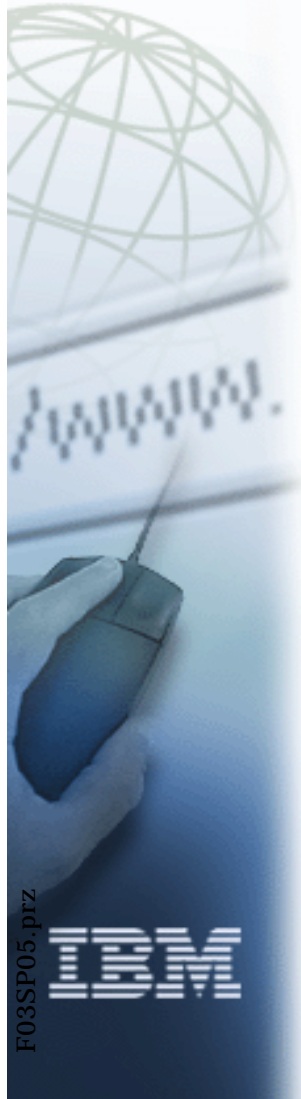e-business

WebSphere Application Server

Express for iSeries V5

SP05

ITSO iSeries Technical Forum

Aleksandr Nartovich

Redbooks

International Technical Support Organization

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IBM

1

Agenda

❏ Web Application Serving Introduction

❏ WebSphere Application Server - Overview

❏ WebSphere Application Server - Installation & Administration

❏ WebSphere Application Server - Additional Features

❏ WebSphere Application Assembly & Installation

❏ Troubleshooting Tips

❏ Resources & Supplemental Materials

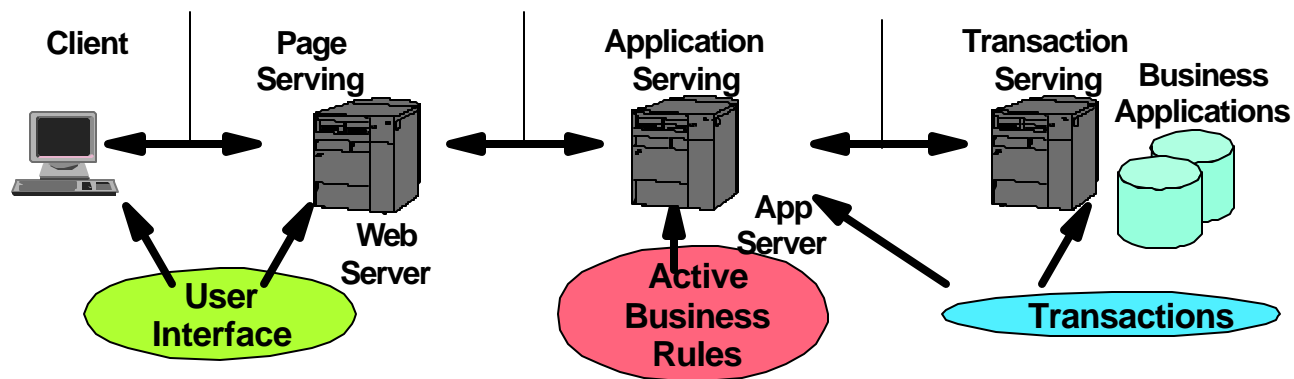# *Web Application Serving Introduction*

Server Definitions

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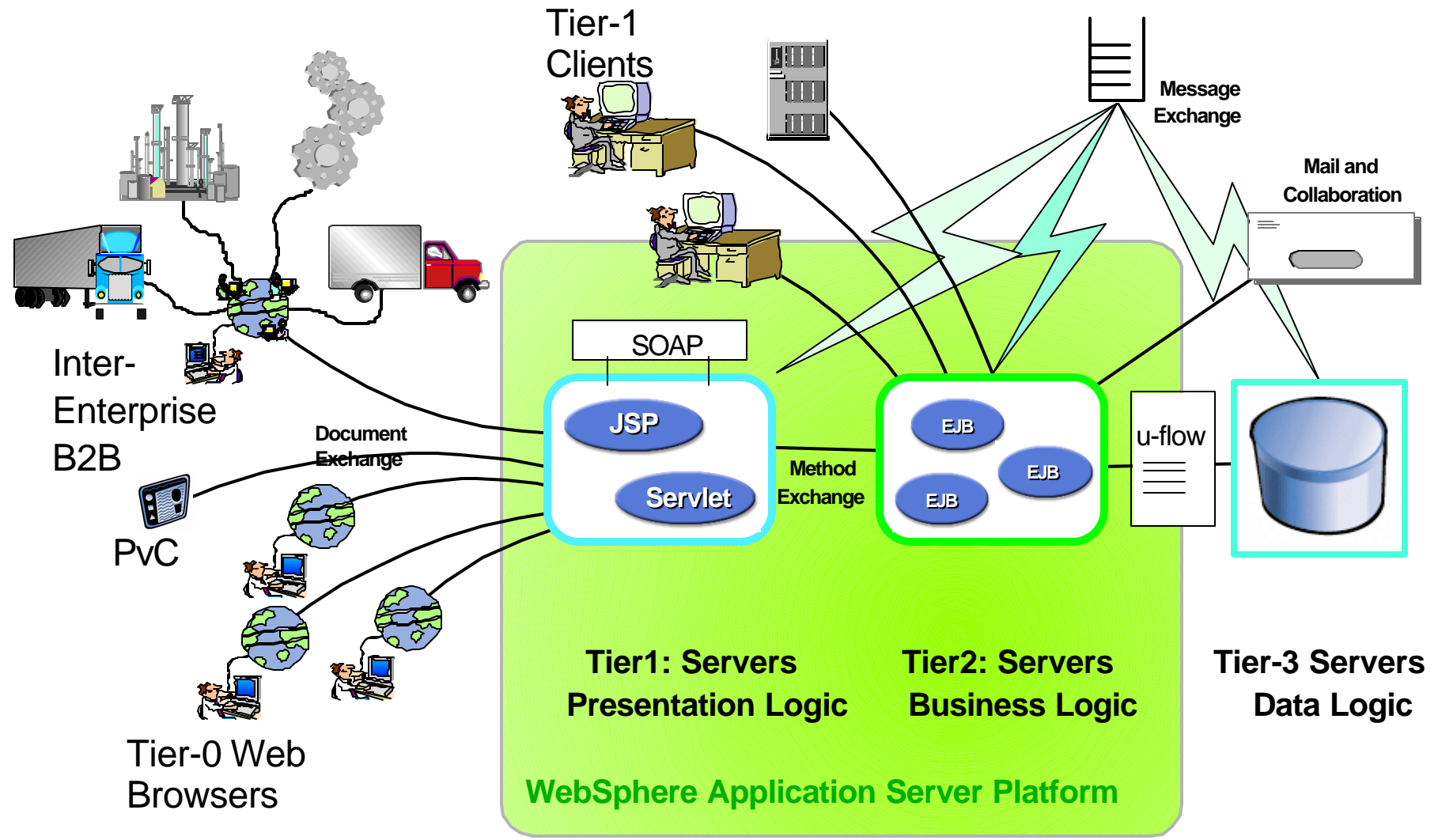
- Work with a Web server to manage browser and Java-based client sessions
- Support server-side business logic (Servlets/JavaServer Pages/EJBs)
- Connect to backend computing resources for data and transaction processing

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

Client | Page Serving | Application Serving | Transaction Serving — Business Applications

Web Server

App Server

User Interface

Active Business Rules

Transactions

J2EE Application Server Overview

Tier-1 Clients

Message Exchange

Mail and Collaboration

Inter-Enterprise B2B

Document Exchange

SOAP

JSP

Servlet

Method Exchange

EJB

EJB

EJB

u-flow

PvC

Tier1: Servers Presentation Logic

Tier2: Servers Business Logic

Tier-3 Servers Data Logic

Tier-0 Web Browsers

WebSphere Application Server Platform

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J2EE Application Server Support

Standard Java Runtime Environment (JRE) is generally available as a no charge option for all popular platforms

J2EE Application Servers *Extend* the Standard Java Runtime Environment (JRE)

- ❏ Web & EJB containers are not part of the base JRE
- ❏ J2EE services components are not part of the base JRE

Numerous Java Based Application Server Options Exist

- ❏ full function J2EE compliant servers
- ❏ partial function J2EE compliant servers
- ❏ commercial, officially supported products
- ❏ open source, unofficially or separately supported products

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What is WebSphere Application Server?

❑ It extends the functionality of a standard Web server

❑ It enables web transactions and interactions with a robust deployment environment for e-business

❑ It provides a portable, Java-based Web application deployment platform focused on supporting and executing:

⚠ Servlets

⚠ JavaBeans

⚠ JSPs

⚠ EJBs

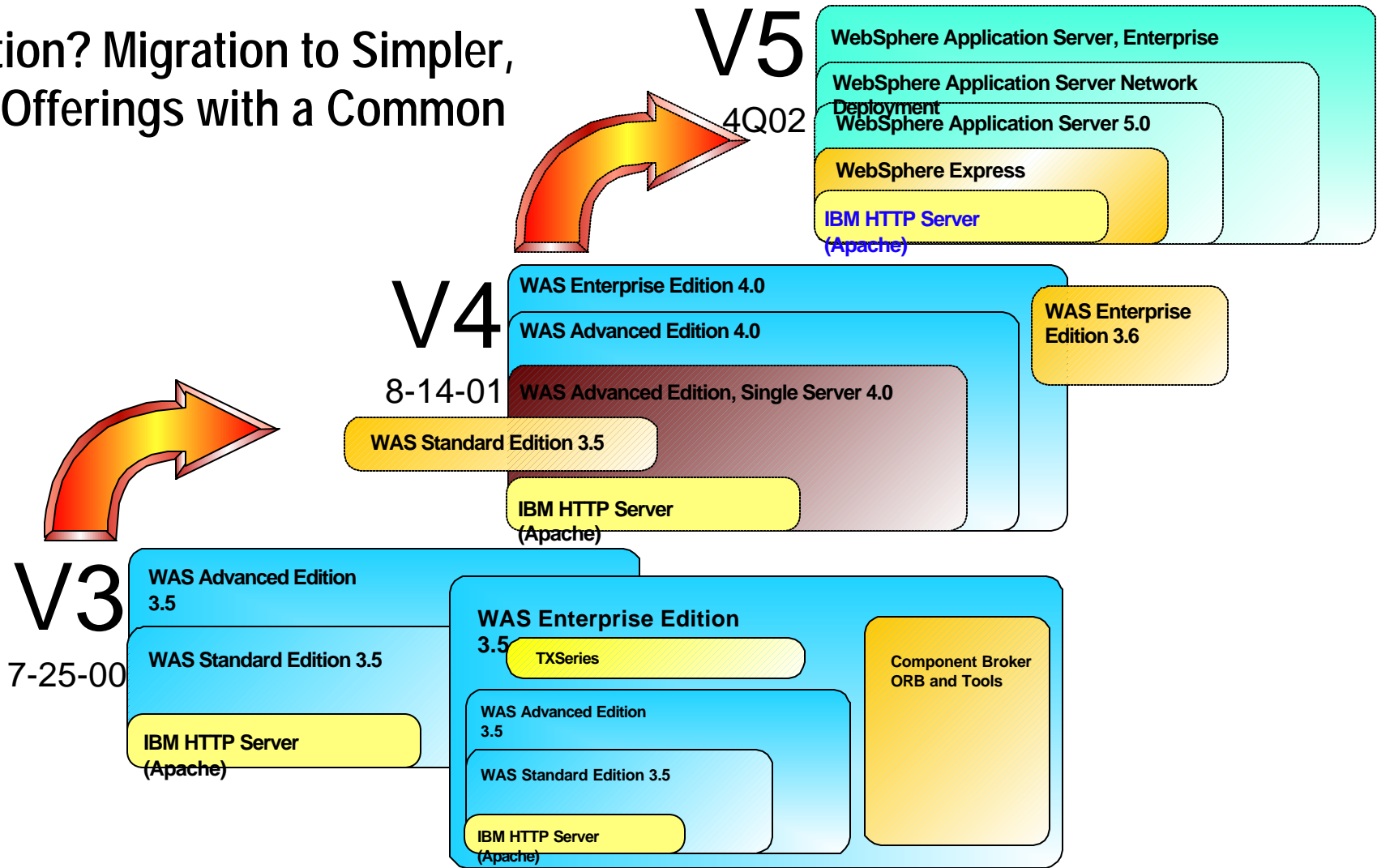❑ It is IBM's strategic, fully J2EE compliant Application Server

WebSphere Application Server - Overview

WebSphere Application Server Evolution

**Its Evolution? Migration to Simpler, Focused Offerings with a Common Base**

V5

4Q02

- WebSphere Application Server, Enterprise
- WebSphere Application Server Network Deployment
- WebSphere Application Server 5.0
- WebSphere Express
- IBM HTTP Server (Apache)

V4

8-14-01

- WAS Enterprise Edition 4.0
- WAS Advanced Edition 4.0
- WAS Advanced Edition, Single Server 4.0
- WAS Standard Edition 3.5
- IBM HTTP Server (Apache)
- WAS Enterprise Edition 3.6

V3

7-25-00

- WAS Advanced Edition 3.5
- WAS Standard Edition 3.5
- IBM HTTP Server (Apache)
- WAS Enterprise Edition 3.5
  - TXSeries
  - WAS Advanced Edition 3.5
  - WAS Standard Edition 3.5
  - IBM HTTP Server (Apache)
  - Component Broker ORB and Tools

V2

1999

WAS on iSeries Versions In Service

WAS Version	Product ID	OS/400 Release	JDK	Servlet	JSP	EJB
3.5 Standard	5733-AS3	V4R5 V5R1	1.2.2	2.1, 2.2	0.91 1.0,1.1	NA
3.5 Advanced	5733-WA3	V4R5 V5R1	1.2.2	2.1, 2.2	0.91 1.0,1.1	1.0
4.0 Single Server	5733-WS4	V4R5 V5R1 V5R2	1.3	2.2	1.1	1.1
4.0 Advanced	5733-WA4	V4R5 V5R1 V5R2	1.3	2.2	1.1	1.1
5.0 Express	5722-IWE	V5R1 V5R2	1.3	2.3	1.2	NA
5.0 Base	5733-WS5	V5R1 V5R2	1.3	2.3	1.2	1.1/2.0
5.0 Network Deployment	5733-WS5 Option 5	V5R1 V5R2	1.3	2.3	1.2	1.1/2.0

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IBM WebSphere Application Server – Express, V5.0

Enterprise	
WebSphere Application Server	z/OS
Express	
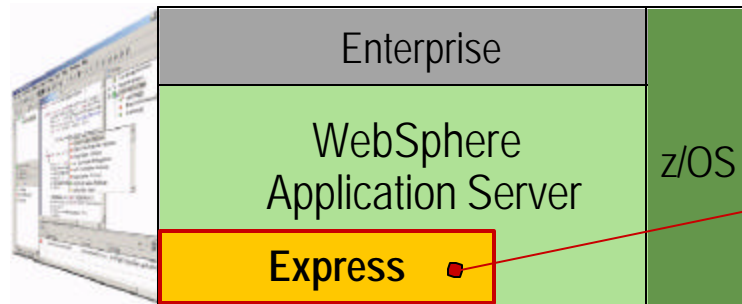
WebSphere Application Server - Express

Ready to go out-of-the-box

❏ A single, tightly integrated package including a simplified application server, development tools & numerous samples

End-to-end ease of use

❏ Simplified installation

❏ Simplified programming model

❏ Simplified administration

Supports partner OEM usage with smaller footprint, silent install and minimal administration

Affordable "on-ramp" to WebSphere platform

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Overview of Express

WebSphere Application Server - Express is targeted:

- ❏ SMB market place
- ❏ low cost easy to use application server for OS/400 software and customer applications.
- ❏ Java and non-Java programmers
- ❏ entry level web application development
- ❏ follow-on offering for WebSphere Application Server Standard Edition (SE) 3.5
- ❏ replacement for ASF Tomcat

What's included?

❑ An application server run-time environment integrated with iSeries. The Application Server - Express is a subset of the application server shipped with the WebSphere Application Server 5.0 iSeries product, and includes a subset of the application server administrative console, with online help text.

❑ An administration GUI interface that is integrated with the current OS/400 web-based administration console for the IBM HTTP Server product (5722-DG1). The integrated GUI interface can administer HTTP Web servers (Powered by Apache) and application servers both ASF Tomcat and Application Server - Express, complete with online help text.

❑ WebSphere Development Studio Client for iSeries (WDSC) development tools. These development tools are the same tools included with IBM WebSphere Studio (WDS). Please refer to the WDSC product, for installation and usage of these tools.

❑ IBM Telephone Directory business application. This is an out of the box ready to use application that is ready to be incorporated into the day to day activity for a business.

❑ DB2 Web Services sample application and runtime. The sample application introduces a easy to use, rapid deployment DB2 access framework. The runtime for the framework is also shipped as part of the Express offering.

