

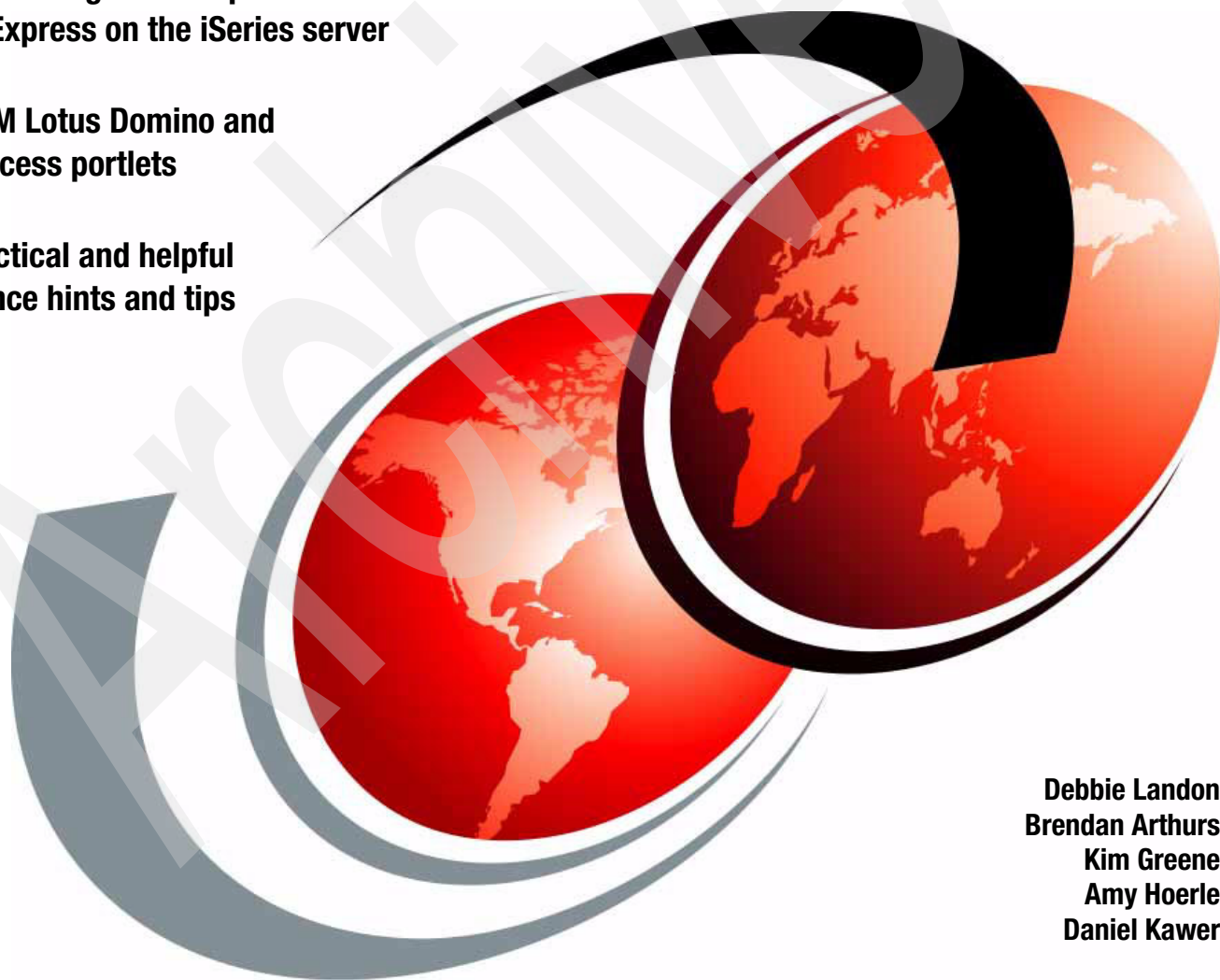
Deploying IBM Workplace Services Express

on the IBM *e*server iSeries Server

Install and configure Workplace Services Express on the iSeries server

Enable IBM Lotus Domino and iSeries Access portlets

Apply practical and helpful performance hints and tips



Debbie Landon
Brendan Arthurs
Kim Greene
Amy Hoerle
Daniel Kawer

Redbooks



International Technical Support Organization

**Deploying IBM Workplace Services Express
on the IBM @server iSeries Server**

May 2006

Archived

Note: Before using this information and the product it supports, read the information in “Notices” on page vii.

Archived

First Edition (May 2006)

This edition applies to IBM Workplace Services Express Version 2.5 running on IBM i5/OS Version 5 Release 3 (V5R3) or later.

© Copyright International Business Machines Corporation 2006. All rights reserved.

Note to U.S. Government Users Restricted Rights -- Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

| | |
|---|------|
| Notices | vii |
| Trademarks | viii |
| Preface | ix |
| The team that wrote this redbook. | ix |
| Become a published author | xi |
| Comments welcome. | xi |
| Chapter 1. Introduction to IBM Workplace Services Express on the iSeries server. . . | 1 |
| 1.1 The IBM Workplace strategy. | 2 |
| 1.1.1 IBM Workplace offerings. | 2 |
| 1.2 IBM Workplace Services Express. | 4 |
| 1.2.1 The business value of Workplace Services Express | 5 |
| 1.3 Why iSeries? | 6 |
| 1.3.1 Workplace Services Express architecture on iSeries | 7 |
| 1.4 Comparison of Workplace Collaboration Services and Workplace Services Express . . | 7 |
| 1.5 Naming conventions and servers used for this redbook | 8 |
| Chapter 2. Hardware and software prerequisites. | 9 |
| 2.1 iSeries server hardware requirements | 10 |
| 2.1.1 IBM eServer Workload Estimator | 10 |
| 2.2 i5/OS software requirements. | 11 |
| 2.2.1 Installing WebSphere Application Server V5.0, Enterprise Enablement. | 12 |
| 2.2.2 Installing iSeries Tools for Developers PRPQ. | 13 |
| 2.2.3 Displaying the installed software on the iSeries server. | 14 |
| 2.3 Program temporary fixes. | 16 |
| 2.3.1 Group PTFs | 16 |
| 2.3.2 Required individual i5/OS V5R3 PTFs | 19 |
| 2.4 i5/OS configuration and network requirements | 22 |
| 2.4.1 Installation and configuration user profiles | 22 |
| 2.4.2 Verifying the i5/OS time zone | 22 |
| 2.4.3 Verifying that the HTTP Administration server is active | 23 |
| 2.4.4 Network requirements | 25 |
| 2.5 Supported LDAP directories | 30 |
| 2.6 Supported HTTP servers | 31 |
| 2.7 Client requirements | 31 |
| 2.8 Planning for Workplace Services Express | 32 |
| 2.8.1 Recommended skills. | 32 |
| 2.8.2 Understanding your environment | 33 |
| Chapter 3. Preparing the directory server for Workplace Services Express. | 35 |
| 3.1 The importance of your directory (LDAP) server. | 36 |
| 3.1.1 LDAP and Workplace Services Express terminology | 36 |
| 3.1.2 Supported LDAP servers | 37 |
| 3.1.3 iSeries server, the one system solution for Workplace Services Express | 37 |
| 3.1.4 Choosing a directory server | 37 |
| 3.2 Read/write or read-only access to the directory server. | 38 |
| 3.2.1 Read/Write access | 38 |
| 3.2.2 Read-only access | 39 |

| | | |
|-------------------|---|------------|
| 3.3 | Preparing the IBM Directory Server | 39 |
| 3.3.1 | Configuring the default LDAP server. | 40 |
| 3.3.2 | Configuring the HTTP Administration server. | 40 |
| 3.3.3 | Configuring the Tivoli Directory Server Web Administration Tool | 40 |
| 3.3.4 | Adding a Workplace Services Express administrator to the LDAP server | 40 |
| 3.3.5 | Importing an .ldif file to add users and groups to IBM Directory Server | 46 |
| 3.3.6 | Testing the IBM Directory Server | 50 |
| 3.4 | Preparing the Domino server for LDAP. | 51 |
| 3.4.1 | Modifying the Domino Directory | 52 |
| 3.4.2 | Modifying the LDAP configuration. | 61 |
| 3.4.3 | Setting up the LDAP and DIIOP tasks | 63 |
| 3.4.4 | Adding Workplace Services Express Administrative accounts to Domino | 65 |
| 3.4.5 | Testing the Domino LDAP server configuration | 68 |
| 3.4.6 | Domino Directory changes after upgrading to Domino v6.5.4 or higher | 69 |
| Chapter 4. | Installing and configuring Workplace Services Express | 71 |
| 4.1 | Obtaining and preparing Workplace Services Express code | 72 |
| 4.1.1 | Downloading the installation files | 72 |
| 4.1.2 | Preparing the installation files | 73 |
| 4.1.3 | Copying the installation files from physical media. | 78 |
| 4.2 | Installing the Workplace Services Express server code | 78 |
| 4.3 | Configuring a Workplace Services Express server | 84 |
| 4.3.1 | Network preparation | 84 |
| 4.3.2 | Using the iSeries Create IBM Workplace wizard | 85 |
| Chapter 5. | Administering Workplace Services Express | 105 |
| 5.1 | Starting and stopping a Workplace Services Express server | 106 |
| 5.1.1 | Starting a Workplace Services Express server | 106 |
| 5.1.2 | Stopping a Workplace Services Express server | 108 |
| 5.2 | Reviewing the Workplace Services Express configuration | 110 |
| 5.3 | Verifying a Workplace Services Express server is active | 112 |
| 5.3.1 | Using iSeries Navigator to view active jobs (method 1) | 114 |
| 5.3.2 | Using iSeries Navigator to view active jobs (method 2) | 117 |
| 5.3.3 | Using i5/OS commands to view active jobs (method 3) | 120 |
| 5.4 | Managing an IBM HTTP Server for iSeries server | 123 |
| 5.5 | Accessing a Workplace Services Express server | 124 |
| 5.6 | Accessing the WebSphere Application Server Administrative Console | 127 |
| 5.7 | Changing administrator account passwords | 129 |
| 5.7.1 | Changing the database administrator password. | 130 |
| 5.7.2 | Changing the Workplace Services Express administrator password | 135 |
| 5.7.3 | Changing the LDAP administrator password | 143 |
| 5.8 | Accessing the Workplace Services Express logs | 144 |
| 5.8.1 | iSeries Create IBM Workplace wizard log files | 145 |
| 5.8.2 | WebSphere Portal Server standard output and standard error logs. | 147 |
| 5.8.3 | WebSphere Application Server standard output and standard error logs. | 149 |
| 5.8.4 | Collecting logs for technical support or development | 150 |
| 5.9 | Obtaining and applying fixes | 152 |
| 5.9.1 | Obtaining iSeries specific fixes | 152 |
| 5.9.2 | Obtaining WebSphere Portal and Workplace Services Express fixes | 152 |
| 5.9.3 | Obtaining and installing the WebSphere Portal Update Installer | 152 |
| 5.9.4 | Installing a Workplace Services Express interim fix | 154 |
| 5.10 | Removing the Sign up and Edit my profile links | 156 |
| 5.11 | Backup and recovery | 159 |

| | |
|--|------------|
| 5.11.1 Saving a Workplace Services Express server: sample CL program | 161 |
| 5.11.2 Restoring a Workplace Services Express server | 163 |
| 5.12 Removing a Workplace Services Express server | 168 |
| Chapter 6. Integrating the Domino portlets | 173 |
| 6.1 Supplied portlets with Workplace Services Express | 174 |
| 6.2 Configuring the Domino Web Access portlet | 175 |
| 6.2.1 Setting up Domino for use with the Domino Web Access portlet | 175 |
| 6.2.2 Configuring Workplace Services Express to use Domino Web Access portlet . . | 178 |
| 6.2.3 Configuring the Domino Web Access portlet | 181 |
| 6.3 Portalizing Domino applications | 191 |
| 6.3.1 Options for portalizing Domino applications | 191 |
| 6.4 Using the Domino Application portlet | 192 |
| 6.5 Portalizing non-Domino applications | 206 |
| Chapter 7. Integrating iSeries Access for Web portlets | 207 |
| 7.1 Configuring EIM for use with the iSeries Access portlets | 209 |
| 7.2 Configuring iSeries Access for Web | 223 |
| 7.3 Installing the iSeries Access for Web portlets | 228 |
| 7.4 Configuring the iSeries Access for Web portlets | 229 |
| 7.4.1 Authenticating using credentials specific to a portlet window | 230 |
| 7.4.2 Authenticating by using credentials set in the iSeries credentials portlet | 232 |
| 7.4.3 Authenticating using shared credentials | 233 |
| Chapter 8. Enabling SSO between Workplace Services Express and Domino | 237 |
| 8.1 How SSO works | 238 |
| 8.2 Enabling SSO in WebSphere Application Server | 240 |
| 8.3 Enabling the Domino server for SSO | 247 |
| 8.4 Testing SSO | 251 |
| 8.5 Troubleshooting SSO | 252 |
| Chapter 9. Performance tuning | 253 |
| 9.1 iSeries architecture | 254 |
| 9.2 Performance assessment and tuning methodology | 255 |
| 9.3 i5/OS tuning | 256 |
| 9.3.1 Automatic performance adjustor | 256 |
| 9.3.2 Memory tuning | 257 |
| 9.3.3 Run priority tuning | 261 |
| 9.3.4 Changing the subsystem Workplace Services Express jobs run in | 263 |
| 9.3.5 System values that affect i5/OS performance | 266 |
| 9.3.6 Disk tuning | 267 |
| 9.4 Network tuning | 269 |
| 9.4.1 TCP/IP buffer sizes | 269 |
| 9.4.2 Optimizing line description settings | 270 |
| 9.4.3 Network routing: ARP storms | 271 |
| 9.5 Workplace Services Express tuning | 276 |
| 9.5.1 Startup performance tuning | 277 |
| 9.5.2 Workplace Services Express portal tuning | 284 |
| 9.5.3 Configuring Edge Side Include caching | 295 |
| 9.5.4 X virtual frame buffer verses virtual network computing | 299 |
| 9.6 Java tuning | 300 |
| 9.6.1 JVM heap sizes | 300 |
| 9.7 IBM HTTP Server tuning | 302 |
| 9.7.1 Monitoring HTTP real-time statistics | 302 |

| | |
|--|------------|
| 9.7.2 HTTP connection time-outs and Max Keep Alive | 304 |
| 9.7.3 Enabling GZIP compression | 306 |
| 9.7.4 Disabling HTTP logging | 312 |
| 9.8 Database tuning | 314 |
| 9.8.1 System value for the SQL Query Engine | 314 |
| 9.8.2 Monitoring database performance | 315 |
| 9.8.3 Creating database indexes | 324 |
| 9.9 IBM Directory Server tuning | 333 |
| 9.9.1 Nested groups. | 334 |
| 9.9.2 Database connections and server threads | 334 |
| 9.10 Lotus Domino LDAP tuning. | 336 |
| 9.10.1 Nested groups. | 336 |
| 9.10.2 Full text indexing of the Domino Directory | 336 |
| Appendix A. Using existing LDAP servers with Workplace Services Express | 339 |
| Recommended object classes and attributes | 340 |
| Required users in the LDAP directory | 341 |
| Appendix B. Setting up IBM Directory Server for i5/OS | 343 |
| Managing the IBM Directory Server on i5/OS | 344 |
| Testing the IBM Directory Server on i5/OS | 347 |
| Enabling the Tivoli Directory Server Web Administration Tool. | 349 |
| Configuring the HTTP Administration server. | 349 |
| Configuring the Tivoli Directory Server Web Administration Tool | 354 |
| Using the Tivoli Directory Server Web Administration Tool | 356 |
| Appendix C. Additional material | 359 |
| Locating the Web material | 359 |
| Using the Web material | 359 |
| Related publications | 361 |
| IBM Redbooks | 361 |
| Other publications | 361 |
| Online resources | 362 |
| How to get IBM Redbooks | 363 |
| Help from IBM | 363 |
| Index | 365 |

Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing, IBM Corporation, North Castle Drive Armonk, NY 10504-1785 U.S.A.

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law. INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.



This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrates programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs. You may copy, modify, and distribute these sample programs in any form without payment to IBM for the purposes of developing, using, marketing, or distributing application programs conforming to IBM's application programming interfaces.

Trademarks

The following terms are trademarks of the International Business Machines Corporation in the United States, other countries, or both:

| | | |
|---|-----------------------|---|
| AS/400® | IBM® | QuickPlace® |
| Cloudscape™ | iNotes™ | Rational® |
| Domino Designer® | iSeries™ | Redbooks (logo)  ™ |
| Domino® | Lotus Notes® | Redbooks™ |
| DB2 Universal Database™ | Lotus® | Sametime® |
| DB2® | Notes® | System i5™ |
| @server® | Operating System/400® | Tivoli® |
|  server® | OS/400® | WebSphere® |
| eServer™ | PartnerWorld® | Workplace™ |
| Freelance Graphics® | Passport Advantage® | Workplace Collaborative Learning™ |
| i5/OS® | POWER5™ | 1-2-3® |

The following terms are trademarks of other companies:

iPlanet, Java, JavaScript, JDBC, JSP, JVM, J2EE, Sun, Sun Java, Sun ONE, and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Excel, Microsoft, PowerPoint, Windows, and the Windows logo are trademarks of Microsoft Corporation in the United States, other countries, or both.

Linux is a trademark of Linus Torvalds in the United States, other countries, or both.

Other company, product, or service names may be trademarks or service marks of others.

Preface

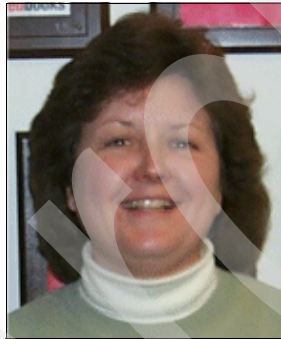
IBM® Workplace™ Services Express is software that makes it simple for you, your colleagues, your teams, and your entire organization to quickly collaborate and effectively work together. Designed specifically for small and medium-sized organizations or departmental needs in larger organizations, Workplace Services Express enables you to easily create, edit, and share documents from your own customized Workplace environment.

This IBM Redbook is written for administrators who want to install, configure, and administer Workplace Services Express on an IBM @server® iSeries™ server. It introduces you to Workplace Services Express. It shows you how to deploy and customize it on the iSeries server, as well as how to integrate with an existing IBM Lotus® Domino® infrastructure.

In addition, this redbook shows you how to integrate Domino mail and applications with a Workplace Services Express environment. It explains how to enable the iSeries Web Access portlets so you can work with your iSeries server from a Workplace Services Express environment. And this redbook provides information about performance tuning for Workplace Services Express on the iSeries server.

The team that wrote this redbook

This redbook was produced by a team of highly skilled specialists from around the world working at the International Technical Support Organization (ITSO), Rochester Center.



Debbie Landon is an IBM Certified Senior IT Specialist in the IBM ITSO, Rochester Center. Her current area of expertise is focused on the collaborations products on iSeries, including IBM Workplace products and Domino for iSeries and related Lotus products such as Sametime® and QuickPlace®. Debbie has been with IBM for 22 years working first with the S/36 and then the AS/400®, which has since evolved to the iSeries server, and is now the IBM System i5™ platform. Before joining the ITSO in November of 2000, Debbie was a member of the PartnerWorld® for Developers iSeries team, supporting IBM Business Partners in the area of Domino for iSeries. You can contact Debbie by sending e-mail to da1andon@us.ibm.com.



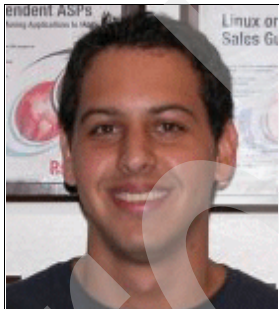
Brendan Arthurs is a Software Development Engineer in the IBM Dublin Software Lab in Ireland. He is currently working on the IBM Workplace Collaborative Learning™ development team. He has several years of experience in the development of IBM Workplace products. His areas of expertise include IBM WebSphere® Portal Server and Application Server and the development of J2EE™ applications for these platforms. Brendan holds a degree in computer science from University College Dublin. You can contact Brendan by sending e-mail to brendan.arthurs@ie.ibm.com.



Kim Greene is president of Kim Greene Consulting, Inc. specializing in Domino for iSeries consulting. Kim has over eight years of experience with Domino and 18 years of experience with the AS/400 and iSeries platform. Kim specializes in iSeries Domino performance analysis and application tuning, problem determination, administration, migration, enterprise integration, and custom Domino development. Prior to starting her own consulting business, Kim was employed at IBM Rochester, MN, where she helped IBM Business Partners incorporate Domino into their existing applications. She also worked on several areas of IBM OS/400® performance in the AS/400 development laboratory. You can contact Kim by sending e-mail to kim@kimgreene.com.



Amy Hoerle is a Staff Software Engineer working in the iSeries Support Center located in Rochester, MN. She joined IBM in 1998 and has extensive experience supporting Domino on iSeries. She is an IBM Certified System Administrator for Lotus Notes® and Domino Version 6.x and a Certified Lotus Professional in Domino System Administration for Domino R5. Amy has written numerous technical documents regarding Domino on the iSeries and presents Domino on iSeries topics at Common, a Users Group. She holds a degree in mathematics and computer information science from Minnesota State University, Mankato. You can contact Amy by sending e-mail to ahoerle@us.ibm.com.



Daniel Kawer is an IBM Software Specialist working for GBM, an IBM Alliance Company, located in San José, Costa Rica. He holds a degree in computer science from the Costa Rican Institute of Technology. His areas of expertise include solution design and architecture and the WebSphere, Domino, and Workplace family of products. You can contact Daniel by sending e-mail to dkawer@gbm.net.

Thanks to the following people for their contributions to this project:

Jon Brandt
Wayne Ganskop
George Hansen
Kevin Kirkeby
John McMeeking
Tim Rowe
Yassir Sheriff
Dan Strauss
IBM Rochester Development Lab

Eric Bjorklund
Dave Johnson
Scott Moore
iSeries System Performance - Lotus Collaboration Products

Elena Lowery
Gottfried Schimunek
IBM eServer™ iSeries Solution Enablement

Marcela Adan
Mike Gordon
IBM Systems & Technology Group, System Sales

Peter Eibak
IBM Sales & Distribution, Nordic iSeries Solution Specialist

Thomas Gray
Joanna Pohl-Misczyk
Jenifer Servais
ITSO, Rochester Center

Become a published author

Join us for a two- to six-week residency program! Help write an IBM Redbook dealing with specific products or solutions, while getting hands-on experience with leading-edge technologies. You'll team with IBM technical professionals, Business Partners, and Clients.

Your efforts will help increase product acceptance and customer satisfaction. As a bonus, you'll develop a network of contacts in IBM development labs, and increase your productivity and marketability.

Find out more about the residency program, browse the residency index, and apply online at:

ibm.com/redbooks/residencies.html

Comments welcome

Your comments are important to us!

We want our Redbooks™ to be as helpful as possible. Send us your comments about this or other Redbooks in one of the following ways:

- Use the online **Contact us** review redbook form found at:

ibm.com/redbooks

- Send your comments in an e-mail to:

redbook@us.ibm.com

- Mail your comments to:

IBM Corporation, International Technical Support Organization
Dept. JLU Building 107-2
3605 Highway 52N
Rochester, Minnesota 55901-7829

Archived



Introduction to IBM Workplace Services Express on the iSeries server

This chapter introduces you to the IBM Workplace strategy, specifically IBM Workplace Services Express on the IBM @server iSeries server. It discusses the business value of Workplace Services Express and presents other products in the Workplace family.

1.1 The IBM Workplace strategy

Before you start to understand the specifics of Workplace Services Express, it is important to have a good understanding of the IBM Workplace strategy. This strategy is about integration and collaboration between people, processes, and information. The IBM way to achieve this strategy is through a *service-oriented architecture (SOA)*, which all the products in the Workplace family follow. An SOA is a way of designing software systems to provide services to end-user applications or other services. From a business perspective, it is a set of business aligned IT services that support an organization's business process goals and objectives.

The Workplace strategy empowers people, offering them access to information and resources, anytime and anywhere. It gives you the power to work in a connected world, with the tools that match your role in the organization. This way of collaboration allows for better and faster decisions, which in turn increases productivity and reduces costs in the workplace.

The IBM Workplace strategy integrates collaboration with business processes. It offers you access to e-mail, instant messaging, and other information, in the same tool used to manage your business processes, avoiding application switching and improving productivity. The merging of traditional and collaborative applications is central to the Workplace strategy.

In summary, the IBM Workplace strategy revolutionizes the way you work, bringing you together with the resources that you need, when you need them. For small and medium business, IBM Workplace Services Express is the solution of choice for a J2EE collaborative environment with an integrated portal.

For more information about IBM Workplace, refer to the IBM Workplace Web site at:

<http://www.ibm.com/software/info/workplace/index.jsp>

1.1.1 IBM Workplace offerings

Built on an SOA, IBM Workplace offerings can address the needs for transforming organizations of all sizes. The products are designed specifically for small, medium, and large enterprises. They span from flexible tools and innovative technologies, to a broad set of solutions. With IBM Workplace offerings, organizations can deploy an online environment with a flexible set of componentized capabilities that can be used to adapt quickly to meet specific business needs.

The IBM Workplace environment helps to consolidate and present the resources that you need, including business processes, collaboration capabilities, information, documents, and productivity tools, all through a unified Workplace interface. And, the Workplace environment can be tailored to each user's or team's business role. The integrated environment keeps resources close at hand and in the appropriate business context. The result? Users can work conveniently, securely, and more efficiently within a single Workplace environment, instead of continuously switching between multiple applications.

The Workplace strategy provided by IBM is the new front end of computing. It's an approach based on an SOA that helps organizations integrate all of their business processes to achieve a more productive, secure environment that is designed according to the roles within the organization.

The products in the IBM Workplace family help organizations increase their productivity while working in a collaborative environment. Such an environment integrates all of the business processes as well as the people, information, and other resources needed to work.

Figure 1-1 illustrates how the different products fit within the IBM Workplace family.

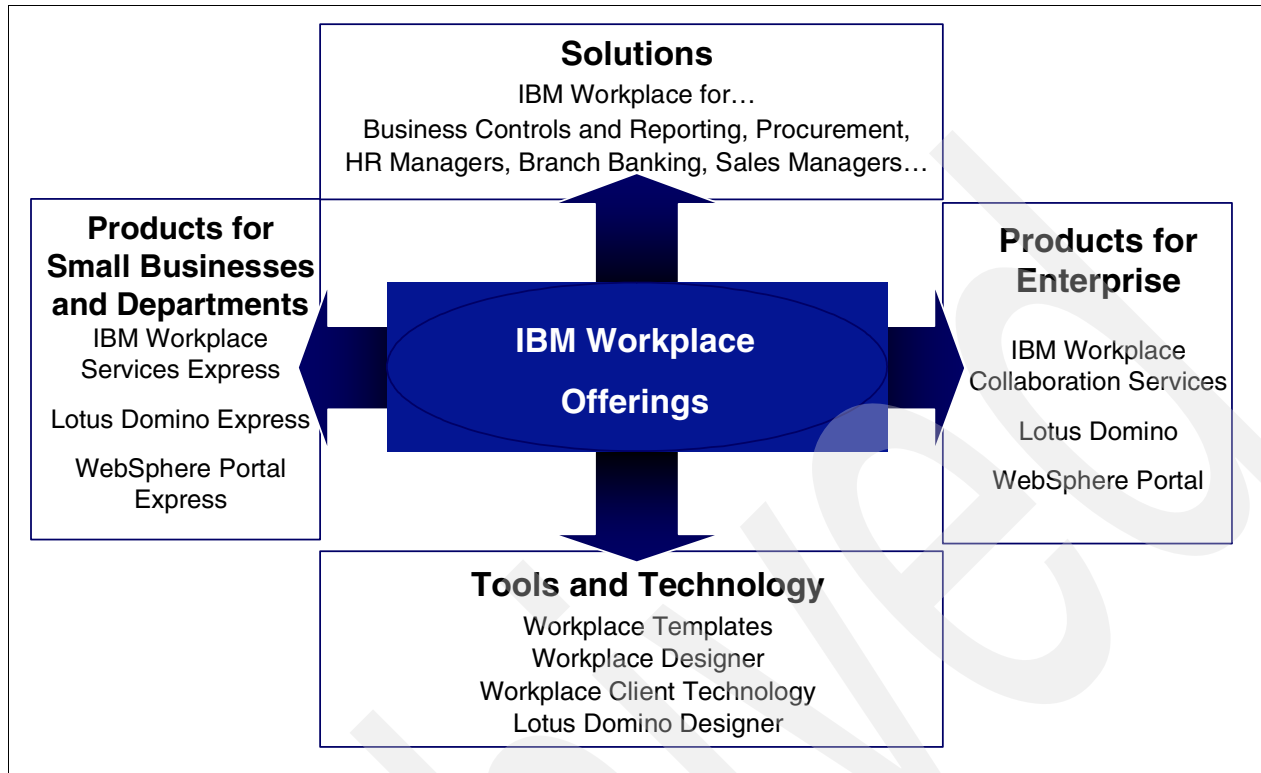


Figure 1-1 IBM Workplace product offerings

As shown in Figure 1-1, there are four components that compose the IBM Workplace offerings:

- ▶ **Products for Small Businesses and Departments**
 These are the IBM Express products such as Lotus Domino Express and WebSphere Portal Express. For more information about IBM Express software, refer to the IBM Redpaper *IBM Express Software Buying and Selling Guide*, REDP-3975.
- ▶ **Solutions**
 IBM Workplace Solutions are role-based frameworks to help clients apply IBM Workplace technologies faster and more productively. These solutions leverage the industry expertise, insights, and analysis of various business applications that IBM provides. The solutions are designed to provide “shortcuts” for creating a high performance, role-based work environment, helping to accelerate time-to-value. IBM Workplace Solutions draw on the rich portfolio of IBM software products and services, as well as on independent software vendor (ISV) applications and other IBM Business Partner skills, to enable clients to address some of their most pressing business issues.
 To learn more about IBM Workplace Solutions, see the following Web site:
<http://www.ibm.com/software/info/workplace/solutions.jsp>
- ▶ **Products for the Enterprise**
 Products for the Enterprise are the products that exist for the enterprise. Examples of such products are Lotus Domino, WebSphere Portal, and Workplace Collaboration Services.

- **Tools and Technology**

These are the various client tools and technologies that support the various IBM Workplace products and solutions. Such examples include Workplace templates and the Workplace Designer.

1.2 IBM Workplace Services Express

IBM Workplace Services Express is a collaborative portal designed for small and medium business. It's easy to install, deploy, and configure. It offers instant collaboration, access to Lotus Domino or Microsoft® Exchange e-mail, instant messaging, collaborative team spaces and centralized document libraries, all through a portal environment, personalized to an organization's needs and roles.

IBM Workplace Services Express offers the following capabilities out of the box:

- **Integrated portal:** Based on WebSphere Portal, Workplace Services Express offers a full collaborative portal.
- **Centralized document management:** On the server, IBM Workplace Services Express stores all the documents, making them available to all users, based on their security settings. You access these documents from either the Workplace portal or through the IBM Desktop Components, which is a tool to integrate the Workplace Document Libraries with Windows® Explorer, a Microsoft Office environment, or both.
- **Productivity center:** IBM Workplace Services Express offers online editors for rich-text documents, presentations, and spreadsheets. You can convert the documents created with these editors to other formats as shown in Table 1-1.

