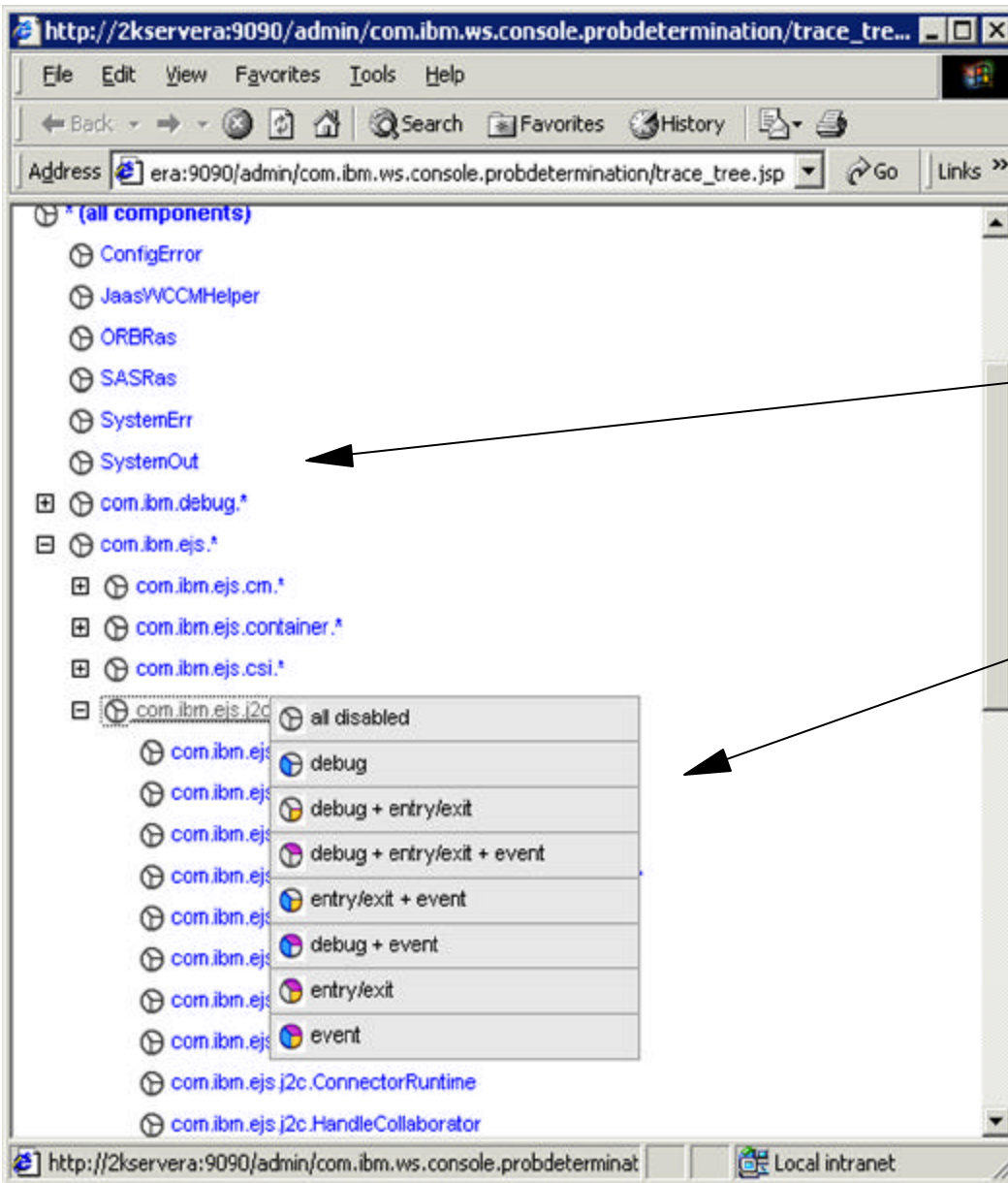
Navigate to component to trace

Select trace type

© 2003 IBM Corporation

Tracing Servers from Startup

Configuration | **Runtime**

Click the Configuration tab

General Properties

Enable Trace	☑ Enable trace with the following specification
Trace Specification	*=all=disabled