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WAS 5 Features Included in Express for iSeries

- Web application container for JSP's & Servlets
- Server-side JavaScript
  - ⚠ Bean Scripting Framework
  - ⚠ Function call support
- WCCM libraries -- WebSphere Common Control Model
- XML parser
- XSL processor
- Web services runtime
- Security runtime
- SWAM -- Simple WebSphere Authentication
- Remote HTTP server support **
- JCA connectors
- Numerous shell scripts
- wsadmin tool
- IBM Telephone Directory application **

- OS/400 & LDAP authentication **
- HTTP in memory session support
- J2EE API libraries
- HTTP transport engine
- Web server plug-ins for:
  - ⚠ IBM HTTP Powered by Apache
  - ⚠ Domino HTTP for iSeries server
- Browser based administrative console
- Debug libraries
- Support for regenerating HTTP server plugin configuration **
- Support for migrating to higher value WAS products
- Migration tools **
- DB2 Web Services sample application **

** features unique to Express for iSeries

WAS 5 Features NOT in Express for iSeries

- ❑ EJB container
- ❑ Work Load Management (WLM)
- ❑ Analysis logger support
- ❑ EJB deployment tool
- ❑ Persistent HTTP sessions
- ❑ Performance monitoring infrastructure (PMI)
- ❑ Localizable text
- ❑ Dynacache
- ❑ Data Replication Service (DRS)
- ❑ J2EE Application Client
- ❑ XML grammar library
- ❑ Java Messaging Support (JMS)
- ❑ No Work Station installable pieces
  - ▲ Application Assembly Tool
  - ▲ Client Container Resource Config Tool (CCRCT)
  - ▲ Tivoli Performance Viewer
  - ▲ Log Analyzer

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IBM WebSphere Application Server – Express V5.0

Application Server Details

- ❑ Proper subset of WebSphere Application Server with the latest Java specifications

- ❑ Programming model focused on HTML,Tag Libraries, JavaScript, JSPs, Servlets, XML and Web services

- ❑ Tool-based application deployment and management

- ❑ Near-zero administration

- ❑ Full support for migration to a higher functionality application server

- ❑ Operating system support: Windows (NT, 2000), Linux (2.4 kernel) and iSeries (OS/400)

- ❑ Database support: IBM DB2, MS SQL Server, Oracle, Informix, and Sybase
  - ⚠ With JDBC support for connecting to other databases

Enterprise	
WebSphere Application Server	z/OS
Express	

Client Container
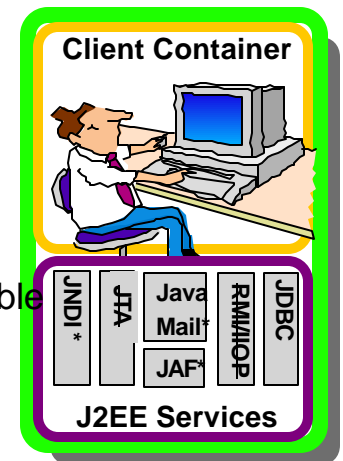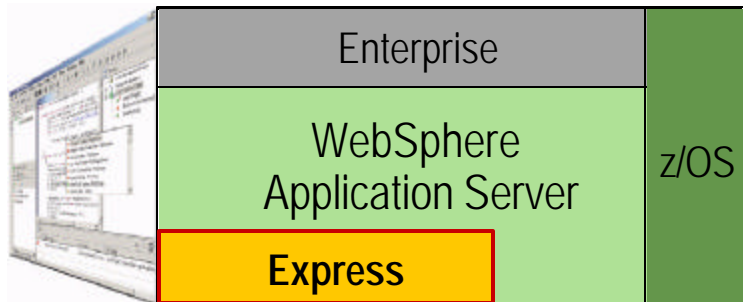
* function available via separately installed components

JNDI* | JTA | Java Mail† | RMI/IIOP | JDBC
JAF†

J2EE Services

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IBM WebSphere Application Server – Express V5.0

Application Development Tools Details

- ❑ Based on open source Eclipse initiative and WebSphere Development Studio Client for iSeries
- ❑ Rapid Web design and authoring tools
- ❑ Visual Page Designer and Visual Java Editor
- ❑ Wizards to create Web interfaces to databases
- ❑ Image editing and animation tools
- ❑ Struts builder to simplify creation of applications
- ❑ Web services creation and consumption
- ❑ JSP debugging
- ❑ Simple deployment of applications
- ❑ Operating system: Windows (NT, 2000, XP), Linux

IBM Server and Middleware Tools	Partner Tools and Middleware
WebSphere Studio	
WebSphere Studio Workbench	

Development Tool

- Integrated unit test environment
- Web services and UDDI tools
- Built-in Web, Java, XML and artistic tools
- JSP debugger, code assist and generation
- Relational database tools
- Eclipse platform

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17

Big Picture

Browser

HTTP Server Powered by Apache (customer instance)

WAS Express Plugin

Domino HTTP Server (customer instance)

WAS Express Plugin

WebSphere Application Server - Express

WAS Express Administrative Console Application

Customer Application 1

Customer Application 2

Snoop Sample Application

DB2 Web Service Sample Application

IBM Telephone Directory Business Application

Comparison of NT and iSeries

Unique to Windows / Linux:
- One offering containing both:
  - application server (embedded Bobcat)
  - tools (WSSD)
- Single Integrated Install of Development tools and entry AppServer
- Supports DB2, Oracle and SQL Server databases
- "Built-in" Cloudscape DB (dev only)
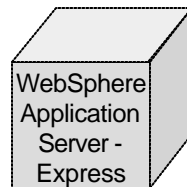
Common for: Windows / Linux / iSeries
- Based on Bobcat runtime
- J2EE programming model minus EJBs
- Web services (no UDDI iserver)
- Value-add documentation, integration, and pre-canned apps
- Easy to install and run including simple electronic download
- Programming model: Javascript/HTML/XML apps w/JSPs, JDBC and Servlets
- Application migration from Tomcat
- IPD deliverables (Accessibility, globalization, etc)
- Inclusion of Jakarta taglibs
- Custom tag library
- NT/LT Template Wizard
- NT/LT Template Builder (tech preview)
- JavaScript debug support for both client and server side
- OS and LDAP registries

Unique to iSeries:
- Two offerings:
  - application server (embedded Bobcat)
    - new iSeries product integrating HTTP and application serving
    - included with new hardware in 2003
    - included with OS/400 in 2004
  - tools (WDSC /w embedded WSSD)
- Consoles:
  - iSeries integrated HTTP and application server web admin console (usability)
  - WAS 5.0 web admin console subset (advance users only)
- Migration tools for existing Tomcat and WAS 3.5 SE
- Web server plug-ins (Apache and Domino HTTP servers for iSeries)
- DB2 for iSeries
- LDAP and LTPA (SSO for Domino)

WebSphere Application Server - Express

WebSphere Developer Studio client for iSeries

5722-IWE Integrated Web Enablement for iSeries

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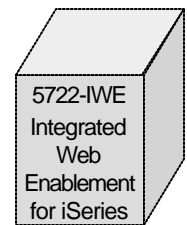
WAS Express for iSeries – Licensing

Existing iSeries & AS/400 servers

- must be at OS/400 V5R1 or later
- must purchase licensed program 5722-IWE

New iSeries servers

- product is included with the 810 advanced edition
- models 825, 870 & 890 enterprise package includes your choice of one of these
  - WAS 5 Express
  - WAS 5 Base edition
  - WAS 4 Single Server
- purchase licensed program 5722-IWE separately

WAS Express for iSeries - Installation

WAS Product Compatibility

OS/400 V5R1

❏ can install WAS 3.5 Standard or Advanced Edition, but not both on a single partition

❏ can install WAS 4 Single Server and/or Advanced Edition on a Single Partition

❏ can install WAS 5 Express and WAS 5 Base or Network Edition on a Single Partition

OS/400 V5R2

❏ WAS 3.5 is not supported

❏ can install WAS 4 Single Server and/or Advanced Edition on a Single Partition

❏ can install WAS 5 Express and WAS 5 Base or Network Edition on a Single Partition

Coexistence Considerations

❏ potential HTTP server port conflicts

❏ WAS Express configuration wizard will ask for a 12 consecutive port starting point

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Basic WAS Express Implementation

1. Visit the iSeries Documentation Center and view/print the appropriate resources

2. Ensure you are on a supported OS/400 Release (V5R1 or later) and have the prerequisite software installed

3. Ensure you have adequate processor & memory resources

4. Ensure the latest cumulative PTF package is installed

5. Stop all *ADMIN HTTP server jobs

6. Install the licensed program code on the iSeries server
   - 5722-IWE (base & option 2)
   - optional - 5722-IWE option 3 (IBM Telephone Directory Application) install from the iSeries CD-ROM

7. Install the appropriate Group & other required PTF's on the iSeries server
   - SF99270 (V5R1)
   - SF99271 (V5R2)

8. IPL the iSeries server partition, if needed

9. Start the HTTP *ADMIN server

10. Start the QASE5 subsystem
    Note: you don't need to do that if you start an Express application server from the integrated GUI

11. Configure an Express and associated HTTP server instance

12. Start your Express & HTTP server instances

13. Test your implementation via the snoop servlet

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Minimum Hardware Requirements

Processor - 300 CPW or more

- Model 170, FC 2292
- Model 720, FC 2061
- Model 270, FC 2250
- Model 820, FC 2395
- Model 800, FC 2463

Disk

- 800 Mb

Main Memory

- 512 Mb

Note: These are minimum requirements for processor and main memory. You may need additional resources, depending on the application and expected workload.

OS/400 Software Requirements

❏ OS/400 V5R1 or later & latest cumulative PTF package

❏ IBM Developer Kit for Java 1.3 (5722-JV1, base & option 5)

❏ OS/400 Qshell (5722-SS1, option 30)

❏ IBM TCP/IP Connectivity Utilities (5722-TC1)

❏ HTTP Server

⚠ 5722-DG1, powered by Apache

⚠ Domino for iSeries HTTP server (5769-LNT)

Optional Components

❏ OS/400 Directory Services (5722-SS1, option 32) [this is REQUIRED if using the ITD application]

❏ OS/400 Digital Certificate Manager (5722-SS1 option 34)

❏ Cryptographic Access Provider (5722-AC3)

WAS Express – Installation

Product comes packaged in 2 CD's

❑ base product & option 2 (required)

❑ option 3 (optional IBM Telephone Directory application)

Installation is via the standard RSTLICPGM OS/400 command

```
RSTLICPGM LICPGM(5722IWE) DEV(OPT02)
RSTLICPGM LICPGM(5722IWE) DEV(OPT02) OPTION(2)


                     Display Installed Licensed Programs
Licensed   Installed
Program    Status        Description
5722DG1    *COMPATIBLE   Triggered Cache Manager
5722IP1    *COMPATIBLE   IBM Infoprint Server
5722IWE    *INSTALLED    WebSphere Application Server - Express
5722IWE    *INSTALLED    IBM WebSphere Application Server Express V5

RSTLICPGM LICPGM(5722IWE) DEV(OPT02) OPTION(3) (took about 1 minute)

                     Display Installed Licensed Programs

Licensed   Installed
Program    Status        Description
5722IWE    *INSTALLED    WebSphere Application Server - Express
5722IWE    *INSTALLED    IBM WebSphere Application Server Express V5
5722IWE    *INSTALLED    IBM Telephone Directory
```

Group PTF: What's in it?

WAS Express Group PTF installation

- SF99270 (V5R1) or SF99271 (V5R2)
- use GO PTF command, option 8
- V5R2 also supports Group PTF's via iSeries Navigator

PTF number	Description
Group PTF - SF99098	IBM HTTP SERVER FOR ISERIES
Group PTF - SF99169	JAVA PTF GROUP
Group PTF - SF99502	DB2 UDB FOR ISERIES
Single PTF - SI06756	5722SS1 for Toolbox Java
Single PTF - SI06886	5722SS1 for Java
Many	MRI PTFs for twenty plus languages for *BASE and Option 2

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WAS Express – Other Implementation Topics

❑ Apply the appropriate group PTF BEFORE starting the WebSphere subsystem

❑ Use the WRKLICINF command to set WAS Express product usage limit

❑ Ensure you have TCP/IP configured correctly
  - ⚠ WAS will use the iSeries host name as the node name
  - ⚠ This host name must be accessible or WAS will not start
    - ➤ ensure the host name and IP address are in the local hosts table
    - ➤ ensure the TCP/IP interface associated with the host name IP address is started

```
                 Change TCP/IP Domain (CHGTCPDMN)

  Type choices, press Enter.


  Host name  . . . . . . . . . . .      'MYSERVER'


  Domain name  . . . . . . . . . .      'MYCOMPANY.COM'




  Domain search list . . . . . . .      *DFT




  Host name search priority  . . .      *LOCAL       *REMOTE, *LOCAL, *SAME
  Domain name server:
     Internet address . . . . . . .     '10.20.30.40'
                                        '10.20.30.41'
```
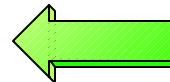
WAS Express Infrastructure – iSeries Objects

QSYS.LIB File System - Licensed Product Code

- QASE5 (subsystem, job description, job queue, etc.)
- QIWE (message files)

Integrated File System (IFS)

- /qibm/proddata/WebASE
  - /bin (contains plugin script)
  - /businessApp (optional, contains ITD application files)
  - /license
  - /sampleApps (contains sample application files)
  - /ASE5 (runtime files)
- /qibm/userdata/WebASE
  - /businessApps (optional, contains ITD configuration files)
  - /service
  - /ASE5 (installed servers)
  - /ASEAdmin (used for console tracing)

Subsystem

- QASE5

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WAS Express Migration Considerations

Multiple WAS versions can coexist (discussed earlier)

Migration assistance scripts shipped with the product

- WASPreUpgrade
  - saves key files
  - saves the configuration
- WASPostUpgrade
  - migrates the configuration
  - creates and deploys applications

Manual migration

- use the WASPreUpgrade & WASPostUpgrade tools
- helpful for doing incremental migration & conversion

WAS 3.5 Standard Edition to Express migration

- additional system configuration effort ranges from minor (i.e. single server & no security) to substantial
- applications will likely require substantial modifications

ASF 'Tomcat' to Express migration

- existing applications packaged in WAR or EAR file archives should require none or minimal modification
- rewrite JDBC code to take advantage of WAS connection pooling

WAS Express for iSeries Administration

WAS 5 Express & HTTP Server Integration

❑ iSeries HTTP server administration application has been updated to integrate WAS 5 Express administration

❑ Used to create WAS 5 Express Instances
  ⚠ first instance (no default is currently shipped with the product)
  ⚠ additional instances

❑ Can create a new, or use an existing Apache HTTP server configuration

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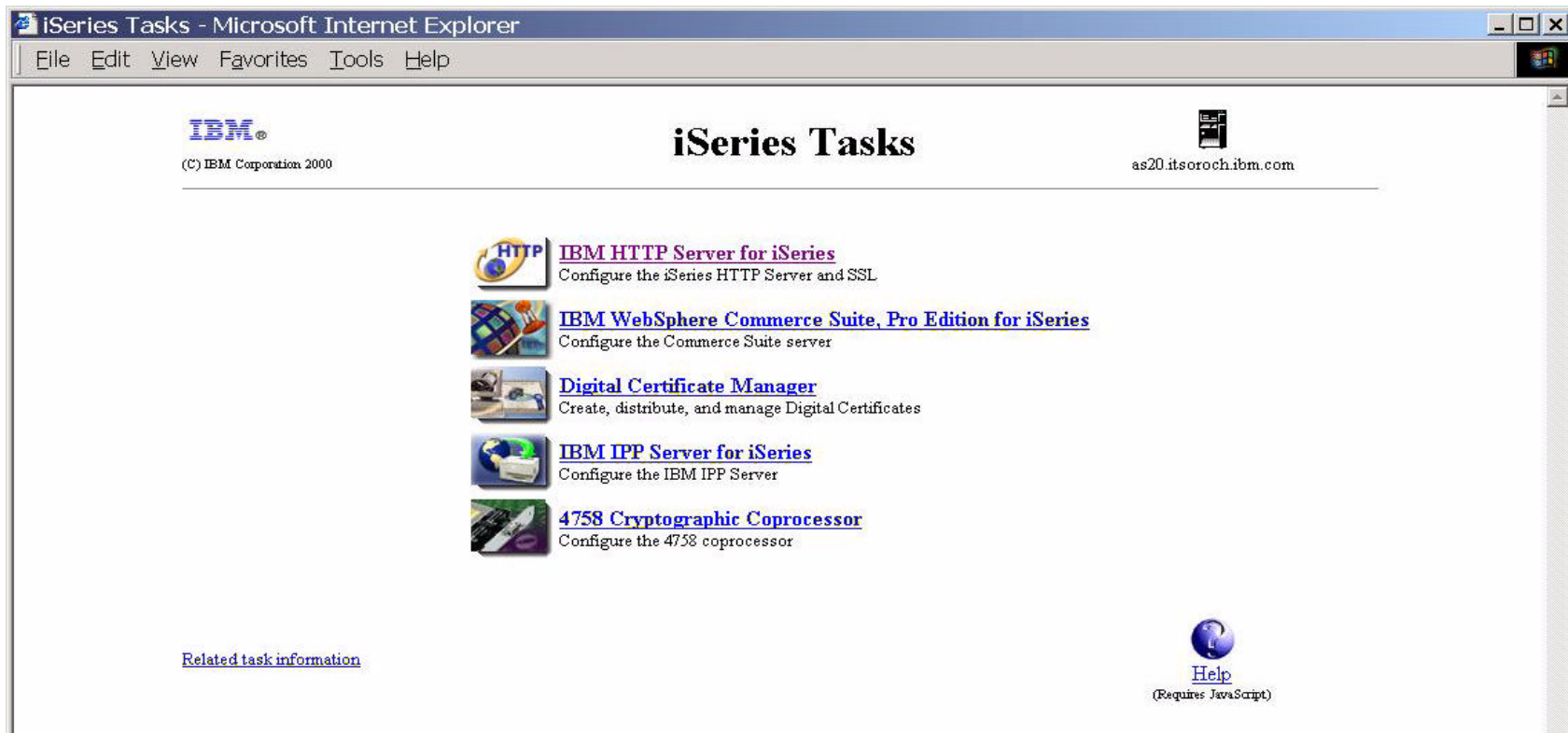
WAS Express for iSeries – Create a New Server Instance

❏ OS/400 HTTP *ADMIN server instance can be used to configure & manage HTTP & Express server instances

❏ configuration wizards simplify common tasks

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Specify or Create an Associated HTTP Server

❑ Express instance creation wizard can create a new HTTP server powered by Apache instance or use an existing one