Table 1-1 Conversion formats for online documents

| Workplace format | Target format |
|------------------|---|
| Rich text | Lotus WordPro, Microsoft Word, and Adobe Portable Document Format (PDF) |
| Spreadsheet | Lotus 1-2-3® and Microsoft Excel® |
| Presentation | Lotus Freelance Graphics® and Microsoft PowerPoint® |

- **Instant messaging and presence awareness:** IBM Workplace Services Express offers you the option to create instant messaging contact lists. This way, whenever a user is available to chat, you can start a new conversation. Presence awareness is also available through the portal. For example, every time you refer to a user, if that user is online, you can start a new conversation by clicking the referenced user's name.
- **Collaborative team spaces:** Workplace Services Express offers dynamically created environments that can be customized to map a team's role inside an organization. These collaborative spaces, called *team spaces*, offer members a space to share documents, group calendars, and participate in discussion groups and chats. Included with Workplace Services Express are different templates that you can easily deploy, and if needed, modify to satisfy a more specific requirement.
- **Search:** You can search through documents, team spaces, and applications. You can also define your own data sources to search, such as intranet Web sites. And you can search for people in your own organization's directory. After you find a person, you can take collaborative actions, such as sending an e-mail or starting a chat session.
- **Mail:** IBM Workplace Services Express offers portlets to access existing mail servers, for example Lotus Domino, Microsoft Exchange, Post Office Protocol Version 3 (POP3), and Internet Message Access Protocol (IMAP) servers, through a portal-based interface. For

more information about Workplace Services Express integration with Domino, see Chapter 6, “Integrating the Domino portlets” on page 173.

- ▶ **Drag and drop customization:** Adding a portlet to a page is as simple as dragging it from the palette and dropping it in the desired place. This way, you can customize your private pages and have a personalized experience.
- ▶ **Back-end integration:** IBM Workplace Services Express is integrated easily with back-end applications. You can accomplish this integration with existing portlets or by building new portlets. You can also download portlets from the IBM Workplace Solution Catalog, available at:

<http://catalog.lotus.com/wps/portal/wse>

IBM Workplace Services Express offers you a centralized collaborative environment, with easy deployment and administration, that helps you achieve better productivity and quicker results.

1.2.1 The business value of Workplace Services Express

IBM Workplace Services Express gives organizations the opportunity to implement a collaborative environment that is easy to install, administer, and use. It provides quick access to resources, people, and documents, which increases productivity. The following list provides some examples that show the business advantages of implementing Workplace Services Express:

- ▶ Workplace Services Express offers a low, total cost of ownership (TCO). Workplace Services Express is a single server deployment. No external servers or software are needed to run Workplace Services Express on the iSeries, therefore lowering the TCO.
- ▶ The time to set up a new client is zero. The client only needs a Web browser, which significantly reduces the demands on the IT department.
- ▶ All documents needed for work are located on the server, eliminating the risk of lost or corrupted documents on personal computers. Having all documents on the server also reduces traffic on internal mail networks, because the documents are not required to be sent by e-mail to all employees. Access to documents is as simple as accessing the appropriate document library, either from a Web browser or from the employee’s Windows Explorer.
- ▶ Workplace Services Express comes preloaded, with ready-to-use templates for team spaces and lists, reducing the time needed to deploy new applications. These templates allow teams to start collaborating in a few minutes.
- ▶ Integrated instant messaging provides a quick way to access people, either from a Contact List portlet or from any other place that a person is referenced, such as from a document library.
- ▶ Workplace Services Express leverages current investments. It integrates with your current Lotus Domino or Microsoft Exchange messaging servers. It also integrates with Microsoft Windows and Microsoft Office to enhance collaboration, offering access to online document libraries from Microsoft Office products and Windows Explorer.
- ▶ Workplace Services Express is licensed as either user based or processor based. This flexibility makes it possible for you to choose the best licensing method for your current environment and budget.
- ▶ Workplace Services Express is built on top of the industry’s most recognized portal server, IBM WebSphere Portal. This means that you can work with the collaborative applications offered by Workplace Services Express, as well as with other applications that can be installed on top of WebSphere Portal.

1.3 Why iSeries?

Running IBM Workplace Services Express on the IBM @server iSeries offers a competitive advantage over other platforms. Some of those advantages are provided in the following list:

- ▶ In a typical Workplace Services Express environment, information has to be exchanged between the Workplace Services Express server and other servers, such as an HTTP server, a database server, and a Lightweight Directory Access Protocol (LDAP) server. The IBM @server iSeries server already has a DB2® Universal Database™ database manager, an HTTP server, and an LDAP server. Therefore it is possible to run a full Workplace Services Express environment on a single system, lowering the TCO of the deployment and improving performance.
- ▶ Installing Workplace Services Express on the IBM @server iSeries server offers a major advantage over other platforms by offering the Create IBM Workplace wizard, which is located in the IBM Web Administration for iSeries. This wizard gathers all necessary data and validates it before starting to configure a Workplace Services Express instance. After gathering the data, it configures a Workplace Services Express instance along with the required HTTP server, DB2 Universal Database databases, and LDAP directory. This wizard simplifies the configuration process and reduces the risk of configuration errors.

For more information about installing and configuring Workplace Services Express on the iSeries server, see Chapter 4, “Installing and configuring Workplace Services Express” on page 71.

- ▶ Because IBM Workplace Services Express is based on WebSphere Portal, you can use it to provide a new front end to typical iSeries applications, through the use of such tools as the iSeries Access for Web portlet, IBM WebFacing Tool, and IBM WebSphere Host Access Transformation Services (HATS).

To learn more about integrating Workplace Services Express with iSeries Access, see Chapter 7, “Integrating iSeries Access for Web portlets” on page 207.

- ▶ As opposed to typical 32-bit operating systems, IBM i5/OS® does not have a 4 GB address space limit. Also, the Java™ Virtual Machine (JVM™) present on the iSeries is 64-bit, making it more powerful and scalable than other platforms.
- ▶ It is possible to run more than one Workplace Services Express instance on a single iSeries server or logical partition (LPAR). An organization can deploy their production environment along with their testing and development environments on a single iSeries server.

For more information about Workplace Services Express on the IBM @server iSeries server, see the IBM Workplace for iSeries Web site at:

<http://www.ibm.com/servers/eserver/iseries/software/workplace/>

1.3.1 Workplace Services Express architecture on iSeries

Figure 1-2 illustrates the architecture of Workplace Services Express on the IBM @server® iSeries server.

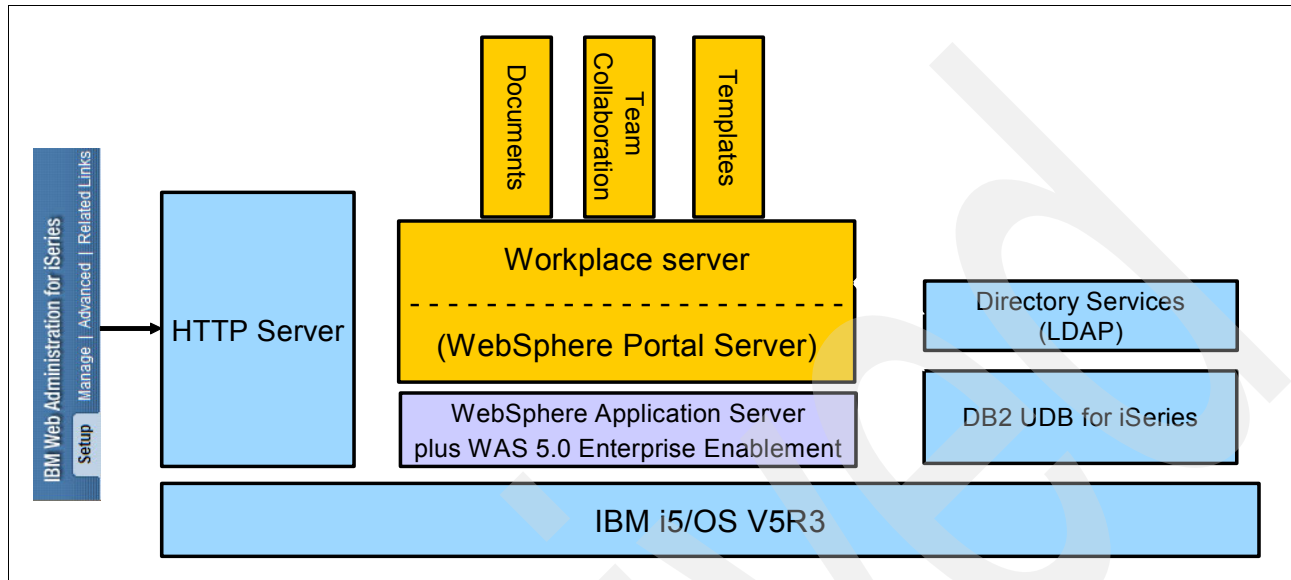


Figure 1-2 High level architecture of Workplace Services Express on the iSeries server

Workplace Services Express installs on top of WebSphere Application Server, along with DB2 Universal Database, the HTTP server, and the LDAP directory, which are already installed on the iSeries. This arrangement makes it possible for the iSeries Create Workplace wizard to perform all the configuration needed to set up Workplace Services Express.

Although an LDAP directory is required to run Workplace Services Express, the Directory Server present on the iSeries server is not the only option. You can also integrate Workplace Services Express with a Domino Directory. You can also do this from the iSeries Create Workplace wizard. For more information about the supported LDAP directories, see 2.5, "Supported LDAP directories" on page 30.

1.4 Comparison of Workplace Collaboration Services and Workplace Services Express

IBM Workplace Collaboration Services is an innovative product from the IBM Workplace family of products that helps transform the way people work. Workplace Collaboration Services is a completely integrated collaborative environment that includes a wide range of capabilities. These capabilities include e-mail, calendaring and scheduling, online awareness, instant messaging, learning, team spaces, Web conferencing, and document and Web content management. With Workplace Collaboration Services, organizations can deploy a single collaboration solution for the enterprise right out of the box. They have the flexibility to deploy one, two, or more capabilities in any combination, all running within a single, fully integrated IBM Workplace collaboration environment.

The functions present in Workplace Services Express are a subset of those functions present in Workplace Collaboration Services. One important difference is that Workplace Services Express includes a WebSphere Portal license, which entitles you to unlimited portal use.

Table 1-2 compares the functions that are available on Workplace Services Express and Workplace Collaboration Services.

Table 1-2 Comparison of Workplace Collaboration Services and Workplace Services Express

| Function | Workplace Collaboration Services | Workplace Services Express |
|--------------------------|----------------------------------|----------------------------|
| E-mail and Calendar | X | X ¹ |
| Instant Messaging | X | X |
| Team Spaces | X | X |
| Web Conferencing | X | |
| Distance Learning | X | |
| Document Management | X | X |
| Web Content Management | X | |
| Workplace Client Support | X | |
| Portal license included | | X |
| Licensing method | Per processor | User or processor |

1. This functionality is not available by default, but can be enabled with an existing mail infrastructure.

For more information about running Workplace Collaboration Services on the iSeries server, see the IBM Redbook *Deploying IBM Workplace Collaboration Services on the IBM @server iSeries Server*, SG24-6640.

1.5 Naming conventions and servers used for this redbook

Throughout this redbook, we provide explanations, details, and window captures of our implementation of Workplace Services Express on the iSeries server. In this section, we explain the naming conventions and different servers used to create this redbook.

In our environment, we had two iSeries servers called *rchas12* and *rchas55*. On these iSeries servers, we configured several Domino and Workplace Services Express servers. The Domino servers are called:

- ▶ *itsodom70*, which is a Domino 7.0 server
- ▶ *itsodom6*, which is a Domino 6.5.3 server
- ▶ *dom654*, which is a Domino 6.5.4 server

For the Workplace Services Express servers, the naming convention was *itsowsen*, with *n* indicating the number of the server, for example *itsowse1*.

Note: Because of the multiple Domino and Workplace Services Express servers used, you might see different window captures of different Workplace Services Express servers through out this redbook.

Hardware and software prerequisites

This chapter describes the hardware and software prerequisites for running IBM Workplace Services Express Version 2.5 on the iSeries server. Before you can install and configure Workplace Services Express, you must install and configure the necessary hardware and software requirements. This chapter discusses the following prerequisites to make sure your iSeries server meets all the Workplace Services Express requirements:

- ▶ Hardware requirements
- ▶ Software requirements
- ▶ Required program temporary fixes (PTFs)
- ▶ i5/OS configuration and network requirements
- ▶ Supported Lightweight Directory Access Protocol (LDAP) directories
- ▶ Supported HTTP servers
- ▶ Client requirements

Tip: For the latest information about these prerequisites, see the Workplace Services Express Release Notes, which are available on the Lotus Documentation Web site:

<http://www.lotus.com/products/product5.nsf/wdocs/productdoc>

2.1 iSeries server hardware requirements

A new IBM @server i5 server must meet the following minimum processor and memory requirements. For existing systems, contact your IBM representative to determine capacity requirements for your organization's deployment.

- ▶ @server i5 model 520 1-way (2400 CPW)
- ▶ 4 GB main storage
- ▶ 15 GB of disk space for installation of Workplace Services Express and WebSphere Application Server V5.0.2 Enterprise Enablement
- ▶ 4 GB of disk space for each Workplace Services Express server configured
- ▶ Additional disk space must be sized based on the Workplace Services Express application being used. Refer to the Workplace Services Express release notes for the latest information.

Note: The name @server i5 merely refers to the POWER5™ line of servers within the iSeries server family. Also, with OS/400 V5R3, the operating system has been renamed to i5/OS. Therefore, throughout this redbook, we use the terms *OS/400* and *i5/OS* interchangeably to refer to OS/400 V5R3.

2.1.1 IBM eServer Workload Estimator

To size your iSeries server based on your business needs, we recommend that you use the *IBM @server Workload Estimator*, which can help you estimate your system correctly. The Workload Estimator is an interactive Java-based tool for sizing an iSeries server for mixed workloads. You can access the IBM @server Workload Estimator on the Web at:

<http://www-912.ibm.com/wle/EstimatorServlet>

For many existing systems, you can import IBM Performance Management (PM/400) data directly into the Workload Estimator and use it to analyze your company growth and server needs. The Workload Estimator provides recommendations for estimating an appropriate configuration for a server running one or more workloads associated with On Demand Business or collaboration, such as Workplace Services Express.

Important: At the time this redbook was written, Workplace Services Express information was not yet available in the Workload Estimator. This information will be made available at some point in the future.

Using the Workload Estimator, you can try different scenarios and print the results for comparison. The Workload Estimator does not replace the advice given by an IBM representative or Business Partner who is experienced with Workplace Services Express requirements. If you are new to or are not familiar with sizing methodologies, we strongly recommend that you obtain expert assistance before you select a final iSeries server configuration.

Tip: Before you start using the Workload Estimator for the first time, we recommend that you carefully read the help documentation. This opens automatically in a separate Web browser window and is available through the tutorial provided with the Workload Estimator tool. You can download the tutorials as PDF files.

The recommendation or Selected System reported by the Workload Estimator includes the model, processor, interactive feature, CPW capacity, memory, and the number and capacity of disk storage (direct access storage device (DASD)) necessary to support the set of workloads defined by the user. When the Workload Estimator provides a sizing recommendation, it always defaults to recommend the latest technology systems that are currently available.

Detailed resource requirements for each Workload Estimator recommendation are given. However, it is important to remember that, as with every performance estimate (whether a rule of thumb or a sophisticated model), you must always treat it as an estimate and not a detailed capacity planner. This is particularly true with a robust system such as the iSeries server that offers so many different capabilities, where each installation has unique performance characteristics and demands.

The sizing recommendations that are generated by the Workload Estimator are based on benchmark measurements and performance tests from well-defined repeatable workloads. To arrive at a recommended system, the Workload Estimator goes through a series of questions to collect the necessary information to calculate the resource requirements of your solution.

As you become more familiar with the Workload Estimator, you can provide more specific information for particular workloads, thereby leading to a more accurate estimation. The Workload Estimator is continually updated to implement the latest versions and releases of the workloads. New function is added on a regular basis to keep the information and projections current. Periodically review the following Web site to keep up-to-date with the most accurate information about Workload Estimator:

<http://www-912.ibm.com/estimator/html/whatsNew.html>

2.2 i5/OS software requirements

Table 2-1 lists the licensed program software for i5/OS that is required to run Workplace Services Express. Notice that IBM Workplace Services Express 2.5 for i5/OS requires i5/OS V5R3 or later. OS/400 V5R2 is not supported.

Note: The IBM Web Administration for iSeries Create IBM Workplace wizard also verifies that the required license program software is installed prior to configuring a Workplace Services Express server. Refer to 4.3.2, “Using the iSeries Create IBM Workplace wizard” on page 85, for more information. Make sure that you have the latest 5722-DG1 group PTF installed before you use the iSeries Create IBM Workplace wizard to configure a Workplace Services Express server.

Table 2-1 i5/OS software requirements for Workplace Services Express Version 2.5

| Licensed program product | Option | Description |
|--------------------------|--------|---|
| 5722SS1 | *BASE | OS/400 V5R3 |
| | 12 | OS/400 - Host Servers |
| | 30 | OS/400 - Qshell Interpreter |
| | 33 | OS/400 - Portable Application Solution Environment (PASE) |
| | 43 | OS/400 - Additional Fonts |
| 5722AC3 | *BASE | Cryptographic Access Provider 128-bit |

| Licensed program product | Option | Description |
|--------------------------|--------|--|
| 5722DG1 | *BASE | IBM HTTP Server for iSeries |
| 5722JC1 | *BASE | IBM Toolbox for Java |
| 5722JV1 | *BASE | IBM Developer Kit for Java |
| | 5 | Developer Toolkit 1.3 |
| | 6 | Developer Toolkit 1.4 |
| 5722TC1 | *BASE | TCP/IP Connectivity Utilities for iSeries |
| 5722XH2 ² | *BASE | iSeries Access For Web ² (optional) |
| 5733WS5 | *BASE | WebSphere Application Server V5.0 |
| | 1 | WebSphere Application Server V5.0 Client development and runtime |
| | 2 | WebSphere Application Server V5.0 Application server runtime |
| | 10 | WebSphere Application Server V5.0 Enterprise Enablement ¹ |
| 5799PTL ³ | *BASE | iSeries Tools for Developers PRPQ (optional) |

1. For instructions on how to install WebSphere Application Server V5.0 option 10, Enterprise Enablement, see the following section.

2. iSeries Access for Web is required only if you want to give users access to existing i5/OS applications using the iSeries Access portlets. See Chapter 7, "Integrating iSeries Access for Web portlets" on page 207, for details.

3. iSeries Tools for Developers PRPQ must be installed only if you intend to use virtual network computing (VNC) for document rendering. See 9.5.4, "X virtual frame buffer versus virtual network computing" on page 299, for more information. To obtain and install 5799-PTL iSeries Tools for Developers PRPQ, see 2.2.2, "Installing iSeries Tools for Developers PRPQ" on page 13.

Important: As part of the IBM Workplace Services Express installation, a runtime version of WebSphere Portal is also installed. WebSphere Portal is *not* required prior to installing Workplace Services Express on the iSeries server.

2.2.1 Installing WebSphere Application Server V5.0, Enterprise Enablement

IBM Workplace Services Express requires functionality that is not available with standard versions of WebSphere Application Server on i5/OS. To add this functionality, you must install IBM Enterprise Enablement for WebSphere Application Server for iSeries (WebSphere Application Server V5.0 option 10, Enterprise Enablement).

WebSphere Application Server V5.0 option 10, Enterprise Enablement, is provided as part of the Workplace Services Express bundle of CDs. Before you install IBM Enterprise Enablement, you must install:

- ▶ Option 1, WebSphere Application Server V5.0 Client development and runtime
- ▶ Option 2, WebSphere Application Server V5.0 Application server runtime
- ▶ The WebSphere Application Server V5.0 group PTF (SF99287 for i5/OS V5R3)

To install WebSphere Application Server V5.0 option 10, Enterprise Enablement, from a PC workstation connected to your iSeries server, perform the following steps:

1. If your WebSphere Application Server subsystem is running, enter the following End Subsystem (ENDSBS) CL command on an i5/OS command line to end it:
`ENDSBS SBS(QEJBAS5)`
2. Insert the WebSphere Application Server V5.0 Enterprise Enablement CD into your PC workstation's CD-ROM drive. The WebSphere Application Server V5.0 Enterprise Enablement installation program starts automatically.
3. In the signon window that opens, when prompted, enter your iSeries server name, user ID, and password. Then click **OK**.
4. Select the language for the installation and click **Next**.
5. In the WebSphere Application Server V5.0 Enterprise Enablement Welcome window that opens, click **Next**.
6. Review the license agreement. Select **I accept the terms of the licensing agreement** and click **Next**.
7. The next window asks which version of WebSphere Application Server V5.0 Enterprise Enablement you want to install. Select **WebSphere Application Server V5.0 Enterprise Enablement** to install the Base Edition. Click **Next**.
8. View the installation summary information and click **Next**.
9. When WebSphere Application Server V5.0 Enterprise Enablement finishes installing, in the confirmation window that opens, indicating a successful installation, click **Finish**.

2.2.2 Installing iSeries Tools for Developers PRPQ

Important: You must install iSeries Tools for Developers PRPQ only if you intend to use VNC for document rendering. See 9.5.4, "X virtual frame buffer versus virtual network computing" on page 299, for more information. Also, you are not required to install iSeries Tools for Developers PRPQ if the 5722-DG1 PTF SI20496 is installed.

To install iSeries Tools for Developers PRPQ:

1. Download 5799-PTL iSeries Tools for Developers PRPQ from the following IBM Software Web site:
<http://www.software.ibm.com>
2. Click the **Trials and betas** link in the left navigation column. On the Trials and betas Web page, in the Search for selection box, type 5799PTL, and click **Search**.
3. Follow the installation instructions for 5799-PTL iSeries Tools for Developers PRPQ provided on the following Web site:
<http://www.ibm.com/servers/enable/site/porting/tools/install.html>

You can find ordering information for 5799-PTL iSeries Tools for Developers PRPQ on the Web at:

<http://www.ibm.com/servers/enable/site/porting/tools/faqs.html>

2.2.3 Displaying the installed software on the iSeries server

To determine which software is currently installed on your iSeries server, perform the following steps:

1. Sign onto your iSeries server.
2. Enter the Display Software Resources (DSPSFWRSC) CL command and press Enter.
3. On the Display Software Resources display (Figure 2-1), verify the software that is installed.

| Display Software Resources | | | | System: RCHAS12 |
|---|--------|---------|--|-----------------|
| Resource ID | Option | Feature | Description | |
| 5722999 | *BASE | 5050 | Licensed Internal Code | |
| 5722SS1 | *BASE | 5050 | Operating System/400 | |
| 5722SS1 | *BASE | 2924 | Operating System/400 | |
| 5722SS1 | 1 | 5050 | OS/400 - Extended Base Support | |
| 5722SS1 | 1 | 2924 | OS/400 - Extended Base Support | |
| 5722SS1 | 2 | 5050 | OS/400 - Online Information | |
| 5722SS1 | 2 | 2924 | OS/400 - Online Information | |
| 5722SS1 | 3 | 5050 | OS/400 - Extended Base Directory Support | |
| 5722SS1 | 3 | 2924 | OS/400 - Extended Base Directory Support | |
| 5722SS1 | 12 | 5050 | OS/400 - Host Servers | |
| 5722SS1 | 12 | 2924 | OS/400 - Host Servers | |
| 5722SS1 | 30 | 5050 | OS/400 - Qshell | |
| 5722SS1 | 30 | 2924 | OS/400 - Qshell | |
| 5722SS1 | 31 | 5050 | OS/400 - Domain Name System | |
| Press Enter to continue. | | | | More... |
| F3=Exit F11=Display libraries/releases F12=Cancel | | | | |
| F19=Display trademarks | | | | |

Figure 2-1 Display Software Resources display

- On the same display, press F11 (Display libraries/releases) to view the release level of the product installed. See Figure 2-2.

| Display Software Resources | | | | | | System: RCHAS12 |
|----------------------------|--------|---------|-------|---------|---------|-----------------|
| Resource ID | Option | Feature | Type | Library | Release | |
| 5722999 | *BASE | 5050 | *CODE | QSYS | V5R3M0 | L00 |
| 5722SS1 | *BASE | 5050 | *CODE | QSYS | V5R3M0 | L00 |
| 5722SS1 | *BASE | 2924 | *LNG | QSYS | V5R3M0 | L00 |
| 5722SS1 | 1 | 5050 | *CODE | QSYS2 | V5R3M0 | |
| 5722SS1 | 1 | 2924 | *LNG | QSYS2 | V5R3M0 | |
| 5722SS1 | 2 | 5050 | *CODE | QHLPSYS | V5R3M0 | |
| 5722SS1 | 2 | 2924 | *LNG | QHLPSYS | V5R3M0 | |
| 5722SS1 | 3 | 5050 | *CODE | QSYSDIR | V5R3M0 | |
| 5722SS1 | 3 | 2924 | *LNG | QSYSDIR | V5R3M0 | |
| 5722SS1 | 12 | 5050 | *CODE | QIWS | V5R3M0 | |
| 5722SS1 | 12 | 2924 | *LNG | QIWS | V5R3M0 | |
| 5722SS1 | 30 | 5050 | *CODE | QSHELL | V5R3M0 | |
| 5722SS1 | 30 | 2924 | *LNG | QSHELL | V5R3M0 | |
| 5722SS1 | 31 | 5050 | *CODE | QDNS | V5R3M0 | |

More...

Press Enter to continue.

F3=Exit F11=Display descriptions F12=Cancel F19=Display trademarks

Figure 2-2 Display Software Resources display showing the installed release

You can also use iSeries Navigator to verify the currently installed licensed software on your system. From iSeries Navigator, click **My Connections** → **servername** → **Configuration and Service** → **Software** → **Installed Products** as shown in Figure 2-3. The panel on the right shows the currently installed software on your system.

| Environment: My Connections | | RchAS12: Installed Products | | | |
|-----------------------------|--------|-----------------------------|--|--|--|
| Product | Option | Release | Description | | |
| 5722999 | 0000 | V5R3M0 | Licensed Internal Code | | |
| 5722ss1 | 0000 | V5R3M0 | Operating System/400 | | |
| 5722ss1 | 0001 | V5R3M0 | OS/400 - Extended Base Support | | |
| 5722ss1 | 0002 | V5R3M0 | OS/400 - Online Information | | |
| 5722ss1 | 0003 | V5R3M0 | OS/400 - Extended Base Directory Support | | |
| 5722ss1 | 0012 | V5R3M0 | OS/400 - Host Servers | | |
| 5722ss1 | 0030 | V5R3M0 | OS/400 - Qshell | | |
| 5722ss1 | 0031 | V5R3M0 | OS/400 - Domain Name System | | |
| 5722ss1 | 0033 | V5R3M0 | OS/400 - Portable App Solutions Environment | | |
| 5722ss1 | 0034 | V5R3M0 | OS/400 - Digital Certificate Manager | | |
| 1tmelcf | 0000 | V4R1M0 | Tivoli Management Agent | | |
| 5639c34 | 0000 | V5R3M0 | WebSphere MQ classes for Java and JMS - V5.3 | | |
| 5639c34 | 0001 | V5R3M0 | WebSphere MQ Classes for Java - samples | | |
| 5722ac3 | 0000 | V5R3M0 | Crypto Access Provider 128-bit | | |
| 5722bz1 | 0000 | V5R1M0 | IBM Business Solutions | | |
| 5722ce3 | 0000 | V5R3M0 | Client Encryption 128-bit | | |
| 5722dg1 | 0000 | V5R3M0 | IBM HTTP Server for iSeries | | |
| 5722dg1 | 0001 | V5R3M0 | Triggered Cache Manager | | |

Figure 2-3 Using iSeries Navigator to display installed licensed software

For more information, refer to the IBM @server iSeries Information Center for Version 5 Release 3 (V5R3) at:

<http://publib.boulder.ibm.com/series/v5r3/ic2924/index.htm>

2.3 Program temporary fixes

System updates and fixes on the iSeries server are applied through a PTF. The PTFs that are required to be loaded on the system depend on the version and release of OS/400 that is used and the software products that are installed on the system. This section covers the minimum PTFs that are required to perform the configuration steps covered in this redbook.

Note: Always make sure the latest OS/400 Cumulative PTF package is installed on your iSeries server.

Running IBM Workplace Services Express Version 2.5 on the iSeries server requires both group PTF packages and individual PTFs. Each group PTF package and individual PTF includes specific installation instructions. Also, the IBM Web Administration for iSeries Create IBM Workplace wizard verifies that the required group PTFs and individual PTFs are installed prior to configuring a Workplace Services Express server.

2.3.1 Group PTFs

You must verify that the required group PTFs are installed on your iSeries server. A *group PTF* provides a logical set of PTFs that affect a specific function. It can span across many products. Typically you install group PTFs after you install the required licensed software products and before you install any individual PTFs.

Table 2-2 lists the required group PTFs for i5/OS V5R3 that you must apply *before* you can install Workplace Services Express Version 2.5 on i5/OS. Verify that your iSeries server has the latest levels of these group PTFs installed.

Table 2-2 Required i5/OS V5R3 group PTFs for Workplace Services Express Version 2.5

| Group PTF | Description | Minimum level |
|-----------|--|---------------|
| SF99530 | Cumulative PTF package | 5102 |
| SF99503 | DB2 Universal Database for iSeries | 4 |
| SF99287 | WebSphere Application Server V5.0 (Base Edition) | 7 |
| SF99282 | WebSphere Portal Express/Express Plus Service Pack | 3 |
| SF99269 | Java | 5 |
| SF99099 | IBM HTTP Server for iSeries | 7 |
| SF99288 | WebSphere Application Server V5.0 (Network Deployment) (This is only required if WebSphere Application Server Network Deployment (5733-WS5 Option 5) is installed.) | 1 |
| SF99173 | IBM Business Solutions (This is only required if IBM Business Solutions (5722-BZ1) is installed.) | 1 |
| SF99295 | WebSphere MQ for iSeries Version 5, Release 3 (This is only required if WebSphere MQ for iSeries (5724-B41) is installed.) | 1 |

Important: You must apply the WebSphere Portal Express/Express Plus Service Pack Group PTF (SF99282) *after* WebSphere Application Server V5.0 Enterprise Enablement (5733-WS5, option 10) is installed. After installing WebSphere Application Server V5.0 Enterprise Enablement (5733-WS5, option 10), it has been observed that several of the group PTFs change to an *uninstalled* status. Installing the WebSphere Portal Express/Express Plus Service Pack Group PTF (SF99282) changes these group PTFs back to an *installed* status.

The WebSphere Portal Express/Express Plus Service Pack group PTF (SF99282) includes the WebSphere Application Server group PTF. This group PTF also includes several PTFs for products other than the WebSphere Application Server product.