Modify

Trace Output

○ Memory Buffer

Maximum Buffer Size |8|

Specify trace file and roll-over parms

● File

File Name |$(LOG_ROOT)/server1/trace.log|

Maximum File Size |20|

Size in MB

Maximum Number of Historical Files |1|

Trace Output Format |Basic (Compatible) ▼|

4.0 style format

Basic (Compatible)
Advanced
Log Analyzer

Extended trace format

Format trace for Log Analyzer

Apply | OK | Reset

Collector Tool

❏ New in WAS 5.0 is the collector tool

  ⚠ Collects product information

  ⚠ Collects instance information

  ⚠ Collects instance log files (if located in the instance directory)

  ⚠ Collects system information

❏ When a customer calls in with a problem, if feasible, have them run collector tool and send in resulting jar file

  ⚠ Jar file can be large

  ⚠ Especially if log files are large

❏ Information to collect is contained in file default.inventory located in [was_install_root]/properties dir

Topologies

Topology Considerations

Major factors to consider when you choose a topology include:

- ❏ Availability
  - ⚠ The goal is to avoid single points of failure
  - ⚠ High availability requires both process redundancy and hardware redundancy
  - ⚠ High availability uses workload management
    - ➤ Multiple systems
    - ➤ Multiple application server processes
- ❏ Security
  - ⚠ Use firewalls to separate the Web server from the application server

Topology Considerations (Cont.)

❑ Performance and throughput

⚠ To address performance issues

➢ Add application servers: Vertical scaling

➢ Add nodes (physical systems): Horizontal scaling

❑ Ease of maintenance

⚠ Multiple machines provide flexibility

➢ Selectively take systems offline for maintenance

➢ Maintain your application server environment without compromising application availability