❑ Express instance creation wizard can also work with Domino HTTP server instances
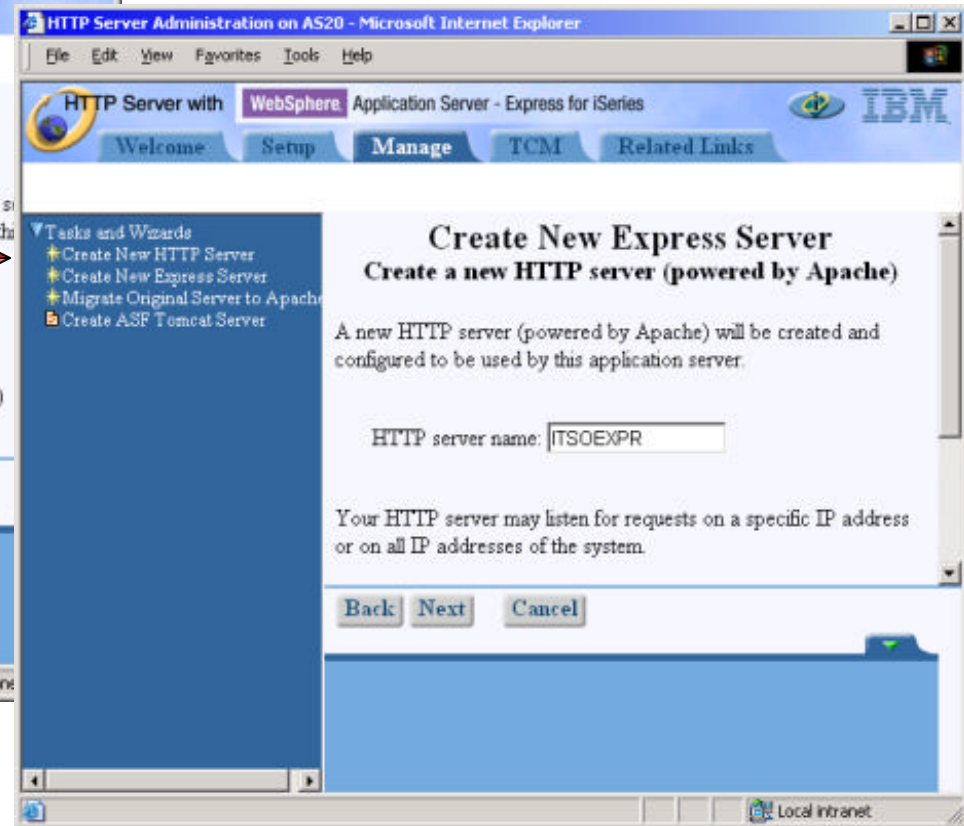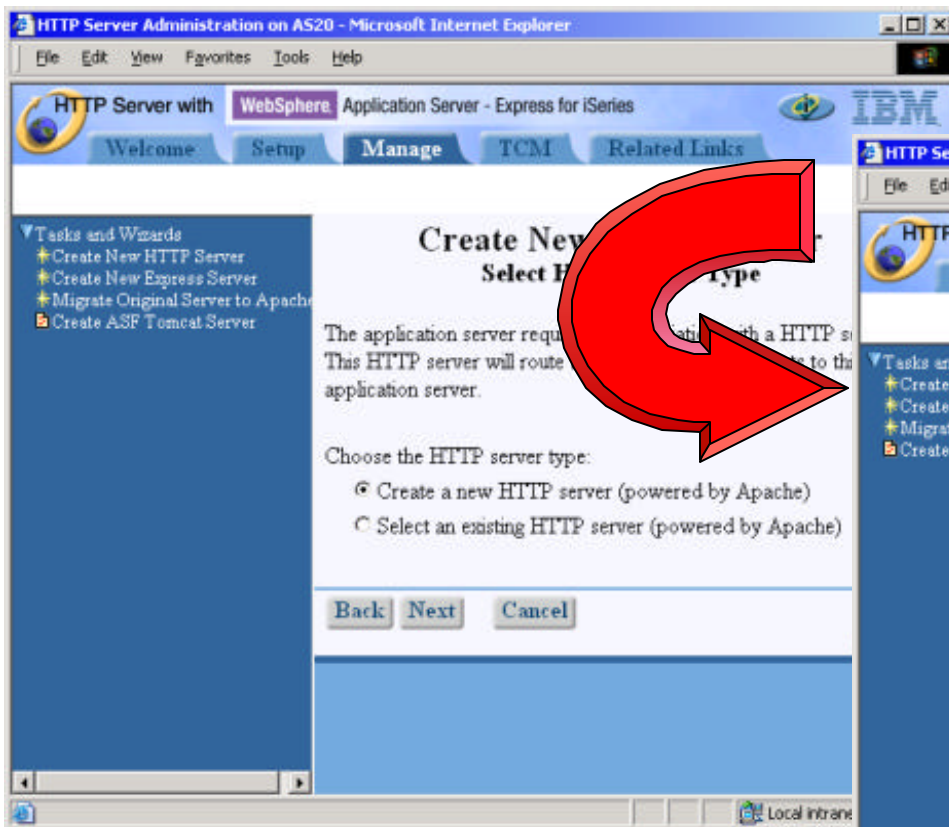
Specify the Application Server Ports

WAS Express wizard will ask for a starting TCP/IP port

12 consecutive, unused ports are required

Example: start at port 25001

❑ port 25001 - RMI port

❑ port 25006 - SOAP port

❑ port 25010 - WAS Express internal HTTP server port

❑ port 25011 - HTTP port for the full function console

❑ port 25012 - HTTPS port for the full function console
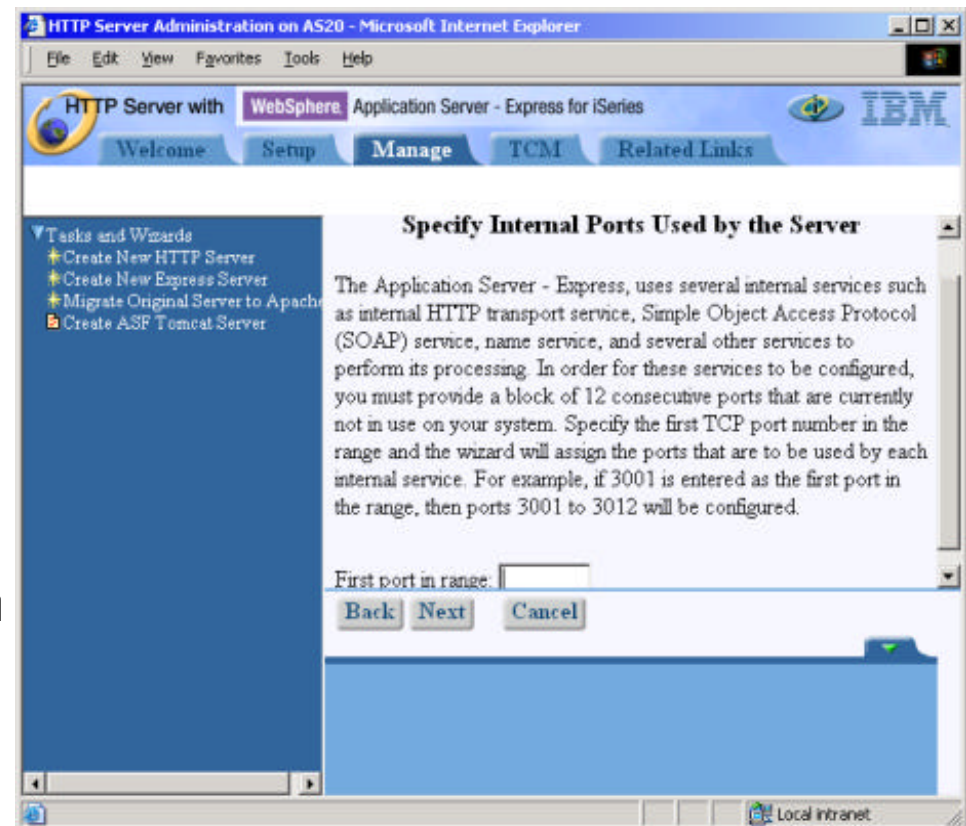
Install any Sample Applications

❏ The instance creation wizard lets you select test & sample applications to install

❏ If the IBM Telephone Directory application is selected the wizard will update the associated HTTP server configuration

Note: You can see ITD only if you have installed 5722IWE Opt.3 and ran the *itdsetup* script.

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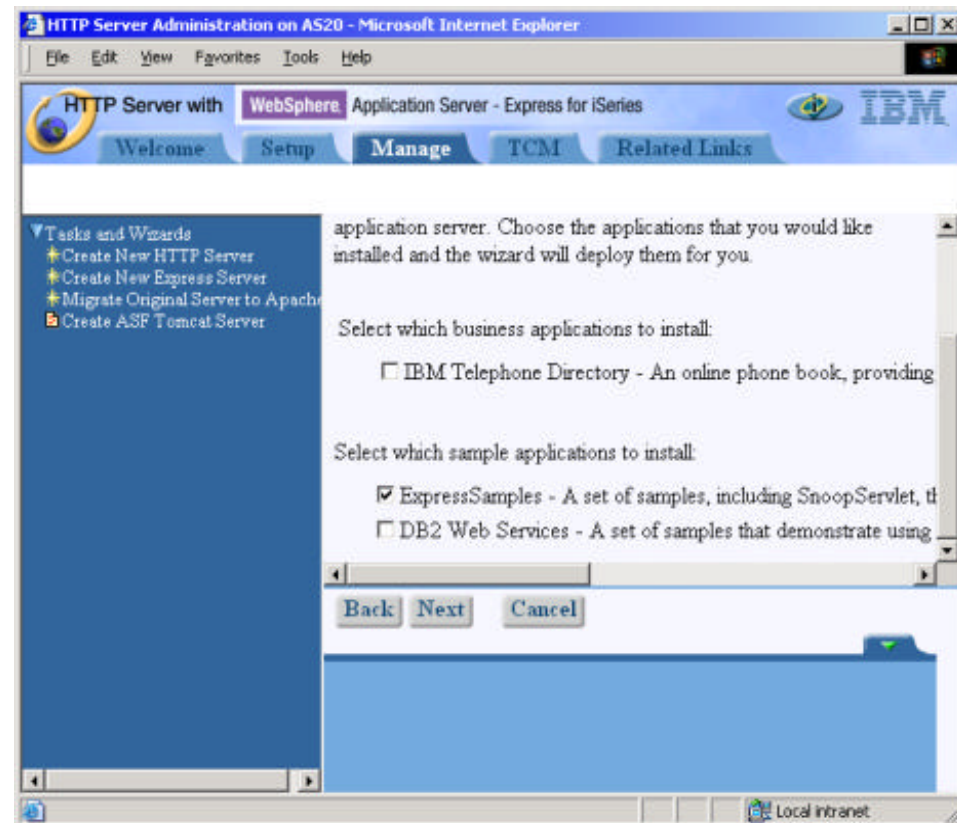
WAS Express for iSeries – Create the Instance

- ❏ The configuration wizard will let you make any necessary modifications prior to actually creating the instance
- ❏ Next step - manage the created instance
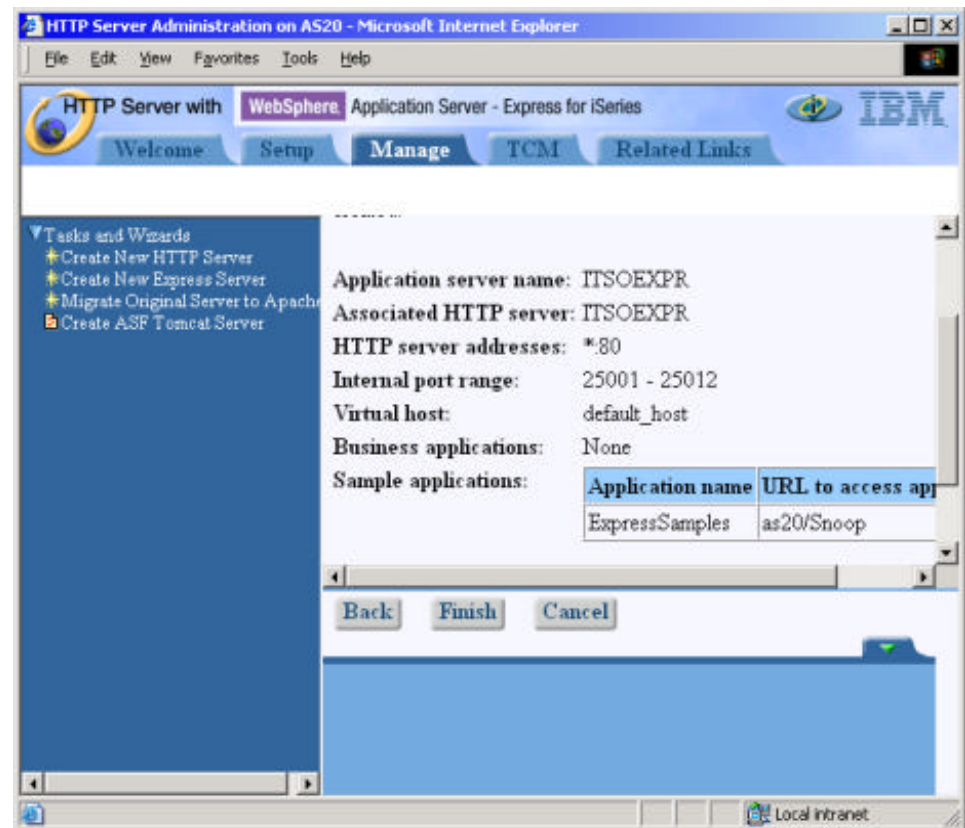
Server Administration Overview

Most administrative tasks can be accomplished from the integrated browser application (HTTP *ADMIN)

- ❏ start, stop, create, delete server instances
- ❏ start, stop, install, uninstall applications
- ❏ define JDBC resources, virtual hosts, other tasks

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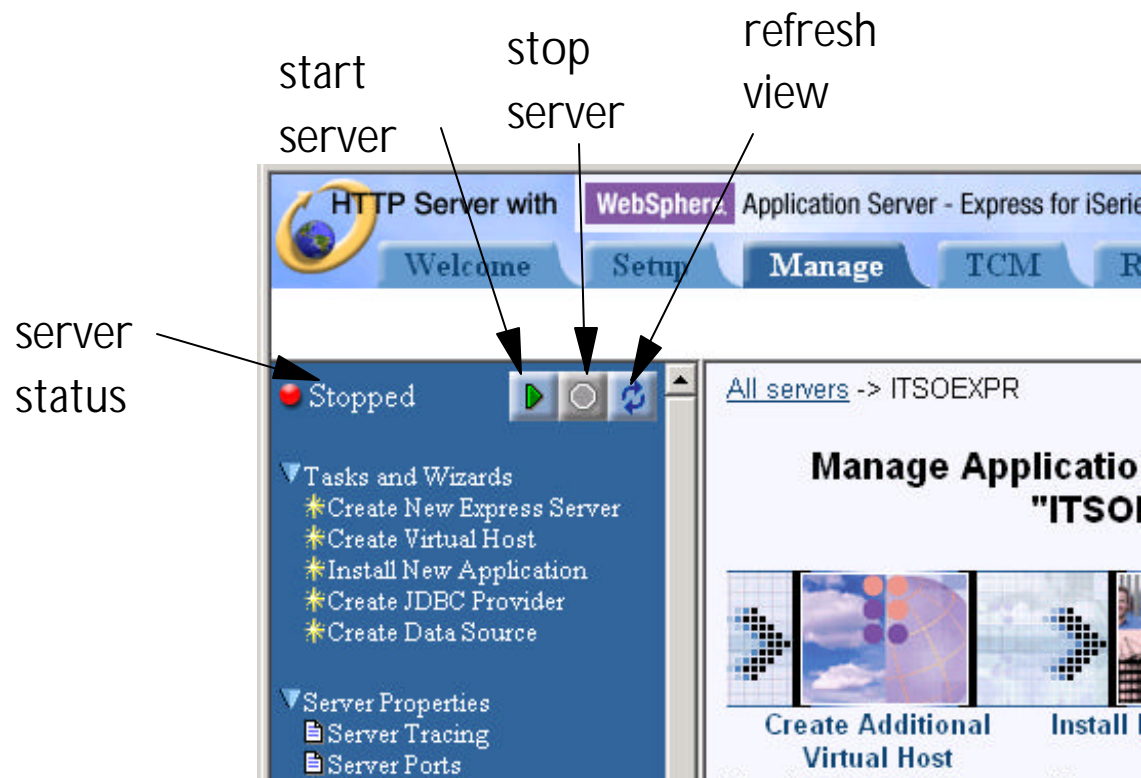
WAS Express – iSeries Job Infrastructure

Each WAS Express instance runs as a separate job in the QASE5 subsystem

The associated HTTP server job will run elsewhere (i.e. the QHTTPSVR subsystem for Apache web servers)

```
                        Work with Active Jobs                     ITCEBIZA


     Type options, press Enter.
       2=Change   3=Hold   4=End    5=Work with   6=Release   7=Display message
       8=Work with spooled files    13=Disconnect ...


     Opt   Subsystem/Job   User        Type   CPU %  Function        Status
           QASE5           QSYS        SBS     .0                    DEQW
             EXPSVR        QEJBSVR     BCH     .0     PGM-QASESTRSVR  JVAW
           QBATCH          QSYS        SBS     .0                    DEQW
           QCMN            QSYS        SBS     .0                    DEQW
           QCTL            QSYS        SBS     .0                    DEQW
             QSYSSCD       QPGMR       BCH     .0     PGM-QEZSCNEP    EVTW
           QHTTPSVR        QSYS        SBS     .0                    DEQW
             ADMIN         QTMHHTTP    BCH     .0     PGM-QZHBHTTP    SIGW
             ADMIN         QTMHHTTP    BCI     .0     PGM-QZSRLOG     SIGW
                                                               More...
```

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WAS 5 Express - Administration Environment

- one or more independent **instances** can be created on a single iSeries partition
  - ⚠ development instance, test instance, production instance, etc.
  - ⚠ default instance, team01 instance, team02 instance, etc.
- can use the HTTP *ADMIN application to create an instance
- can also use the /QIBM/UserData/WebASE/ASE5/crtwasinst QShell script
- Configuration data is stored in XML files

http://myserver/myapp

http://myserver:8080/myapp

http://myserver:8282/myapp

Production Instance	Instance Configuration File 1
Department X Instance	Instance Configuration File 2
System Test Instance 1	Instance Configuration File 3