Refer to the following link regarding Preventive Service Planning (PSP) information for the WebSphere Portal Express/Express Plus Service Pack Group PTF SF99282:

http://www-912.ibm.com/a_dir/as4ptf.nsf/0/137eb683e8bf962f86256eb1001605ef?OpenDocument

Verifying group PTFs

To verify the correct group PTF levels are installed on your system, perform the following steps:

1. Sign onto your iSeries server.
2. Enter the Work with PTF Groups (WRKPTFGRP) CL command on a command line and press Enter.
3. In the Work with PTF Groups display (Figure 2-4), which lists the group PTF installed on your system as well the level, verify that each group PTF shows a status of Installed.

| Work with PTF Groups | | | | System: RCHAS12 |
|--|-----------|-------|-----------|-----------------|
| Type options, press Enter. | | | | |
| 4=Delete 5=Display 6=Print 8=Display special handling PTFs | | | | |
| 9=Display related PTF groups | | | | |
| Opt | PTF Group | Level | Status | |
| | SF99530 | 5102 | Installed | |
| | SF99503 | 4 | Installed | |
| | SF99287 | 7 | Installed | |
| | SF99282 | 3 | Installed | |
| | SF99269 | 5 | Installed | |
| | SF99099 | 6 | Installed | |
| | | | | Bottom |
| F3=Exit F6=Print F11=Display descriptions F12=Cancel | | | | |
| F22=Display entire field | | | | |

Figure 2-4 Work with PTF Groups (WRKPTFGRP) initial display

- The initial Work with PTF Groups display provides limited information. For a more descriptive display of the group PTF information, press F11 (Display descriptions) and you see the group PTF descriptions like the example in Figure 2-5.

| Work with PTF Groups | | System: RCHAS12 |
|--|-----------|--|
| Type options, press Enter. | | |
| 4=Delete 5=Display 6=Print 8=Display special handling PTFs | | |
| 9=Display related PTF groups | | |
| Opt | PTF Group | Text |
| | SF99530 | CUMULATIVE PTF PACKAGE C4272530 |
| | SF99503 | DB2 UDB FOR ISERIES |
| | SF99287 | WEBSPPHRE APP SERVER V5.0 (BASE EDITION) |
| | SF99282 | WEBSPPHRE PORTAL EXPRESS/EXPRESS PLUS SERVICE PACK |
| | SF99269 | JAVA |
| | SF99099 | IBM HTTP SERVER FOR ISERIES |
| | | Bottom |
| F3=Exit F6=Print F11=Display status F12=Cancel | | |
| F22=Display entire field | | |

Figure 2-5 Work with PTF Groups (WRKPTFGRP) display, using F11 to display the descriptions

You can also use iSeries Navigator to verify the installed group PTFs on your system. From iSeries Navigator, click **My Connections** → **servername** → **Configuration and Service** → **Fixes Inventory** → **Fix Groups** as shown in Figure 2-6.

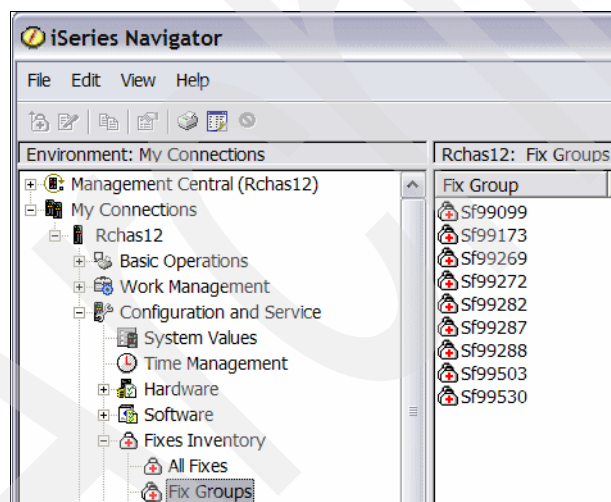


Figure 2-6 Using iSeries Navigator to display the installed group PTFs

For more information, refer to the following Web sites:

- ▶ All group PTFs for the different OS/400 and i5/OS releases
http://www-912.ibm.com/s_dir/sline003.NSF/GroupPTFs?OpenView&view=GroupPTFs
- ▶ Methods and instructions for ordering group PTFs
<http://www.ibm.com/servers/eserver/support/iserics/fixes/orderfix.html>
- ▶ Fix Central
<http://www-912.ibm.com/eserver/support/fixes/fcgui.jsp>

2.3.2 Required individual i5/OS V5R3 PTFs

Table 2-3 lists the required individual i5/OS V5R3 PTFs for IBM Workplace Services Express 2.5. To review the cover letters for these required PTFs, refer to the following Web site:

http://www-912.ibm.com/a_dir/as4ptf.nsf/as4ptfhome

Important: Install the required individual PTFs *after* you install the required group PTFs (see 2.3.1, “Group PTFs” on page 16).

The IBM Web Administration for iSeries Create IBM Workplace wizard verifies that the required group PTFs and individual PTFs are installed prior to configuring a Workplace Services Express server. Refer to 4.3.2, “Using the iSeries Create IBM Workplace wizard” on page 85, for details.

Refer to the following Web site for information and instructions on ordering individual PTFs:

<http://www.ibm.com/servers/eserver/support/series/fixes/orderfix.html>

Table 2-3 Required individual i5/OS V5R3 PTFs for Workplace Services Express Version 2.5

| Product | PTF number |
|----------|------------|
| 5722-999 | MF34851 |
| | MF34853 |
| | MF34854 |
| | MF34855 |
| | MF34856 |
| | MF34923 |
| 5722-SS1 | SI14360 |
| | SI14668 |
| | SI14875 |
| | SI15032 |
| | SI15608 |
| | SI15974 |
| | SI16692 |
| | SI16999 |
| | SI17063 |
| | SI17274 |
| | SI17276 |
| | SI14360 |
| | SI14668 |
| | SI14875 |
| | SI15032 |
| | SI17277 |

| Product | PTF number |
|----------------------|-----------------------|
| 5722-SS1 (continued) | SI17308 |
| | SI17314 |
| | SI17480 |
| | SI17551 |
| | SI17684 |
| | SI16999 (recommended) |
| | SI18345 |
| | SI18367 |
| | SI18796 |
| 5733-WS5 | SI17024 |
| 5799-PTL | SI09622 |
| 5772-DG1 | SI15323 |
| | SI18732 |
| 5722-AC3 | SI18370 |

Important: PTF SI17980 (product 5722-DG1) includes the IBM Web Administration for iSeries Create IBM Workplace wizard. This individual PTF is part of the IBM HTTP Server for iSeries group PTF, SF99099 level 5.

Verifying individual PTFs

To determine if the required individual PTFs are installed on your iSeries server, perform the following steps:

1. Sign onto your iSeries server.
2. Enter the following Display Program Temporary Fix (DSPPTF) CL command on an i5/OS command line and press Enter:

```
DSPPTF LICPGM(productID)
```

In this example, for *product ID*, we type 5722SS1.

In the Display PTF Status display, you see the PTFs that have been applied for a particular product. Figure 2-7 shows the PTFs installed for i5/OS V5R3.

Display PTF Status

System: RCHAS12

Product ID : 5722SS1

IPL source : ##MACH#B ##SERV#P

Release of base option : V5R3M0 L00

Type options, press Enter.

5=Display PTF details 6=Print cover letter 8=Display cover letter

| PTF | IPL |
|---------------|---------------------|
| Opt ID Status | Action |
| TC04272 | Temporarily applied |
| TC04209 | Permanently applied |
| TC04153 | Superseded |
| TC04118 | Superseded |
| TC04083 | Superseded |
| TCP0039 | Temporarily applied |
| TCP0038 | Superseded |
| TCP0037 | Superseded |
| TCP0036 | Superseded |

More...

F3=Exit F11=Display alternate view F17=Position to F12=Cancel

Figure 2-7 Displaying PTF status for i5/OS V5R3 (5722SS1)

You can also use iSeries Navigator to verify the installed individual PTFs on your system. From iSeries Navigator, click **My Connections** → **servername** → **Configuration and Service** → **Fixes Inventory** → **licensed program** as shown in Figure 2-8.

iSeries Navigator

File Edit View Help

Last collected:

Environment: My Connections

Rchas12: 5722dq1

| Fix | Status | Release | Save File | Cover Letter | Last Changed |
|---------|-----------------------|---------|-----------|--------------|---------------------|
| SI11074 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11409 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11432 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11453 | Superseded | v5r3m0 | No | No | 9/16/2004 1:50:31 / |
| SI11518 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11727 | Installed | v5r3m0 | No | No | 9/16/2004 2:41:44 / |
| SI11747 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11839 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11892 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI11901 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12051 | Superseded | v5r3m0 | No | No | 9/16/2004 1:49:58 / |
| SI12130 | Superseded | v5r3m0 | No | No | 9/16/2004 1:50:35 / |
| SI12170 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12289 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12298 | Installed permanently | v5r3m0 | No | No | 11/3/2004 6:41:38 / |
| SI12376 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12397 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12514 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12583 | Superseded | v5r3m0 | No | No | 9/16/2004 2:18:35 / |
| SI12718 | Superseded | v5r3m0 | No | No | 9/16/2004 1:50:31 / |
| SI12730 | Superseded | v5r3m0 | No | No | 9/16/2004 1:49:58 / |

Figure 2-8 Using iSeries Navigator to display installed individual PTFs

2.4 i5/OS configuration and network requirements

This section explains the i5/OS configuration and network requirements. These include the installation and configuration user profiles, system values, the HTTP administration server, and the network requirements.

2.4.1 Installation and configuration user profiles

To install and configure IBM Workplace Services Express for i5/OS, you need the following user profiles with the specified special authorities:

- ▶ A valid user ID and password on the i5/OS server

This user profile must at have least *ALLOBJ, *IOSYSCFG, and *JOBCTL special authorities to install and configure a Workplace Services Express server on the iSeries server.

- ▶ An existing database user profile with at least *USER authority and a maximum storage parameter set to *NOMAX on the iSeries server where the DB2 Universal Database to be used is located

This profile is specified as the database owner in the IBM Web Administration for iSeries Create Workplace wizard. We recommend that you do not use this user profile for any other purpose or you could encounter problems. You cannot change the database user after a Workplace Services Express server is created.

Note: If the user profile you are using to configure a Workplace Services Express server has *SECADM special authority, you can create the database owner user profile when using the IBM Web Administration for iSeries Create IBM Workplace wizard.

2.4.2 Verifying the i5/OS time zone

Before you install the IBM Workplace Services Express software, make sure the time zone system value is set correctly. The i5/OS system value of QTIMZON specifies the time zone information used to calculate local system time. You can use the Change System Value (CHGSYSVAL) CL command to set the QTIMZON system value.

Before you change the QTIMZON system value, verify the current time zone setting by using the following Work with System Values (WRKSYSVAL) CL command:

```
WRKSYSVAL SYSVAL(QTIMZON)
```


If you must change the QTIMZON system value, select it by using option 2 (Change) to access the Change System Value display (Figure 2-9). Or enter the following CHGSYSVAL command, which in this example, changes the time zone value to Central Standard Time:

```
CHGSYSVAL SYSVAL(QTIMZON) VALUE(QN0600CST)
```

Change System Value

System value : QTIMZON

Description : Time zone

Type choice, press Enter.

Time zone : QN0600CST Name

Associated settings:

Offset : -06:00

Full name : Central Standard Time

Abbreviated name : CST

F3=Exit F4=Prompt F5=Refresh F12=Cancel

Figure 2-9 Changing the QTIMZON system value

2.4.3 Verifying that the HTTP Administration server is active

The HTTP Administration server must be active in order to access the IBM Web Administration for iSeries Create IBM Workplace wizard. Perform the following steps to verify that the HTTP Administration server is active:

1. Start the HTTP Administration server on i5/OS using either of the following options:
 - Enter the following Start TCP/IP Server (STRTCPSVR) CL command:
STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)
 - From iSeries Navigator, click **My Connections** → **servername** → **Network** → **Servers** → **TCP/IP**. In the right pane, right-click **HTTP Administration** and click **Start** (Figure 2-10).

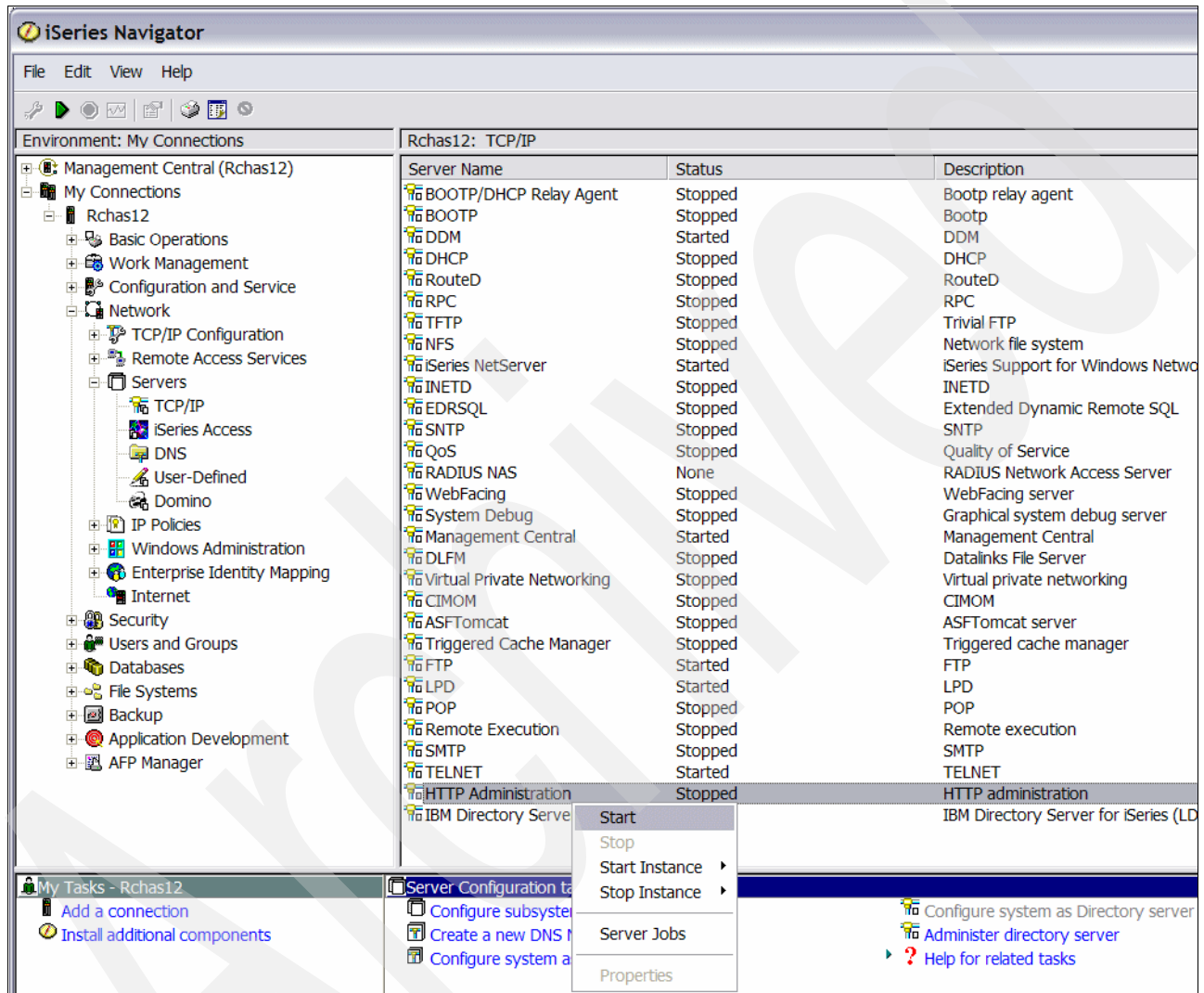


Figure 2-10 Starting the HTTP Administration server from iSeries Navigator

2. Access IBM Web Administration for iSeries. Point your Web browser to the following URL, where *server-hostname* is the fully qualified host name of your iSeries server:
http://server-hostname:2001
In this example, we use:
http://rchas12.rch1and.ibm.com:2001
3. When prompted, enter a valid i5/OS user profile and password with at least *ALLOBJ, *IOSYSCFG, and *JOBCTL special authorities. Click **OK**.

4. In the iSeries Tasks Web page (Figure 2-11), click the **IBM Web Administration for iSeries** link.

Note: The options listed on the iSeries Tasks Web page depend on the products that are installed on your iSeries server.



Figure 2-11 iSeries Tasks page

2.4.4 Network requirements

The configuration of an IBM Workplace Services Express server on the iSeries server requires a static TCP/IP address and a fully-qualified host name. This allows the Workplace Services Express server to use well-known ports on that TCP/IP address for functions such as instant messaging.

You also need a static TCP/IP address for the external HTTP server, which might or might not be on the same system as the Workplace Services Express server. The IBM Web Administration Create IBM Workplace wizard allows you to create a local external HTTP server on the same TCP/IP address on the same iSeries server on which the Workplace Services Express server is being created.

Before you start the configuration of a Workplace Services Express server, determine the dedicated static TCP/IP address and the fully qualified host name to use.

Determining the availability of a static TCP/IP address

A Workplace Services Express server on i5/OS requires the use of a static TCP/IP address. Perform the following steps to determine an available TCP/IP address:

1. From an i5/OS command line, enter the Configure TCP/IP (CFGTCP) CL command and press Enter.
2. On the Configure TCP/IP menu, type option 1 (Work with TCP/IP interfaces), and press Enter.
3. On the Work with TCP/IP Interfaces display (Figure 2-12), all the currently configured TCP/IP addresses on the iSeries server are displayed. From here, you have the options to add, change, remove, display, start, or end the TCP/IP interfaces.

| Work with TCP/IP Interfaces | | | | | System: RCHAS12 |
|---|------------------|-----------------|------------------|-----------|-----------------|
| Type options, press Enter. | | | | | |
| 1=Add 2=Change 4=Remove 5=Display 9=Start 10=End | | | | | |
| Opt | Internet Address | Subnet Mask | Line Description | Line Type | |
| | 10.10.10.1 | 255.255.255.128 | ETHLINE | *ELAN | |
| | 10.10.10.2 | 255.255.255.128 | ETHLINE | *ELAN | |
| | 10.10.10.3 | 255.255.255.128 | ETHLINE | *ELAN | |
| | 10.10.10.4 | 255.255.255.128 | ETHLINE | *ELAN | |
| | 127.0.0.1 | 255.0.0.0 | *LOOPBACK | *NONE | |
| | | | | | Bottom |
| F3=Exit F5=Refresh F6=Print list F11=Display interface status | | | | | |
| F12=Cancel F17=Top F18=Bottom | | | | | |

Figure 2-12 Work with TCP/IP Interfaces display

Note: You must have at least one TCP/IP address other than 127.0.0.1 defined on your system.

You can also use iSeries Navigator to verify whether an available static TCP/IP address is defined on your system. Using iSeries Navigator, select **My Connections** → **servername** → **Network** → **TCP/IP Configuration** → **IPv4** → **Interfaces** as shown in Figure 2-13.

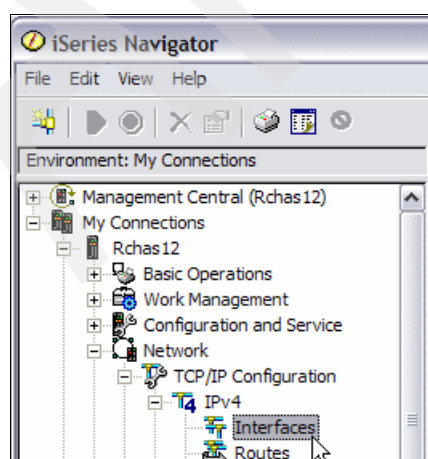


Figure 2-13 Using iSeries Navigator to determine available TCP/IP addresses

The currently configured TCP/IP addresses on the iSeries server are displayed in the right pane.

Verifying the fully qualified host name

Each IBM Workplace Services Express server on the iSeries server requires a static TCP/IP address and a fully-qualified host name. If the host name is listed in the i5/OS host table, it is required that the fully qualified host name is the first item listed after the IP address.

Along with the i5/OS host table, adding the fully-qualified host name to your Domain Name System (DNS) server or servers should ensure remote and client name resolution. For client and server connections, you *must* have name resolution for the Workplace Services Express server.

Note: We recommend that you update the i5/OS local host table with the fully-qualified host name of the Workplace Services Express server. The name resolution of the Workplace Services Express server by a DNS server is also a supported configuration.

Perform the following steps to verify whether your system is configured with a fully-qualified host name:

1. From an i5/OS command line, enter the Configure TCP/IP (CFGTCP) CL command and press Enter.
2. On the Configure TCP/IP menu that is displayed, type option 12 (Change TCP/IP domain information), and press Enter.
3. On the Change TCP/IP Domain (CHGTCPDMN) display, verify the fully qualified host name of your iSeries server. In Figure 2-14, the fully qualified host name in our example is RCHAS12.RCHLAND.IBM.COM.

Change TCP/IP Domain (CHGTCPDMN)

Type choices, press Enter.

Host name 'RCHAS12'

Domain name 'RCHLAND.IBM.COM'

Domain search list *DFT

Host name search priority . . . *LOCAL *REMOTE, *LOCAL, *SAME

Domain name server:

Internet address '10.10.244.100'

Internet address '10.10.244.200'

Bottom

F3=Exit F4=Prompt F5=Refresh F10=Additional parameters F12=Cancel

F13=How to use this display F24=More keys

Figure 2-14 Verifying the fully qualified host name of the iSeries server

Using an available static TCP/IP address and a fully-qualified host name for the Workplace Services Express server, perform the following steps to update the i5/OS local host table:

1. From an i5/OS command line, enter the Configure TCP/IP (CFGTCP) CL command and press Enter.
2. On the Configure TCP/IP menu that is displayed, type option 10 (Work with TCP/IP host table entries), and press Enter.
3. On the Work with TCP/IP Host Table Entries display, type option 1 (Add), and press Enter.
4. On the Add TCP/IP Host Table Entry (ADDTCPHTE) display, add the TCP/IP address with the fully-qualified host name listed *first*.

Figure 2-15 shows an example of the host table entries for a Workplace Services Express server called ITSOWSE1. Notice that the fully qualified host name is added first.

Add TCP/IP Host Table Entry (ADDTCPHTE)

Type choices, press Enter.

Internet address > '10.10.10.1

Host names:

Name > ITSOWSE1.RCHLAND.IBM.COM

Name > ITSOWSE1

Text 'description' 'IBM Workplace Services Express server'

Bottom

F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display

F24=More keys

Figure 2-15 Adding a TCP/IP host table entry

5. Confirm that the fully qualified host name resolves to the correct IP address by typing the following PING CL command from an i5/OS command line:

```
ping ITSOWSE1.RCHLAND.IBM.COM
```

Replace *ITSOWSE1.RCHLAND.IBM.COM* with the fully qualified host name that you assigned to your Workplace Services Express server. See Figure 2-16.

```
Command Entry                                RCHAS12
                                           Request level: 1

Previous commands and messages:
> ping ITSOWSE1.RCHLAND.IBM.COM
Verifying connection to host system ITSOWSE1.RCHLAND.IBM.COM at address
10.10.10.1.
PING reply 1 from 10.10.10.1 took 0 ms. 256 bytes. TTL 64.
PING reply 2 from 10.10.10.1 took 0 ms. 256 bytes. TTL 64.
PING reply 3 from 10.10.10.1 took 0 ms. 256 bytes. TTL 64.
PING reply 4 from 10.10.10.1 took 0 ms. 256 bytes. TTL 64.
PING reply 5 from 10.10.10.1 took 0 ms. 256 bytes. TTL 64.
Round-trip (in milliseconds) min/avg/max = 0/0/0.
Connection verification statistics: 5 of 5 successful (100 %).

Type command, press Enter.
===>
F3=Exit   F4=Prompt   F9=Retrieve   F10=Include detailed messages
F11=Display full   F12=Cancel   F13=Information Assistant   F24=More keys
```

Figure 2-16 Verifying the TCP/IP host table entry

Port assignments

Before you install and configure an IBM Workplace Services Express server on your iSeries server, it is important to verify that the ports required for the installation and configuration are available for use.

Table 2-4 lists some of the more common ports used by a Workplace Services Express server. Make sure that these port numbers are available on the IP address which you assigned to the Workplace Services Express server. The Workplace Services Express server binds these ports to the dedicated IP address.

Table 2-4 Ports bound to the specific host name used by a Workplace Services Express server

| Port number | Application | Description |
|-------------|-------------|---|
| 25 | SMTP | Simple Mail Transfer Protocol (SMTP), a protocol to send e-mail between servers |
| 80 | HTTP | Hypertext Transfer Protocol (HTTP) |
| 5060 | SIP | Session Initiated Protocol (SIP), a protocol used for Internet conferencing and instant messaging |
| 5061 | SIP | SIP Transport Layer Security (TLS) |
| 8080 | SIP | HTTP, Server1 application server |
| 8081 | SIP | HTTP, WebSphere_Portal application server |

A Workplace Services Express server also requires a block of 100 consecutive ports, which are bound across all IP addresses configured on your iSeries server. The iSeries Create IBM Workplace wizard automatically determines an available port block when configuring a Workplace Services Express server.

Port conflicts

Make sure that you do not have port conflicts on the TCP/IP address that you have chosen for your Workplace Services Express server. This is especially true for the system SMTP server. If you are not using the i5/OS SMTP server, you can end the server by using the following End TCP/IP Server (ENDTCPSVR) CL command:

```
ENDTCPSVR SERVER(*SMTP)
```

Also, if you are not using the i5/OS SMTP server, do not set it to *autostart* when starting TCP/IP on your iSeries server.

If you are using the i5/OS SMTP server, you can bind it to a specific TCP/IP address by performing the following steps:

1. Using iSeries Navigator, click **My Connections** → **servername** → **Network** → **Servers** → **TCP/IP**.
2. From the right pane, right-click **SMTP** and select **Properties**.
3. From the SMTP Properties window, click the **Bindings** tab and select a specific TCP/IP address to bind the system SMTP server to.

2.5 Supported LDAP directories

Workplace Services Express requires the use of an LDAP directory. The following LDAP directories are supported for use with Workplace Services Express 2.5:

- ▶ IBM Domino Enterprise Server V6.0.x or V6.5.x
- ▶ IBM Directory Server V5.1 (which is shipped with IBM i5/OS V5R3)
- ▶ Microsoft Active Directory 2000
- ▶ Microsoft Active Directory 2003
- ▶ Novell eDirectory 8.7.3
- ▶ Sun™ One Directory Server V5.2 with Fix Pack 3

Important: At the time this redbook was written, Workplace Services Express only supports IBM Domino Enterprise Server V6.0.x or V6.5.x. However, because of the similarities between Domino Versions 6.5.4 and 7.0, we anticipate that Domino Version 7.0 will be supported in the future. Therefore, we indicate any differences between Domino V6.5.x and V7.x as applicable throughout this redbook. For a list of the supported Domino versions, see the Technical specification at a glance Web site at:

<http://www.lotus.com/products/product5.nsf/wdocs/wsetechspects>

Note: The IBM Web Administration for iSeries Create IBM Workplace wizard verifies whether a valid LDAP directory server has been specified during the configuration of a Workplace Services Express server. Refer to 4.3.2, "Using the iSeries Create IBM Workplace wizard" on page 85, for more information.

For more information about configuring a supported LDAP directory for use with Workplace Services Express, see Chapter 3, "Preparing the directory server for Workplace Services Express" on page 35.

2.6 Supported HTTP servers

A separate, external HTTP server is required for instant messaging and presence awareness. Workplace Services Express comes with an internal HTTP server provided by WebSphere Application Server. However using an external HTTP server can improve performance.

Workplace Services Express supports the following local or remote HTTP servers running on i5/OS:

- ▶ IBM HTTP Server for iSeries 2.0.49
- ▶ IBM Lotus Domino Server for iSeries Release 5.0.12 or later

Workplace Services Express also supports the following remote HTTP servers running on other platforms:

- ▶ HTTP Server (powered by Apache) 1.3.26 and 1.3.28
- ▶ IBM HTTP Server 1.3.26.1 and 1.3.26.2
- ▶ IBM HTTP Server 2.0.42.1 and 2.0.42.2
- ▶ IBM Lotus Domino Enterprise Server (as Web server) 5.0.9a
- ▶ Microsoft IIS 5.0
- ▶ Sun ONE™ Web Server (formerly iPlanet™), Enterprise Edition 6.0 with Service Pack 4

Important: When you use the IBM Web Administration for iSeries Create IBM Workplace wizard to configure a Workplace Services Express server, it automatically configures a new IBM HTTP Server (powered by Apache) for iSeries. If you plan to use any other HTTP server, you must manually configure that HTTP server after you configure the Workplace Services Express server. For more information, see the Workplace Services Express Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

2.7 Client requirements

To deploy IBM Workplace Services Express in your client environment, the client software and operating system must meet several requirements.

The following operating systems are supported for Web browser clients:

- ▶ Microsoft Windows 2000 Professional with Service Pack 2
- ▶ Microsoft Windows XP with Service Pack 1
- ▶ Red Hat Enterprise Linux® WS 3.0 with Update 3
- ▶ SuSE Linux Desktop 1.0

The following Web browsers are supported by the Web browser client:

- ▶ Microsoft Internet Explorer 6.0 with Service Pack 1

This browser is supported only on Microsoft Windows 2000 or XP with the Sun Java™ Runtime Environment (JRE) 1.4.2 or with Microsoft Java Virtual Machine (JVM) 1.1 installed.

- ▶ Mozilla 1.4

This browser is supported on Linux platforms and on Microsoft Windows 2000 or XP with Sun JRE 1.4.2 installed.

- ▶ Mozilla Firefox 1.0

This browser is supported on Linux platforms and on Microsoft Windows 2000 or XP with Sun JRE 1.4.2 installed.

2.8 Planning for Workplace Services Express

Planning your Workplace Services Express environment is a necessary task. The decisions made during installation and configuration might be difficult or impossible to change after the system is in use. In this section, we explain why it is important to understand what is involved in deploying Workplace Services Express on your iSeries server.

Prior to installing Workplace Services Express, consider the number of people who will use it, the amount of data you expect to manage, the types of servers you will host, and the third-party components you plan to use with Workplace Services Express. Answer the following questions to gain an understanding of what is needed before you begin:

- ▶ What are your user requirements for collaborative systems?
- ▶ Will there be a pilot installation and testing period?
- ▶ Do you have an LDAP directory in place?
- ▶ Do you have experience with all the Workplace Services Express components?
- ▶ Will Workplace Services Express be integrated with other collaborative products, such as Lotus Domino?

Sometimes, answering one question leads to new ones. It is a good practice to go through these questions and any that might come up, prior to starting the installation of Workplace Services Express.

To help you size your Workplace Services Express server, answer the following questions:

- ▶ How many users do you plan to deploy the system for?
- ▶ What are your requirements for team collaboration?
 - How many team collaboration users will you have?
 - How many team spaces will exist?
 - What is the peak number of concurrent team space users that you expect to have?
 - What is the average size of the data which will be stored in each team space?
- ▶ What are your requirements for document management?
 - How many document management users will you have?
 - What is the peak number of concurrent document management users that you expect to have?
 - What is the average size of document data that you expect to store per user?

2.8.1 Recommended skills

IBM Workplace Services Express is comprised of core IBM software such as:

- ▶ WebSphere Application Server
- ▶ WebSphere Portal Server
- ▶ DB2 Universal Database

For these reasons, we recommend that an organization gather together personnel with working experience in these areas in order to make the initial installation and configuration of Workplace Services Express on your iSeries server a success.

LDAP administration

LDAP knowledge is one of the most critical areas of expertise required for a successful deployment of Workplace Services Express. Your LDAP directory is key to all Workplace Services Express functionality. If your organization currently has an LDAP directory in place, you might have to update it so that it can be used with Workplace Services Express. If your

organization does not currently have an LDAP directory in place, then you need the skills to design a proper directory that suits the needs of your organization and grow with it.

For more information, see Chapter 3, “Preparing the directory server for Workplace Services Express” on page 35.

WebSphere administration

WebSphere Application Server is the engine behind Workplace Services Express. WebSphere Portal Server handles the presentation of Workplace Services Express to the administrator and the end user. An experienced WebSphere administrator plays a key role in your deployment process. Most of the problems which you might encounter using Workplace Services Express can be fixed by reviewing the WebSphere Application Server and WebSphere Portal Server logs for error information.