Single Machine Topology

Application server

Client
HTTP

HTTP
server

Plug-in

Application
server
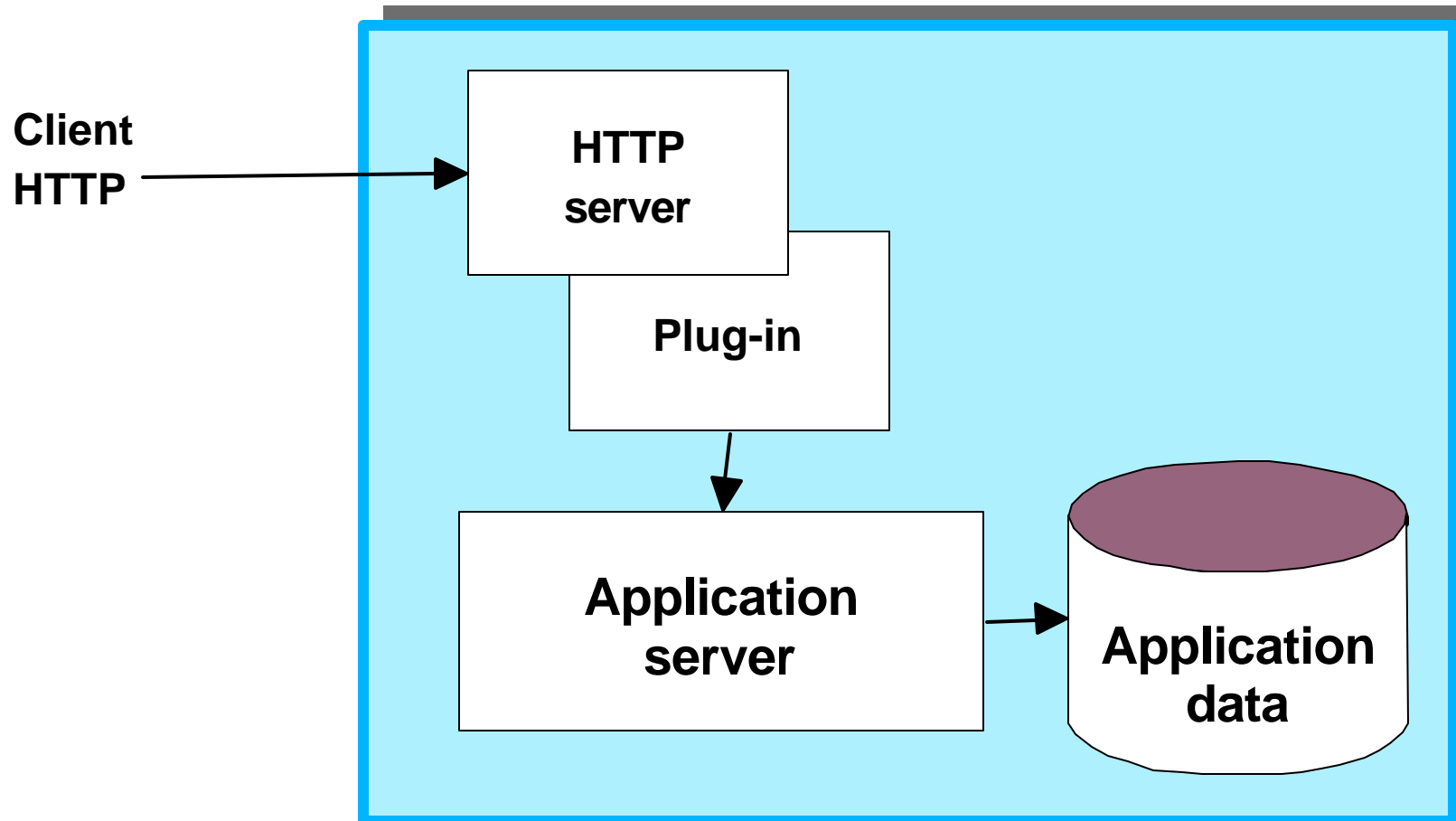
Application
data

Vertical Scaling

WebSphere Application Server