Node
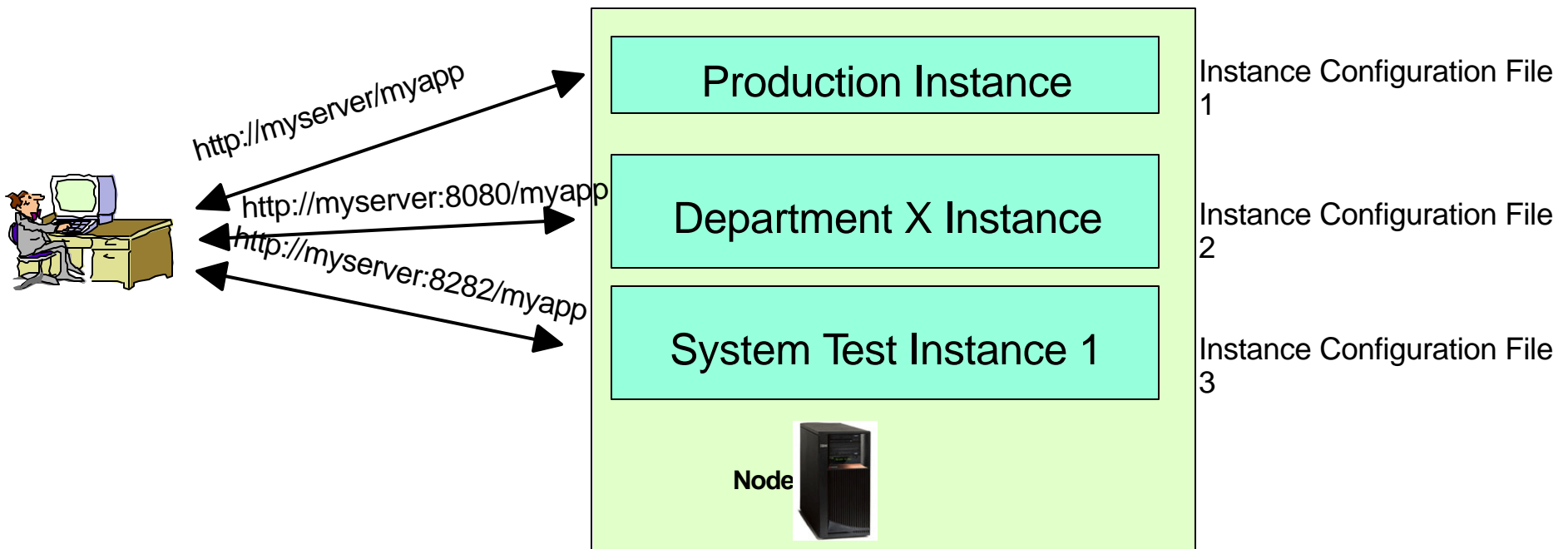
WAS 5 Express - Full Function Administrative Console

❏ Provides a full administrative access to WAS Express configuration

❏ Implemented as Web application running in WAS Express - adminconsole

❏ You should enable and start the adminconsole application in order to access the administrative console

⚠ Select the adminconsole app

⚠ Click Properties

⚠ Select Enable on the Properties page and click OK

⚠ Start your WAS Express instance

© 2003 IBM Corporation
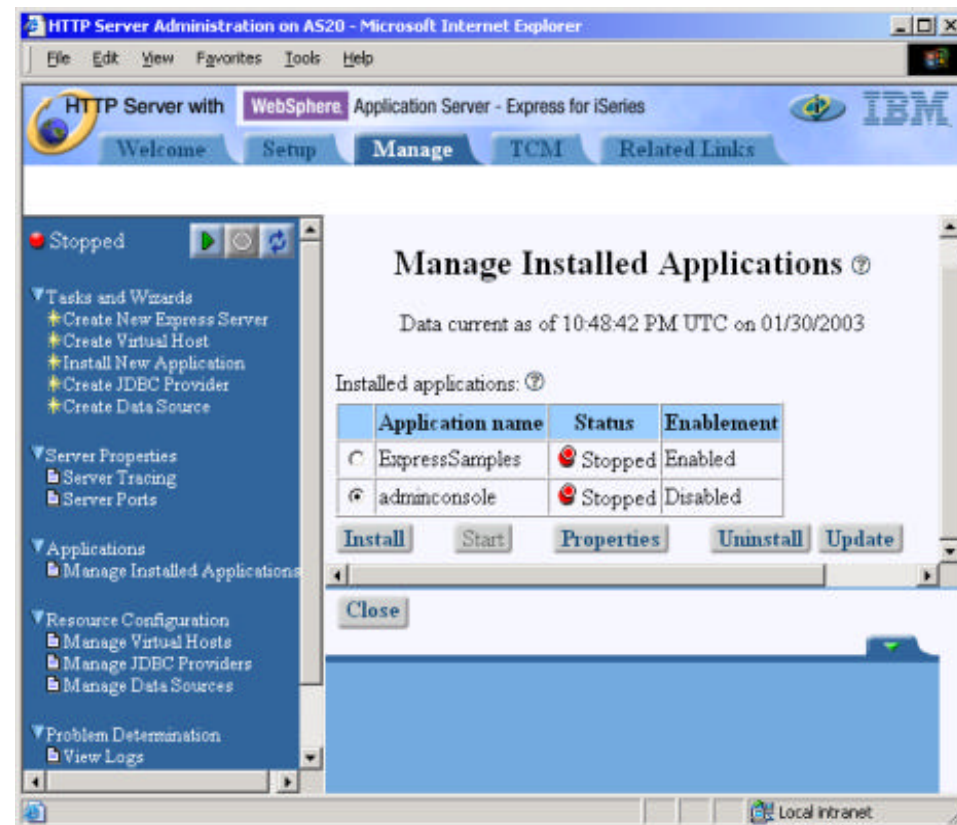
WAS 5 Express – Full Function Administrative Console

❑ Console URL - **http://myserver:port/admin** (port specified at server creation time)

❑ Each instance MUST have a unique port

© 2003 IBM Corporation
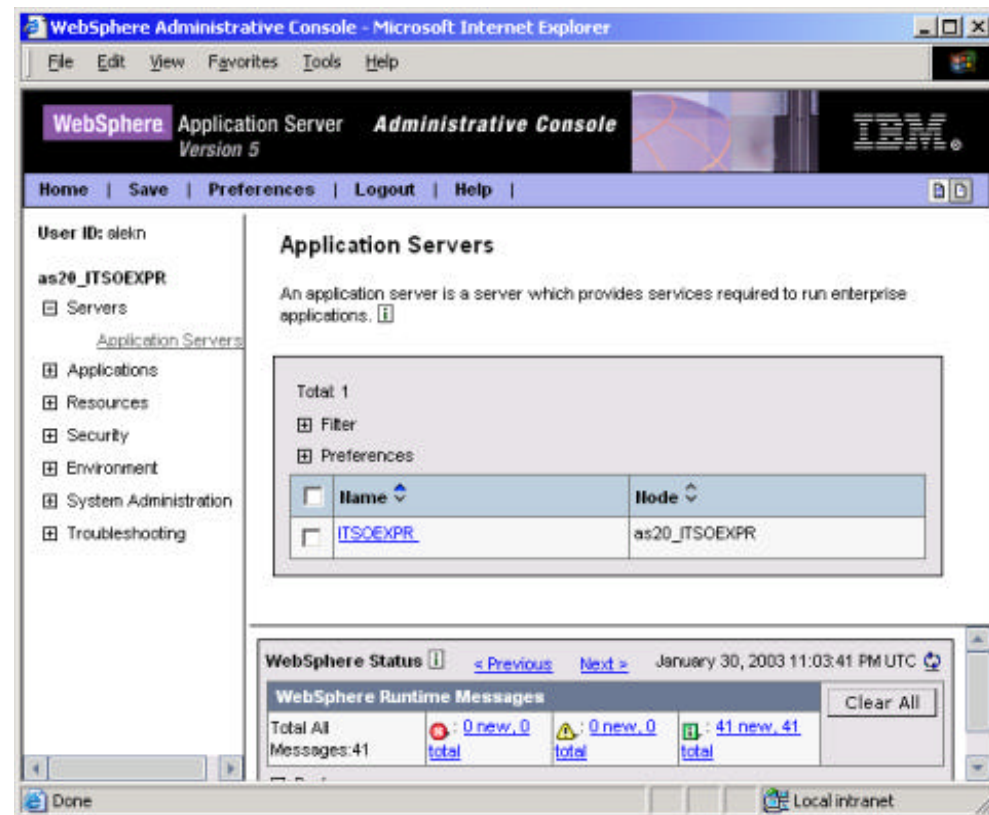
WAS 5 Express – Command Line Scripts

Scripts are located in `/QIBM/ProdData/WebASE/ASE5/bin`

- startServer -instance *instance_name server_name*
  - example: startServer -instance teamxxInst teamxxServ
- stopServer -instance *instance_name server_name*
  - example: stopServer -instance teamxxInst teamxxServ
  - example: stopServer -instance myInstance myServer -username xyz -password abc
- dspwasinst
- crtwasinst
- GenPluginCfg
- genVersionReport
- many others

You can also use `wsadmin` command line tool

WAS 5 Administration - wsadmin tool

❑ 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

❑ Used to automate repetitive or lengthy manual tasks performed at the console
  ⚠ system administration tasks such as shutdowns & startup
  ⚠ application installation & resource configuration

Script → wsadmin
- AdminApp → MBean
- AdminConfig → MBean
- AdminControl → MBean
- Help → MBean

© 2003 IBM Corporation
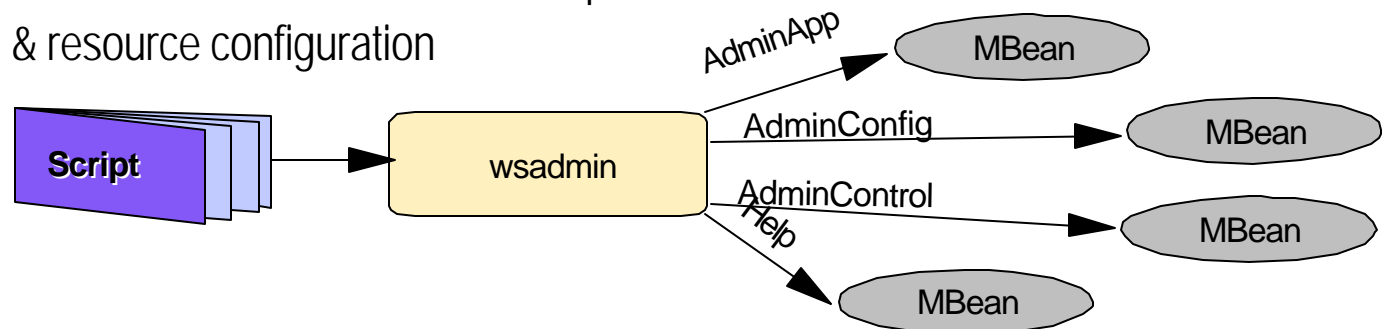
WAS 5 - Virtual Hosts

❑ Virtual Hosts define one or more HTTP server host:port or ipaddress:port combinations that WebSphere can link to

❑ Default configuration includes two Virtual Hosts

⚠ default_host

➢ used for accessing enterprise applications

➢ example entries:

✔ *:80, *:443 (all hosts on default the HTTP server ports)

✔ myserver:8080, 10.10.10.*:8282 (other user defined ports)

⚠ admin_host

➢ typically used only for browser based administrative console

➢ example entries: *:9090, *:9043 (default nonsecure & secure ports)

❑ Additional categories can be defined (i.e. internal or external HTTP servers)

❑ Applications are installed within a specific Virtual Host

http://myserver/myapp

https://myserver/myapp

http://myserver:port/myapp

HTTP Server 1

SSL

HTTP Server 2

WebSphere Application Server Instance

Node

Cell

© 2003 IBM Corporation
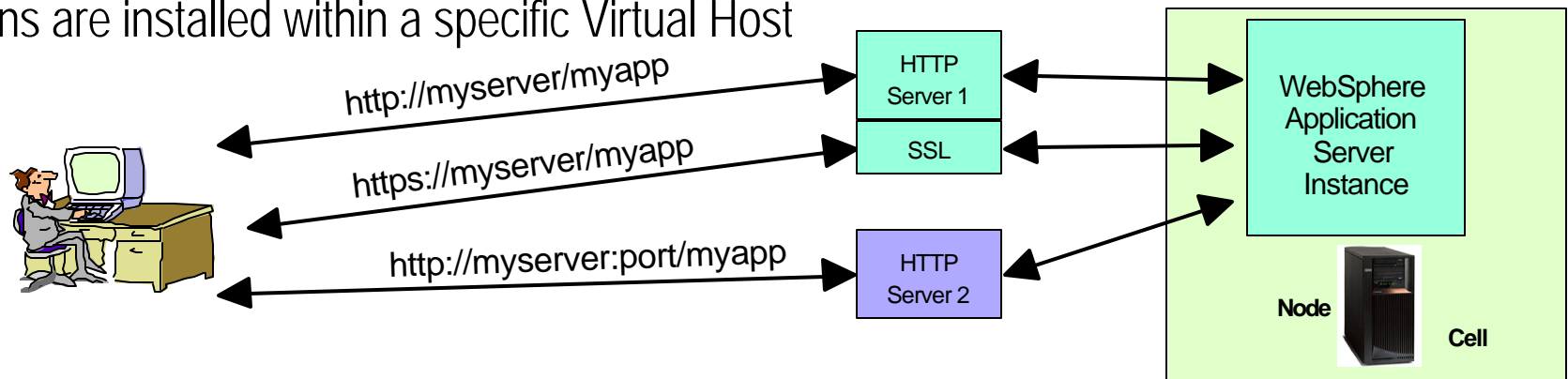
WAS 5 Express – Create A Virtual Host

© 2003 IBM Corporation
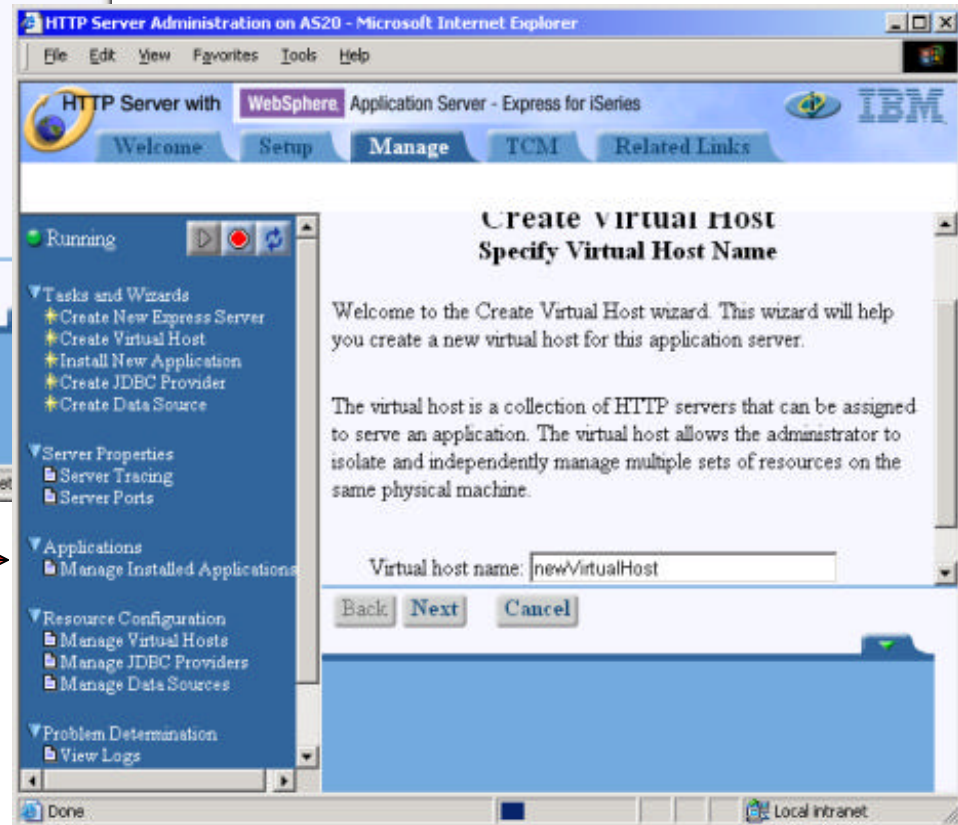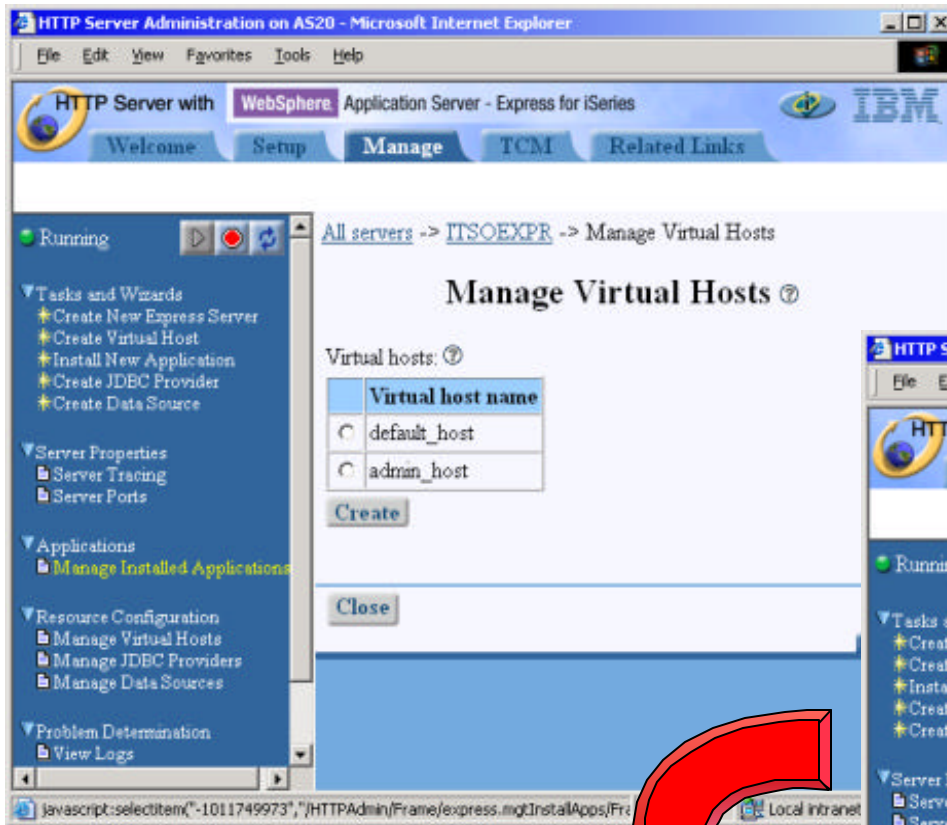
WAS 5 Express - Virtual Hosts Configuration