Relational database administration

Storage of data is a central part of Workplace Services Express. All data related to a Workplace Services Express server is stored in DB2 Universal Database for iSeries. You need a person with medium to high administration skills in this area to manage the databases and perform daily administrative tasks such as backup and recovery.

Operating system administration

Workplace Services Express requires i5/OS V5R3. An administrator needs an understanding of i5/OS to set up and maintain the Workplace Services Express environment. This includes working with the Qshell Interpreter environment and many of the i5/OS TCP/IP utilities.

Network administration and security

The Workplace Services Express environment depends on network connections. Consult with an experienced network administrator before you deploy Workplace Services Express to ensure that server-to-server and client-to-server communications perform optimally. This is important for efficient communication, but also for secure transmission inside and outside the organization. You need network skills to configure your DNS server, host names, and TCP/IP addresses.

2.8.2 Understanding your environment

A full understanding of your organization’s hardware and software topology is essential when deploying Workplace Services Express. This might require you to bring together those responsible for each of the technologies that Workplace Services Express relies on. Outline the goals for your deployment and the impact which they will have on your current environment. Consider these questions when reviewing the environment:

- ▶ Will Workplace Services Express replace any existing system?
- ▶ Is an LDAP directory in place?
- ▶ Can the current network handle the traffic needs of the server and client systems?
- ▶ Who has responsibility for each aspect of the environment?
- ▶ What applications will Workplace Services Express interact with?

Pilot system

After you complete the plan for deployment, we recommend that you implement a pilot system. The pilot allows administrators to correct any potential problems in the deployment plan. It is also beneficial to see how end users will interact with the system. A preproduction pilot makes the move to a production system much smoother.

Archived

Preparing the directory server for Workplace Services Express

This chapter describes the fundamental role that directory services plays within Workplace Services Express on iSeries. It discusses the following topics:

- ▶ Understanding the importance of your directory server
- ▶ Selecting your directory service provider
- ▶ Preparing your directory server to configure a Workplace Services Express server

In addition, this chapter provides checklists to help ensure that you have configured your directory server properly.

Note: Directory servers use the Lightweight Directory Access Protocol (LDAP). In this chapter, the terms *directory server*, *LDAP server*, and *LDAP directory* are synonymous and are used interchangeably.

3.1 The importance of your directory (LDAP) server

Your directory server is the starting point for your Workplace Services Express server. All user information is stored in the LDAP directory. Everything from authentication, authority, and data access is determined from the information received from the directory server. If the information stored in the directory server is invalid, the function of Workplace Services Express is compromised. Due to the dependence on the LDAP server, configuring your directory server properly before you configure your first Workplace Services Express server is important.

In this chapter, we provide in-depth information to help you confirm that your directory configuration will work with Workplace Services Express, as well as checklists to help you along the way.

Important: If you do not configure security as part of the configuration process for Workplace Services Express on iSeries, a self-contained directory service based upon WebSphere Member Manager is deployed. This is considered to be the *internal directory server*. The internal directory server is not designed for use beyond a typical sandbox implementation consisting of a few users. Those users can be self registered via the Sign up link on the Workplace Services Express home page. Since the purpose of this redbook is to configure Workplace Services Express for a production environment, we assume that you will use an LDAP server for your directory service provider.

3.1.1 LDAP and Workplace Services Express terminology

Before you read this chapter, there are some LDAP terms and concepts used that you should be familiar with. This section provides a quick reference for you to use as you review your directory server's configuration.

- ▶ **Suffix:** The top entry in your LDAP directory information tree
This can also be referred to as the *base entry* or the *root*. There can be several suffixes in an LDAP directory, each representing the top of a separate directory information tree.
- ▶ **Users container:** The container in your LDAP directory where information about Workplace Services Express users is stored
- ▶ **Groups container:** The container in your LDAP directory where information about Workplace Services Express groups is stored
Initially only one group is created, the administrative users group with a single member, which is the Workplace Services Express administrator user. To grant administrative privileges to other users, add them to the administrative users group.
- ▶ **LDAP administrator:** A user account in your directory server that has read/write authority to the directory server
Use of this account is needed during the configuration of the Workplace Services Express server.
- ▶ **Workplace Services Express administrator:** The administrator account that is selected or created when the Workplace Services Express server is configured
This account is used to configure portlets. It is also used to run scripts to modify the Workplace Services Express configuration and to access the LDAP server after the initial configuration of the server.

3.1.2 Supported LDAP servers

Workplace Services Express on iSeries Version 2.5 supports the following LDAP servers:

- ▶ IBM Domino Enterprise Server V6.0.x or V6.5.x
- ▶ IBM Directory Server V5.1 (which is shipped with i5/OS V5R3)
- ▶ Microsoft Active Directory 2000
- ▶ Microsoft Active Directory 2003
- ▶ Novell eDirectory 8.7.3
- ▶ Sun One Directory Server V5.2 with Fix Pack 3

Important: At the time this redbook was written, Workplace Services Express supports only IBM Domino Enterprise Server V6.0.x or V6.5.x. However, because of the similarities between Domino Versions 6.5.4 and 7.0, we anticipate that Domino Version 7.0 will be supported in the future. Therefore, we indicate any differences between Domino V6.5.x and V7.x as applicable throughout this redbook. For a list of the supported Domino versions, see the Technical specification at a glance Web site at:

<http://www.lotus.com/products/product5.nsf/wdocs/wsetechspects>

Refer to the IBM Workplace Services Express Release Notes for more specific version and service pack details. You can find the release notes and other Workplace Services Express product documentation on the Web at:

<http://www.lotus.com/products/product5.nsf/wdocs/productdoc>

3.1.3 iSeries server, the one system solution for Workplace Services Express

The architecture of Workplace Services Express varies based on the platform on which the solution is deployed. On the iSeries, deploying Workplace Services Express has been simplified. All of the technologies that are required to run a Workplace Services Express deployment can run on the same system. Here are a few examples of the technologies that are supported concurrently on the same iSeries server:

- ▶ DB2 Universal Database
- ▶ IBM Directory Server
- ▶ IBM HTTP Server
- ▶ Lotus Domino
- ▶ WebSphere Application Server
- ▶ WebSphere Portal Server
- ▶ Workplace Services Express

As you can see from the list, you have a choice of two directory servers when seeking a one system solution for Workplace Services Express, using either Lotus Domino or IBM Directory server.

3.1.4 Choosing a directory server

Choosing a directory server is an important decision. If you have an existing LDAP infrastructure which is supported for use with Workplace Services Express, your decision is easy. Continue to use your existing directory server.

If you *have an existing Domino infrastructure*, this chapter helps you to configure your Domino server to use the LDAP functionality that is part of Domino. If you are *using the IBM Directory Server* that is part of the i5/OS operating system, continue to use this with your Workplace Services Express server. If you *do not have an existing LDAP server*, you might use any of the supported servers. Since LDAP is configured for you automatically within

i5/OS, consider using this as your LDAP server. (Refer to Appendix B, “Setting up IBM Directory Server for i5/OS” on page 343, for additional information.) If you are *planning on migrating to Domino* or want to *use the Domino Collaboration portlets with your Workplace Services Express server*, consider configuring a Domino server now and using it as your directory server.

You can see that a number of options are available to you. To help you understand what you must do before you can configure your first Workplace Services Express server, refer to Table 3-1 as a checklist to follow when preparing your directory server.

Table 3-1 Checklist of setup tasks for your directory server

| Task to be completed | Where you can find help in this chapter |
|--|---|
| Choose a directory server | 3.1.4, “Choosing a directory server” on page 37 |
| Determine read or write access to the directory server | 3.2, “Read/write or read-only access to the directory server” on page 38 |
| Modify the LDAP server configuration (three choices): | |
| IBM Directory Server | 3.3, “Preparing the IBM Directory Server” on page 39 |
| IBM Domino Enterprise server | 3.4, “Preparing the Domino server for LDAP” on page 51 |
| Other directory servers | Refer to the IBM Redbook <i>IBM Workplace Services Express</i> , SG24-6758. |

3.2 Read/write or read-only access to the directory server

Before you can run the iSeries Create IBM Workplace wizard, you must determine whether you will allow read-only or read/write access to your directory server. The following sections provide a brief explanation about read/write access versus read-only access to help you make this decision.

3.2.1 Read/Write access

If you do not have an existing LDAP tree, have little LDAP experience, or want the iSeries Create IBM Workplace wizard to correctly create and configure the objects needed for your Workplace Services Express server, then consider granting the iSeries Create IBM Workplace wizard write access to the directory server. In this case the iSeries Create IBM Workplace wizard can optionally perform the following tasks for you:

- ▶ Create a users container.
- ▶ Create a groups container.
- ▶ Create a Workplace Services Express administrator user under the users container.
- ▶ Create a Workplace Services Express administrator group under the groups container.
- ▶ Add the Workplace Services Express administrator as a member of your Workplace Services Express administrator group.
- ▶ Grant your Workplace Services Express administrator write access to the LDAP directory.

Workplace Services Express uses the administrator user to permit Workplace Services Express users to self-register themselves via a Sign up link on the initial Workplace Services Express home page. Workplace Services Express also uses the administrator user to allow users to maintain some basic personal information via an Edit my profile link.

Permitting users to self-register via the Sign up link and maintain some of their attributes via the Edit my profile link might not be desired. These features can be disabled by customizing the Workplace Services Express configuration, thereby creating no harm by granting write access to the LDAP directory at this time. With this customization in place, all user registration and maintenance are performed by the LDAP administrator. For information about removing the Sign up and Edit my profile links, refer to 5.10, “Removing the Sign up and Edit my profile links” on page 156.

Tip: For simplicity, we recommend that you allow the iSeries Create Workplace wizard read/write access to the LDAP directory and then customize the Workplace Services Express server to remove the Sign up and Edit my profile links.

3.2.2 Read-only access

Read-only access is better suited for experienced LDAP administrators who require a tightly managed directory. If this is the case, then it is the LDAP administrator’s responsibility to mimic the LDAP-related tasks performed by the iSeries Create IBM Workplace wizard. The iSeries Create IBM Workplace wizard also runs a script to remove the Sign up and Edit my profile links. The following entries must exist in the directory in order to use read-only access:

- ▶ A users container
- ▶ A groups container
- ▶ A Workplace Services Express administrator user located in your users container
- ▶ A Workplace Services Express administrator group located in your groups container

You also must add your Workplace Services Express administrator as a member of your Workplace Services Express administrator group.

3.3 Preparing the IBM Directory Server

This section explains how to prepare the IBM Directory Server for use by a Workplace Services Express server.

Note: If you already have i5/OS user profiles that you want Workplace Services Express to use, you must import the user profiles into the LDAP server.

The process to prepare the IBM Directory Server depends on whether you are already using the IBM Directory Server and whether you will allow write access to the directory. We presume that most people have already configured the IBM Directory Server on their system. However, to make sure that nothing is overlooked, the following steps, which you can use as a checklist, are required to prepare the IBM Directory Server for Workplace Services Express:

1. Configure the default LDAP server.
2. Configure the HTTP Administration server.
3. Configure the IBM Tivoli® Directory Server Web Administration Tool.
4. Add the appropriate users to the LDAP server. Optionally import them from an .ldif file.
5. Test the IBM Directory Server.

If you are already using the IBM Directory Server and are going to give the iSeries Create Workplace wizard write authority to the directory, you can skip this section and go to 3.3.6, “Testing the IBM Directory Server” on page 50.

Important: If you implemented IBM Directory Server for i5/OS prior to V5R3, then your entries are missing the *ibm-entryUuid* attribute that is required for Workplace Services Express. If you intend for those users to have access to Workplace Services Express, then you must add the *ibm-entryUuid* attribute to those entries manually. See the Workplace Collaboration Services release notes for step-by-step instructions, which are the same for Workplace Collaboration Services and Workplace Services Express. You can find the release notes on the Web at:

[http://www-12.lotus.com/ldd/doc/uafiles.nsf/docs/lwp25/\\$File/releasenotes.pdf](http://www-12.lotus.com/ldd/doc/uafiles.nsf/docs/lwp25/$File/releasenotes.pdf)

3.3.1 Configuring the default LDAP server

The focus of this redbook is to set up IBM Workplace Services Express. To ensure that your IBM Directory Server is configured correctly, we provide the information that you need in Appendix B, “Setting up IBM Directory Server for i5/OS” on page 343.

3.3.2 Configuring the HTTP Administration server

For you to add users to the IBM Directory Server, you can use the HTTP Administration server interface. To access the HTTP Administration server interface, iSeries Tasks menu, point your Web browser to:

`http://iSeriesHostName.domain:2001`

If you cannot access the iSeries Tasks menu, refer to “Configuring the HTTP Administration server” on page 349 for additional information.

3.3.3 Configuring the Tivoli Directory Server Web Administration Tool

To administrator the IBM Directory Server on iSeries, you can access the Tivoli Directory Server Web Administration Tool. If you have not configured this tool, refer to “Enabling the Tivoli Directory Server Web Administration Tool” on page 349.

3.3.4 Adding a Workplace Services Express administrator to the LDAP server

The iSeries Create Workplace wizard can do all the work for you, if you allow it. If you plan to allow read/write access to the LDAP directory, then you are not required to add the required Workplace Services Express administrator user and group manually. The wizard does it for you. In this case, you can skip to 3.3.6, “Testing the IBM Directory Server” on page 50.

If you do not want the exposure of Workplace Services Express having write access to your LDAP directory, you must manually add the required Workplace Services Express administrator user and group. You have two options to add the Workplace Services Express administrator user and group, import an .ldif file or use the Tivoli Directory Server Web Administration Tool.

The following steps walk you through the process of manually adding the Workplace Services Express administrator user and group via the Tivoli Directory Server Web Administration Tool. If you are using an .ldif file to add a user and group to an LDAP directory, refer to 3.3.5, “Importing an .ldif file to add users and groups to IBM Directory Server” on page 46.

Tip: By default, the iSeries Create IBM Workplace wizard adds a user named *wpsadmin* and a group named *wpsadmins* to the LDAP directory. In the following steps, we manually add a user named *wpsadmin* and a group named *wpsadmins*. You can change these names and use any user or group name that you desire.

Using the Tivoli Directory Server Web Administration Tool

Perform the following steps to add a user and group to the IBM Directory Server using the Tivoli Directory Server Web Administration Tool:

1. Access the Tivoli Directory Server Web Administration Tool:
 - a. Point your Web browser to your fully qualified iSeries host name on port 2001:

`http://iSeriesHostName.domain:2001`

In our example, we enter:

`http://rchas55.rchland.ibm.com:2001`

- b. After the iSeries Tasks menu opens, click **IBM Directory Server for iSeries**.

Note: If the Tivoli Directory Server Web Administration Tool does not load for you, configure the HTTP Administration server. Refer to “Enabling the Tivoli Directory Server Web Administration Tool” on page 349.

- c. Select the host name of the LDAP server that you are going to administer. In most cases, this is the same as the host name of your iSeries server.
 - d. Enter the distinguished name (DN) for the administrator (cn=admin by default) and password that is configured in the IBM Directory Server properties. If you do not know which user and password to provide here, see Appendix B, “Setting up IBM Directory Server for i5/OS” on page 343, for assistance in modifying the administrator user name and password.

2. Manage entries in the Tivoli Directory Server Web Administration Tool:
 - a. In the left pane, expand **Directory management**.
 - b. Click **Manage entries**.
 - c. Select the appropriate domain suffix for your system as shown in Figure 3-1.

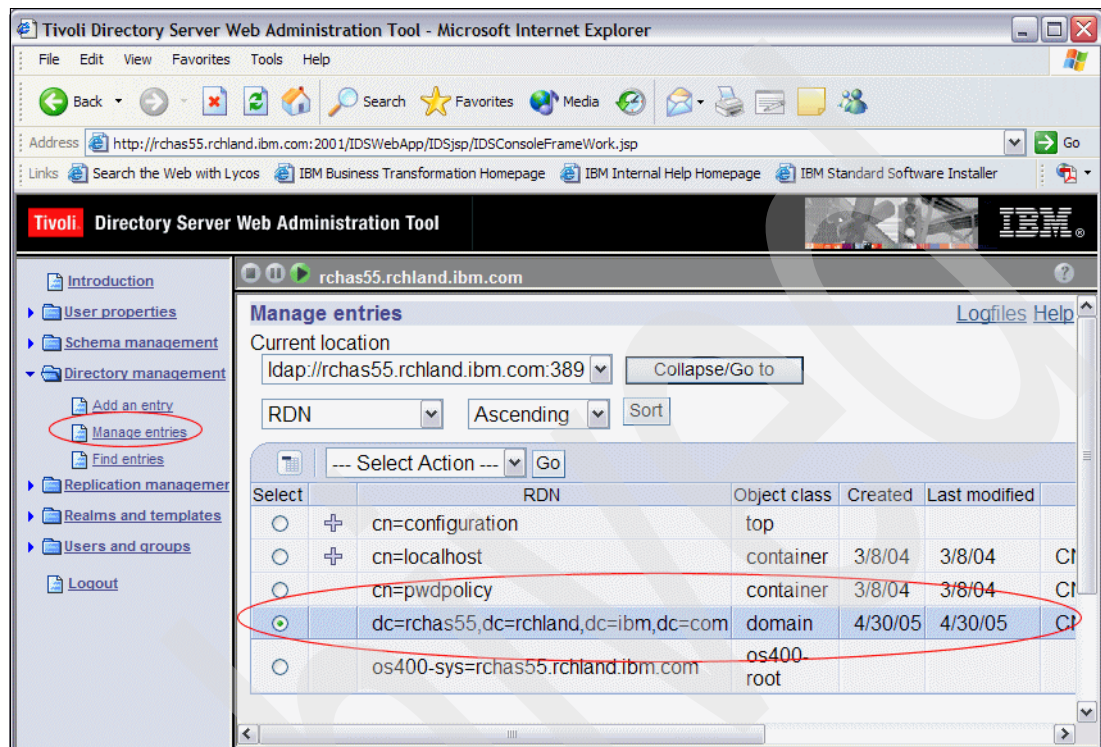


Figure 3-1 Tivoli Directory Server Web Administration Tool

3. Create cn=users and cn=groups containers. We start with the users container. To create the users container, select the suffix where you want to create the container and click **Add**.

Note: If you already have a cn=users and cn=groups container for this suffix, you can skip to step 5 on page 44. If you do not see a + sign in the second column for your suffix, you must complete this step.

Tip: The Add button is located on the far right side of the panel. You might need to scroll to the right to find this button.

- a. In the Select object class pane (Figure 3-2), for Structural object class, select **container** and click **Next**.

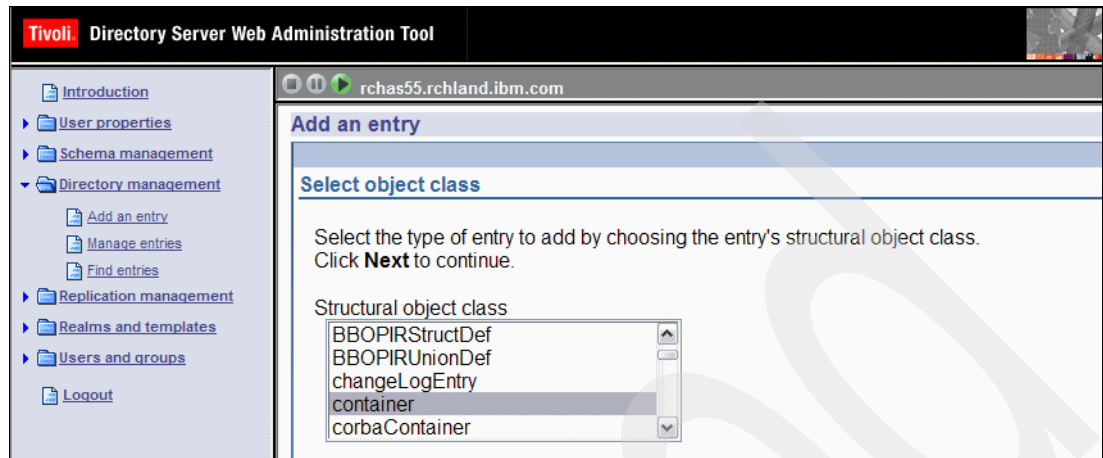


Figure 3-2 Selecting the object class container

- b. In the Select Auxiliary Object Class pane, you are not required to specify an auxiliary object class for the new container. Click **Next**.
- c. In the Enter the attributes pane (Figure 3-3), set the following values:
 - i. For Object class, keep the setting of **container**.
 - ii. For the Relative DN field, type **cn=users**.
 - iii. Verify that the Parent DN field contains the correct suffix for your host.
 - iv. In the cn field, type **users**.
- d. Click **Finish**.

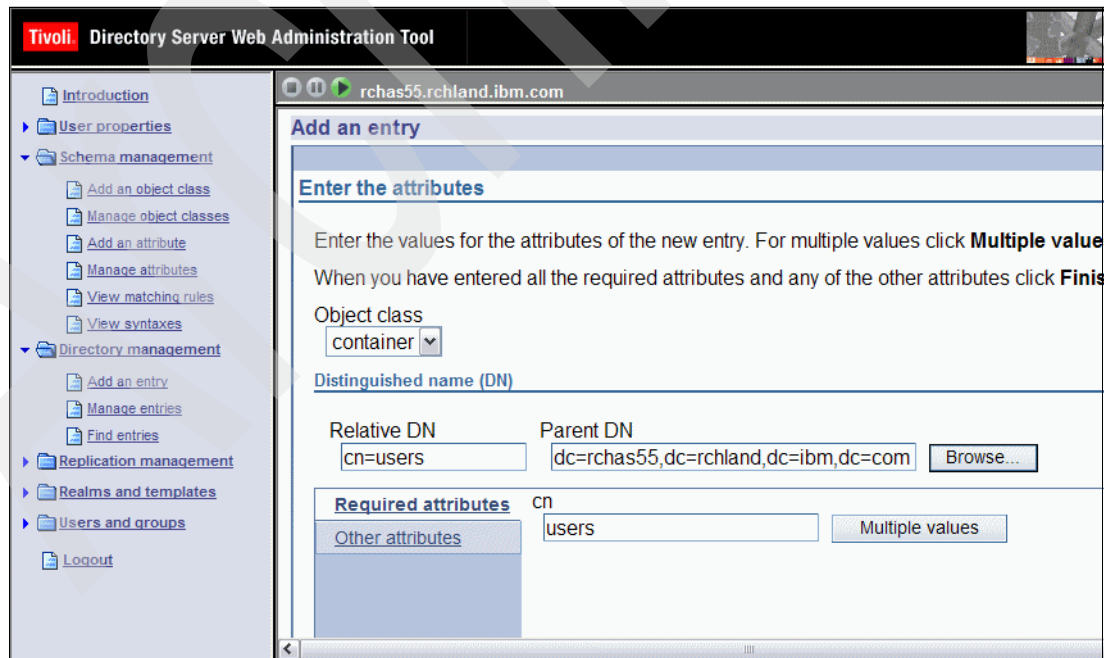


Figure 3-3 Modifying the attributes for the cn=users entry

4. In the Manage Entries pane, click **Add** to create the groups container.
 - a. In the Select object class pane (Figure 3-2), for Structural object class, select **container** and click **Next**.
 - b. In the Select Auxiliary Object Class pane, you are not required to specify an auxiliary object class for the new container. Click **Next**.
 - c. In the Enter the attributes pane (Figure 3-4), set the following values:
 - i. For Object class, keep the setting of **container**.
 - ii. In the Relative DN field, type `cn=groups`.
 - iii. Verify that the Parent DN field contains the correct suffix for your host.
 - iv. In the cn field, type `groups`.
 - d. Click **Finish**.

The screenshot shows the 'Add an entry' form in the Tivoli Directory Server Web Administration Tool. The form is titled 'Add an entry' and has a sub-section 'Enter the attributes'. It contains the following fields and controls:

- Object class:** A dropdown menu set to 'container'.
- Distinguished name (DN):**
 - Relative DN:** A text field containing 'cn=groups'.
 - Parent DN:** A text field containing 'dc=rchas55,dc=rchland,dc=ibm,dc=com'.
 - Browse...** button next to the Parent DN field.
- Required attributes:** A section with a 'cn' attribute set to 'groups'.
- Multiple values:** A button next to the 'cn' attribute.

Figure 3-4 Modifying the attributes for the `cn=groups` entry

5. Create the Workplace Services Express administrator user and the Workplace Services Express administrator group. To create the Workplace Services Express administrator user, in the Manage Entries pane, click **Add**.
 - a. In the Select object class pane, select the Structural object class of **inetOrgPerson** and click **Next**.
 - b. In the Select Auxiliary Object Class pane, you are not required to specify an auxiliary object class for the new container. Click **Next**.
 - c. In the Enter the attributes pane (Figure 3-5), set the following values where *wpsadmin* represents your Workplace Services Express administrator:
 - i. For Object class, keep the setting of **inetOrgPerson**.
 - ii. In the Relative DN field, type `uid=wpsadmin`.
 - iii. Verify that the Parent DN field contains the correct suffix for your users container.
 - iv. In the cn field, type `wpsadmin`.
 - v. In the sn field, type `wpsadmin`.

Tivoli Directory Server Web Administration Tool

rchas55.rchland.ibm.com

Add an entry

Enter the attributes

Enter the values for the attributes of the new entry. For multiple values click **Multiple values** next to the attribute name. When you have entered all the required attributes and any of the other attributes click **Finish** at the bottom of the page.

Object class
inetOrgPerson

Distinguished name (DN)

Relative DN: uid=wpsadmin Parent DN: cn=users,dc=rchas55,dc=rchland,dc=ibm [Browse...](#)

| Required attributes | Value | Action |
|---------------------|----------|---------------------------------|
| cn | wpsadmin | Multiple values |
| sn | wpsadmin | Multiple values |

Figure 3-5 Adding the wpsadmin user to the IBM Directory server

- d. Click **Other attributes**. You must scroll down and specify the following values as shown in Figure 3-6:
 - i. In the uid field, type the UID of your Workplace Services Express administrator. In this example, we type *wpsadmin*.
 - ii. In the userPassword field, type a password.
- e. Click **Finish** to create the Workplace Services Express administrator user.

Tivoli Directory Server Web Administration Tool

rchas55.rchland.ibm.com

| | | |
|---------------------------|----------------------|---------------------------------|
| teletexTerminalIdentifier | <input type="text"/> | Multiple values |
| telexNumber | <input type="text"/> | Multiple values |
| title | <input type="text"/> | Multiple values |
| uid | wpsadmin | Multiple values |
| userCertificate | <input type="text"/> | Binary data |
| userPKCS12 | <input type="text"/> | Binary data |
| userPassword | •••••••• | Multiple values |
| userSMIMECertificate | <input type="text"/> | Binary data |

Figure 3-6 Setting a password for the wpsadmin user

6. To create the Workplace Services Express administrator group, in the Manage Entries pane, click **Add**.
 - a. In the Select object class pane, select the Structural object class of **groupOfUniqueNames** and click **Next**.
 - b. In the Select Auxiliary Object Class pane, you are not required to specify an auxiliary object class for the new container. Click **Next**.
 - c. In the Enter the attributes pane (Figure 3-7), set the following values where *wpsadmins* represents the name of your Workplace Services Express administrator group:
 - i. For Object class, keep the setting of **groupOfUniqueNames**.
 - ii. For Relative DN field, type *cn=wpsadmins*.
 - iii. Verify the Parent DN field contains the correct suffix for your groups container.
 - iv. In the cn field, type *wpsadmins*.
 - v. The uniqueMember field must contain the DN of the Workplace Services Express administrator. In this example, we type:
`cn=wpsadmin,cn=users,dc=rchas55,dc=rchland,dc=ibm,dc=com`
 - d. Click **Finish** to create the Workplace Services Express administrators group.

The screenshot shows the 'Add an entry' form in the Tivoli Directory Server Web Administration Tool. The form is titled 'Enter the attributes' and contains the following fields:

- Object class:** A dropdown menu showing 'groupOfUniqueNames'.
- Distinguished name (DN):**
 - Relative DN:** A text box containing 'cn=wpsadmins'.
 - Parent DN:** A text box containing 'cn=groups,dc=rchas55,dc=rchland,dc=ibm' and a 'Browse...' button.
- Required attributes:**
 - cn:** A text box containing 'wpsadmins' and a 'Multiple values' button.
 - uniqueMember:** A text box containing 'cn=wpsadmin,cn=users,dc=rchas55,dc=rchland,dc=ibm,dc=com' and a 'Multiple values' button.

Figure 3-7 Adding the wpsadmins group to the IBM Directory server

7. Go to 3.3.6, "Testing the IBM Directory Server" on page 50.

3.3.5 Importing an .ldif file to add users and groups to IBM Directory Server

This section shows you how to modify the IBM Directory server using an .ldif file. The file used in this example does the following actions:

- ▶ Adds a users container
- ▶ Adds a groups container
- ▶ Adds a user called *wpsadmin* to the users container
- ▶ Adds a group called *wpsadmins* to the groups container
- ▶ Adds wpsadmin as a member to the wpsadmins group
- ▶ Gives read, write, search and compare authorities to the wpsadmins group for the users and groups containers

To import the .ldif file into your directory, perform the following steps:

1. Download the example rchas55.ldif file. Refer to Appendix C, “Additional material” on page 359, for information about obtaining this file.
2. Modify the rchas55.ldif file on your PC workstation using Notepad or another PC text editor of your choice. Change the domain suffix to match the domain suffix in your environment.
3. In Example 3-1 you can see the file that we imported to create the users. To use this file for your directory server, change the domain suffix to match your environment. When you are finished editing the file, you should have no remaining references to rchas55. You must also edit the mail attribute for the wpsadmin user. If you do not want wpsadmin to have a reference to a mail account, remove that line from the .ldif file.

Example 3-1 Imported rchas55.ldif file

```
version: 1
dn: cn=users,DC=RCHAS55,DC=RCHLAND,DC=IBM,DC=COM
objectClass: top
objectClass: container
cn: users
IBM-ENTRYUUID: 298e6001-4edb-18a5-81e6-0004ac086256
aclpropagate: TRUE
ownerpropagate: TRUE
entryowner: access-id:CN=ADMINISTRATOR
entryowner: group:CN=WPSADMINS,CN=GROUPS,DC=RCHAS55,DC=RCHLAND,DC=IBM,DC=COM
aclentry: group:CN=WPSADMINS,CN=GROUPS,DC=RCHAS55,DC=RCHLAND,DC=IBM,DC=COM:obj
ect:ad:normal:rwc:sensitive:rwc:critical:rwc
aclentry: group:CN=ANYBODY:normal:rsc
aclentry: access-id:CN=THIS:object:d:normal:rwc:sensitive:rwc:critical:rwc

dn: cn=groups,DC=RCHAS55,DC=RCHLAND,DC=IBM,DC=COM
objectClass: top
objectClass: container
cn: groups
IBM-ENTRYUUID: 29d09801-4edb-18a5-81e6-0004ac086256
aclpropagate: TRUE
ownerpropagate: TRUE
entryowner: access-id:CN=ADMINISTRATOR
entryowner: group:CN=WPSADMINS,CN=GROUPS,DC=RCHAS55,DC=RCHLAND,DC=IBM,DC=COM
aclentry: group:CN=WPSADMINS,CN=GROUPS,DC=RCHAS55,DC=RCHLAND,DC=IBM,DC=COM:obj
ect:ad:normal:rwc:sensitive:rwc:critical:rwc
aclentry: group:CN=ANYBODY:normal:rsc
aclentry: access-id:CN=THIS:object:d:normal:rwc:sensitive:rwc:critical:rwc

dn: uid=wpsadmin,cn=users,dc=RCHAS55,dc=RCHLAND,dc=IBM,dc=COM
objectClass: top
objectClass: person
objectClass: organizationalPerson
objectClass: inetOrgPerson
mail: wpsadmin@ITSOWSE4.RCHLAND.IBM.COM
uid: wpsadmin
userPassword:: e1NIQX1bqmHkybk/PwaCJQts+DMbfuaP2A==
sn: wpsadmin
cn: wpsadmin
IBM-ENTRYUUID: 296fb801-4ee5-18a5-81e6-0004ac086256
```

```

dn: cn=wpsadmins,cn=groups,dc=RCHAS55,dc=RCHLAND,dc=IBM,dc=COM
objectClass: top
objectClass: groupOfUniqueNames
cn: wpsadmins
IBM-ENTRYUUID: 2a973001-4ee5-18a5-81e6-0004ac086256
uniqueMember: uid=wpsadmin,cn=users,dc=RCHAS55,dc=RCHLAND,dc=IBM,dc=COM

```

4. Copy the modified .ldif file from your PC to the iSeries server. You can do this by using mapped network drive or File Transfer Protocol (FTP).
5. Open iSeries Navigator.
6. In the left pane, select **Network** → **Servers** → **TCP/IP**.
7. The directory server must have a status of *Stopped* in order for you to import the .ldif file. Right-click **IBM Directory Server** and click **Stop** as shown in Figure 3-8.