HTTP requests → **HTTP server** / **Plug-in** → **Vertically clustered application servers** → **Application data**
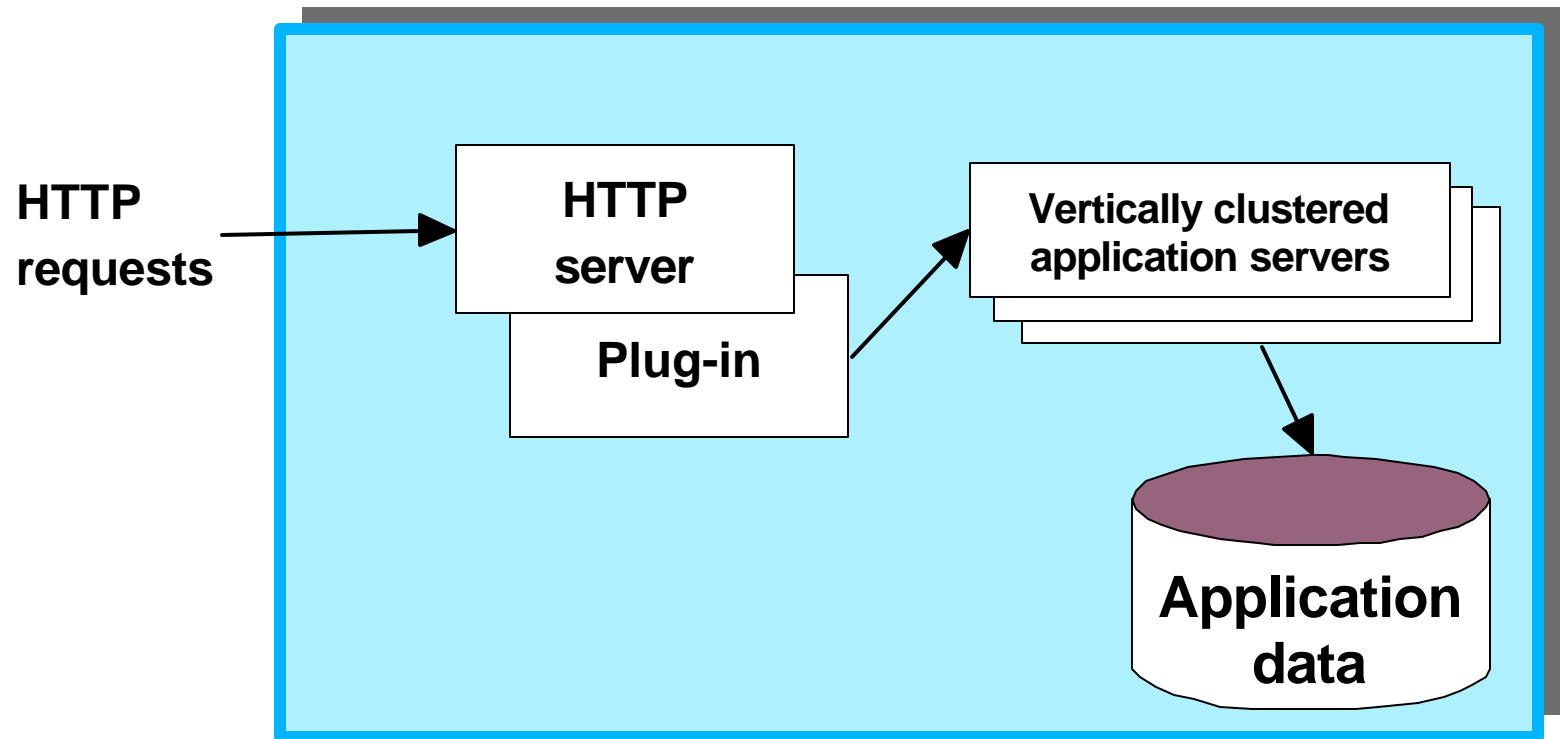
In this sample topology, multiple cluster members of an application server work together to implement vertical scaling.