You can use Administrative Console to create a virtual host

- ❑ Select **Environment -> Virtual Hosts**
- ❑ Click **New**
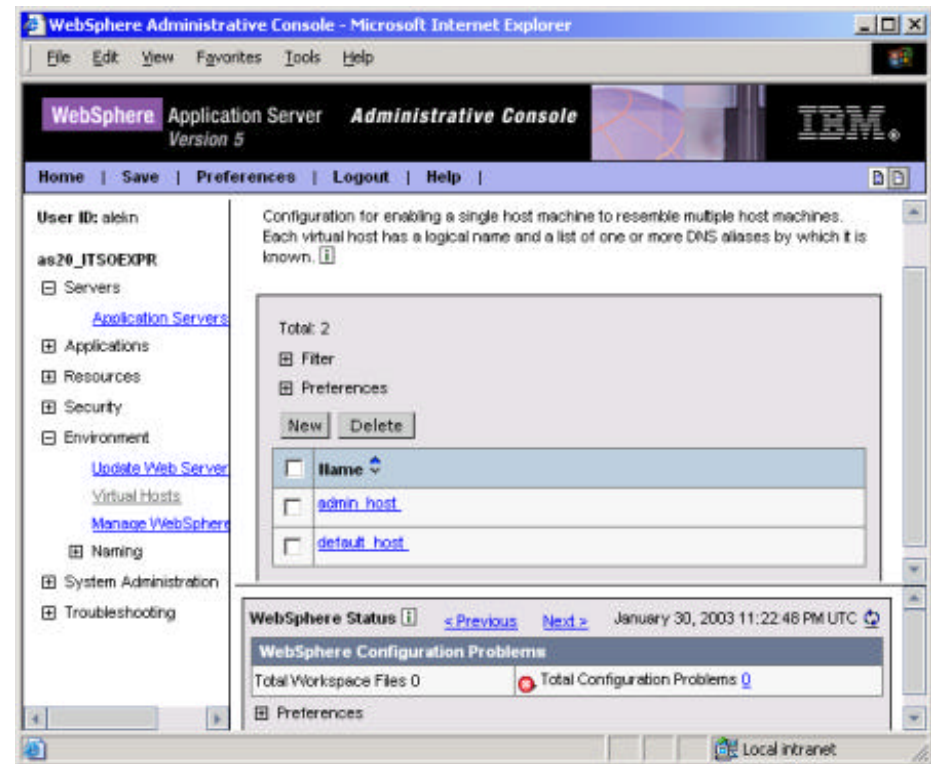
WAS 5 – HTTP Server Plug In

Enables communications between the HTTP server and the WebSphere Application Server

Primary plug-in functions:

- Passing requests between HTTP server and WebSphere
- Determining which requests are to be handled by the HTTP server, and which are passed to WebSphere
- Callbacks and error handling

Provides a loosely coupled, high performance separation between HTTP & WebSphere Application Servers

- Use all HTTP server functions available, independent of WAS
- Changes to one do not affect the other

Web Browser Client

HTTP Server

Plug-in

plugin-cfg.xml

Embedded HTTP Server

HTML

Servlet

JSP

Web Container

Application Server JVM

F03SP05.prz
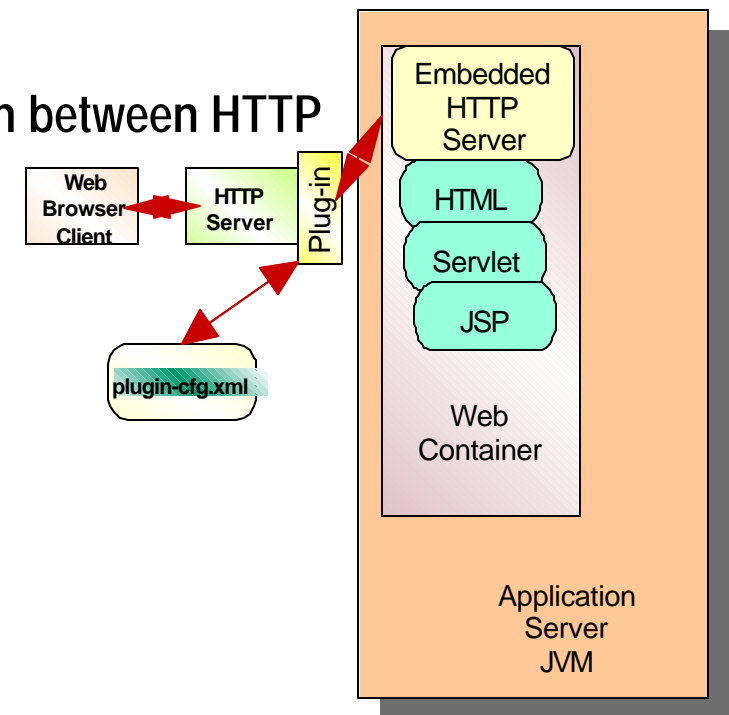
WAS Express – HTTP Server Plug in

❑ WAS uses an internal HTTP server for its web container

❑ WAS sets the instance's web container and virtual host parameters in the **plugin-cfg.xml** file (located in iSeries IFS)

❑ WAS provides a 'regenerate HTTP server plugin' task to keep things in synch with the web server

⚠ automatic when using the integrated console

⚠ manual when using the full function console

❑ The HTTP server configuration file links to the appropriate plugin-cfg.xml file
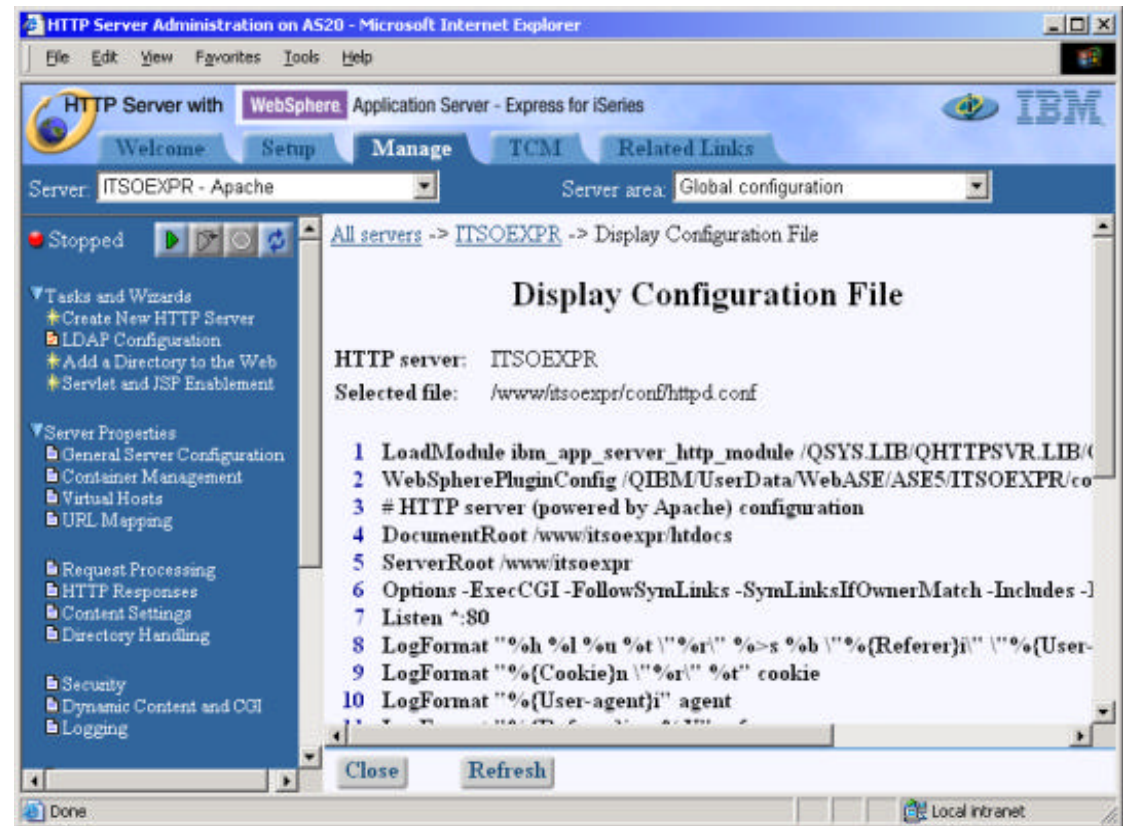
WAS Express – Remote Servlet Execution

Running WAS on every HTTP Server may not be possible

- ❑ HTTP server(s) may be outside the firewall or at an ISP
- ❑ One may use multiple HTTP servers and software licensing and administration costs become prohibitive

HTTP plug-in enables physical separation between web & application servers

- ❑ Install 5722-IWE base option on the HTTP server machine
- ❑ Use the **/QIBM/ProdData/WebASE/bin/crtplugininst** script

Public Network   DMZ or Network Provider   Enterprise Network

HTTP Server
Farm or Cluster

firewall or router

Web Server

HTTP Server plugin

firewall

WebSphere Application Server

Business Data

Business App's

Ports
HTTP (80)
HTTPS (443)

Ports
HTTP (9080)
HTTPS (9443)

F03SP05.prz
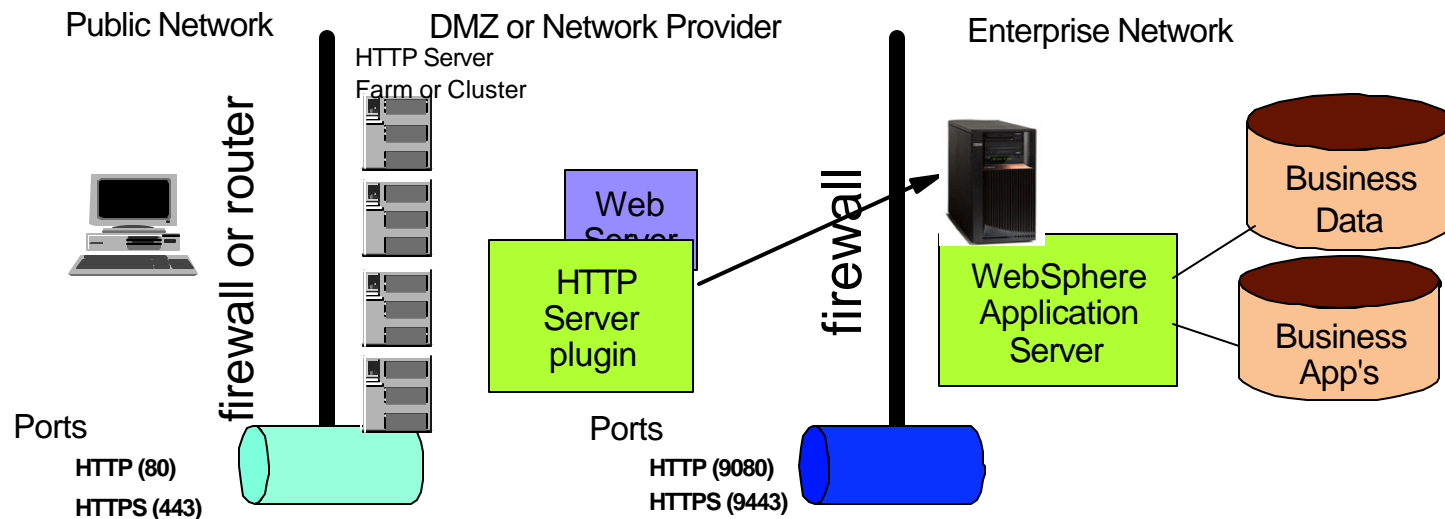
WebSphere Application Server Java Class Loaders

❑ ALL Java bytecodes (servlets, beans, EJBs...) must run in a Java Virtual Machine

❑ The location for Java bytecodes is specified as the *CLASSPATH*

❑ WAS enables multiple CLASSPATH definitions
- ⚠ application server command line startup parameter
- ⚠ resource definitions (i.e. JDBC driver)
- ⚠ application definitions & content
- ⚠ in predetermined IFS locations

❑ WAS provides a hierarchical model for loading classes
- ⚠ individual application level
- ⚠ individual application server level
- ⚠ individual node level
- ⚠ WebSphere product level
- ⚠ JVM bootclass level

WAS Express Java Class Loaders - Examples

WAS Express for iSeries - J2EE Resources

WAS Express – J2EE Application Resources

Java 2 Enterprise Edition specification requires support for

❑ JNDI, Java Messaging Service (JMS), JDBC connection pooling, Java Mail, Java Transaction API (JTA), others

WAS 5 Express supports a subset of the full J2EE specification

❑ servlet 2.3

❑ JSP 1.2

❑ JDBC 2.0

❑ Java Mail & Java Activation Framework

❑ J2EE API libraries

❑ J2EE roles based security

❑ J2C connectors

❑ applications packaged in WAR or EAR archive format

WAS Express – Java Messaging Service (JMS)

❑ JMS provides a J2EE compliant message delivery API
- ⚠ asynchronous and synchronous message delivery
- ⚠ point to point and publish/subscribe messaging included
- ⚠ used with servlets, JSP's, EJB's or standalone applications
- ⚠ J2EE 1.3 requires a JMS provider be included

❑ WAS Express does not include a JMS provider

❑ WAS Express does not include JMS resource definitions

❑ WAS Express can run still run JMS applications
- ⚠ JMS client applications (JMS provider on another machine)
  - ➤ require provider specific coding
  - ➤ support is via MQ Java Classes for iSeries (free download of SupportPack MA88 from www.software.ibm.com/mqseries)
- ⚠ JMS server applications (JMS provider on the machine)
  - ➤ WebSphere MQ 5.2 or later needs to be installed on the iSeries server
  - ➤ provider specific coding is not needed
- ⚠ JNDI lookup service must still be defined, network enabled
  - ➤ WAS COSNaming - server address & bootstrap port
  - ➤ LDAP - server address & port
  - ➤ file context

WAS Version 5 - Java Database Connectivity (JDBC)

❑ JDBC provides servlets, JSP's, EJB's & standalone applications access to DB2/400 resources

❑ JDBC Driver Resource defines the implementation class and appropriate .JAR file

❑ iSeries implementation options
  - Native JDBC driver with and without XA
  - Java Toolbox JDBC driver with and without XA
  - Others (i.e. DB2 for other operating systems and for other databases)

❑ JDBC DataSources are created for each JDBC Driver Resource
  - JNDI context binding
  - Database (i.e. *LOCAL, *LOCAL/MYLIB, ASERVER/YOURLIB)
  - Default Userid/Password, connection pool parameters

❑ WebSphere 5 particulars (all versions)
  - WAS 5 defines a new JDBC DataSource infrastructure (JCA)
  - WAS 4 compatibility mode is included in WAS 5 (i.e. for WDSC or WSSD Version 4 applications)