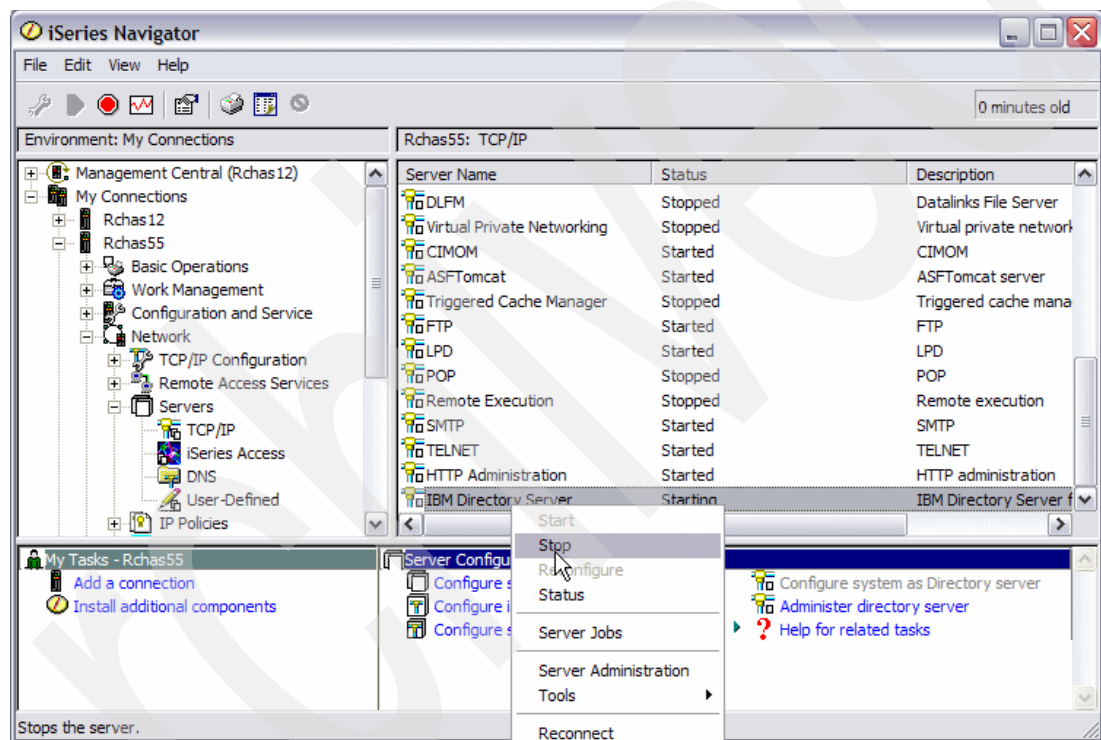


Figure 3-8 Stopping the IBM Directory Server via iSeries Navigator

8. Right-click **IBM Directory Server** and select **Tools** → **Import File** as shown in Figure 3-9.

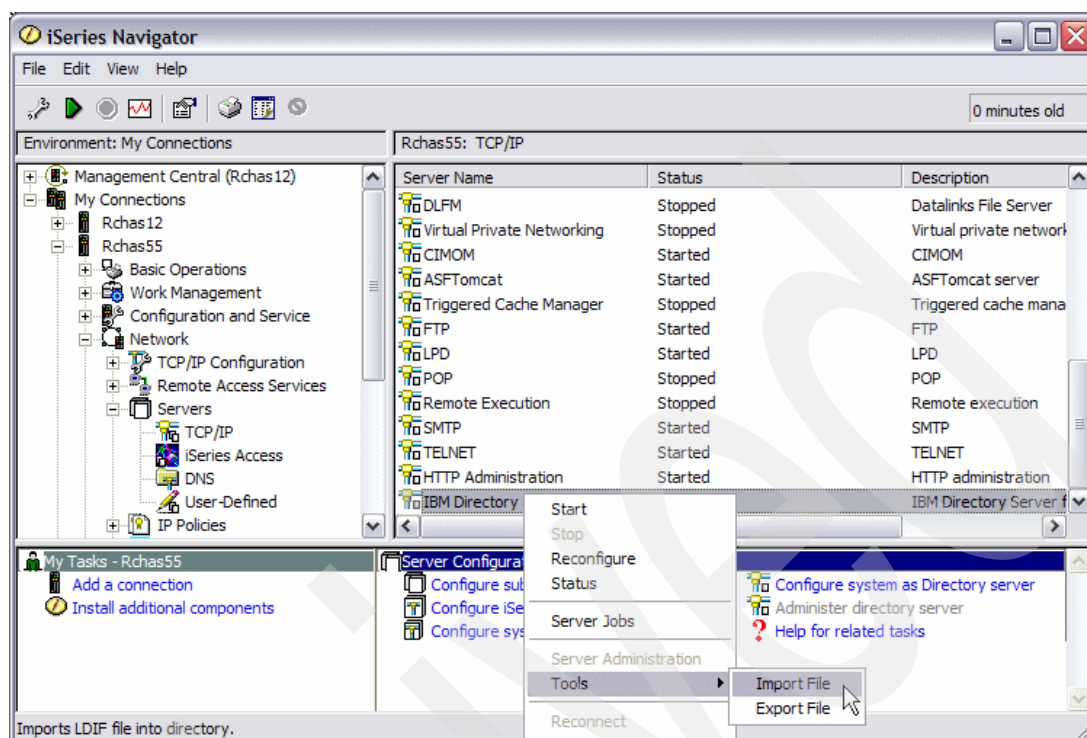


Figure 3-9 Selecting the Import File option for IBM Directory Server

9. In the Import LDIF File window (Figure 3-10), select the file that you copied to the iSeries server in the previous step. On our test system, we named the file `rchas55.ldif` and placed the file in the root directory. Click **OK**.

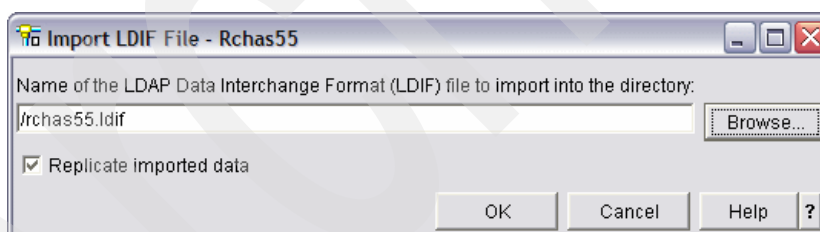


Figure 3-10 Selecting the .ldif file to import

10. When the import is completed, you receive a status message indicating that the entries were added successfully. If you did not have a `cn=users` or a `cn=groups` container, then four entries are added. If you already had a `cn=users` or a `cn=groups` container, then only two entries are successfully added as shown in Figure 3-11. Click **OK**.

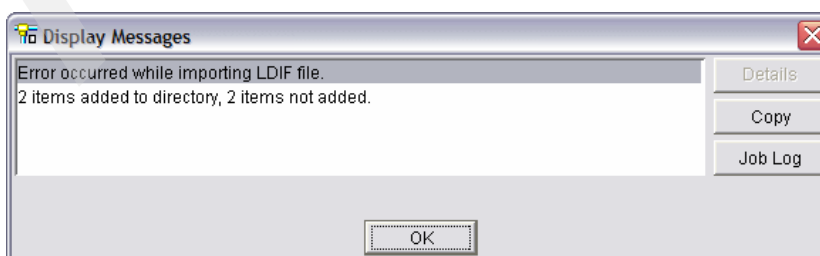


Figure 3-11 Displayed messages after importing the .ldif file

11. You return to main iSeries Navigator window. Right-click **IBM Directory Server** and select **Start** to start the IBM Directory Server.

3.3.6 Testing the IBM Directory Server

Running an **ldapsearch** command against the LDAP directory indicates whether you configured your LDAP server correctly. If you prefer a graphical user interface, third-party products are available on the Internet for download. In Example 3-2, we run the following **ldapsearch** command from a Windows command prompt to verify that the Workplace Services Express administrator user and Workplace Services Express administrator group exists in the IBM Directory server:

```
ldapsearch -h rchas55.rchland.ibm.com -p 389 -D cn=admin -w password -b
dc=rchas55,dc=rchland,dc=ibm,dc=com cn=wps*
```

If you manually created the wpsadmin user and wpsadmins group, you should see a minimum of two entries returned to you as shown in Example 3-2. If you have chosen to use an alternative administrator user and group, modify the command to search for the appropriate entries in your directory.

Note: If you did not manually add the wpsadmin user as your Workplace Services Express administrator and the wpsadmins group as the Workplace Services Express administrator group, the command returns with no output.

Example 3-2 LDAP search to verify that wpsadmin and wpsadmins are in the LDAP directory

```
C:\>ldapsearch -h rchas55.rchland.ibm.com -p 389 -D cn=admin -w password -b
dc=rchas55,dc=rchland,dc=ibm,dc=com cn=wps*
```

```
uid=wpsadmin,cn=users,dc=rchas55,dc=rchland,dc=ibm,dc=com
userpassword=NOT ASCII
uid=wpsadmin
objectclass=inetOrgPerson
objectclass=organizationalPerson
objectclass=person
objectclass=top
sn=wpsadmin
cn=wpsadmin
mail=wpsadmin@ITSOWSE1.RCHLAND.IBM.COM

cn=wpsadmins,cn=groups,dc=rchas55,dc=rchland,dc=ibm,dc=com
objectclass=groupOfUniqueNames
objectclass=top
cn=wpsadmins
uniquemember=cn=wpsadmin,cn=users,dc=rchas55,dc=rchland,dc=ibm,dc=com
uniquemember=uid=wpsadmin,cn=users,dc=RCHAS55,dc=RCHLAND,dc=IBM,dc=COM
```

The IBM Directory Server is now setup, and you are ready to configure your Workplace Services Express server. For information about configuring a Workplace Services Express server, refer to Chapter 4, "Installing and configuring Workplace Services Express" on page 71.

3.4 Preparing the Domino server for LDAP

This section explains how to prepare a Domino Enterprise server for LDAP for use by a Workplace Services Express server.

The Domino Directory (names.nsf) is a familiar and easy to manage LDAP directory for most. If you are currently using Domino in your environment, you might want to leverage it for your Workplace Services Express implementation.

Unlike the schemas of other LDAP directories supported by Workplace Services Express, the default schema for the Domino Directory does not provide a unique ID attribute required by Workplace Services Express. If you are running Domino Version 6.5.3 or earlier, some modifications to the Domino Directory database design and data are required before it can be used with Workplace Services Express.

Hotfix for Domino 6.5.3: There is a hotfix for Domino 6.5.3 related to the full text indexer that impacts LDAP searches. This hotfix is required if using this version of Domino. The number for this hotfix is SE19246 and the SPR is CSMH65WPRX. You can obtain the hotfix only through Lotus support or a Web submitted Problem Management Record (PMR).

Table 3-2 summarizes the tasks that you must perform on your Domino server prior to configuring your first Workplace Services Express server.

Table 3-2 Checklist of tasks for preparing a Domino Directory for use as an LDAP server

| Task | Required or optional |
|--|--|
| Modifying the Domino Directory | Only required for Domino 6.5.3 or earlier versions |
| Setting up the LDAP and Domino Internet Inter-ORB Protocol (DIIOP) tasks | Required for all Domino versions |
| Modifying the LDAP configuration | Required for all Domino versions |
| Adding Workplace Services Express Administrative accounts to Domino | Optional; required only if read-only access is given to the iSeries Create Workplace Server wizard |
| Testing the Domino LDAP server configuration | Required for all Domino versions |
| Domino Directory changes after upgrade to version 6.5.4 or higher | Required only after upgrading Domino from 6.5.3 or earlier to Domino 6.5.4 or later |

Important: At the time this redbook was written, Workplace Services Express supports only IBM Domino Enterprise Server V6.0.x or V6.5.x. However, because of the similarities between Domino Versions 6.5.4 and 7.0, we anticipate that Domino Version 7.0 will be supported in the future. Therefore, we indicate any differences between Domino V6.5.x and V7.x as applicable throughout this redbook. For a list of the supported Domino versions, see the Technical specification at a glance Web site at:

<http://www.lotus.com/products/product5.nsf/wdocs/wsetechspects>

3.4.1 Modifying the Domino Directory

To use a Domino server as the user repository for Workplace Services Express, you must have a unique identifier for each user. In Domino Version 6.5.3 and earlier, the LDAP schema does not have a unique identifier that can be used for Workplace Services Express. The modifications that we make in this section add a new field to the Person, Group, and Server/Certifier forms to fulfill the requirements for Workplace Services Express.

Modifications to the Domino Directory design should take place in the template (pubnames.ntf). However, since the changes that we are making are temporary and should be removed when you upgrade to Domino 6.5.4 and later, we make our changes directly into the names.nsf database. If you have questions when working with the Domino Designer®, you can find help in the Domino Designer Help and Domino Administrator Help databases.

Important: Perform the following steps only if you are running Domino 6.5.3 or earlier. Also, if your Domino 6.5 LDAP service searches additional Domino directories, you must make these changes in each additional directory.

Perform the following steps:

1. Using a Domino administrator account, start the Domino Designer client and open the Domino Directory database (names.nsf).
 - a. Select **File** → **Database** → **Open**.
 - b. Select your Domino server and the Domino Directory database (names.nsf).
2. Make a copy of the names.nsf for backup purposes.
 - a. Select **File** → **Database** → **New Copy**.
 - b. In the Copy Database window, specify the values to choose a destination server and new files name as shown in Figure 3-12.
 - c. Click **OK**.

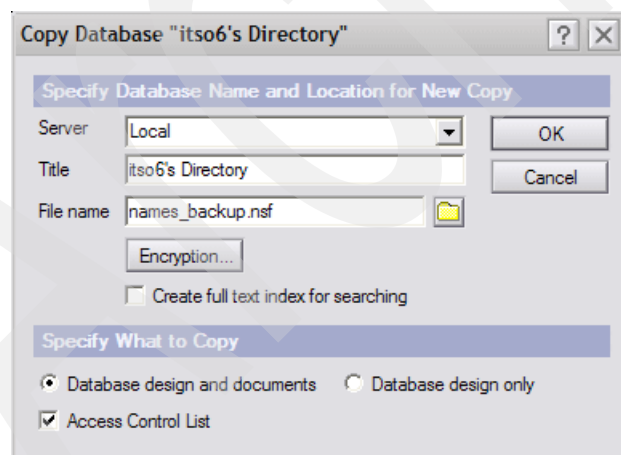


Figure 3-12 Creating a backup copy of names.nsf

3. As shown in Figure 3-13, open the Person form. In the left pane, select **Forms**, and then in the right pane, double-click the **Person** form.

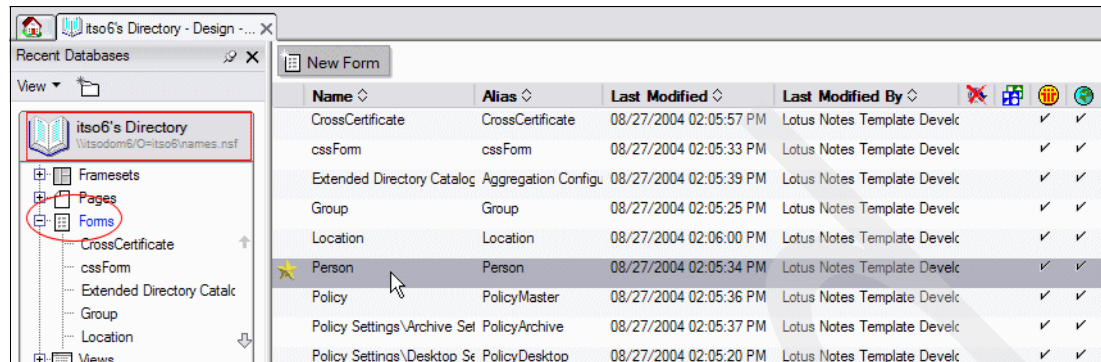


Figure 3-13 Opening the Person form

4. If you see a warning message like the example in Figure 3-14, click **OK** to ignore it.

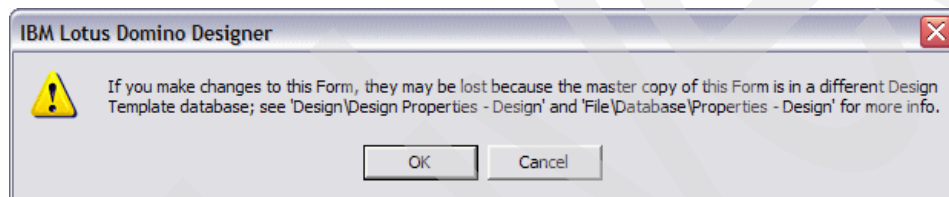


Figure 3-14 Domino Designer warning message

5. Add the DominoUNID field to the Person form:
 - a. Place your cursor at the bottom of the form. Click the **Create** menu and select **Field** as shown in Figure 3-15.

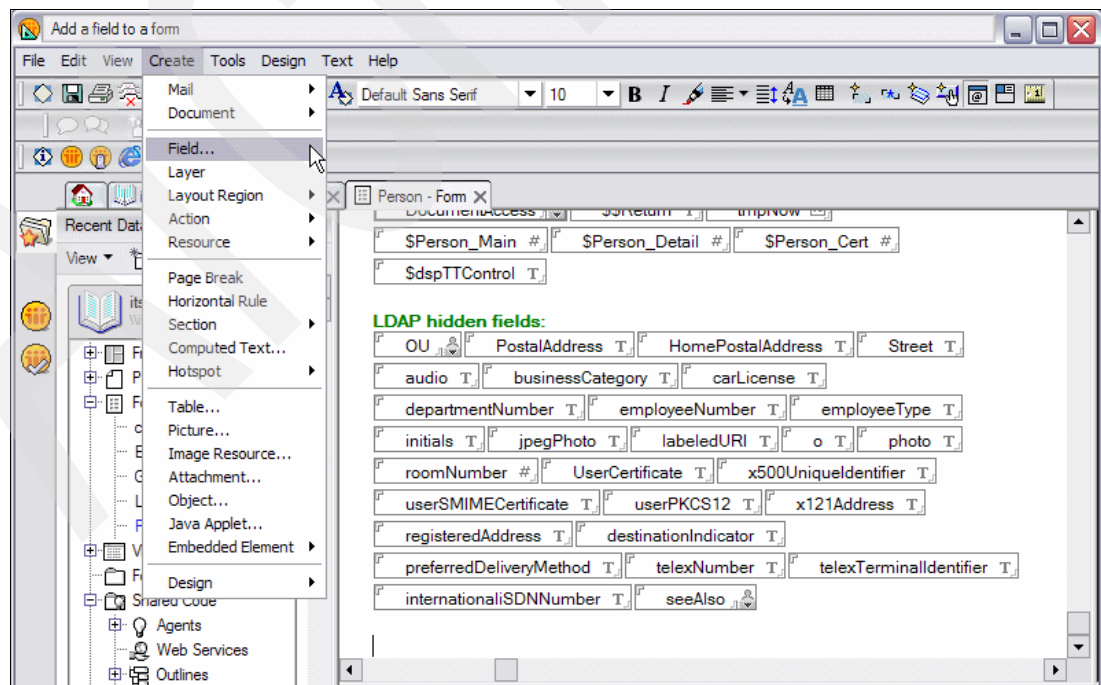


Figure 3-15 Creating a new field in the Person form

- b. In the Field properties window (Figure 3-16), specify the following values:
 - i. In the Name field, type DominoUNID.
 - ii. From the Type drop-down list on the left, select **Text**.
 - iii. From the Type drop-down list on the right, select **Computed when composed**.

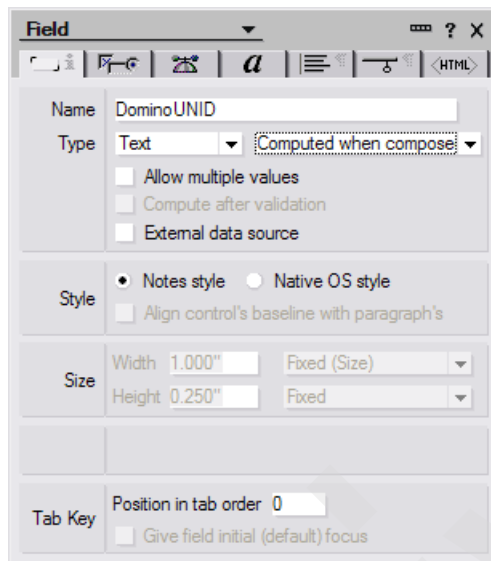


Figure 3-16 DominoUNID field properties

- c. Click the **Hide Paragraph When** tab (the sixth tab from the left in the window) and select all of the Hide paragraph from options as shown in Figure 3-17.

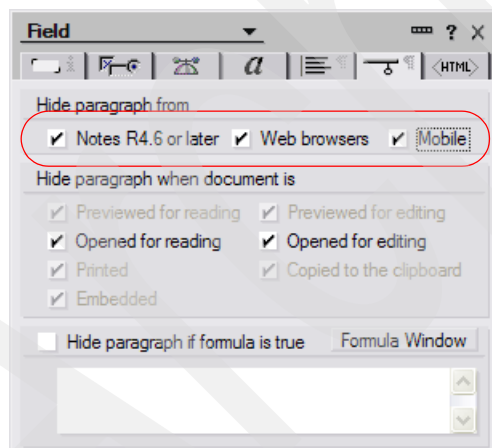


Figure 3-17 Hide paragraph from properties of the DominoUNID field

- d. Close the DominoUNID Field properties window.

- e. In the DominoUNID (Field) Value pane, in the lower right corner of the window (Figure 3-18), type the following field value formula:

`@If(dominoUNID != ""; dominoUNID; @Text(@DocumentUniqueID))`

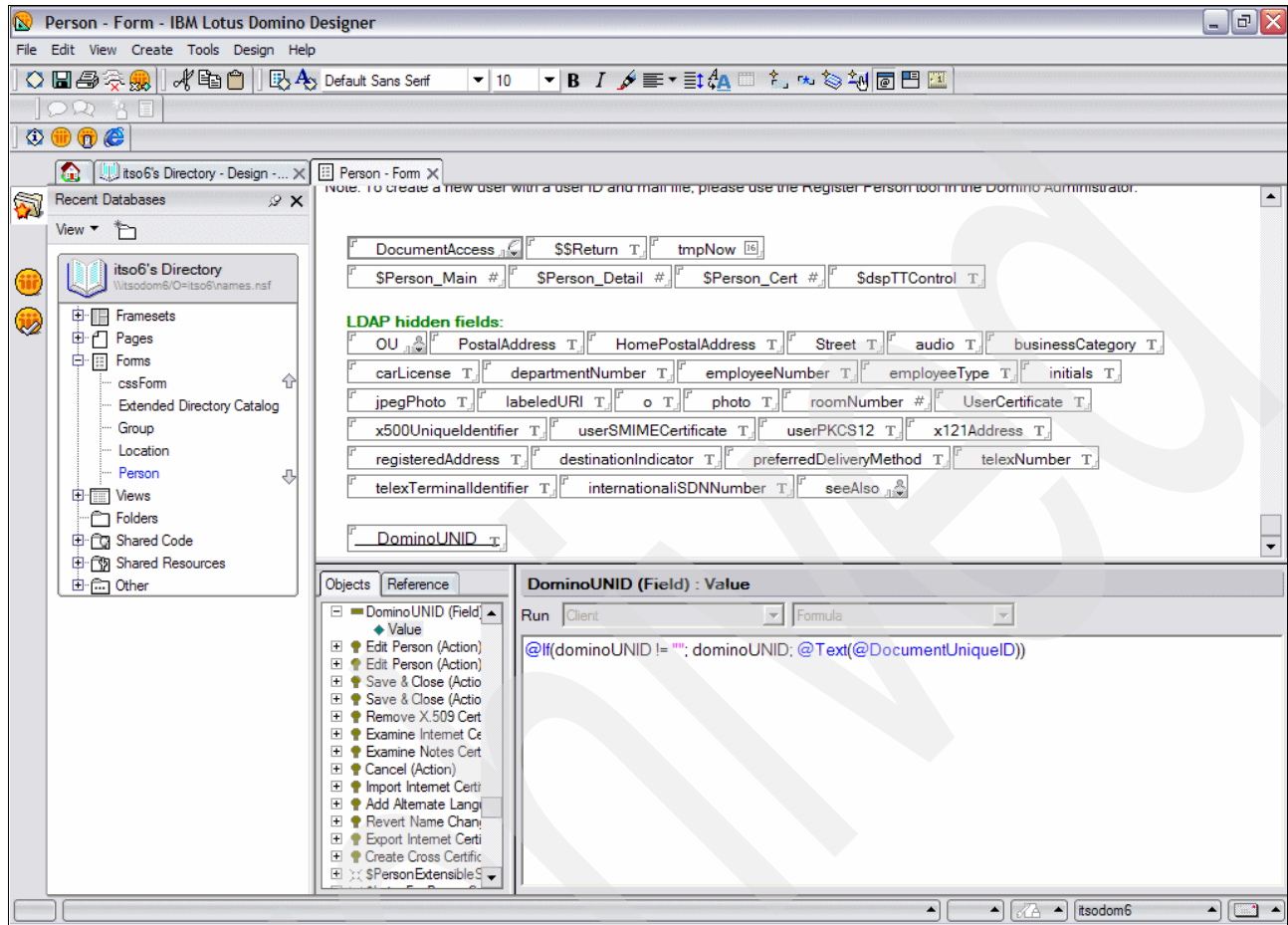


Figure 3-18 Entering a value for the DominoUNID field

- f. Select **Edit** → **Copy** to copy the field.
- g. Save and close the Person form.

6. Double-click the **Group** form and follow these steps:
 - a. Place the cursor at the bottom of the Group form.
 - b. Select **Edit** → **Paste** to paste the DominoUNID field into the form. The DominoUNID field is now copied into the form as shown in Figure 3-20.
 - c. Save and close the form.

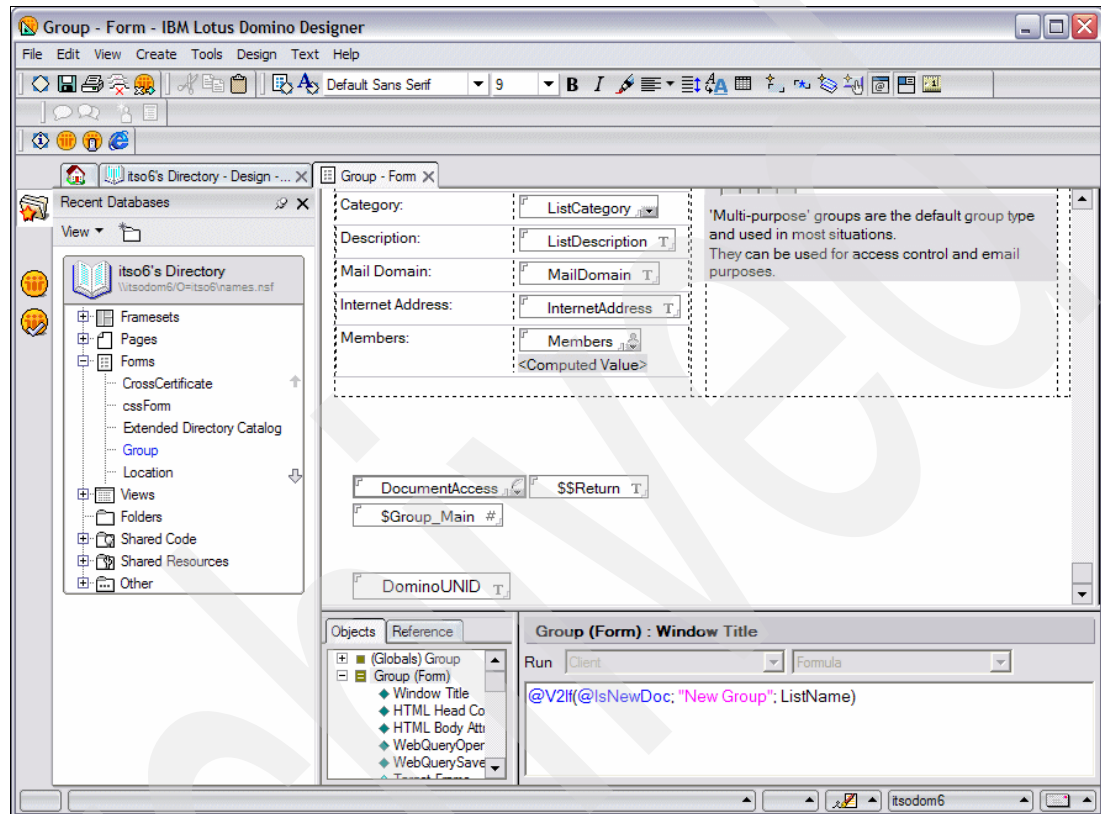


Figure 3-19 Copying the DominoUNID into the Group form

7. Double-click the **Server\Certifier** form and complete the following steps.
 - a. In the Server\Certifier form, place the cursor at the bottom of the form.
 - b. Select **Edit** → **Paste** to paste the DominoUNID field into the form. The DominoUNID field is now copied into the form.
 - c. Save and close the form.
8. We must prevent the design task from removing our design changes. Right-click the **Person** form and select **Design Properties**.

9. Click the **Design** tab (the third tab from the left in the window), and select **Prohibit design refresh or replace to modify** as shown in Figure 3-20. Close the Design Document window when finished.

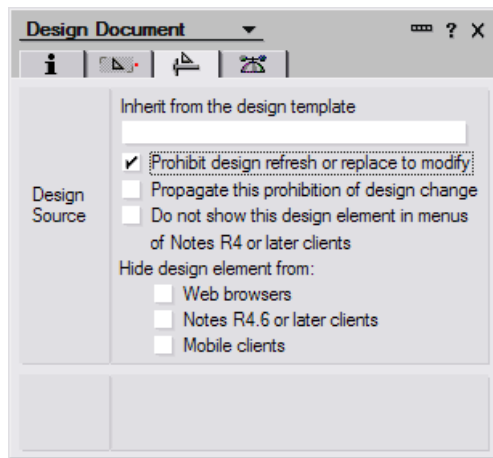


Figure 3-20 Prohibiting design refresh or replace to modify

10. Right-click the **Group** form and select **Design Properties**.
11. Click the **Design** tab (the third tab from the left in the window) and select **Prohibit design refresh or replace to modify**.
12. Right-click the **Server/Certifier** form and select **Design Properties**.
13. Click the **Design** tab (the third tab from the left in the window) and select **Prohibit design refresh or replace to modify**.