Vertical Scaling (Cont.)

❑ Advantages

   ⚠ Potential efficiency improvement

   ⚠ Straightforward instance creation

   ⚠ Load balancing

   ⚠ Process failover

❑ Disadvantage

   ⚠ Single point of failure

Horizontal Scaling

WebSphere Application Server Cell

Application server Machine A

Primary (managing) partition

Secondary partition

Secondary partition

Secondary partition

Client HTTP requests

HTTP server

Plug-in

Horizontally clustered application servers

Application data

Node agent

Network Deployment manager

Persistent Session data

Node agent

Horizontally clustered application servers

Horizontal Scaling (Cont.)

❑ Advantages

⚠ More throughput and failover support

⚠ Improved availability

⚠ Optimized request distribution

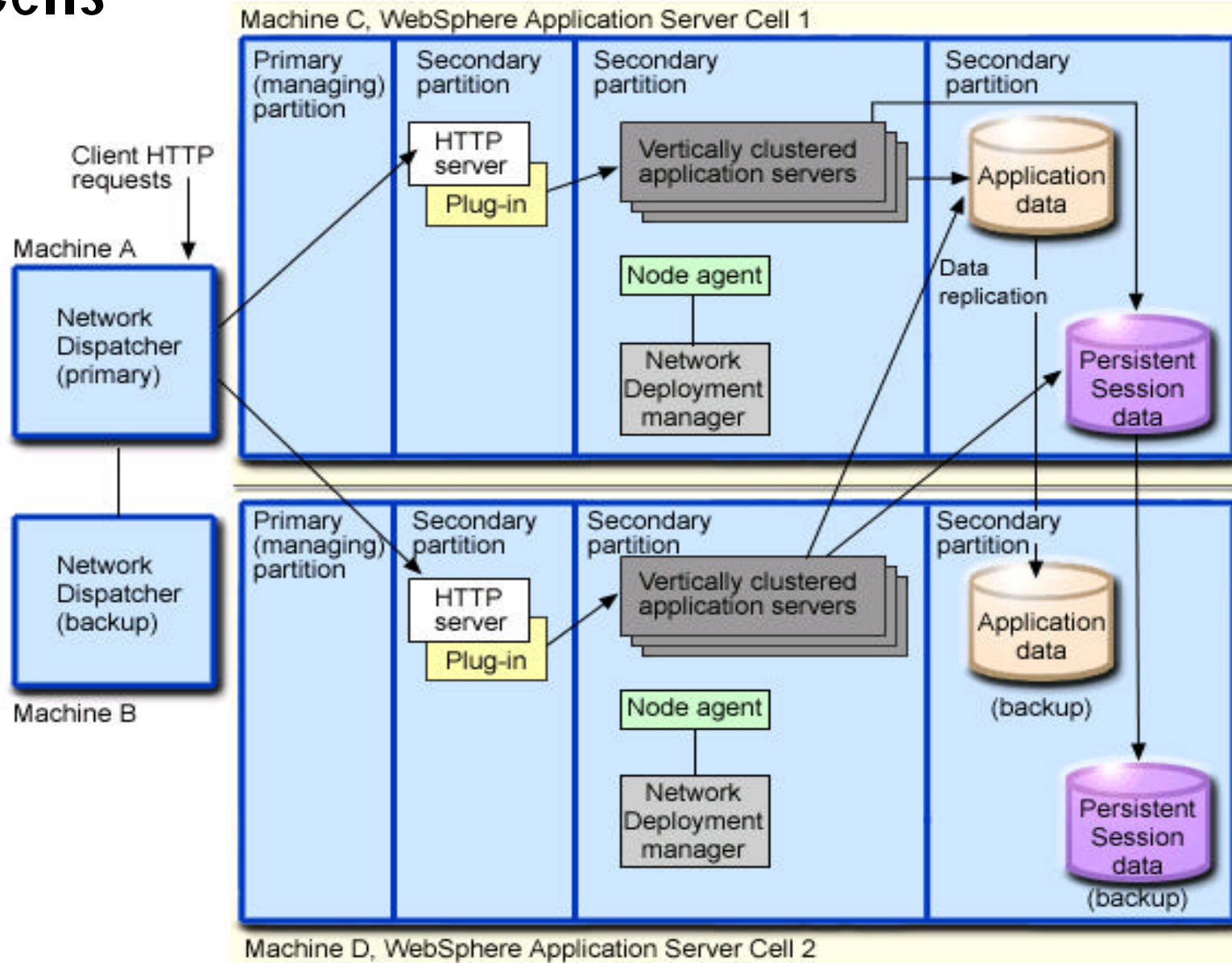❑ Disadvantage

⚠ Administration more complex

Multiple WebSphere Application Server Cells

Machine C, WebSphere Application Server Cell 1

Primary (managing) partition | Secondary partition | Secondary partition | Secondary partition

Client HTTP requests

Machine A

Network Dispatcher (primary)

HTTP server / Plug-in

Vertically clustered application servers

Node agent

Network Deployment manager

Application data

Data replication

Persistent Session data

Network Dispatcher (backup)

Machine B

Machine D, WebSphere Application Server Cell 2

Primary (managing) partition | Secondary partition | Secondary partition | Secondary partition

HTTP server / Plug-in

Vertically clustered application servers

Node agent

Network Deployment manager

Application data (backup)

Persistent Session data (backup)

Multiple WebSphere Application Server Cells (Cont.)

❏ Advantages

- ⚠ Provides isolation of hardware failure
- ⚠ You can perform hardware upgrades on a cell-by-cell basis during off-peak hours
- ⚠ Provides isolation of software failure
- ⚠ Improves performance and workload balancing

❏ Disadvantages

- ⚠ Deployment is more complicated than for a single administrative cell
- ⚠ Multiple cells require more administration effort because each cell is administered independently

Topology Selection Criteria Summary

Topology	Security	Performance	Throughput	Maintainability	Availability
Vertical scaling		Limited benefit	Limited to resources on a single server	Easiest to maintain	Process isolation
Horizontal scaling		Best in general	Best in general	Code migration to multiple nodes	Process and hardware redundancy
HTTP separation	Allow for firewalls in DMZ	Usually better than local	Usually better than local		
Three tiers	Most options for firewalls	Typically slower than a single JVM API	Clustering can improve throughput		

Related Publications

- *The publications listed in this section are considered particularly suitable for a more detailed discussion of the topics covered in this workshop.*

International Technical Support Organization Publications
- For information on ordering ITSO publications, visit us at **http://www.redbooks.ibm.com** (Internet Web site) or
- **http://w3.itso.ibm.com** (intranet Web site)

For Technical Support see http://www.ibm.com/support and **http://w3.ibm.com/support**

Redbooks on CD-ROMs
- Redbooks are available on CD-ROMs.

CD-ROM Title	Collection Kit Number
System/390 Redbooks Collection	SK2T-2177
Networking and Systems Management Redbooks Collection	SK2T-6022
Transaction Processing and Data Management Redbook	SK2T-8038
AS/400 Redbooks Collection	SK2T-2849
RS/6000 Redbooks Collection (HTML, BkMgr)	SK2T-8040
RS/6000 Redbooks Collection (PostScript)	SK2T-8041
Application Development Redbooks Collection	SK2T-8037
Personal Systems Redbooks Collection	SK2T-8042

© 2003 IBM Corporation

Related Publications – Continued

Other Publications

- *These publications are also relevant as further information sources:*

Redbooks and Redpapers

Title	Publication Number
WebSphere Application Server V5 for iSeries: Installation, Configuration, and Administration (coming soon)	SG24-6588-00
WebSphere Application Server Express on iSeries (coming soon)	REDP3624
IBM WebSphere V5.0 Security WebSphere Handbook Series	SG24-6573-00
Migrating to WebSphere V5.0: An End-to-End Migration Guide	SG24-6910-00