WAS Express – Create a JDBC Provider
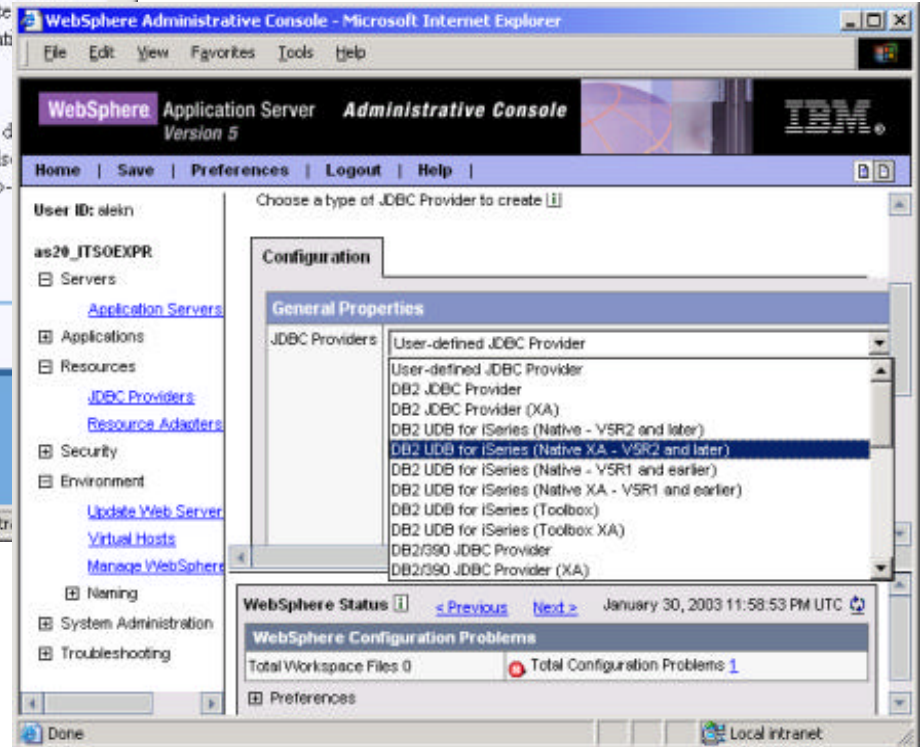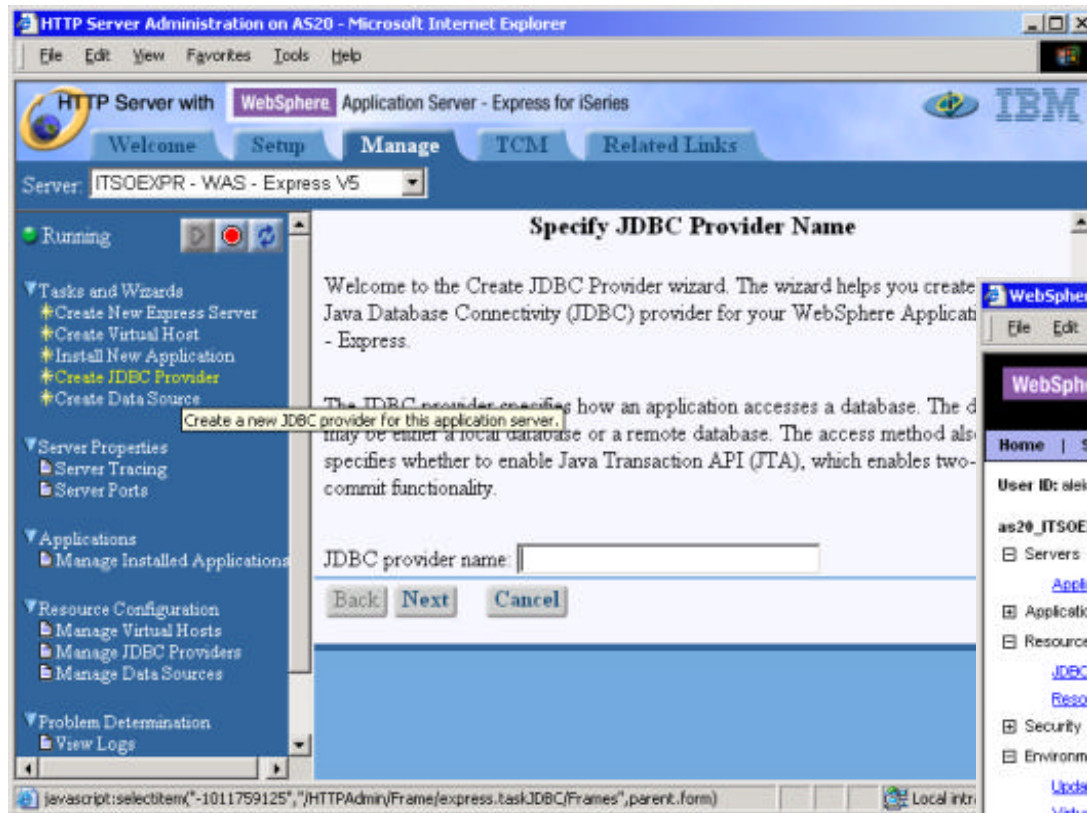
WAS 5 Express – Create a JDBC DataSource
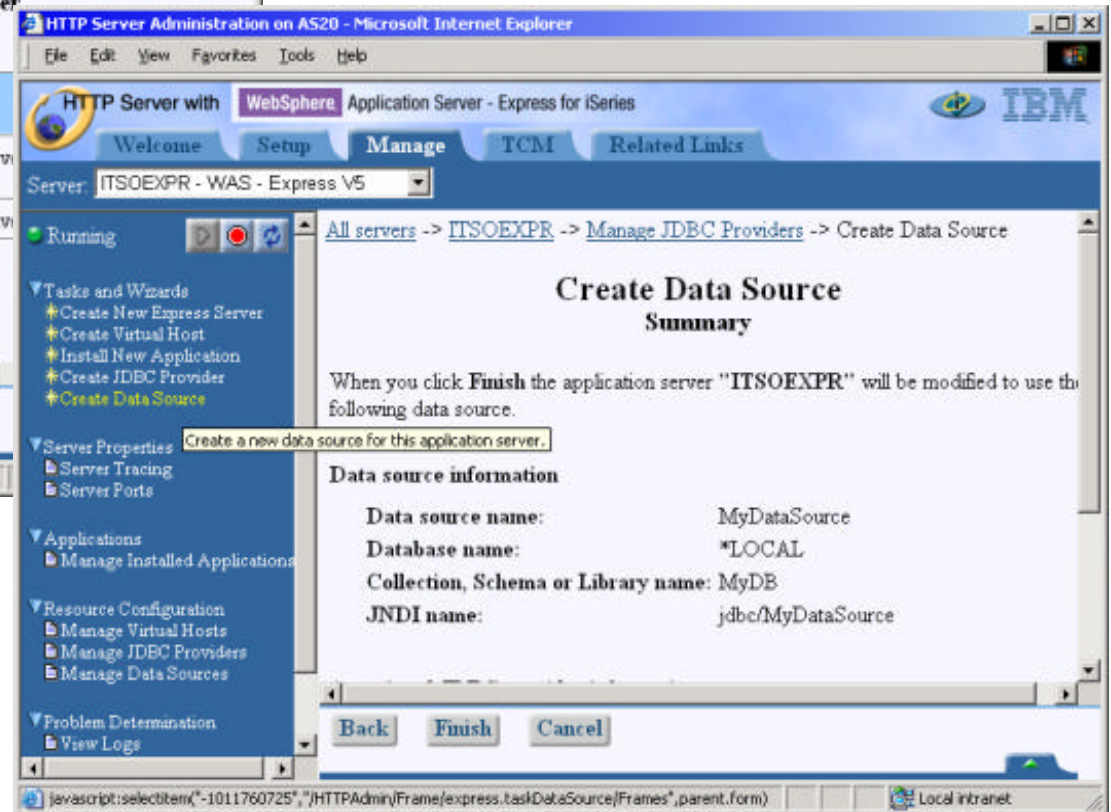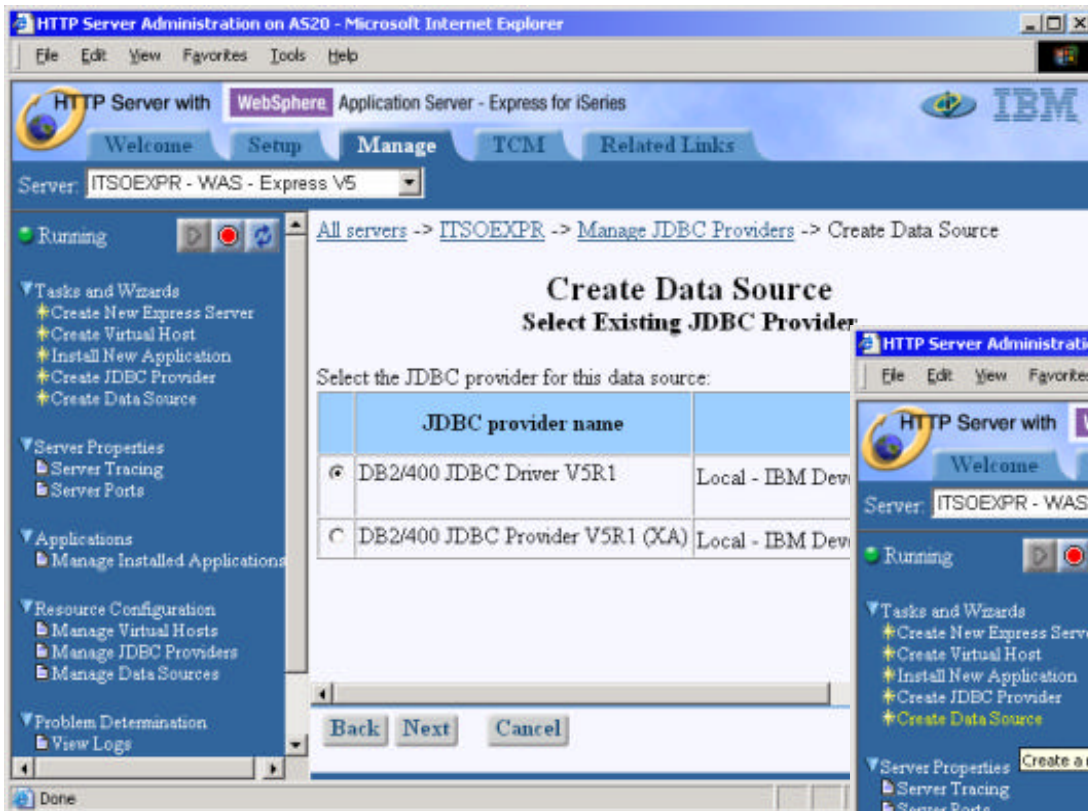
Create one or more DataSources per JDBC provider

WAS Express – Create A JDBC DataSource

JDBC Providers >

DB2 UDB for iSeries (Native - V5R2 and later)

JDBC providers are used by the installed applications to access data from databases. [i]

Configuration

General Properties

Scope	★ cells:ITCEBIZ2_WAS77:nodes:ITCEBIZ2_WAS77
Name	★ DB2 UDB for iSeries (Native - V5R2 a
Description	IBM Developer Kit for Java JDBC Driver for local DB2 connections on iSeries. This driver is not recommended for remote access. The jar file for this driver is /QIBM/ProdData/Java400/ext/db2_classes.jar
Classpath	${OS400_NATIVE_JDBC_DRIVER_PATH}/db2_classes .jar

Create one or more DataSources per JDBC provider

JDBC Providers > **DB2 UDB for iSeries (Native - V5R2 and later)** > **Data Sources (Version 4)** >

WSSClassDS

This is the WebSphere 4.x data source that uses the WebSphere old ConnectionManager architecture. A use this data source. [i]

Configuration

General Properties

Scope	★ cells:ITCEBIZ2_WAS77:nodes:ITCEBIZ2_WAS77	[i] The scope resource. This configuration l configuration
Name	★ WSSClassDS	[i] The require resource.
JNDI Name	jdbc/WSSClassDS	[i] The JNDI n
Description	New DB2 Datasource	[i] An optiona resource.
Category		[i] An optiona be used to cla resource.
Database Name	*LOCAL	[i] The databa WebSphere 4 get a connecti

59

WebSphere Application Server Security

Security Overview

HTTP server security may not adequately protect WebSphere Application Server resources

- ❏ Access to the administrative console

- ❏ Controlling access to web resources

- ❏ Providing encryption and digital signature services to enterprise applications

WAS provides its own unified security model

- ❏ J2EE application declarative & programmatic security

- ❏ SSL services between HTTP and WebSphere servers

WAS security entails authentication (who are you, and prove it to me) and authority (what you can and can't do)

- ❏ Local OS/400

- ❏ LDAP/LTPA (including WAS 5 Express for iSeries)

- ❏ Roles based authority

WebSphere Security – Layers of Defense

WebSphere Application Server Resources

*Naming
*User Registry
*JMX Message beans

*HTML
* Servlet/JSP file
*Enterprise beans
*Web Services

Access Control

WebSphere Application Server Security

WebSphere Security

J2EE Security API

Java Security

CORBA Security (CSIv2)

Java 2 Security

JVM 1.3

Platform Security

OS Security

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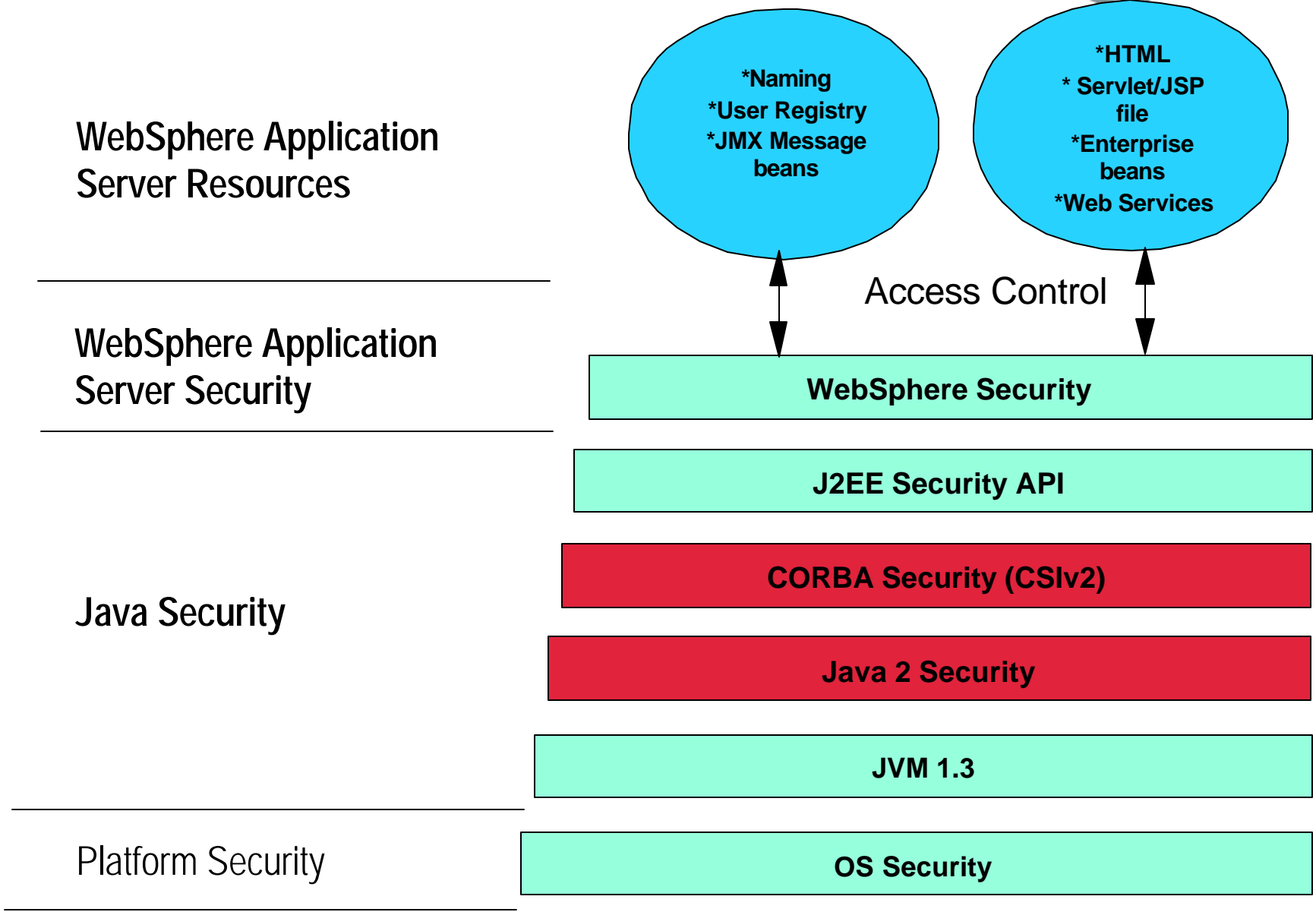
Role-based Access

❑ WAS Express provides role-based access to the administrative console: 4 predefined console users
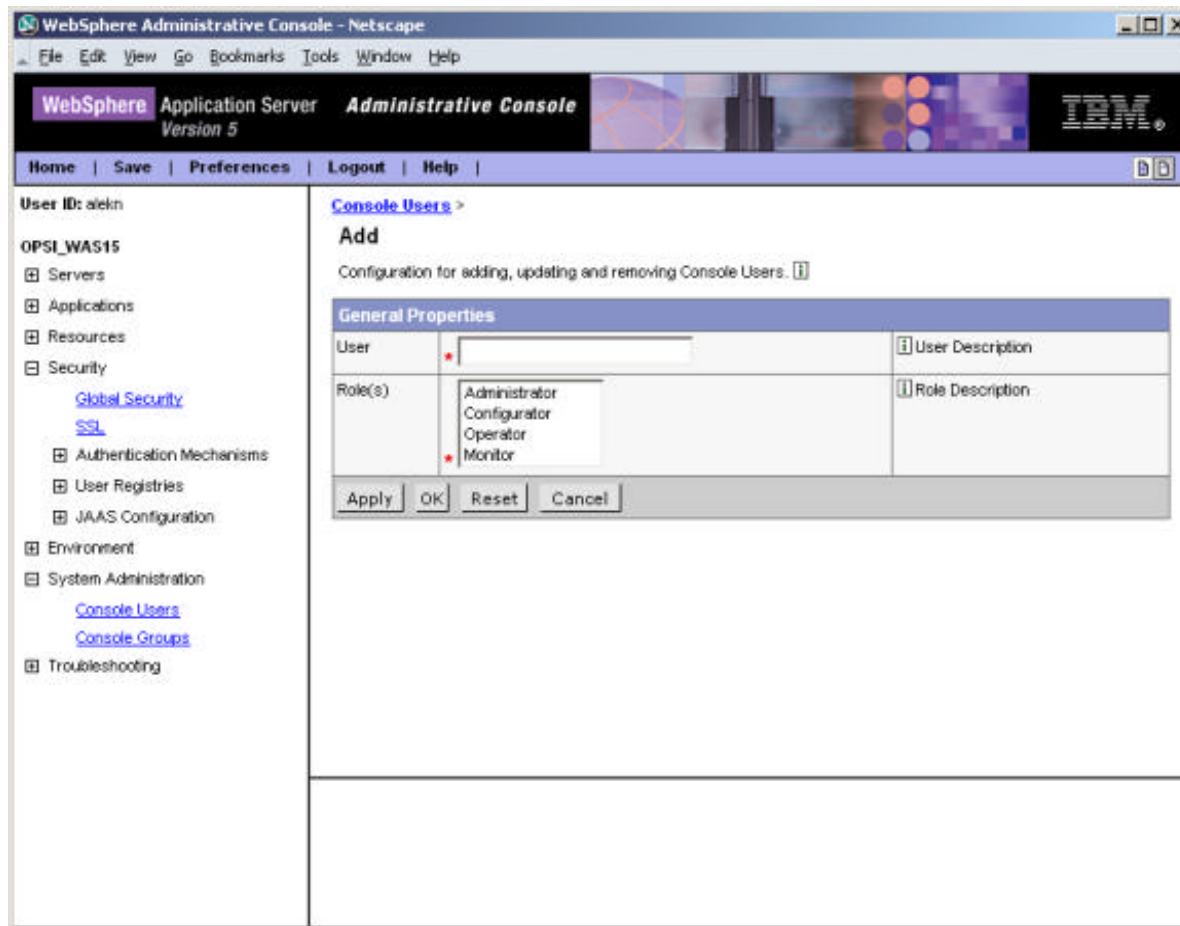
Java 2, JAAS and J2EE Security comparison

Java 2 Security

- ❑ Code based security
- ❑ Defined in Policy files (i.e. the application developer role)
- ❑ Enforced at runtime

JAAS Security

- ❑ Principle/Subject based security
- ❑ Defined in Application Code (i.e. the application developer role)
- ❑ Enforced programmatically

J2EE Security

- ❑ Role based security
- ❑ Defined in configuration settings or within Application Code
  - ⚠ development tool such as WSAD (application developer or assembler role)
  - ⚠ application assembly tool (application developer or assembler role)
- ❑ Enforced by runtime and/or programmatically