By following these steps, you ensure that any new person, group, or certifier is created with a DominoUNID field. However, this does not modify any existing person, group, or certifier documents. In the next steps, we create an agent to modify existing documents.

Note: The following steps show how to create a simple formula language agent to populate the DominoUNID field. However, this agent requires manual intervention to update the documents. If you are an experienced Domino administrator or designer, you might optionally use a provided Java agent (ExtIdUpdate.java) as shown in “**Sample Java agent to populate DominoUNID field**” on page 59 to update the documents.

1. From the Domino Designer client, expand **Shared Code** in the tree in the left pane and select **Agents**.
2. Click the **New Agent** button.

3. In the Agent properties window (Figure 3-21), set the Name field to PopulateDominoUNID and leave the rest of the fields as the default. Close the Agent window when you are finished.

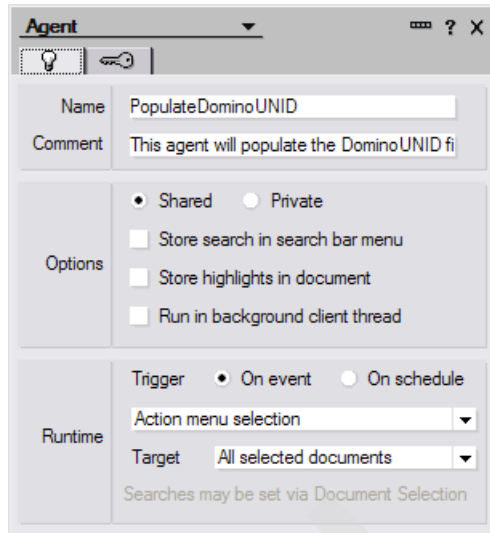


Figure 3-21 PopulateDominoUNID agent properties

4. In the center frame, select **Action** to enter the code. From the right drop-down list in the PopulateDominoUNID(Agent): Action frame, select **Formula**, and type the following formula as shown in Figure 3-22:

```
FIELD dominoUNID := @If(dominoUNID != ""; dominoUNID; @Text(@DocumentUniqueID));
```

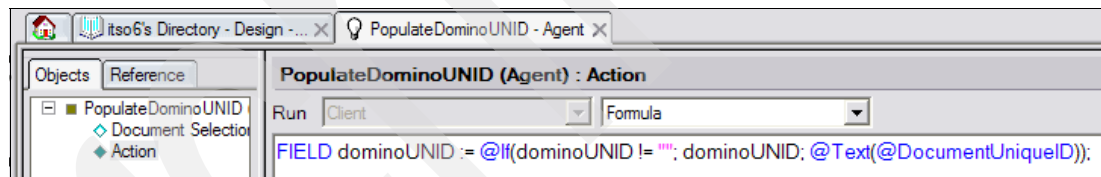
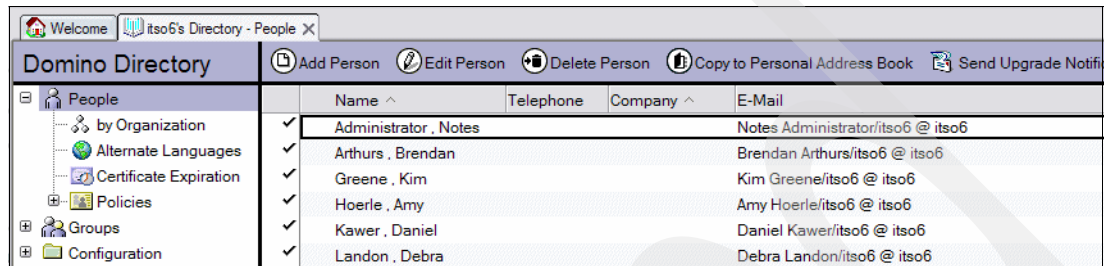


Figure 3-22 PopulateDominoUNID action formula

5. Save and close the agent.
6. Prevent the design task from modifying or removing the agent from the database.
 - a. Right-click the **PopulateDominoUNID** agent and click **Properties**.
 - b. In the Properties window, select **Prohibit design refresh or replace to modify**.
 - c. Close the Domino Designer client.

7. Run the agent that you created.
 - a. From the Lotus Notes client, open the names.nsf (Domino Directory) file.
 - b. In the Domino Directory, click the **People** view and select all the people as shown in Figure 3-23.
 - c. From the menu, select **Actions** → **PopulateDominoUNID**.



| | Name ^ | Telephone | Company ^ | E-Mail |
|-------------------------------------|-----------------------|-----------|-----------|-----------------------------------|
| <input checked="" type="checkbox"/> | Administrator , Notes | | | Notes Administrator/itso6 @ itso6 |
| <input checked="" type="checkbox"/> | Arthurs , Brendan | | | Brendan Arthurs/itso6 @ itso6 |
| <input checked="" type="checkbox"/> | Greene , Kim | | | Kim Greene/itso6 @ itso6 |
| <input checked="" type="checkbox"/> | Hoerle , Amy | | | Amy Hoerle/itso6 @ itso6 |
| <input checked="" type="checkbox"/> | Kawer , Daniel | | | Daniel Kawer/itso6 @ itso6 |
| <input checked="" type="checkbox"/> | Landon , Debra | | | Debra Landon/itso6 @ itso6 |

Figure 3-23 Updating all existing person documents with the DominoUNID field

8. Verify that the agent worked successfully by viewing the document properties for a Person document. Right-click any Person document and select **Document Properties**.
9. In the Document window, select the **Fields** tab (second from the left). Verify that the **DominoUNID** field appears in the list with a value as shown in Figure 3-24. Do this for multiple documents to ensure that the change is made to all the Person documents.

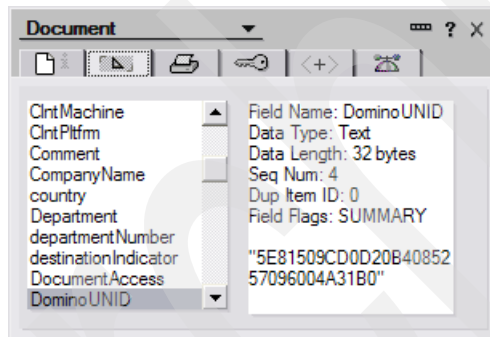


Figure 3-24 Person document properties after running the PopulateDominoUNID agent

10. Use the same process to select all groups and certificates and run the agent against those documents as well. Note that you can find certificates under the Configuration folder.

Sample Java agent to populate DominoUNID field

Example 3-3 shows a sample Java agent (ExtIidUpdate.java) to populate the DominoUNID field. You can use this agent as an alternative to the agent demonstrated in the previous steps. Refer to Appendix C, "Additional material" on page 359, for information about obtaining this Java agent.

Example 3-3 Sample Java agent (ExtIidUpdate.java) to populate the DominoUNID field

```

/*
 * Created on November 15, 2004 This agent needs to be placed in the Domino
 * Directory. Running it will populate existing People, Group, and Cert
 * documents with a DominoUNID field. This field does not exist in the default
 * Domino 6.5.3 or earlier LDAP schema.
 */

```

```

package workplace;
import lotus.domino.*;
public class ExtIdUpdate extends AgentBase {
    public void NotesMain() {
        try {
            Session session = getSession();
            AgentContext agentContext = session.getAgentContext();
            Database dbContext = agentContext.getCurrentDatabase();

            //-- Update the documents in the People, Groups, and Certificates views.
            View vwPeople = dbContext.getView("People");
            updateDocs(vwPeople);
            vwPeople.recycle();

            View vwGroups = dbContext.getView("Groups");
            updateDocs(vwGroups);
            vwGroups.recycle();

            View vwCerts = dbContext.getView("Certificates");
            updateDocs(vwCerts);
            vwCerts.recycle();

        } //- end try
        catch (NotesException ne) {
            System.out.println("NotesException: " + ne.id + " - " + ne.text);
            ne.printStackTrace();
        } //- end catch, NotesException.
        catch (Exception e) {
            System.out.println("Exception: " + e.getMessage());
            e.printStackTrace();
        } //- end catch, Exception.
    } //- end mehod, NotesMain.

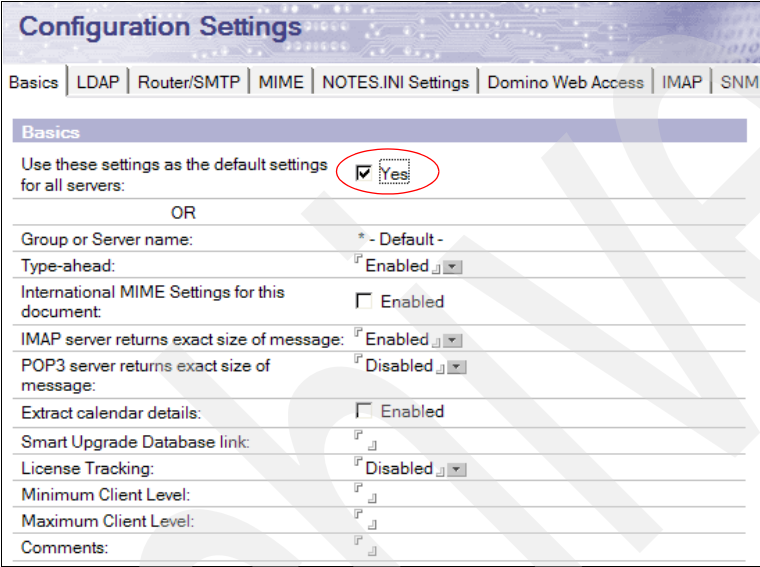
    public void updateDocs(View vwUpdate) {
        try {
            //-- For the given view, loop through its docs and write the DominoUNID field.
            Document docUpdate = vwUpdate.getFirstDocument();
            Document docNextUpdate = null;
            while (docUpdate != null) {
                docNextUpdate = vwUpdate.getNextDocument(docUpdate);
                docUpdate.replaceItemValue("DominoUNID", docUpdate.getUniversalID());
                docUpdate.save(true, false);
                docUpdate.recycle();
                docUpdate = docNextUpdate;
            } //- end while, docUpdate.
        } //- end try
        catch (NotesException ne) {
            System.out.println("NotesException: " + ne.id + " - " + ne.text);
            ne.printStackTrace();
        } //- end catch, NotesException.
        catch (Exception e) {
            System.out.println("Exception: " + e.getMessage());
            e.printStackTrace();
        } //- end catch, Exception.
    } //- end method, UpdateDocs
} //- end class, ExtIdUpdate

```

3.4.2 Modifying the LDAP configuration

You must also add or edit the Global Configuration document to include the necessary LDAP attribute types. To add the attribute types, perform the following steps:

1. Open the Domino Administrator client.
2. Click the **Configuration** tab.
3. In the left frame, click **Server** → **Configurations**.
4. Open the Global Configuration document, or create one if it does not already exist. The Global Configuration document has a server name of * - [All Servers]. To create a new Global Configuration document, click **Add Configuration** and select **Use these settings as the default settings for all servers** as shown in Figure 3-25.



Configuration Settings

Basics | LDAP | Router/SMTP | MIME | NOTES.INI Settings | Domino Web Access | IMAP | SNM

Basics

Use these settings as the default settings for all servers: ☒ **Yes**

OR

Group or Server name: * - Default -

Type-ahead: ☒ Enabled

International MIME Settings for this document: ☐ Enabled

IMAP server returns exact size of message: ☒ Enabled

POP3 server returns exact size of message: ☒ Disabled

Extract calendar details: ☐ Enabled

Smart Upgrade Database link: ☐

License Tracking: ☒ Disabled

Minimum Client Level: ☐

Maximum Client Level: ☐

Comments: ☐

Figure 3-25 Creating or modifying the Global Configuration document

5. Click the **LDAP** tab, and click **Select Attribute Types**.

Note: You do not see the LDAP tab until you select the Use these settings as the default settings for all servers option.

6. In the LDAP Attribute Type Selection window (Figure 3-26), in the Object Classes field, type an asterisk (*) and click **Display Attributes**.

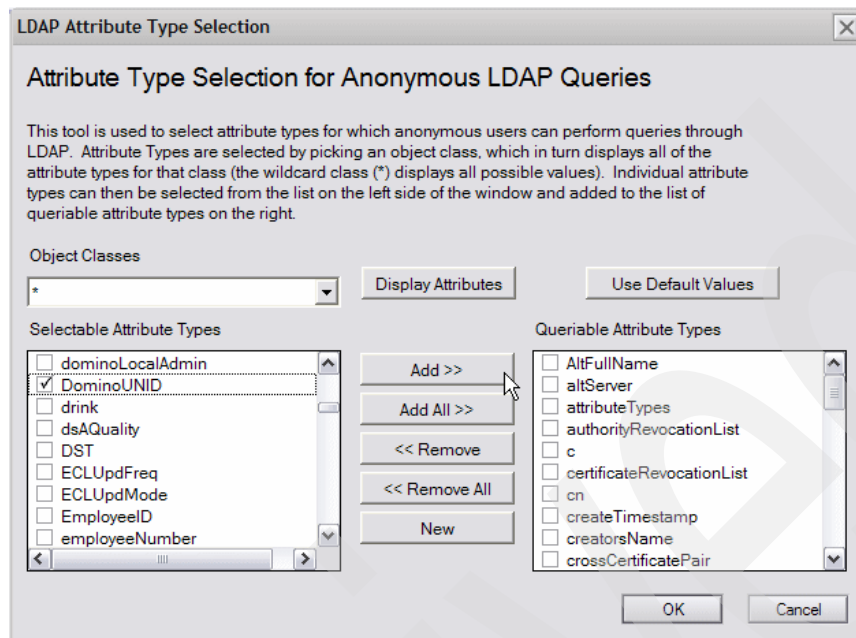


Figure 3-26 Attribute Type Selection for Anonymous LDAP Queries window

7. In the LDAP Type Selection window, select the following attributes and then click **Add**:

- DominoUNID
- HTTP-HostName
- MailFile
- MailServer
- NetAddresses
- Manager
- supportedExtension
- vendorName
- vendorVersion

Important: The HTTP-HostName, MailFile, MailServer, NetAddresses, and Manager fields are only required for Workplace Services Express integration with Domino. If you do not plan to use the Domino Web Access or People Finder portlets, add only the DominoUNID field. The supportedExtension, vendorName, and vendorVersion attributes should be listed by default. If they are not listed, you cannot use the iSeries Create IBM Workplace wizard to configure to the Workplace Services Express server.

8. In the LDAP Type Selection window, click **OK** to finish adding the attributes.
9. You return to the Configuration Settings document. Select **Yes** or **No** based on your business requirements for the Allow LDAP users write access field. For help on determining which value to select, refer to 3.2, “Read/write or read-only access to the directory server” on page 38. Select **Yes** for Automatically Full Text index Domino Directory field as shown in Figure 3-27.

Note: An LDAP search without a full text index is a linear search. Create a full text index to improve LDAP search performance.

| | |
|---|---|
| Allow LDAP users write access: | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Timeout: | 0 seconds |
| Maximum number of entries returned: | 0 |
| Minimum characters for wildcard search: | 1 |
| Allow Alternate Language Information processing: | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Rules to follow when this directory is the primary directory, and there are multiple matches on the distinguished name being compared/modified: | <input checked="" type="radio"/> Don't modify any <input type="radio"/> Modify first match <input type="radio"/> Modify all matches |
| Automatically Full Text Index Domino Directory? | <input checked="" type="radio"/> Yes <input type="radio"/> No |
| Enforce schema? | <input checked="" type="radio"/> Yes <input type="radio"/> No |

Figure 3-27 Additional LDAP settings

10. Save and close the document.

11. From the Domino server console, type the following command to reload the LDAP schema:

```
tell ldap reloadschema
```

Tip: Our testing has shown that reloading the schema is not always sufficient. To be safe, consider restarting the Domino server prior to configuring your Workplace Services Express server.

3.4.3 Setting up the LDAP and DIIOP tasks

Both the LDAP and DIIOP tasks must be running under the Domino server for proper integration with Workplace Services Express. Perform the following steps to make sure these tasks are configured properly:

1. Open the Domino Directory (names.nsf). Navigate to **Configuration** → **Servers** → **All Server Documents**, and double-click the server document for your Domino server.
2. Navigate to the **Ports** → **Internet Ports** → **Directory** tab. Then verify that the LDAP port is enabled as shown in Figure 3-28.

| | | | | |
|---------------------------------|-----------|------|-------|----------------------|
| Web | Directory | Mail | DIIOP | Remote Debug Manager |
| Directory (LDAP) | | | | |
| TCP/IP port number: | 389 | | | |
| TCP/IP port status: | Enabled | | | |
| Enforce server access settings: | No | | | |
| Authentication options: | | | | |
| Name & password: | Yes | | | |
| Anonymous: | Yes | | | |
| SSL port number: | 636 | | | |
| SSL port status: | Disabled | | | |
| Authentication options: | | | | |
| Client certificate: | No | | | |
| Name & password: | No | | | |
| Anonymous: | Yes | | | |

Figure 3-28 Directory (LDAP) settings

3. Navigate to the **Ports** → **Internet Ports** → **DIIOP** tab and verify that the DIIOP port is enabled as shown in Figure 3-29.

| | |
|--|----------|
| Web Directory Mail DIIOP Remote Debug Manager | |
| Remote Java/Domino IIOP | |
| TCP/IP port number: | 63148 |
| TCP/IP port status: | Enabled |
| Enforce server access settings: | No |
| Authentication options: | |
| Name & password: | Yes |
| Anonymous: | Yes |
| SSL port number: | 63149 |
| SSL port status: | Disabled |
| Authentication options: | |
| Client certificate: | N/A |
| Name & password: | No |
| Anonymous: | Yes |

Figure 3-29 DIIOP port settings

4. Click **Save and Close** to exit the Domino server document.
5. The LDAP and DIIOP tasks should start when the Domino server starts. If you know this is already happening, you can skip to 3.4.4, “Adding Workplace Services Express Administrative accounts to Domino” on page 65. Otherwise use the Change Domino Server (CHGDOMSVR) CL command to modify the server configuration as explained in the following steps:
 - a. End the Domino server by entering the following End Domino Server (ENDDOMSVR) CL command:

```
ENDDOMSVR DominoServerName
```

Here *DominoServerName* represents your Domino server name.
 - b. Change the Domino server configuration by entering the following Change Domino Server (CHGDOMSVR) CL command:

```
CHGDOMSVR DominoServerName
```

Here *DominoServerName* represents your Domino server name.
 - c. In the Change Domino Server (CHGDOMSVR) panel (Figure 3-30), modify the Web browsers and Directory services parameters to include *IIOP and *LDAP respectively and press Enter.

Change Domino Server (CHGDOMSVR)

Type choices, press Enter.

Server name > 'ITSODOM6'

Additional server ID:

| | | |
|-------------------------------------|--------------|-------------------------------------|
| ID file's password | *NONE | |
| Time zone | CST | *SAME, GMT, EST, CST, MST ... |
| Daylight savings time | *YES | *SAME, *YES, *NO |
| Web browsers | *HTTP | *SAME, *NONE, *ALL, *IIOP... |
| | *IIOP | |
| Internet mail packages | *SMTP | *SAME, *NONE, *ALL, *IMAP ... |
| + for more values | | |
| Directory services | *LDAP | Character value, *SAME... |
| Connection services | *NONE | *SAME, *DECS, *NONE |

More...

F3=Exit F4=Prompt F5=Refresh F10=Additional parameters F12=Cancel
F13=How to use this display F24=More keys

Figure 3-30 Change Domino Server (CHGDOMSVR) command to add LDAP and IIOP tasks

- d. Start the Domino server by entering the following Start Domino Server (STRDOMSVR) CL command:

STRDOMSVR *DominoServerName*

Here *DominoServerName* represents your Domino server name.

Note: If the LDAP task does not start after you make these changes, make sure that the line `DisableLDAPOnAdmin=1` does not exist in the Domino server's `notes.ini` file. If you see this entry, remove it. To view the `notes.ini` file, use the Work with Domino Servers (WRKDOMSVR) CL command and type option 13 (Edit Notes.ini) next to your Domino server.

3.4.4 Adding Workplace Services Express Administrative accounts to Domino

If you plan to give read/write access to Workplace Service Express, be aware that for users to sign-up or edit their profile, the LDAP administrative account given to the iSeries Create IBM Workplace wizard must have manager access to the Domino Directory (`names.nsf`). This user must also have Create documents and Delete documents authorities selected. And this user must have the following roles:

- ▶ GroupCreator
- ▶ GroupModifier
- ▶ UserCreator
- ▶ UserModifier

To view the authority for a user to your Domino Directory, perform the following steps:

1. Start the Lotus Notes client.
2. Open the Domino Directory (`names.nsf`) for your Domino server.
3. Select **File** → **Database** → **Access Control** to view the Access Control List.

4. Select the entry for the user that you want to use as the LDAP Administrator in the iSeries Create IBM Workplace wizard. Figure 3-31 shows the authority that this user must have.

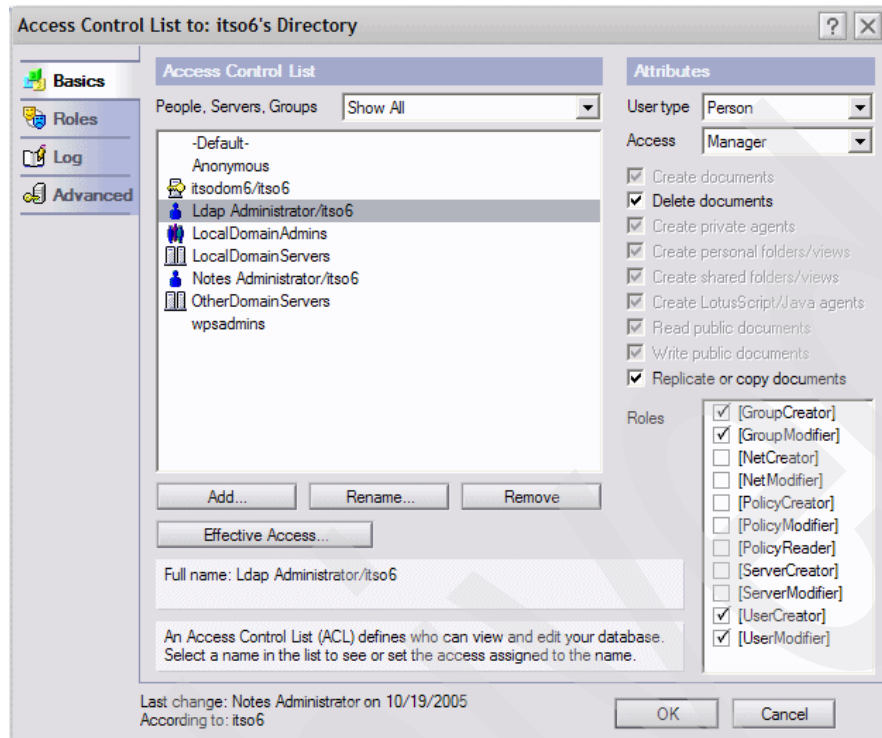


Figure 3-31 Security required by the iSeries Create IBM Workplace wizard

5. Review the authority and then close the Access Control List window when you are finished. If the authority matches the example in Figure 3-31, and you are going to give write access to the iSeries Create IBM Workplace wizard, you can skip the following steps.

If you only give read access to the iSeries Create Workplace wizard, you must create a Workplace Services Express administrator group and account such as wpsadmin user and a wpsadmins group. Perform the following steps to create a Workplace Services Express administrator user and administration group:

1. Open the Domino Administrator client and click the **People and Groups** tab.
2. Select **People** and click **Add Person**.

- On the Basics tab (Figure 3-32), specify the values from Table 3-3 in the fields, where *wpsadmin* represents your Workplace Services Express administrator.

Table 3-3 Values used to create the *wpsadmin* Person document

| Parameter | Value |
|-------------------|---------------------------------------|
| Last Name | wpsadmin |
| User Name | wpsadmin/YourOrganization wpsadmin |
| Shortname/UserID | wpsadmin |
| Internet Address | wpsadmin@yourdomain.com |
| Internet Password | password of your choice |

The screenshot shows the IBM Domino Administrator window for the 'wpsadmin/itso6' person document. The 'Basics' tab is active, showing the following fields:

- First name: []
- Middle name: []
- Last name: [wpsadmin]
- User name: [wpsadmin/itso6]
- Alternate name: []
- Short name/UserID: [wpsadmin]
- Personal title: []
- Generational qualifier: []
- Internet password: []
- Preferred language: []

The 'Mail' tab is also visible, showing the following fields:

- Mail system: [Notes]
- Domain: []
- Mail server: []
- Mail file: []
- Forwarding address: []
- Internet address: [wpsadmin@itsowse1.rchland.ibm.com]
- Format preference for incoming mail: [Keep in senders' format]
- When receiving unencrypted mail, encrypt before storing in your mailfile: [No]

Figure 3-32 Creating the *wpsadmin* Person document

- Click the **Save and Close** button to exit the Person document.
- Select **Groups** and click **Add Group**.
- On the Basics tab (Figure 3-33), specify the values from Table 3-4, where *wpsadmin* represents your Workplace Services Express administrator and *wpsadmins* represents your administration group.

Table 3-4 Values used to create the wpsadmins Group document

| Parameter | Value |
|------------|---------------------------|
| Group Name | wpsadmins |
| Group Type | Multi-purpose |
| Members | wpsadmin/YourOrganization |

The screenshot shows the 'Multi-purpose group' document creation window. The 'Basics' tab is active, displaying the following fields:

- Group name: wpsadmins
- Group type: Multi-purpose
- Category: (empty dropdown)
- Description: (empty text box)
- Mail Domain: (empty text box)
- Internet Address: (empty text box)
- Members: wpsadmin/itsod6

Figure 3-33 Creating the wpsadmins Group document

- Click the **Save and Close** button to exit the Group document.

3.4.5 Testing the Domino LDAP server configuration

Running an **ldapsearch** command against the LDAP directory indicates whether you have configured your LDAP server correctly. If you prefer a graphical user interface, third-party products are available on the Internet for download.

In the following examples, we run an **ldapsearch** command from a Windows command prompt. In Example 3-4, we verify that the DominoUNID can be returned for a Domino user. In our example, we created a Domino user named LDAP Administrator. We use the following **ldapsearch** command, where *itsodom6* is the host name of our Domino server:

```
ldapsearch -h itsodom6 -p 389 "cn=LDAP Administrator"
```

Example 3-4 Running ldapsearch to return the entry for the LDAP Administrator

```
C:\Documents and Settings\Administrator>ldapsearch -h itsodom6 -p 389 "cn=Ldap Administrator"
```

```
CN=Ldap Administrator,0=itsod6
objectclass=dominoPerson
objectclass=inetOrgPerson
objectclass=organizationalPerson
objectclass=person
objectclass=top
dominounid=789FFCB95562ACA18625709E005B98AA
givenname=Ldap
sn=Administrator
cn=Ldap Administrator
uid=LAdministrator
```

If you do not see the DominoUNID attribute returned, your LDAP server is not ready for use with Workplace Services Express. Return to 3.4, “Preparing the Domino server for LDAP” on page 51, for help on configuring your Domino LDAP server.

If you do not allow write access to the Domino LDAP directory, make sure that the wpsadmin person and wpsadmins group are setup properly as shown in Example 3-5. In our example, we use the following **ldapsearch** command, where *itsodom6* is the name of our Domino server:

```
ldapsearch -h itsodom6 -p 389 cn=wps* CN=wpsadmin,0=itso6
```

Example 3-5 Running ldapsearch to return the entries for wpsadmin and wpsadmins

```
C:\Documents and Settings\Administrator>ldapsearch -h itsodom6 -p 389 cn=wps*
CN=wpsadmin,0=itso6
mail=wpsadmin@itsowse1.rchland.ibm.com
objectclass=dominoPerson
objectclass=inetOrgPerson
objectclass=organizationalPerson
objectclass=person
objectclass=top
dominounid=CB41205ACE9994E0862570970050FFAB
sn=wpsadmin
cn=wpsadmin
uid=wpsadmin
CN=wpsadmins
cn=wpsadmins
mail=wpsadmins@rchland.ibm.com
objectclass=dominoGroup
objectclass=groupOfNames
objectclass=top
member=CN=wpsadmin,0=itso6
dominounid=414035F3AFE72F786257097005214F0
```

3.4.6 Domino Directory changes after upgrading to Domino v6.5.4 or higher

The previous sections explain how to modify the Domino Directory to integrate with Workplace Services Express when running Domino Versions 6.5.3 or earlier. This section explains the necessary steps to take advantage of the new changes with the LDAP server that is part of Domino Versions 6.5.4 or later. Perform the following steps:

Important: You must only follow these steps if you modified the design of your Domino Directory when you were at Domino V6.5.3 or earlier and have now upgraded your server to Domino V6.5.4 or later.

1. Open the Domino Directory (names.nsf) in the Domino Designer client.
2. In the left pane, click **Forms** and then right-click the **Person** form.
3. Select **Design properties**.
4. Deselect the **Prohibit design refresh or replace to modify** option.
5. Close the Design properties box.
6. Follow the same steps on the Group and Server\Certifier forms. For both forms, deselect the **Prohibit design refresh or replace to modify** option.

7. Select **Shared Code** → **Agents** and remove the **PopulateDominoUNID** agent if it exists in your database.
8. Select **File** → **Database** → **Refresh Design** to refresh the design of the Domino Directory with the latest template.

The changes are now complete, and your Domino Directory should be updated with the latest design for the version of Domino you are running. All previous modifications made in the server configuration document are still valid and do not require changing.



Installing and configuring Workplace Services Express

This chapter explains how you can download, install, and configure Workplace Services Express on the iSeries server. First, you learn how to obtain the Workplace Services Express code and prepare it for installation. Then you see how to install the Workplace Services Express code. Finally you follow the steps to configure a Workplace Services Express server using the iSeries Create IBM Workplace wizard.

4.1 Obtaining and preparing Workplace Services Express code

Depending on your role as an IBM Client or Business Partner, you might acquire the Workplace Services Express software in different ways:

- ▶ On a single DVD or on a number of CD-ROMs
- ▶ Online through the IBM PartnerWorld gateway
- ▶ Online through the IBM Passport Advantage® Web site

Regardless of the method that you use to access the Workplace Services Express code, the installation process is the same. The steps to prepare files for installation vary slightly depending on the method that you use to obtain the software.

4.1.1 Downloading the installation files

If you are an IBM Business Partner, you can download Workplace Services Express through the IBM PartnerWorld gateway using the following steps:

1. Open a Web browser and point to the following Web address:
<http://www.ibm.com/partnerworld/>
2. Log on to the IBM PartnerWorld gateway using your IBM ID and password.
3. From the Software Downloads page (Figure 4-1), search for Workplace Services Express. Select the **All** search option. Then click **Search**.