Related Publications - Continued

WebSphere Application Server for iSeries

❏ http://www.ibm.com/servers/eserver/iseries/software/websphere/wsappserver/index.html

Contains information and documentation

❏ What's New

❏ About WebSphere

❏ Packaging

❏ Documentation

❏ FAQs

❏ Samples

❏ PTFs

❏ Performance

❏ Migration

❏ Forum

❏ Newsletter

❏ Related Resources

Contains related links of interest
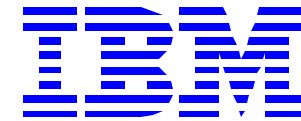
❏ IBM WebSphere Application Server

❏ Partners in Development

❏ WebSphere e-business Java HTTP Server

❏ iSeries 400 Developer Kit for Java JDBC Web Page

❏ WebSphere Commerce Suite for iSeries

❏ WebSphere Payment Manager for iSeries

❏ WebSphere Personalization for iSeries

❏ WebSphere Development Tools for iSeries

Related Publications – Continued

❏ WebSphere Application Server for iSeries
- ⚠ http://www.ibm.com/servers/eserver/iseries/software/websphere/wsappserver/index.html
- ⚠ http://www.iseries.ibm.com/developer/websphere/

❏ WebSphere Application Server
- ⚠ http://www.ibm.com/software/webservers/

❏ Development Tools
- ⚠ Visual Age for Java:
  - ➤ http://www.ibm.com/software/ad/vajava/
- ⚠ WebSphere Studio:
  - ➤ http://www.ibm.com/software/webservers/studio/
- ⚠ WebSphere Development Tools for iSeries:
  - ➤ http://www.ibm.com/software/ad/wdt400/

F03SP04.PRZ

About ITSO Residencies....

Who writes Redbooks?.....

They can be IBMers, Business Partners and Customers....YOU!

Are you a subject matter expert and want to do a short internship at an IBM development site?

Are you a field practitioner or an avid reader of IBM Redbooks?

Would you like to join a team of subject matter experts to develop content for a Redbook?....or a Redpaper?.... or a Workshop?.....or a Presentation?
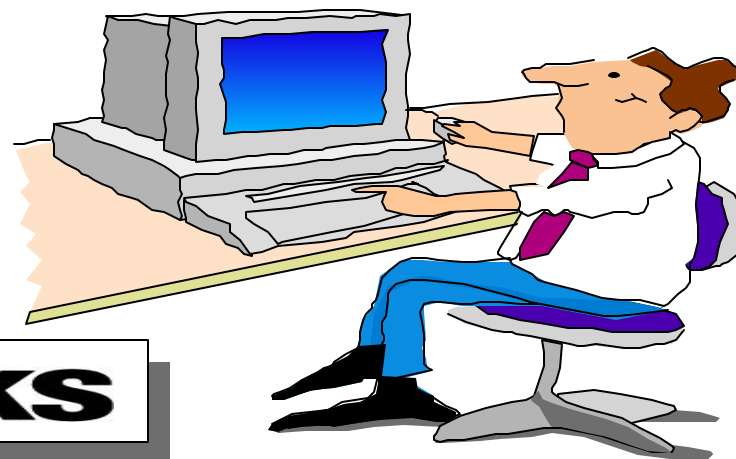
Where?:
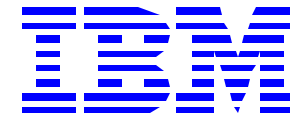**Austin, TX (USA)**
Cambridge, MA (USA)
Hursley, UK
Poughkeepsie, NY (USA)
Raleigh, NC (USA)
Rochester, MN (USA)
San Jose, CA (USA)

Redbooks
International Technical Support Organization

How can I find out more?

http://www.redbooks.ibm.com/

Redbook Domains:

-- Select one --

Click on ➤ Residencies

Accepted residents join a multinational team, typically for a two-to-eight
week effort, at an ITSO Center on or near the IBM development
location. Often the residency leader and the accepted residents
begin their communications in the weeks before the start of the
residency in order to get a headstart.
Working long hours during the residency is common.
The emphasis is on producing the content needed for the redbook by
the last day of the residency.
Benefits are many...network building, obtaining a unique view of emerging technologies, meeting
developers....
Note: *ITSO pays authorized travel and living expenses for
all residents, but does not compensate for the time or
services of its residents.
For IBMers, ITSO residency travel is pre-approved*

Redbooks
International Technical Support Organization