WAS Express for iSeries - Application Deployment

Overview of Web Application Assembly and Installation

Web Application Archives

Deployment Descriptors

Servlet

JSP

HTML, GIF, and others

Application Assembly

Assemble

J2EE Application .EAR file

Install

Application Server
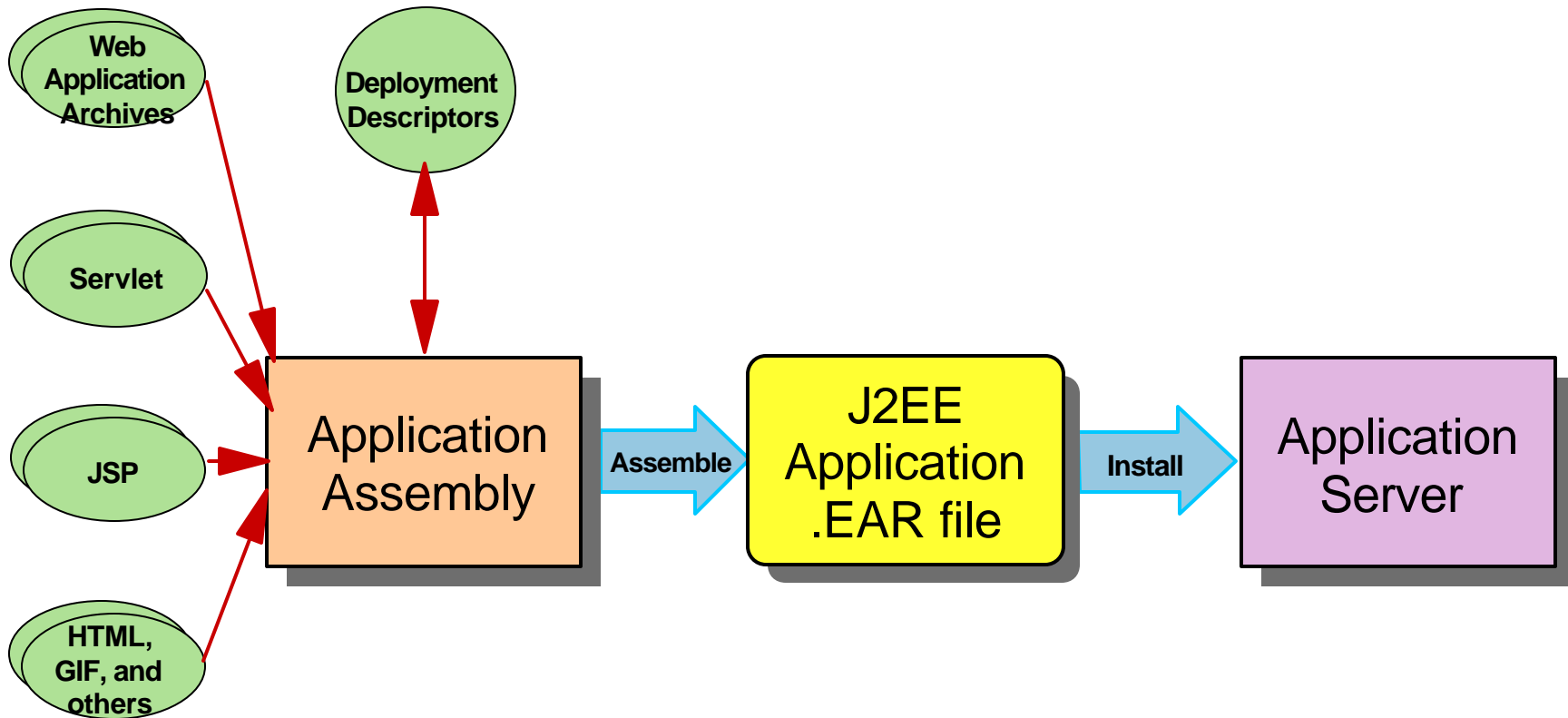
WAS 5 Express – Application Installation

❑ OS/400 integrated browser console provides an easy to use application installation wizard for WAR & EAR files

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WAS 5 Express – Application Installation Wizard

WAS 5 Express – Application Installation Wizard
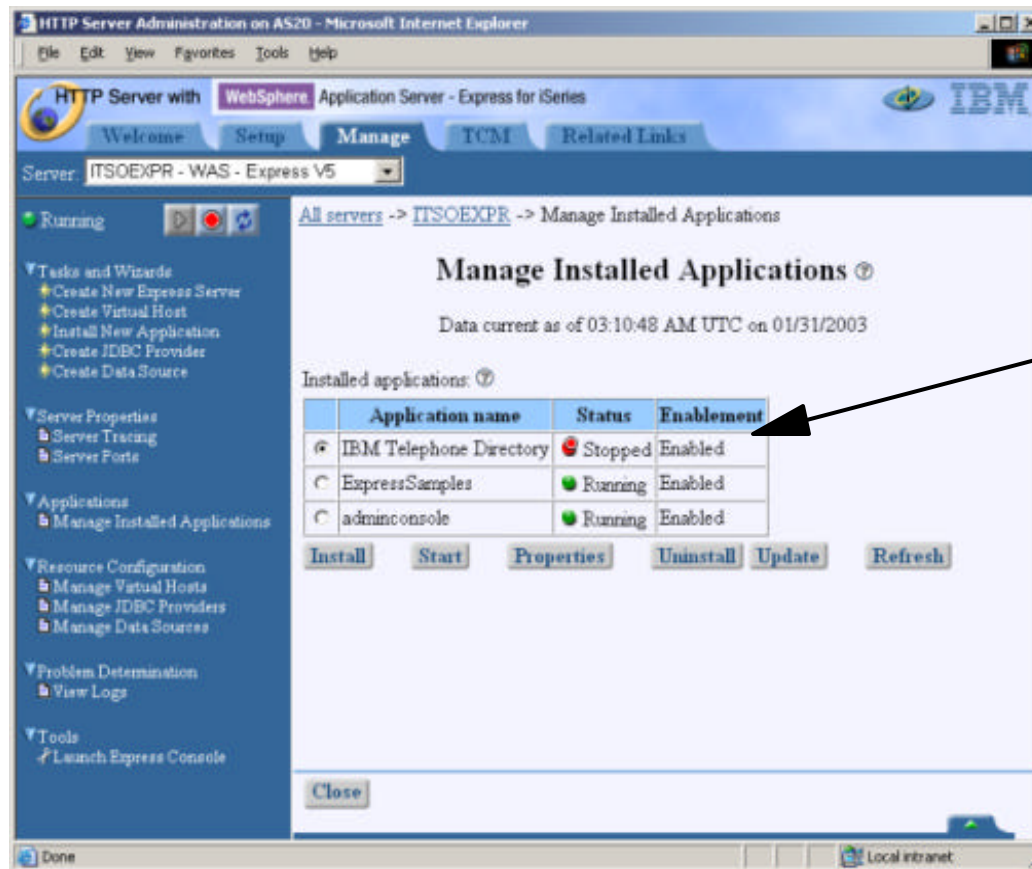
WAS 5 Express - Application & Server Management

❑ Applications can be started, stopped, enabled & disabled from the integrated console

❑ Application Server can be started & stopped from the integrated console

Telephone Directory Application
An iSeries Differentiator!

WAS 5 Express – Application Installation Wizard

WAS 5 Administrative Console provides additional installation options

- local or mapped drive access to WAR & EAR files
- application security settings
- class reloading parameters

WAS Express - IBM Telephone Directory Application

- ❑ IBM Telephone Directory (ITD) application is an installable option of WAS Express for iSeries (5722-IWE, option 3)
- ❑ ITD application overview
  - ⚠ Provides an online telephone directory where users can search for details on employees within an organization.
  - ⚠ Is based upon the internal IBM 'Bluepages' application
  - ⚠ Uses a Lightweight Directory Access Protocol (LDAP) enabled directory infrastructure
    - ➤ OS/400 Directory services
    - ➤ Domino LDAP service
  - ⚠ Allows 1000 directory entries before incurring charges
  - ⚠ Can be installed on any number of WAS Express instances
- ❑ ITD is preloaded and preconfigured on iSeries hardware ordered with WAS Express and shipped after 2/21/2003
- ❑ ITD is also available (for a nominal fee) for WAS 5 Base & Network Deployment

WAS Express – IBM Telephone Directory Example

With ITD you even can add a small picture to an entry
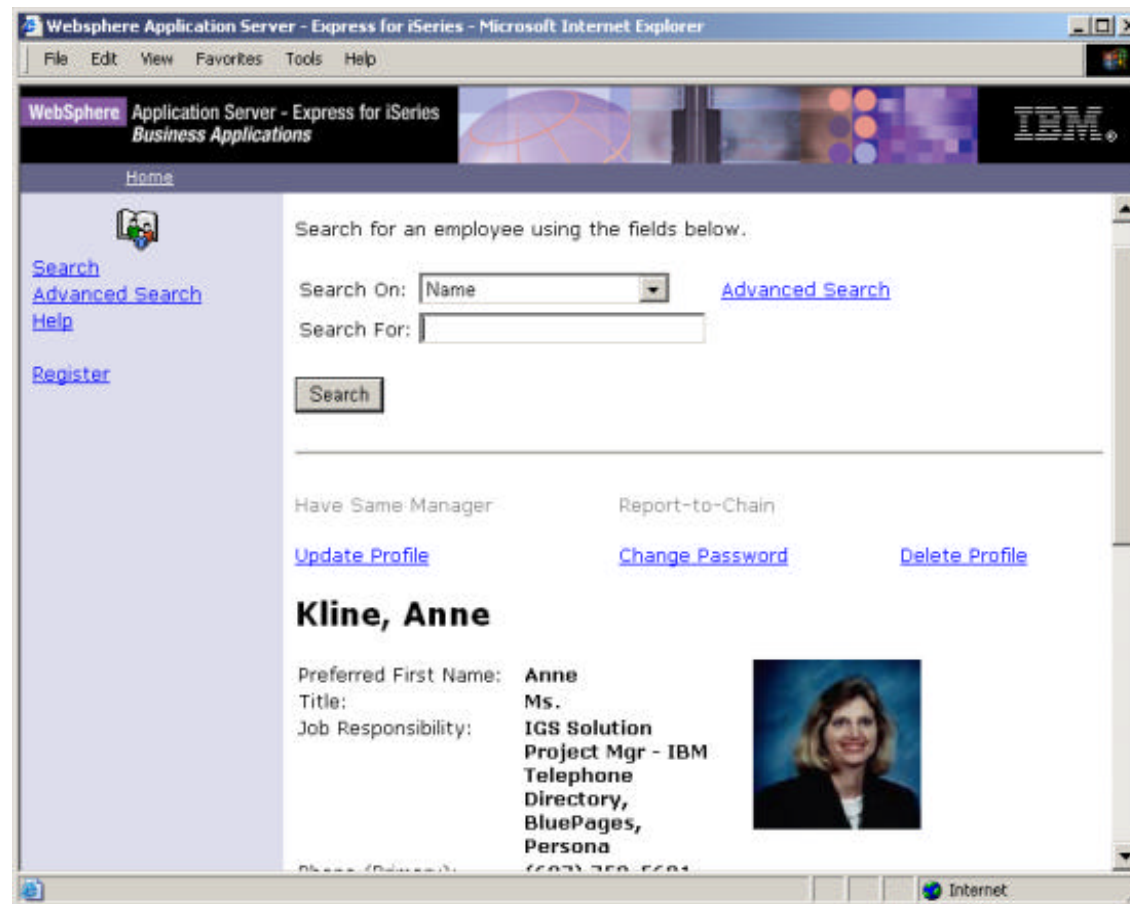
ITD – Installation

RSTLICPGM LICPGM(5722IWE) OPTION(3)

❏ This command installs files into the
`/QIBM/ProdData/WebASE/businessApps/IBMTelDir` directory

```
Opt    Object link           Type
__     installable           DIR
__     itd.html              STMF
__     itdbasedn.ldif        STMF
__     itdschema.ldif        STMF
__     itdschemaDomino.ld >  STMF
__     itdsetup.qsh          STMF
__     itdApache.conf        STMF
```

❏ `itd.html` - for preload/preconfig of ITD

❏ `itdbasedn.ldif` - example ldif file for creating a base DN

❏ `itdschema.ldif` - used to update schema on IBM LDAP server

❏ `itdschemaDomino.ldif` - used to update schema on Domino LDAP server

❏ `itdsetup.qsh` - setup program to configure ITD on the system

❏ `itdApache.conf` - for preload/preconfig of Apache server

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ITD – Configuration

To configure ITD on the system, the following must be done:

❑ Issue command QSH or STRQSH - itdsetup command needs to be run in QSH to setup ITD on the system.

❑ itdsetup uses as many defaults as possible and assumes there is an LDAP server autoconfigured. If the LDAP server is not autoconfigured on the system, or if the user wants to use a different LDAP server on another system, or a non-default base DN, this can be specified on the command.

❑ Run itdsetup without any options to see the syntax and key information.

Note: itdsetup applies to all instances of IBM Telephone Directory applications deployed on that system. There can only be one ITD configuration for all ITD applications deployed on the same system.

ITD Configuration - Continued

❑ The only information the user needs to know by default is the LDAP administrator password (the -w option). The -a option sets the password for the ITD administrator.

   itdsetup -w ldapAdminPwd -a iweAdminPwd

❑ By default, this uses:

⚠ LDAP server on the local system using port 389

⚠ Base DN of either "o=IBMTelDir" or "cn=users,dc=xxx,dc=yyy,dc=zzz" where the dc information is the tcp/ip hostname of the system.

⚠ LDAP administrator "cn=Administrator"

⚠ Closed enrollment - only the ITD administrator can add and update information in the ITD portion of the directory.

⚠ Max number of entries returned on a search is 100

⚠ Max number of seconds to wait for a search is 60

❑ Specify -v to run in verbose

❑ This command creates the following configuration files in the /QIBM/UserData/WebASE/businessApps/IBMTelDir directory:

⚠ itd.conf - ITD application for configuration information

⚠ itd.ldap - Apache server for LDAP directives

Note: -u is not a default option. This option updates the LDAP schema on the LDAP server with ITD object classes and attributes. If the LDAP server does not have the ITD schema yet, they will get the error: Specify the -u option on the itdsetup command to update the LDAP schema on the LDAP server

ITD Configuration - Continued

The following entries are created in the base DN of the LDAP server:

- ❑ 'cn=users' entry if it does not exist in the base DN and default was taken on itdsetup. If the base DN does not exist and is specified on the itdsetup command, this needs to already exist on the LDAP server.

- ❑ 'cn=iweAdministrator' entry with password specified in -a option

- ❑ 'cn=iweAdministrators' group - this group has administrator access to the base DN specified on the itdsetup command. iweAdministrator user is an entry in this group. The LDAP administrator can add others to this group if they so wish.

The file itd.conf looks like the following. In this example "bpDebug=yes;" was manually added to indicate to debug the ITD application. By default, this line does not exist.

```
Browse : /qibm/userdata/webase/businessapps/ibmteldir/itd.conf
Record :        1    of        13 by  18                        Column :    1
Control :

....+....1....+....2....+....3....+....4....+....5....+....6....+....7...
***********Beginning of data**************
###########################################
# IBM Telephone Directory Configuration file
###########################################
bpBase=cn=users,dc=rchasw4m,dc=rchland,dc=ibm,dc=com;
bpLdapHostname=rchasw4m.rchland.ibm.com;
bpLdapPort=389;
bpLdapSecurity=simple;
bpSearchTimeout=60;
bpMaxHits=100;
bpMaxPhotoSize=15360;
bpBindThreshold=100;
bpDebug=yes;
####################### THIS MUST BE THE LAST LINE ##################
***********End of Data*******************
```

The itd.ldap file is used by the Apache server. The file looks like the following:

```
Browse : /qibm/userdata/webase/businessapps/ibmteldir/itd.ldap
Record :        1    of        7 by  18                    Column :   1     90 by 131
Control : _____

....+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....8....+....9.
*************Beginning of data**************
LDAP.Realm "Business Applications Directory"
LDAP.URL ldap://rchasw4m.rchland.ibm.com:389/cn=users,dc=rchasw4m,dc=rchland,dc=ibm,dc=com
LDAP.User.Name.FieldSep "\t,"
LDAP.Application.AuthType None
LDAP.User.Name.Filter "(&(objectclass=inetOrgPerson)(cn=%v1))"
LDAP.Group.MemberAttributes "member uniquemember"
LDAP.Group.Name.Filter (&(objectclass=accessGroup)(cn=%v))
*************End of Data********************
```

The LDAP URL is used by the Apache server to define where the LDAP server is located.

The group name filter defines that accessGroup objects have access to the data (i.e. iweAdministrators).

ITD – Open vs Closed enrollment

❑ Closed - only ITD administrators are authorized to register and update ITD entries.

⚠ Closed enrollment is set when '-o' is NOT specified on itdsetup

⚠ The default administrator is 'iweAdministrator' user with the password specified in the '-a' option on the itdsetup command

⚠ Other users may be added to the cn=iweAdministrators group using an LDAP user interface (i.e. Directory Management Tool).

⚠ If changing from open to closed enrollment, the entry 'cn=itdCreateAdministrator' in the base DN is deleted.

❑ Open - any user may register themselves and update their own data. They cannot update other users that they did not register unless they have admin authority.

⚠ Open enrollment is set when '-o' is specified on itdsetup command.

⚠ Service can tell immediately if open enrollment is enabled by viewing the /QIBM/UserData/WebASE/businessApps/IBMTelDir/itd.conf file and if the following two lines exist (bpLdapAdmin and bpLdapAdminPw) in the itd.conf file, they have open enrollment.

⚠ The user 'cn=itdCreateAdministrator' is created in the base DN on the LDAP server. This user always has password of 'itdadmin'. This is public information as the only thing the user can do with this info is to create

```
bpLdapAdmin=cn=itdCreateAdministrator,cn=users,dc=lpar3nzm,dc=rchland,dc=ibm,dc=com;
bpLdapAdminPw=itdadmin;
```

ITD - Miscellaneous

Running itdsetup when ITD app is already running

❑ The administrator needs to stop the ITD application running in Express and Apache server and then restart them so that the new ITD configuration information can be set.

If the administrator does not know the LDAP admin password and they have *ALLOBJ & *IOSYSCFG authority:

❑ Set the LDAP password using iSeries Navigator: Network -> Servers -> TCP/IP -> Directory -> Properties.

❑ Password is set in the 'General' tab.

If the user wants a base DN that is not the default, the base DN entry must already exist in the LDAP server.

❑ If the base DN entry does not exist, they can update the example /QIBM/ProdData/WebASE/businessApps/IBMTelDir/itdbasedn.ldif file and import the ldif file using Operations Navigator or run the ldapadd command in QSH to add the entry or entries needed.