Figure 4-1 Searching for Workplace Services Express

4. From the list of results, select **IBM Workplace Services Express V2.5 for iSeries Multilingual eAssembly** (Figure 4-2).

| Software Downloads IBM Software Access Catalog | |
|--|-------------|
| Search results for <i>workplace AND services AND express</i> 30 Products: | |
| Multi-File Assemblies | Date Posted |
| IBM Workplace Services Express V2.0 for Linux intel Multilingual eAssembly | Feb-18-2005 |
| IBM Workplace Services Express V2.0 for Windows Multilingual eAssembly | Feb-18-2005 |
| IBM Workplace Services Express V2.5 for Linux Multilingual eAssembly | Jun-20-2005 |
| IBM Workplace Services Express V2.5 for Windows Multilingual eAssembly | Jun-17-2005 |
| IBM Workplace Services Express V2.5 for iSeries Multilingual eAssembly | Jun-20-2005 |

Figure 4-2 Selecting IBM Workplace Services Express V2.5 for iSeries Multilingual eAssembly

5. From the next page, download all of the individual components. Save the downloaded files to a directory named /opt/download on the integrated file system of your iSeries server.
- If the /opt/download directory does not exist on the integrated file system of your iSeries server, create it by performing the following steps:

- Sign on to your iSeries server.
- Enter the Start Qshell (STRQSH) CL command and press Enter. You can also use the Qshell (QSH) command, if you prefer.
- Create the /opt/download directory by entering the following command:

```
mkdir -p /opt/download
```

If you prefer to download the files to your local PC workstation, copy them to the /opt/download directory on your iSeries after the downloads are complete.

4.1.2 Preparing the installation files

If you download the Workplace Services Express installation files, you must unpack, rename, and move these files to a particular directory structure in order to successfully install the Workplace Services Express code. You can do this using one of two methods:

- ▶ Using an automatic install preparation script
- ▶ Renaming the installation files manually

Using an automatic install preparation script

We created a script called prepareInstall.sh to facilitate the preparation of the downloaded files for installation. Refer to Appendix C, “Additional material” on page 359, for details about how to download this script file.

Important: The install preparation script is for Workplace Services Express Version 2.5 only. It does not work with later releases of Workplace Services Express.

Perform the following the steps to use the install preparation script:

1. Download the install preparation script from the location specified in Appendix C, “Additional material” on page 359. Save it in the same directory on the integrated file system in which you downloaded the Workplace Services Express files, which is typically /opt/download.

2. Sign on to your iSeries server.

Tip: Set your 5250 terminal size to 27 x 132 to ensure that the lines in the following displays are not truncated or wrapped.

3. Enter the Start Qshell (STRQSH) CL command and press Enter.
4. Change to the directory in which you downloaded the Workplace Services Express files by entering the following command:

```
cd /opt/download
```

5. Run the install preparation script by entering the following command (see Figure 4-3):

```
prepareInstall.sh
```

```
QSH Command Entry

> cd /opt/download
$

===> prepareInstall.sh

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

Figure 4-3 Launching the prepareInstall.sh script

6. The script runs and produces some output, listing the directories that it creates and the files that it extracts (Figure 4-4). Press the Page Up key to scroll back through the output and make sure that no errors occurred while preparing the Workplace Services Express Version 2.5 files.

```
QSH Command Entry

./LWPArchives/WPS_Archive_I50S.tar.gz
pax: 001-2298 For archive file ustar and volume 1, 4 files were processed wit
.
./WASPME
./WASPME/pmeinstall.jar
./WASPME/media.inf
./WASPME/install400.bat
./WASPME/pmeinstall.exe
./WASPME/install.sh
./WASPME/installresponse.txt
./WASPME/autorun.inf
pax: 001-2298 For archive file ustar and volume 1, 9 files were processed wit
File extraction complete
$

===>

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

Figure 4-4 Checking the output from the prepareInstall script for errors

7. After the script has run, enter the following command to verify the files were copied correctly:

```
ls /opt/install
```

You should see a directory structure similar to the example in Figure 4-5.

```
QSH Command Entry

> ls /opt/install
  LWPArchives      WASPME           WSEServer
$
===>

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

Figure 4-5 Contents of the /opt/install directory after the prepareInstall script has run successfully

Renaming the installation files manually

You might decide to install the Workplace Services Express installation files from a directory other than /opt/install. Or you might have decided to place the downloaded install files in a directory other than /opt/download. In this case, you must manually unpack, rename, and copy the Workplace Services Express files from their download location to the install directory structure.

The downloaded files fall into a number of categories:

- ▶ WebSphere Application Server archive install files
- ▶ WebSphere Portal Server archive install files
- ▶ Workplace Services Express archive install files
- ▶ Workplace Services Express archive installer

You must copy the files that belong to the first three categories to a LWPArchives directory and appropriately rename them. For files that belong to the fourth category, you must extract them to the parent directory of the LWPArchives directory to allow the archive installer to run. If we use /opt/install/LWPArchives as the LWPArchives directory, then we must extract the files from the fourth category to /opt/install.

The following steps show how to unpack, rename, and copy the Workplace Services Express installation files using the Qshell environment:

1. Sign on to your iSeries server.
2. Enter the Start Qshell (STRQSH) CL command and press Enter.
3. Change to the directory which you downloaded the Workplace Services Express installation files to by entering the following command in Qshell:

```
cd /opt/download
```

If you downloaded the installation files to a directory other than /opt/download, substitute that directory path in this command.

4. Create an /opt/install directory by entering the following command:

```
mkdir /opt/install
```

If this command fails, check whether the /opt/install directory already exists. If it does, use a different directory to install from, for example /opt/wseinstall.

Note: In the instructions that follow, which reference /opt/install, replace /opt/install with the directory that you want to use for storing the Workplace Services Express installation files.

5. Create the /opt/install/LWPArchives directory by entering the following command:

```
mkdir /opt/install/LWPArchives
```

6. Copy the downloaded archive install files to the LWPArchives directory and rename them for use by the archive installer. For each file listed in Table 4-1, run the following command:

```
cp original /opt/install/LWPArchives/destination
```

Replace *original* with the file to copy, and replace *destination* with the destination path and new file name. For example, for the first entry in the table, enter the following command:

```
cp C84B5ML.tar.gz /opt/install/LWPArchives/LWP_Archive_Common1.tar.gz
```

Table 4-1 Downloaded install files and their destination file names

| Original file name | Destination file name |
|--------------------|------------------------------------|
| C84B5ML.tar.gz | LWP_Archive_Common1.tar.gz |
| C84B6ML.tar.gz | LWP_WAS_Archive_Common1.tar.gz |
| C84B7ML.tar.gz | LWP_WAS_Archive_Common2.tar.gz |
| C84B8ML.tar.gz | LWP_WPS_Archive_Common1.tar.gz |
| C84B9ML.tar.gz | WAS_Archive_Common1.tar.gz |
| C84BAML.tar.gz | WPS_Archive_Common1.tar.gz |
| C84BBML.tar.gz | LWP_Upgrade_Archive_Common1.tar.gz |

7. Extract files that belong to the Workplace Services Express archive installer to the /opt/install directory:

- a. Change directory to /opt/install by entering the following command:

```
cd /opt/install
```

- b. Extract the archive installer. For each file in Table 4-2, run the following command:

```
pax -rv -C 819 -f /opt/download/filename.tar
```

For example, for C84B3ML.tar, enter:

```
pax -rv -C 819 -f /opt/download/C84B3ML.tar
```

Table 4-2 Downloaded Workplace Services Express Version 2.5 archive installer files

| File name | Description |
|-------------|--|
| C84B3ML.tar | Server install and migration tools |
| C84BGML.tar | Server archive install for iSeries |
| C84BHML.tar | WebSphere Application Server Enterprise Enablement for iSeries |

Preparing the installation files for Workplace Services Express Version 2.5.1

If you downloaded the Workplace Services Express installation files for version 2.5.1, the procedure for preparing the installation files is slightly different than it is for version 2.5 which is discussed in the previous section.

Note: In Workplace Services Express Version 2.5.1, you no longer are required to rename the files like you had to in version 2.5. This is done automatically for you when you unpack or extract the installation files.

Perform the following steps for Workplace Services Express, Version 2.5.1:

1. Sign on to your iSeries server.
2. Enter the Start Qshell (STRQSH) CL command and press Enter.
3. Change to the directory to which you downloaded the Workplace Services Express installation files by entering the following command in Qshell:

```
cd /opt/download
```

If you downloaded the installation files to a directory other than /opt/download, substitute that directory path in this command.

4. Create the /opt/install directory by entering the following command:

```
mkdir /opt/install
```

If this command fails, check whether the /opt/install directory already exists. If it does, use a different directory to install from, for example /opt/wseinstall.

Note: In the instructions that follow, which reference /opt/install, replace /opt/install with the directory that you want to use for storing the Workplace Services Express installation files.

5. Create the /opt/install/LWPArchives directory by entering the following command:

```
mkdir /opt/install/LWPArchives
```

6. Extract the files that belong to the Workplace Services Express archive installer, to the /opt/install directory:

- a. Change directory to /opt/install by entering the following command:

```
cd /opt/install
```

- b. Extract the archive installer. For each file in Table 4-3, run the following command:

```
pax -rv -C 819 -f /opt/download/filename.tar
```

For example, for C87A0ML.tar, run the following command:

```
pax -rv -C 819 -f /opt/download/C87A0ML.tar
```

Table 4-3 Downloaded Workplace Services Express Version 2.5.1 archive installer files

| File name | Description |
|-------------|---|
| C87A0ML.tar | IBM Workplace Services Express 2.5.1 Server Install Multilingual |
| C87A1ML.tar | IBM Workplace Services Express 2.5.1 Server Install Archive 1 of 3 |
| C87A2ML.tar | IBM Workplace Services Express 2.5.1 Server Install Archive 2 of 3 |
| C87A3ML.tar | IBM Workplace Services Express 2.5.1 Server Install Archive 3 of 3 |
| C87AUML.tar | IBM Workplace Services Express 2.5.1 Server Install Archive for iSeries |
| C87CQML.tar | IBM Workplace Services Express 2.5.1 Server Install Upgrade Archive Multilingual |
| C88J1ML.tar | IBM Workplace Services Express 2.5.1 WebSphere Application Server Enterprise Enablement for iSeries |

Two additional files are downloaded with Workplace Services Express Version 2.5.1 for i5/OS:

- ▶ **C879ZIE.PDF:** IBM Workplace Services Express V2.5.1 Read Me First for Windows, Linux and iSeries International English
- ▶ **C88ECML.EXE:** IBM Workplace Services Express V2.5.1 WebSphere Application Server for iSeries V5.0

4.1.3 Copying the installation files from physical media

Note: It is possible to install Workplace Services Express remotely from a Microsoft Windows PC workstation using a graphical installer. This method takes considerably longer than the process described here. For more information, refer to the Workplace Services Express Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

If you received the Workplace Services Express install files on physical media (several CD-ROM discs or a single DVD), copy them to your iSeries integrated file system before you start the install process.

If you are copying the files from the optical drive of a local PC workstation, perform the following steps:

1. Insert the first CD or the DVD into the optical drive of the local PC workstation.
2. Map a network drive to the root share on your iSeries server.
3. Create a directory named /opt/install on the root share's mapped network drive.
4. Copy the full contents of all the CD-ROMs or the full contents of the DVD to this newly created directory.

Note: If you don't have a root share configured on your iSeries server, refer to the IBM @server iSeries Information Center Version 5 Release 3 (V5R3):

<http://publib.boulder.ibm.com/infocenter/iseries/v5r3/index.jsp>

Search for create a file share to access the relevant section.

4.2 Installing the Workplace Services Express server code

There are several ways to install the Workplace Services Express server code. You can install it locally from your iSeries server or remotely from a PC workstation running Microsoft Windows. In this redbook, we document the local installation process. For information about installing Workplace Services Express remotely from a Microsoft Windows PC workstation, refer the IBM Workplace Services Express Version 2.5.x Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

Navigate to **Getting started** → **Installing on i5/OS** → **Installing the product on i5/OS**.

Tip: Installing Workplace Services Express locally from your iSeries server is much faster than doing a remote graphical install from a PC workstation.

To install Workplace Services Express from an i5/OS session, perform the following steps:

1. Sign on to your iSeries server.
2. Enter the Start Qshell (STRQSH) CL command and press Enter.

3. Change to the directory to which you copied the install files by entering the following command:

```
cd /opt/install/WSEServer
```

If you copied the install files to a directory other than /opt/install, substitute that directory name for /opt/install in this command.

Important: If you downloaded the Workplace Services Express installation files from the Web, make sure that you have properly prepared the files for installation. Refer to 4.1.2, “Preparing the installation files” on page 73, for details.

4. Start the installation process by running the `install.sh` script, as shown in Figure 4-6. There might be a brief pause while the installer loads.

```
QSH Command Entry

> cd /opt/install/WSEServer
$

==> install.sh

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

Figure 4-6 Launching the Workplace Services Express server installation

5. You should see the QSH Command Entry panel like the example in Figure 4-8. Depending on the height of your terminal, you might not be able to see all of the options presented. To view the missing options, press the Page Up key to scroll up. This shows a display similar to the example in Figure 4-7.

```
QSH Command Entry

IBM Workplace Services Express 2.5
(C) Copyright IBM Corp. 2001 - 2005 All Rights Reserved.

Attaching Java program to /opt/install/WSEServer/dist/wseinstall.jar.

-----

Select a language to be used for this wizard.

[ ] 1 - Czech
[X] 2 - English
[ ] 3 - French
[ ] 4 - German
[ ] 5 - Greek

==>

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

Figure 4-7 Language selection display (upper half; scroll down to view all options)

Tip: Depending on the size of your display terminal, some of the installation wizard displays might be too long to view all at once. If this is the case, use the Page Up key to scroll back to view the top of the display.

Type a number that corresponds to the language to use in the wizard and press Enter. Note that the language selected for the wizard does not affect the range of languages available in the installed product. Then type 0 and press Enter to continue.

```
QSH Command Entry

[ ] 6 - Hungarian
[ ] 7 - Italian
[ ] 8 - Japanese
[ ] 9 - Korean
[ ] 10 - Polish
[ ] 11 - Portuguese
[ ] 12 - Portuguese (Brazil)
[ ] 13 - Russian
[ ] 14 - Simplified Chinese
[ ] 15 - Spanish
[ ] 16 - Traditional Chinese
[ ] 17 - Turkish

To select an item enter its number, or 0 when you are finished: [0]

==> 0

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

Figure 4-8 Language selection display (lower half; scroll up to view all options)

6. A welcome display (Figure 4-9) opens in the language that you selected. Type 1 and press Enter to continue with the wizard.

```
QSH Command Entry

-----
--
Welcome to IBM Workplace Services Express

The installer will install IBM Workplace Services Express on your computer.
Click Next to continue.

Copyright IBM Corp. 2003, 2005; All Rights Reserved. US Government Users
Restricted Rights - Use, duplication or disclosure restricted by GSA ADP
Schedule Contract with IBM Corp.

Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]

==> 1

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

Figure 4-9 Workplace Services Express server installation welcome display

7. The installer checks that your user profile has sufficient authority and that the required operating system level is met. If an error is displayed, refer to 2.2, “i5/OS software requirements” on page 11.
8. An introduction to the licensing agreement is displayed (Figure 4-10). Press Enter to view the full licensing agreement.

```

QSH Command Entry

Checking for required operating system and software prerequisites. Please wait.

-----
--
Software Licensing Agreement
Press Enter to display the license agreement on your screen. Please
read the agreement carefully before installing the Program. After
reading the agreement, you will be given the opportunity to accept it
or decline it. If you choose to decline the agreement, installation
will not be completed and you will not be able to use the Program.

===>

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

```

Figure 4-10 Software Licensing Agreement

9. Read the licensing agreement. Then type 1 and press Enter to continue.
10. Type 1 again and press Enter to proceed to the next step of the installation.
11. The wizard prompts you for an install location with a default value of /QIBM/ProdData/Workplace/WSE25 specified, as shown in Figure 4-11. On the iSeries server, this location cannot be changed. Type 1 and press Enter to continue.

```

QSH Command Entry

> 1

-----
IBM Workplace Services Express is ready to install.

Summary:

Install location: /QIBM/ProdData/Workplace/WSE25

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]

===> 1

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

```

Figure 4-11 Install location summary

12. The installation wizard installs the Workplace Services Express server files. While it installs the files, it displays a progress bar as shown in Figure 4-12.

Note: The progress bar might not accurately reflect the installation progress. The installation might be complete even though the progress bar still indicates less than 40%. Check the display for messages to determine when the installation finished.

```
QSH Command Entry

Summary:

Install location: /QIBM/ProdData/Workplace/WSE25

Press 1 for Next, 2 for Previous, 3 to Cancel or 4 to Redisplay [1]
> 1

Installing IBM Workplace Services Express. Please wait.

|-----|-----|-----|-----|
0%       25%      50%      75%     100%

===>

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

Figure 4-12 Start of the installation process

13. After the server files are installed, the wizard prompts you to configure a Workplace Services Express server instance as shown in Figure 4-13. Type 1 and press Enter to continue.

```
QSH Command Entry

Installing IBM Workplace Services Express. Please wait.

|-----|-----|-----|-----|
0%       25%      50%      75%     100%
|||||||
-----
--
IBM Workplace Services Express has been successfully installed on the system.
Select Next to configure an instance or Cancel to exit.

Press 1 for Next, 3 to Cancel or 4 to Redisplay [1]

===> 1

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

Figure 4-13 Installation process completed successfully

14. There are two ways in which you can configure a Workplace Services Express server:

- Using the iSeries Create IBM Workplace wizard
- Manually, using the custom configuration option

The iSeries Create IBM Workplace wizard takes all user input and validates it before it starts the process of creating a new Workplace Services Express server. Unless you have a specific reason to configure an Workplace Services Express server manually, we recommend that you use the iSeries Create IBM Workplace wizard method. The steps involved in creating a new Workplace Services Express server using the iSeries Create IBM Workplace wizard are documented in 4.3.2, “Using the iSeries Create IBM Workplace wizard” on page 85.

To use the wizard to configure a Workplace Services Express server, type 0 and press Enter to continue as shown in Figure 4-14.

```
QSH Command Entry

[X] 1 - IBM Workplace Services Express setup wizard for i5/OS (recommended):
      The IBM Workplace Services Express wizard creates a production ready IBM
      Workplace Services Express instance. This wizard will help you create an
      IBM HTTP Server, create an IBM Workplace Services Express instance,
      create and configure DB2 schemas needed by IBM Workplace Services
      Express, and configure LDAP security.

[ ] 2 - Custom configuration:
      The custom configuration option for IBM Workplace Services Express
      provides a means of creating an IBM Workplace Services Express instance
      that will use a Cloudscape database. After the instance is created, use
      the database transfer tool to migrate the Cloudscape database to IBM DB2
      for i5/OS. Additional configuration is required to set up an external
      HTTP server and configure LDAP security for the instance. Refer to the
      IBM Workplace Services Express Information Center for more information.

To select an item enter its number, or 0 when you are finished: [0]

===> 0

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

Figure 4-14 Workplace Services Express server configuration options

In this redbook, we do not document the use of the custom configuration (or manual configuration) option. If you want to configure a new Workplace Services Express server using custom configuration, refer to the IBM Workplace Services Express Version 2.5.x Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

15. The install wizard shows some information about the iSeries Create Workplace wizard, including the URL from which the wizard can be accessed (see Figure 4-15). To exit the server install wizard, type 3 and press Enter. You return to the Qshell prompt.

Tip: Replace *localhost* with the fully qualified host name of your iSeries server in the URL to access the iSeries Create Workplace wizard.

```
QSH Command Entry

Use the link below to launch the IBM Workplace Services Express setup wizard
http://localhost:2001/HTTPAdmin?entry=express.taskCreateWorkplace

Press 3 to Finish or 4 to Redisplay [3]

==> 3

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

Figure 4-15 Workplace Services Express setup wizard link

4.3 Configuring a Workplace Services Express server

There are two ways to configure a Workplace Services Express server on the iSeries server:

- ▶ Using the iSeries Create IBM Workplace wizard
- ▶ Manually, using the custom configuration option

The iSeries Create IBM Workplace wizard validates user input related to the configuration of a new Workplace Services Express server before it begins the configuration process.

Important: The iSeries Create IBM Workplace wizard can only configure one Workplace Services Express server at a time. You must wait for the configuration of the previous server to complete before you start to configure a new Workplace Services Express server.

Custom configuration allows slightly more control over some aspects of the configuration process. It is a manual process, error-prone, and is not recommended as a means of configuring Workplace Services Express servers. If you choose the custom configuration option, refer to the IBM Workplace Services Express Version 2.5.x Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

4.3.1 Network preparation

You need a separate static TCP/IP address and fully qualified host name for each Workplace Services Express server that you want to configure on your iSeries server. Having this address and host name allows each Workplace Services Express server to use standard ports for HTTP and instant messaging communication.

Refer to 2.4, “i5/OS configuration and network requirements” on page 22, for information about how to configure a separate static TCP/IP address for each Workplace Services Express server.

4.3.2 Using the iSeries Create IBM Workplace wizard

A unique feature of Workplace Services Express on iSeries is the Create IBM Workplace wizard. This feature allows you to create and fully configure new Workplace Services Express servers through a graphical user interface. After you provide the initial configuration information, you do not need any further interaction with the wizard until the server is created. This is in sharp contrast to the manual process of configuring a new Workplace Services Express server using the custom configuration option.

Specifically, the wizard allows you to configure the following items:

- ▶ The product for which you want to create a server
Depending on which IBM Workplace products you have installed, this might include both Workplace Collaborative Services and Workplace Services Express.
- ▶ The name of the Workplace Services Express server that you want to create
- ▶ The optional components of Workplace Services Express that you want to configure
- ▶ The fully qualified host name to use for the Workplace Services Express server
- ▶ The port range to use of the Workplace Services Express server
- ▶ The HTTP server to use when processing Workplace Services Express requests
- ▶ The collections, libraries, or schema to use for the Workplace Services Express databases
- ▶ The Lightweight Directory Access Protocol (LDAP) server where information about users of Workplace Services Express is stored
- ▶ Single sign-on (SSO) configuration that you want to use with Workplace Services Express

To configure a Workplace Services Express server, perform the following steps:

1. Make sure that the iSeries HTTP administration server is running. This server provides the Web-based user interface to the iSeries Create IBM Workplace wizard. Start the iSeries HTTP administration server by using one of the following options:
 - From iSeries Navigator, click **Network** → **Servers** → **TCP/IP**. Right-click the **HTTP Administration** in the right pane and click **Start**.
 - From an i5/OS command line, enter the following Start TCP/IP Server (STRTCPSVR) CL command:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)
```
2. Open a Web browser and navigate to the IBM Web Administration for iSeries page. In the URL, replace *iSeriesHostName* with the fully qualified host name of your iSeries server:
`http://iSeriesHostName:2001`
3. Log on to IBM Web Administration for iSeries. The user profile which you use to log on must have a minimum authority of *ALLOBJ, *IOSYCFG, and *JOBCTL to configure a Workplace Services Express server.
4. From the iSeries Tasks page, click **IBM Web Administration for iSeries**.

5. In the IBM Web Administration for iSeries page, you can create, configure, and manage HTTP servers, application servers, and Workplace servers.

To start the process of creating a Workplace Services Express server, under the Setup tab, click **Create IBM Workplace** in the left panel or click **Create a New IBM Workplace environment** in the main pane. See Figure 4-16.

Important: Do not resize your Web browser window while completing the iSeries Create IBM Workplace wizard. Doing so restarts the wizard.

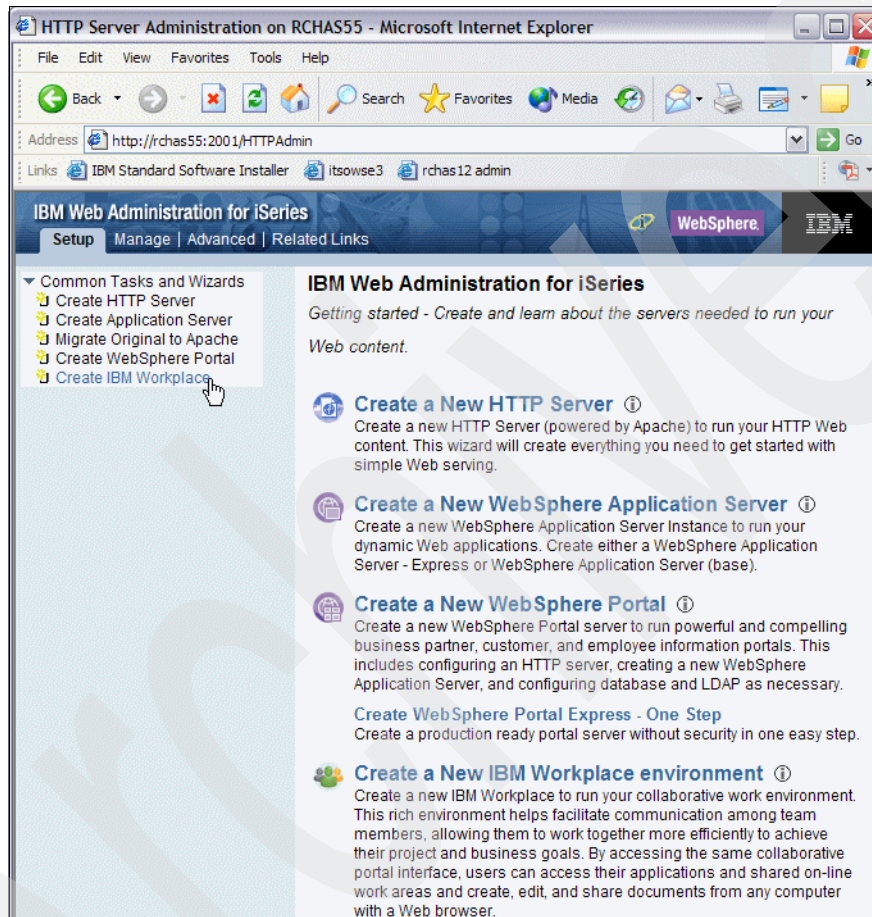


Figure 4-16 IBM Web Administration for iSeries Setup tab

6. In the Create IBM Workplace information pane (Figure 4-17), which describes the technologies used by IBM Workplace, you do not need to interact directly with these while completing the wizard. However, it is useful to read through this page so that you are aware of the different layers involved in IBM Workplace. When you are ready, click **Next** to continue with the wizard.

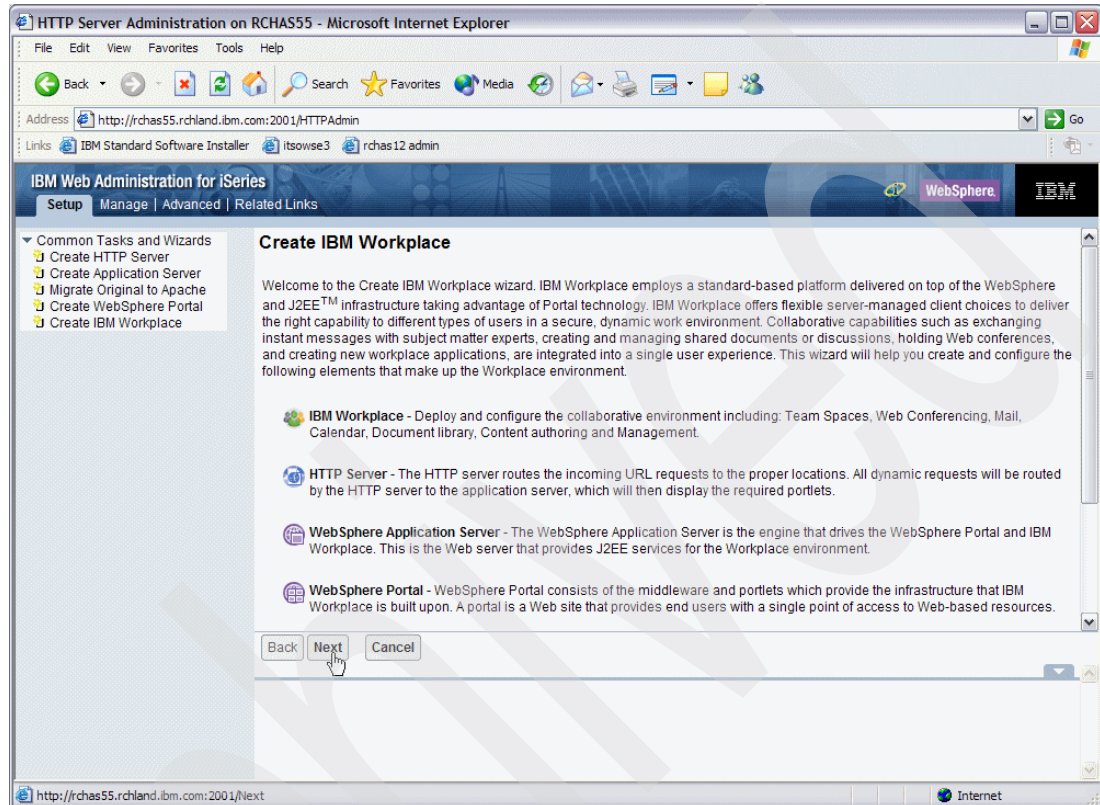


Figure 4-17 Create IBM Workplace pane

7. The wizard prompts you to select which product you want to create a server of (Figure 4-18). Select **IBM Workplace Services Express V2.5** and click **Next**.

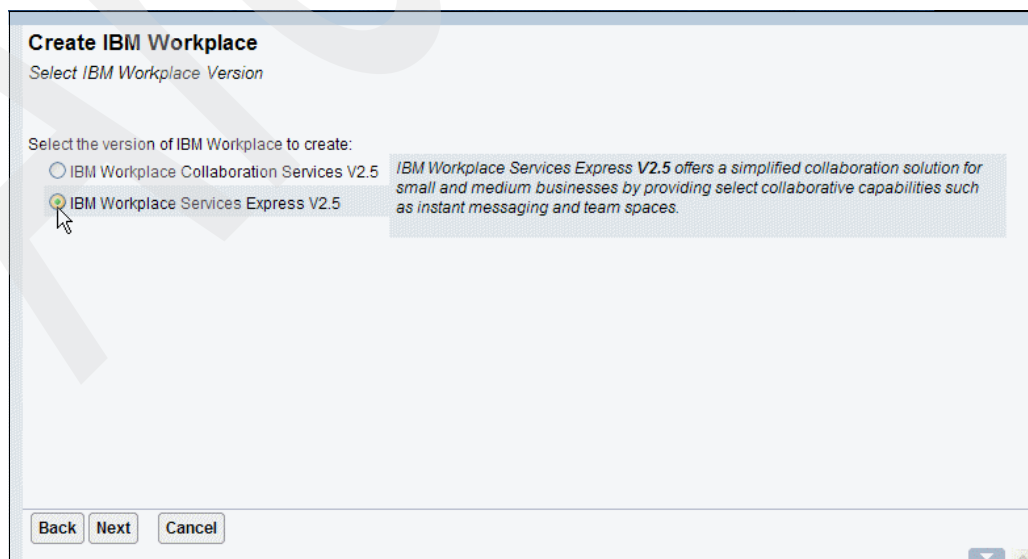


Figure 4-18 Selecting the IBM Workplace product and version to configure

8. A dependency checker runs at this point. If you are missing any of the required licensed products or PTFs listed in Chapter 2, “Hardware and software prerequisites” on page 9, an error message is displayed in the lower right pane, and you are not allowed to continue with the wizard. If this happens, refer to Chapter 2, “Hardware and software prerequisites” on page 9, and make sure that all prerequisites are installed.
9. In the next pane (Figure 4-19), you can enter a name and description for your Workplace Services Express server. You can use the default name provided or specify a more descriptive name. We recommend that you use the short form of the host name that you have assigned to this Workplace Services Express server. If you have not assigned a host name to this Workplace Services Express server, refer to 2.4.4, “Network requirements” on page 25, before continuing.