WAS Express & ITD – iSeries Preload

❑ WAS Express is available preloaded on models 810, 825, 870 & 890

❑ IBM Telephone Directory application is also loaded and has an initial configuration

⚠ The LDAP server is automatically configured with

  ➤ Suffix of 'o=IbmTelDir' and ITD data is loaded in this base DN

  ➤ LDAP administrator of 'cn=Administrator'

⚠ ITD configured to use the LDAP server on the system

⚠ ITD is set to closed enrollment

⚠ /QIBM/UserData/WebASE/businessApps/IBMTelDir/itd.conf file looks like the following:

```
**************Beginning of data***************
##############################################
# IBM Telephone Directory Configuration file
##############################################
opBase=o=IbmTelDir;
opLdapHostname=127.0.0.1;
opLdapPort=389;
opLdapSecurity=simple;
opSearchTimeout=60;
opMaxHits=100;
opMaxPhotoSize=15360;
opBindThreshold=100;
##################### THIS MUST BE THE LAST LINE
************End of Data*******************
```

WAS Express & ITD - iSeries Preload

❏ The administrator of the preloaded system must:
- ⚠ Configure TCP/IP
- ⚠ CHGTCPDMN must have correct host name
- ⚠ CHGTCPDMN must have DNS specified
- ⚠ Call QIWE/QSTRITD
- ⚠ STRTCPSVR *HTTP HTTPSVR(ITD)
- ⚠ STRTCPSVR *HTTP HTTPSVR(*ADMIN)

DB2 Web Services Sample Application

❑ WAS Express includes optionally installable Web Services sample application

❑ Sample application details

⚠ Uses WebServices Object Runtime Framework (WORF) to provide a services oriented interface to DB2/400 data

⚠ Uses XML documents to define the inputs & outputs

⚠ Includes integration code to read an incoming request from a servlet, perform necessary processing and send the results
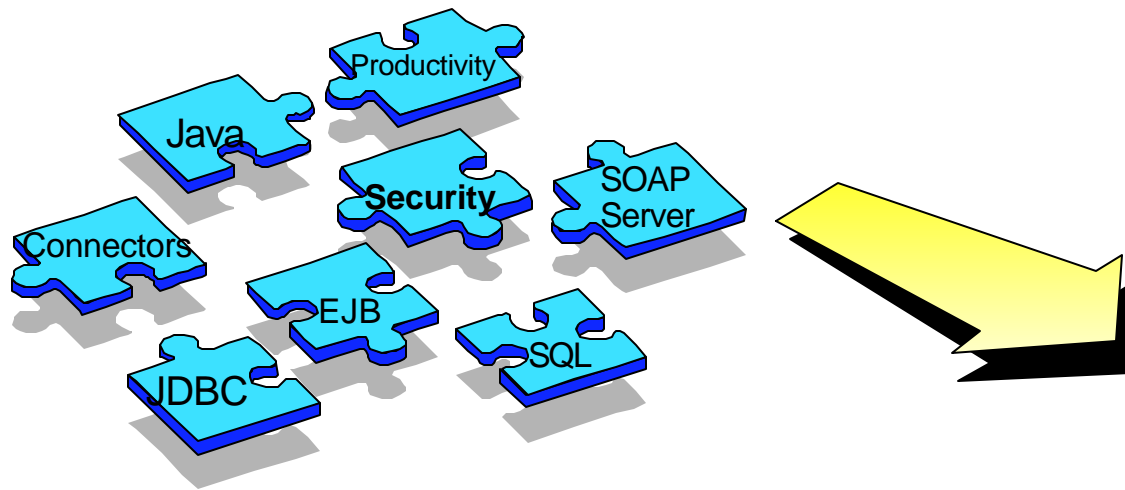
DB2 Web Service

► Rapid deployment
  ► Create DADX file with WebSphere Studio tools and wizards
► Specify DADX Web Service XML file on the HTTP POST, GET request
► Runtime shipped with Express

Puzzle piece labels: Productivity, Java, Security, SOAP Server, Connectors, EJB, JDBC, SQL

Session, Workload & Performance Management

WAS Express – Session Management

- ❑ HTTP is a stateless protocol - i.e. after a web request is completed, the client and server disconnect from each other
- ❑ This can be a problem for many environments
  - ⚠ Shopping cart or other multi-step browser based applications
  - ⚠ Personalized, portal type applications
- ❑ Java Servlet API defines an HTTPSession class for implementing appropriate solutions
  - ⚠ Cookies
  - ⚠ URL rewriting
  - ⚠ HTML form hidden fields
  - ⚠ Write your own
- ❑ WAS Express provides HTTPSession support
  - ⚠ Configurable, uses cookies by default
  - ⚠ Session data can not be persisted to database or other servers

WebSphere Application Development Environment

- ❑ Uses IBM Agent Controller technology
- ❑ Application performance profiling on local or remote server

WebSphere Application Server Environment

- ❑ Instrumentation via Performance Manager Interface
- ❑ WebSphere caching environment

OS/400 Environment

- ❑ WebSphere Application Server runs within its own subsystem
- ❑ Use high level snapshots (WRKACTJOB, WRKSYSSTS, etc.)
- ❑ Use 'big picture' trends (Management Central, Performance Collection Services)
- ❑ Use low level traces (job trace, transaction trace, Performance Explorer, Database Monitor)
- ❑ Use other tools (iDoctor for iSeries, Visual Explain, etc.)
- ❑ Use Workload Estimator for sizing system requirements

iSeries Workload Estimator

❏ Workload Estimator can be used to size numerous iSeries workloads, including WebSphere Application Server Express for iSeries

❏ Available at http://http://www-912.ibm.com/supporthome.nsf/document/16533356

iSeries Workload Estimator

❑ Other workloads for WebFacing, HTTP serving, traditional workloads, etc. can be added

❑ Refer to the online help for assistance on setting the parameters

iSeries Workload Estimator

❑ Different workloads, transaction rates, etc. can quickly & easily be modeled

❑ Different growth, upgrade paths & models can be selected

Troubleshooting

Enabling Tracing

❑ Servicing the HTTP Integrated GUI - Turning on Tracing.

⚠ Stop the HTTP Admin GUI - ENDTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)

⚠ Edit the file /QIBM/ProdData/httpa/admin/conf/workers.properties

⚠ Under the heading 'JVM props for Express Admin'

⚠ Change the value for '...AdminWrapperTracing= ' to the value of 'true'

⚠ Save the file and restart the Admin GUI - STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)

```
# JVM props for Express Admin
worker.jni.sysprops=traceSettingsFile=expressAdminTracing.properties
worker.jni.sysprops=com.ibm.websphere.os400.express.AdminWrapperTracing=true
worker.jni.sysprops=was.install.root=/QIBM/ProdData/WebASE/ASE5
worker.jni.sysprops=was.instance.root=/QIBM/UserData/WebASE/ASE5
worker.jni.sysprops=was.repository.temp=/QIBM/UserData/WebASE/ASE5/ASEAdmin
worker.jni.sysprops=com.ibm.ws.os400.express.useFullAppSvrListMethod=true


worker.jni.stderr=/QIBM/UserData/HTTPA/admin/logs/jvmstderr.txt
worker.jni.stdout=/QIBM/UserData/HTTPA/admin/logs/jvmstdout.txt


# Tomcat verbose class loading
# worker.jni.java2opts=-verbose
# worker.jni.sysprops=tomcat.classloader.debug_level=30


# JVM debug (provides actual source line numbers on stack traces)
#worker.jni.sysprops=java.compiler=jitc_de
#worker.jni.sysprops=os400.defineClass.optLevel=10
```

Un-comment these two lines for the correct line numbers to be generated in the stack dump when an error occurs. These lines are shipped in the file to help you in gathering meaningful error documentation. They should only be un-commented when attempting to debug a problem as server performance will be slower.

Enabling Tracing (Cont.)

⚠ Edit the file '/qibm/userdata/webase/ase5/aseadmin/expressAdminTracing.properties'

⚠ To enable tracing, modify the last line of the file to be:

➤ 'com.ibm.ws.os400.express.*=all=enabled '

⚠ Save the file

⚠ Start the HTTP admin GUI STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)

```
###############################################################################
# A property to specify where the output messages and trace (if enabled)
# should be routed. Valid values include stdout or a fully qualified
# file name. If a file is specified but cannot be opened, stdout is used.
# To specify stdout - traceFileName=stdout
# To specify a file- traceFileName=/QIBM/UserData/WebASE/ASE5/ASEAdmin/MyT
###############################################################################
traceFileName=stdout


###############################################################################
# Specify trace strings here. Trace strings take the form of:
# logger={level}={type} where:
#     level = entryexit || debug || event || all
#     type =  enabled || disabled
# examples:
# com.ibm.ejs.ras.SharedLogBase=all=enabled enables all tracing for the
#         single logger created in class com.ibm.ejs.ras.SharedLogBase.
# com.ibm.ejs.*=debug=enabled enables debug tracing for all loggers with
#         names starting with com.ibm.ejs.
#
# Multiple trace strings can be specified, one per line.
###############################################################################
com.ibm.ws.os400.express.*=all=enabled
```
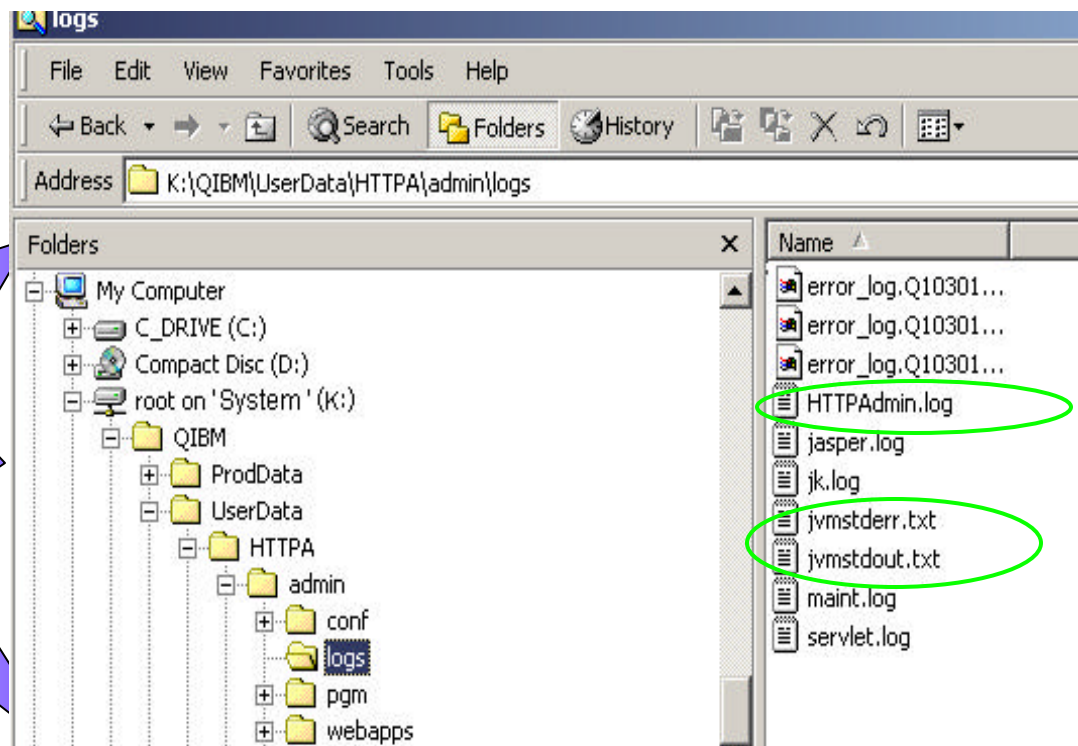
Viewing Traces

❑ The output of the trace is written to the file

  ⚠ '/QIBM/UserData/httpa/admin/logs/jvmstdout.txt'

❑ The 2 other logs that are of interest

  ⚠ /QIBM/UserData/httpa/admin/logs/jvmstderr.txt

  ⚠ /QIBM/UserData/httpa/admin/logs/HTTPAdmin.log
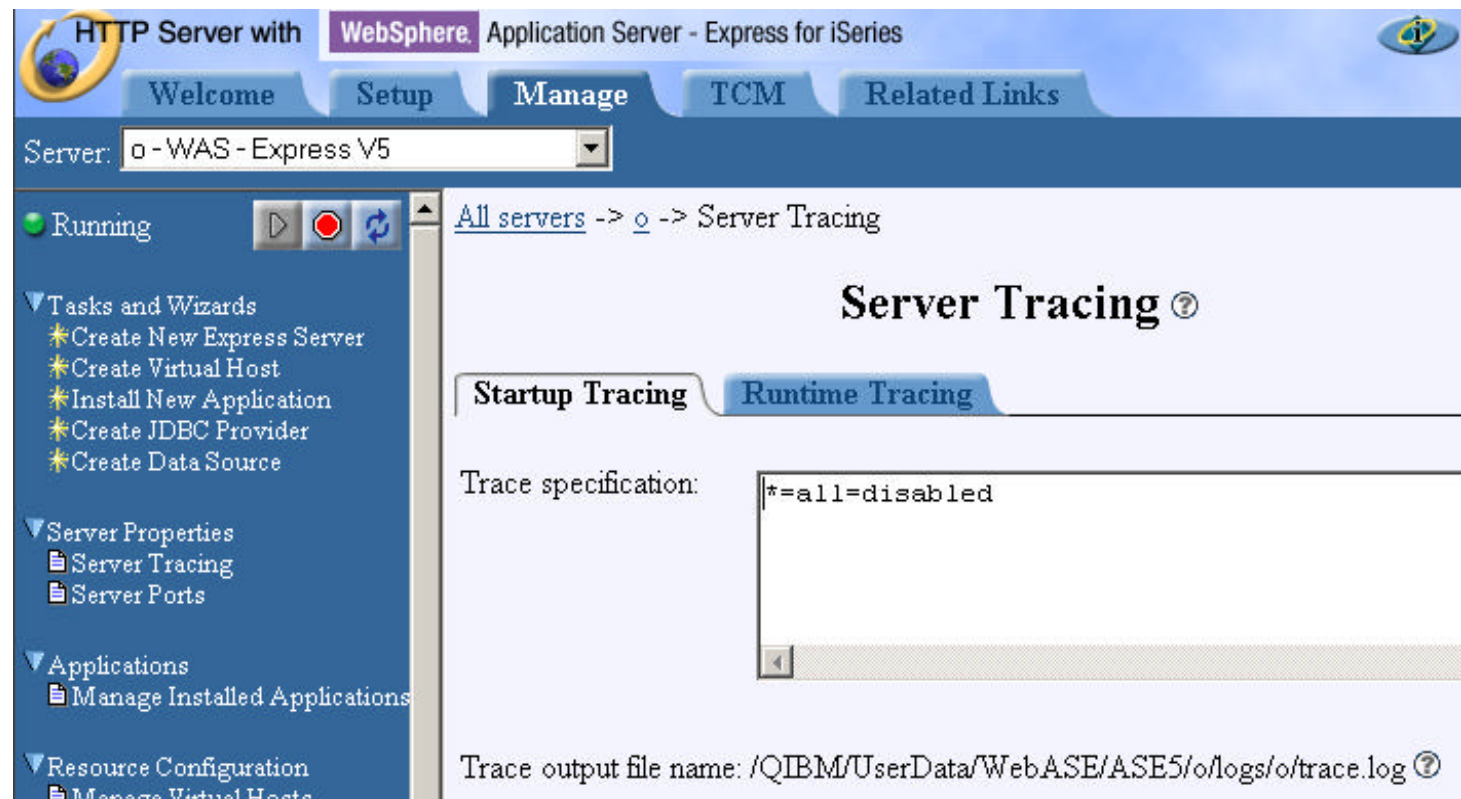
Please include all 3 logs when debugging problems within the HTTP integrated admin GUI

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Turning Tracing: Integrated GUI

❑ Turn on tracing for a user created Express server with the Integrated GUI
- ⚠ Select the server
- ⚠ Click on the 'Server Tracing' link
- ⚠ Enter the trace specification
- ⚠ Click 'OK' or 'Apply'

Viewing Traces: Integrated GUI

❏ To view the trace log, click the 'View Logs' link. From the list of logs select the '.../trace.log' and then click the **View** button. A new window will launch that will display the contents of the file.

Resources

Additional Resources

http://www.ibm.com/eserver/iseries/products/websphere

- ❑ Built and maintained by development for users of the product
- ❑ <u>Current</u> PTF information, product documentation, FAQs, link to iSeries WebSphere Application Server newsgroups, etc.

Newsgroups:

- ❑ ibm.software.websphere.application-server.as400 newsgroups (under server news.software.ibm.com)
- ❑ ibm.software.websphere.application-server newsgroups (under server news.software.ibm.com)

Redbooks:

- ❑ SG24-6195 - WebSphere V5 Handbook
- ❑ REDP3624 - WebSphere Express for iSeries
- ❑ SG24-6559 - WebSphere J2EE Application Development for iSeries
- ❑ SG24-6256 - Java & WebSphere Performance on iSeries
- ❑ SG24-6910 - Migrating to WebSphere V5.0
- ❑ SG24-6711 - AS/400e e-business Handbook for V5R1

Documentation/Resources

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

Documentation/Resources

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/

WebSphere Product Family

- ❏ WebSphere Commerce Suite for iSeries
  - ⚠ http://www.ibm.com/software/webservers/commerce/
- ❏ WebSphere Payment Manger for iSeries
  - ⚠ http://www.ibm.com/software/webservers/commerce/paymentmanager/
- ❏ WebSphere Personalization for iSeries
  - ⚠ http://www.ibm.com/software/webservers/personalization/
- ❏ WebSphere Host On-Demand
  - ⚠ http://www.ibm.com/software/webservers/hostondemand/
- ❏ WebSphere Host Publisher
  - ⚠ http://www.ibm.com/software/webservers/hostpublisher/
- ❏ WebSphere Transcoding Publisher
  - ⚠ http://www.ibm.com/software/webservers/transcoding/

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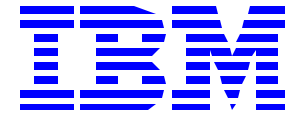**Hursley, UK**
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101

Questions

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