The name must be unique within all WebSphere Application Server installations on the system. If you specify a name that is already in use, the wizard shows an error message and does not allow you to continue until you specify a unique name. After you enter a unique name, click **Next**.

Tip: To find useful information about each pane in the iSeries Create Workplace wizard, click the question mark (?) icon.

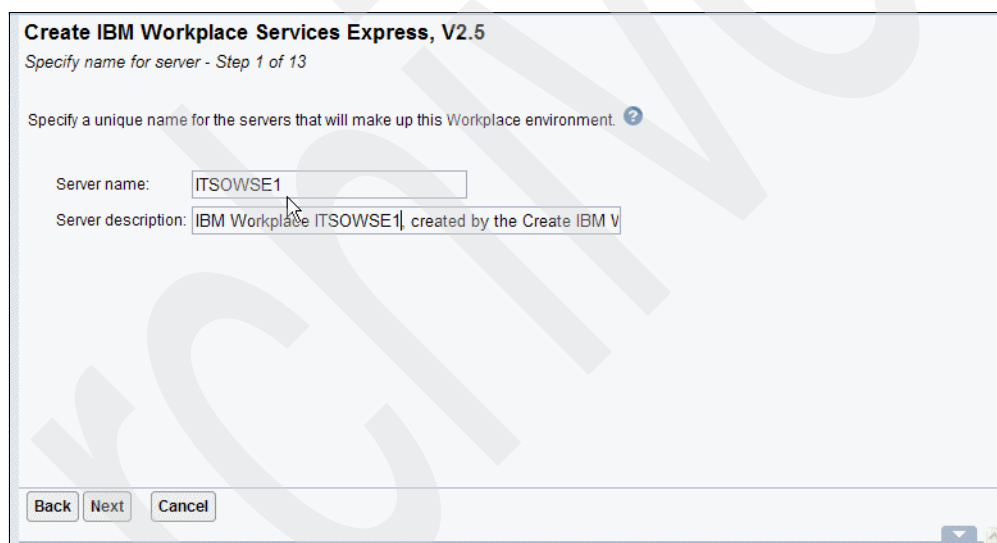


Figure 4-19 Specifying a name and description for the Workplace Services Express server

10. In the next pane (Figure 4-20), you can specify the collaboration components to enable. An option is available to configure the iSeries Access for Web portlet collection. This collection is a series of portlets that allow you to access information on your iSeries server through the Workplace Services Express interface. If you want to administer your iSeries server through a portlet interface, or run 5250 character-based applications in Workplace Services Express, select the **iSeries Access for Web portlets** option. Click **Next**.

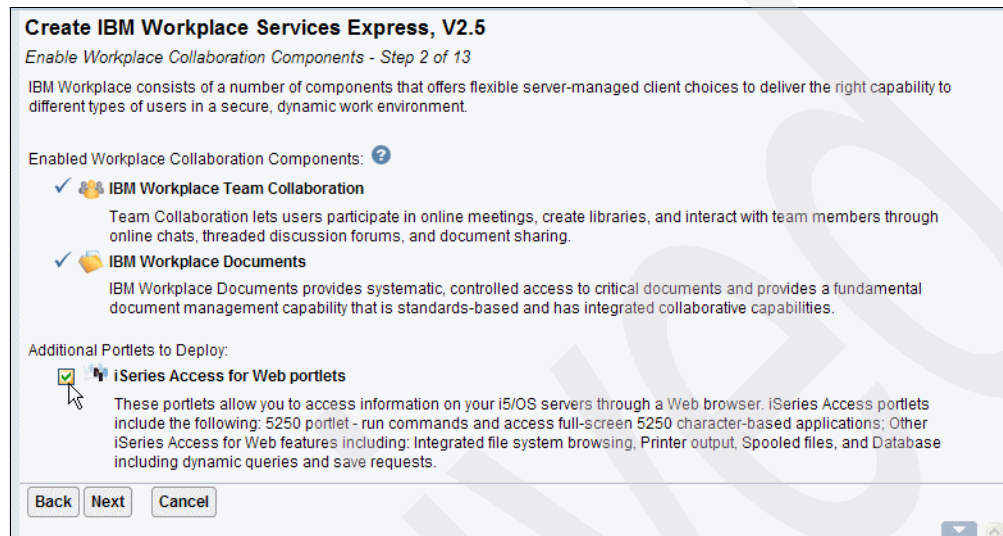


Figure 4-20 Enabling iSeries Access for Web portlets

11. In the next pane (Figure 4-21), specify the host name to use with this Workplace Services Express server. You should have allocated a unique host name and TCP/IP address to this Workplace Services Express server before you started the wizard. For details, see 2.4.4, “Network requirements” on page 25.

The Host name drop-down list indicates all host names configured on your iSeries server. From the Host name drop-down list, select the host name that you allocated to this server. If the host name is not listed in the list, refer to 2.4.4, “Network requirements” on page 25, to make sure you configured the TCP/IP settings for this Workplace Services Express server correctly.

Tip: If you modify the iSeries server host table after starting the wizard, the new entries will not be available in the wizard. To update the available options, restart the wizard.

Create IBM Workplace Services Express, V2.5
Specify Host Name for Workplace Environment - Step 3 of 13

Each Workplace environment requires an association with a dedicated host name value. It is recommended that TCP/IP be configured such that your host name value is fully qualified and defined in your DNS.

Note: If the desired host name value is not displayed, the host table entries or DNS server entries are not correctly configured. See help text for additional details.

Select the host name for this IBM Workplace: ?

Host name: Select one

- Select one
- ITSOWSE1.RCHLAND.IBM.COM
- ITSOWSE6.RCHLAND.IBM.COM
- RCHAS55.RCHLAND.IBM.COM
- ITSOWSE8.RCHLAND.IBM.COM
- ITSOWCS08.RCHLAND.IBM.COM
- ITSOWCS10.RCHLAND.IBM.COM

Back Next Cancel

Figure 4-21 Specifying the host name for the Workplace Services Express server

12. After you select the host name, the ports which are required for use by Workplace Services Express are displayed (see Figure 4-22). If any of these ports are already bound to another service on the host name that you selected, a warning message is displayed. If this happens, verify that any services running on these ports on your iSeries server are bound to a specific host name rather than all host names. Also ensure that no services are bound to the required ports on the host name that you selected.

To see which ports are currently in use on your iSeries server, use the Work with TCP/IP Network Status (NETSTAT) command:

- a. On an i5/OS command line, type:
NETSTAT
- b. In the panel that is displayed, type option 3 (Work with TCP/IP connection status) to view the ports in use and press Enter.

Note: The NETSTAT command only displays ports that are bound at the time the command is issued. If servers are stopped, the ports that they use are not displayed.

Verify that no errors are displayed in the lower pane and click **Next**.

Each Workplace environment requires an association with a dedicated host name value. It is recommended that TCP/IP be configured such that your host name value is fully qualified and defined in your DNS.

Note: If the desired host name value is not displayed, the host table entries or DNS server entries are not correctly configured. See help text for additional details.

Select the host name for this IBM Workplace: ?

Host name:

The following ports will be bound to the selected host name:

| Activate service | Service name | Unsecured and Secure Port value | Service description |
|-------------------------------------|--------------|---------------------------------|---|
| <input checked="" type="checkbox"/> | SIP | 5060 - TCP | Session Initiated Protocol - a protocol used for Internet conferencing and instant messaging. |
| <input checked="" type="checkbox"/> | SMTP | 25 - TCP | Simple Mail Transfer Protocol - a protocol used to send e-mail between servers. |

Back Next Cancel

Figure 4-22 Ports required by Workplace Services Express

13. Workplace Services Express requires a block of 100 consecutive ports to be assigned to each server. These ports are used by the internal Workplace Services Express servers to provide various services. The ports in this block are bound across all IP addresses configured on your iSeries server. Therefore, they must be unique across all configured IP addresses, not only on the TCP/IP address assigned to your Workplace Services Express server.

The iSeries Create IBM Workplace wizard suggests a default value (Figure 4-23). Unless you have a specific reason to do otherwise, use this default. If you enter a value other than the default, the wizard checks that all ports in the range are free. If any are not, an error message is displayed and you will be unable to continue until you specify an available range. Click **Next** to continue.

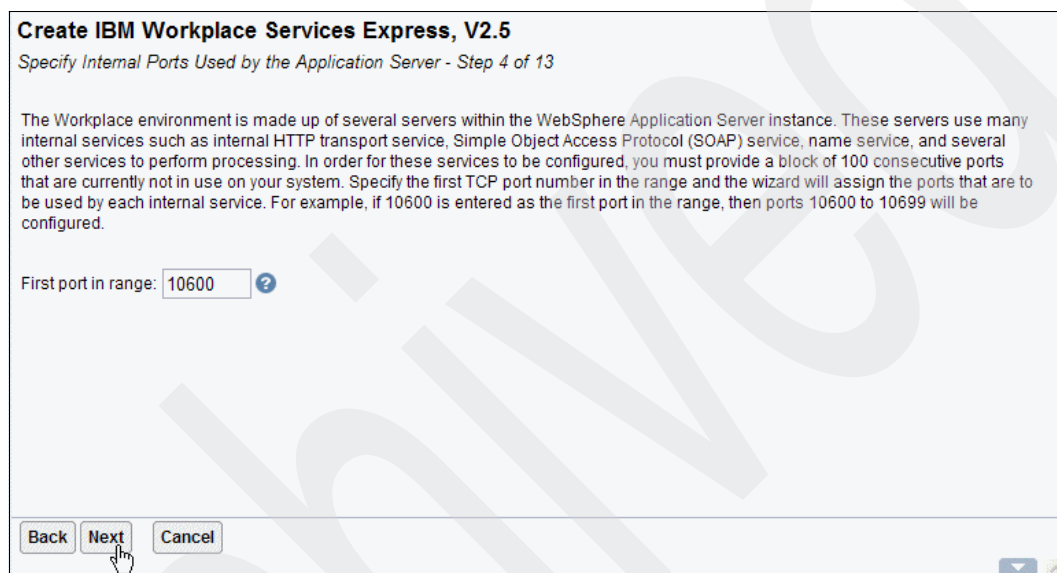


Figure 4-23 Specifying the port range used by the Workplace Services Express server

14. Workplace Services Express uses an HTTP server to receive user requests. The HTTP server forwards relevant requests to the application server for processing. By default, the name of the HTTP server is the same as the name of your new Workplace Services Express server (Figure 4-24). You can specify a different value, but it must be unique. You cannot use an existing HTTP server with Workplace Services Express.

You must also specify the TCP/IP address and port to which the HTTP server will be bound. Port 80 is used by default. You might specify an alternative port. If you do so, users must include the port number in the URL that they use to access the Workplace Services Express server.

After you enter the required information, click **Next** to continue.

Figure 4-24 Creating a new HTTP server

15. Workplace Services Express uses a number of databases to store information. To create the databases associated with a Workplace Services Express server, a user ID must be associated with the databases as the owner. This must be an i5/OS user profile. As explained in greater detail in this step, you can:

- Use an existing user ID.

If you decide to use an existing user ID, make sure the user profile has a minimum class of *USER and maximum allowed storage of *NOMAX. These values ensure that the size to which the databases can grow is not limited by restrictions on the database owner's storage space.

You can modify an existing user profile from an i5/OS command line.

- i. Enter the Work with User Profiles (WRKUSRPRF) command; replace *USERPROFILE* in the following example with the user profile to work with:

```
WRKUSRPRF USERPROFILE
```

- ii. From the Work with User Profiles display, type option 2 next to the user profile and press Enter.
- iii. In the Change User Profile (CHGUSRPRF) display, press F10 to display additional parameters.

Scroll down using the Page Down key to edit the user's maximum allowed storage property field.

- Create a new user ID.

To create a new user profile to own the Workplace Services Express databases, the user profile with which you authenticated to IBM Web Administration for iSeries must have *SECADM authority. If it does not have this authority, the option is not displayed.

We recommend that you create a new user ID to own the databases associated with Workplace Services Express. Creating this user ID avoids situations where the database owner's authorities or password is changed inadvertently. To easily associate a user profile with a Workplace Services Express server, it is best to use the Workplace Services Express server name as part of the user ID.

- Create the databases on a remote i5/OS server.

The databases can be named based on purpose, which makes them easily recognizable, or based on server name, which can be useful to allow you to identify all databases associated with a particular Workplace Services Express server. If you plan to configure multiple Workplace Services Express servers on the iSeries server, we recommend that you name the databases based on the Workplace Services Express server name.

A list of all databases created for this Workplace Services Express server is available on the summary page after the iSeries Create Workplace wizard gathers all required information.

Select the naming option that you want to use (Figure 4-25) and click **Next** to continue.

Figure 4-25 Creating a new user ID to own the Workplace Services Express databases

16. The wizard can configure Workplace Services Express to use an LDAP server to manage user information. If you have not yet configured your LDAP server, refer to Chapter 3, “Preparing the directory server for Workplace Services Express” on page 35, before you continue. If you choose not to configure LDAP at this time, WebSphere Member Manager is used to manage user account information. To switch to LDAP at a later stage, you must use the manual configuration option to enable LDAP security. For details about this process, refer to the IBM Workplace Services Express Version 2.5.x Information Center at: <http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

To configure LDAP security (Figure 4-26):

- a. Select **Configure security using LDAP now. (Recommended)**.
- b. In the LDAP server host name field, enter the fully qualified host name of your LDAP server.
- c. Enter the port which your LDAP server is bound to in the LDAP port field. Unless you specified a nonstandard port when setting up your LDAP server, this should be the default value of 389.
- d. Click **Next** to continue.

• Global security will be turned on for the application server.
• Access to an LDAP server will be required. This will be the repository of users and will provide security for the Workplace environment.
• The LDAP server must be active, and a user and password that can access the directory will need to be provided.
• The wizard will update the LDAP server with the application server and Workplace environment information, if necessary.
• Single Signon (SSO) will be configured for the application server.
• WebSphere Member Manager (WMM) and a look-aside database will be configured to store additional information for the users of IBM Workplace.

Specify security options for the Workplace environment: ?

☒ Configure security using LDAP now. (Recommended)

Specify LDAP server information:

LDAP server host name: e.g. "hostname.domain.com"

LDAP port:

☐ Configure security using LDAP at a later time.

Back Next Cancel

Figure 4-26 Configuring security using LDAP

17. Depending on the way in which you manage your LDAP directory, you might choose to give Workplace Services Express write access to the LDAP directory or restrict it to read-only access. *Write access* allows Workplace Services Express to create and update directory entries. It allows users to create new Workplace Services Express accounts for themselves and to update their account details. This is the best method to use if you do not plan on using the LDAP directory for other than for Workplace Services Express and if you are the administrator of the LDAP server.

Note: It is considerably easier to configure a Workplace Services Express server to work with your LDAP directory if you give the server write access to the LDAP directory.

Read-only access is the best method to use if you:

- Manage the LDAP directory independently of Workplace Services Express
- Do not want to allow users to update their profiles or to create profiles for themselves
- Do not manage the LDAP server which you are using for Workplace Services Express user information.

If you want to give Workplace Services Express write access to your LDAP directory:

- a. Select **Allow write access to the LDAP directory** (Figure 4-27).
- b. In the LDAP user DN field, enter the distinguished name (DN) of an LDAP user who has write permissions on the containers that you will use to store user and group information.
- c. In the LDAP user password field, enter the password for this LDAP user.

If you decide to provide read-only access:

- a. Select **Allow read-only access to the LDAP directory** (Figure 4-27).
- b. In the LDAP user DN field, enter the DN of an LDAP user who does not have write permissions on the LDAP directory.
- c. In the LDAP user password field, enter the password for this LDAP user.

Note: It is possible to give your Workplace Services Express server write access to the LDAP directory and still prevent users from creating their own user profiles. See 3.2, “Read/write or read-only access to the directory server” on page 38, for details.

For further information about configuring your LDAP server, refer to Chapter 3, “Preparing the directory server for Workplace Services Express” on page 35.

Tip: It is best practice to create a new LDAP user entry to be used only with this Workplace Services Express server. This user entry avoids any potential problems if the user’s permissions are modified, or if their password is changed at a later stage.

Click **Next**.

Create IBM Workplace Services Express, V2.5
LDAP Configuration Parameters - Step 8 of 13

Security for the Workplace environment can be configured with write access or read-only access to the LDAP directory information. Write access allows the Workplace server to update and manage user information. Read-only access will not allow the Workplace server to update user information in the LDAP directory.

Specify the access method: ?

☒ Allow write access to the LDAP directory.
Specify an LDAP user DN that has write access to the LDAP directory. The LDAP administrator value is recommended.

LDAP user DN: e.g. cn=admin

LDAP user password:

☐ Allow read-only access to the LDAP directory.

Figure 4-27 LDAP configuration parameters

18. Workplace Services Express requires containers in your LDAP directory to store user and group information. Specify the DN of the containers in your LDAP directory under which Workplace Services Express users and groups will be stored (Figure 4-28). If they already exist, click the **Browse** button to select them.

Figure 4-28 Specifying containers for user and group information

19. If you are using an existing LDAP directory in read-only mode, these containers should already exist. At a minimum, they should contain a user and group to be assigned the administrator role in Workplace Services Express.

If you are using an existing LDAP directory in read-write mode, you can use existing containers if the directory already contains information about the users for whom you want to provision Workplace Services Express. If you are using a new LDAP directory, or if your LDAP directory does not already contain entries for the Workplace Services Express users, specify the DN of new containers. The containers are created automatically by the wizard during the process of creating a new Workplace Services Express server provided that you have read-write access to the LDAP directory.

Depending on the directory server which you are using, the default values for these containers will vary:

- If you are using IBM Directory Server as an LDAP server for this Workplace Services Express server, the parent DN for user information is typically:

`cn=users,DC=SERVER,DC=SUBDOMAIN,DC=DOMAIN,DC=TLD`

The parent DN for group information is typically:

`cn=groups,DC=SERVER,DC=SUBDOMAIN,DC=DOMAIN,DC=TLD`

In both of these examples, replace SERVER, SUBDOMAIN, DOMAIN, and TLD with the appropriate sections of your iSeries server's fully qualified domain name. The default values suggested by the iSeries Create IBM Workplace wizard should be appropriate in most cases.

- If you are using Domino as an LDAP server for this Workplace Services Express server, the parent DN for user information is typically:

`o=organization`

In this example, replace *organization* with the name of your Domino domain.

The parent DN for group information is typically the root of the Domino LDAP tree, which can be represented as `*ROOT` in the Parent DN field. See Figure 4-29.

See Chapter 3, “Preparing the directory server for Workplace Services Express” on page 35, for further details about setting up and populating your LDAP directory.
Click **Next**.

Create IBM Workplace Services Express, V2.5
LDAP Configuration Parameters - Step 9 of 13

IBM Workplace utilizes LDAP to store user information for authentication purposes. Below is where the users and groups for the Workplace environment will reside in your LDAP directory.

Information describing user entries ?

Parent DN:

Object class:

Naming attribute:

Information describing the administrative group entry

Parent DN:

Object class:

Naming attribute:

Member attribute: member

Figure 4-29 Specifying user and group containers when using Domino as an LDAP server

20. In the next pane (Figure 4-30), you enter details of the administrative user and group for your Workplace Services Express server, and click **Next**. Workplace Services Express requires an administrative user and administrative group entry in the LDAP directory. The administrative user has full access to Workplace Services Express and WebSphere Application Server configuration settings. It is best practice to have a dedicated entry in the LDAP directory for the administrative user and not to use this account for tasks other than administering the system.

The administrative user is automatically added to the administrative group. If you must give other users administrative access at a later stage, add them to the administrative group specified here. Refer to Chapter 3, “Preparing the directory server for Workplace Services Express” on page 35, for details about how to add users to your LDAP directory.

Create IBM Workplace Services Express, V2.5
LDAP Administrative Group and Administrative User - Step 10 of 13

IBM Workplace requires an administrative group and user entry in the LDAP directory. If the group and user entries do not already exist, the wizard will create them. If the group and user entries already exist, the wizard will validate that they are correct. The wizard will also ensure that the administrator user is added to the administrative group.

Note: The administrator user name specified here is the Workplace administrator, the WebSphere Application Server administrator, and the LDAP authentication user.

Workplace administrative group information: ?

Group name:

Workplace administrator information:

User name:

Password: Important - Keep this for future reference

Confirm password:

Figure 4-30 Specifying the administrative user and group

21. SSO is a mechanism that allows a single user sign-on action to provide authentication to multiple servers without re-authenticating when connecting to other servers than the one to which the user originally authenticated. Workplace Services Express supports two forms of SSO:

- Lightweight Third Party Authentication (LTPA) for Web server access
- Enterprise Identity Mapping (EIM) for i5/OS application access

EIM is not configured at this point. It is documented in step 23.

LTPA provides SSO to multiple Web servers and Web application servers. It is useful when your Workplace Services Express server requires access to information from other servers, such as Domino, QuickPlace, Sametime, or WebSphere Application Servers.

In the configuration page (Figure 4-31), you can configure LTPA SSO. The SSO domain name parameter specifies which servers can be accessed within the SSO environment.

If your Workplace Services Express server does not require access to information from other Web servers, or if those servers run on the same host name as your Workplace Services Express server, select **Limit SSO domain to this Web server's host name**. If your Workplace Services Express server requires access to information from Web servers running on other hosts, select **Include other Web servers in your SSO environment**.

Then you can specify the domain name that you want to use for SSO. This should be as qualified as possible while including all servers which you want to give access to using SSO. Consider an example where you have three servers:

- **Server 1:** server1.subdomain.domain.com
- **Server 2:** server2.subdomain.domain.com
- **Server 3:** server3.subdomain2.domain.com

To use SSO with server 1 and Server 2, specify a domain name of subdomain.domain.com. This prevents server 3 from being included. To include server3, specify a domain of domain.com. This allows any server in domain.com and its subdomains to be configured for SSO.

Note: The domain parameter for LTPA SSO must be at least two elements long. The iSeries Create IBM Workplace wizard does not allow you to specify shorter domains.

To configure other servers for inclusion in your SSO domain, see Chapter 8, “Enabling SSO between Workplace Services Express and Domino” on page 237.

Enter the required information, and click **Next**.

signon action permits access to multiple Web servers without the need to re-authenticate. The domain name identifies the Web servers that can be accessed within the SSO environment. SSO is useful when your Portal server needs to access information from other Web servers such as Domino, QuickPlace, Sametime, or WebSphere Application Servers.

- If your Workplace environment does not require information from other Web servers, the SSO domain should be limited to this Web server's host name.
- If your Workplace environment requires information from other Web servers, you will need to specify an SSO domain name. This domain name must be the portion of the fully qualified Domain Name System (DNS) host name that is shared by all Web servers participating in your SSO environment. When accessing any of the Web servers in the SSO environment, you will only need to authenticate one time.

Specify SSO domain: ?

☐ Limit SSO domain to this Web server's hostname

☒ Include other Web servers in your SSO environment

SSO domain name: e.g. "domain.com"

Examples: Based on the following server hostnames, the corresponding SSO domain name would be:

| Workplace | Additional server | SSO domain name |
|-------------------------------|------------------------------|---------------------|
| workplace.subdomain1.acme.com | sametime.subdomain1.acme.com | subdomain1.acme.com |
| workplace.subdomain1.acme.com | domino.subdomain2.acme.com | acme.com |

Figure 4-31 Web server SSO configuration

22. If you decide to include other Web servers in your SSO environment, you are prompted to enter a password to encrypt the LTPA keys (Figure 4-32). Enter a password in the LTPA password and Confirm password fields and click **Next**.

See Chapter 8, "Enabling SSO between Workplace Services Express and Domino" on page 237, for more information about configuring SSO across multiple servers.

Create IBM Workplace Services Express, V2.5

Configure Lightweight Third Party Authentication (LTPA) for Web Server Single Signon (SSO) Environment

Lightweight Third Party Authentication (LTPA) is the mechanism used to implement Web Server SSO. LTPA is a set of tokens or cookies which provide a means to share authentication and access control information between Web servers. The information in these tokens uniquely identifies the user. LTPA keys will be created by this application server. These keys must be exported from this application server and imported into the other application servers in your SSO environment. When importing these keys into the other application servers, a password is necessary to encrypt and decrypt the LTPA keys.

If you forget the LTPA keys password or need to change it, use the WebSphere Application Server Administrative Console. After changing the password, you will need to generate and export new LTPA keys and import these new keys into other application servers and into the SSO configuration for Domino servers.

LTPA password: Important - Keep this for future reference ?

Confirm password:

Figure 4-32 Specifying a password to encrypt the LTPA keys

23. Workplace Services Express can be configured to integrate with iSeries Access for Web through the iSeries Access portlets. These portlets allow you to administer your iSeries server through a portlet interface and to run full-screen, 5250 character applications in a portlet. Workplace Services Express provides several methods by which a Workplace Services Express user can authenticate to i5/OS while using the iSeries Access portlets.

One of these methods, EIM, maps Workplace Services Express user IDs to iSeries user profiles, allowing a user of the iSeries Access portlets to automatically authenticate to i5/OS without entering any additional credentials.

If you do not want to use EIM with Workplace Services Express, select **Do not Configure Identity Tokens** (see Figure 4-33) and click **Next**.

Create IBM Workplace Services Express, V2.5
Configure Identity Token SSO for Web to i5/OS Access - Step 12 of 13

Identity Token SSO is a mechanism where a single user signon action permits access to multiple i5/OS servers. This allows your Web-based interfaces to access i5/OS back-end applications without having to prompt for additional authentication. Identity Tokens are implemented using Enterprise Identity Mapping (EIM). EIM maintains the relationships between Web users and i5/OS user profiles. The application server creates a token for the servers configured to support Identity Tokens in this EIM Domain.

Note: EIM is hosted on an LDAP server that must be configured and running before continuing.

Configure Identity Tokens: ?

☒ Do not configure Identity Tokens
☐ Configure Identity Tokens

Back Next Cancel

Figure 4-33 Selecting whether to use Identity Tokens with Workplace Services Express

If you want to use EIM with Workplace Services Express, you must configure EIM before continuing. Refer to 7.1, “Configuring EIM for use with the iSeries Access portlets” on page 209, for information about configuring EIM. After EIM is configured, perform the following steps to use it with Workplace Services Express:

- Select **Configure Identity Tokens** (Figure 4-34).
- In the LDAP server host name field, enter the fully qualified host name of the LDAP server which is hosting your EIM domain.
- In the LDAP port field, if the LDAP server hosting your EIM domain is running on a port other than 389, type that port number.
- In the LDAP administrator DN field, enter the DN of the EIM administrator user.
- In the LDAP administrator password field, enter the password of the EIM administrator user.
- Click **Next**.

application server creates a token for the servers configured to support Identity Tokens in this EIM Domain.

Note: EIM is hosted on an LDAP server that must be configured and running before continuing.

Configure Identity Tokens: ?

☐ Do not configure Identity Tokens
☒ Configure Identity Tokens

In order to configure Identity Tokens, an EIM Domain must be configured and the EIM Domain Controller must be running. Specify the LDAP server that is hosting EIM:

LDAP server host name: RCHAS55.rchland.ibm.com e.g. "hostname.domain.com"

LDAP port: 389

LDAP administrator DN: cn=Administrator e.g. cn=admin

LDAP administrator password:

Note: For more information on configuring EIM and Identity Tokens SSO and the required PTFs, see the [iSeries Information Center](#).

Figure 4-34 Selecting to use Identity Tokens with Workplace Services Express

- g. In the pane that opens (Figure 4-35), you are prompted for information about the EIM domain name and the source registry name where your Workplace Services Express user information is stored. From the EIM Domain Name drop-down list, select the EIM domain that you want to use with Workplace Services Express.

From the Source Registry Name drop-down list, select the name of the EIM registry where your Workplace Services Express user information is stored. Click **Next**.

Figure 4-35 Details of the EIM domain

- 24.A summary pane (Figure 4-36) is displayed and shows details of the Workplace Services Express server which you are configuring. To record a copy for future reference, click the **Printable Summary** button and save or print a copy of the full summary.

Tip: You can retrieve the information displayed on the summary page through the properties section of the IBM Web Administration for iSeries application after your Workplace Services Express server is configured.

If you are satisfied that the settings displayed on the summary page accurately describe the Workplace Services Express server which you want to create, click **Finish**. The process of creating a new Workplace Services Express server begins.

Figure 4-36 Workplace Services Express server configuration summary

25. After the configuration process starts, a page is displayed that gives a visual indication of the progress of the configuration process (Figure 4-37). The process can take a long time and is measured in hours. During the configuration process, the Web browser can be closed. You can re-open the progress page to monitor the configuration at a later stage.

Important: The configuration process to create a new Workplace Services Express server is extremely resource intensive. Make sure that you have sufficient available resources before you start the configuration process to avoid adversely affecting other business applications.

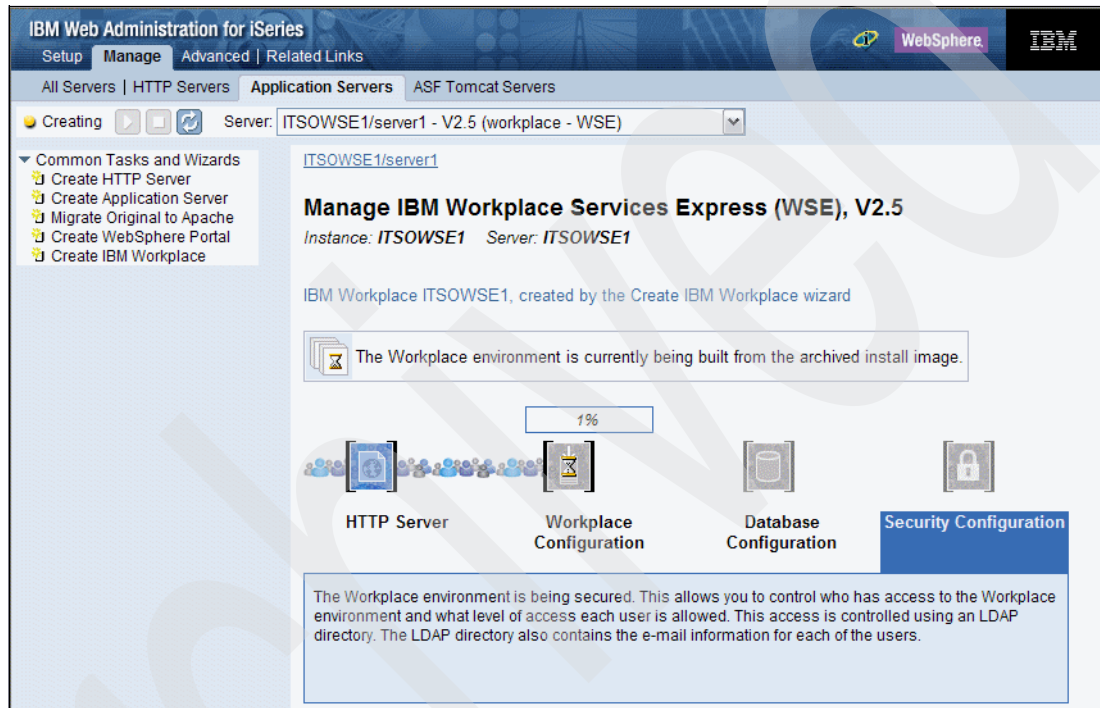


Figure 4-37 Workplace Services Express server configuration progress indicator

26. When the wizard completes, you can access your new Workplace Services Express server by opening a Web browser and navigating to the URL specified on the configuration summary page. The URL should be of the form:

`http://server.domain/lwp/workplace`

Here *server.domain* is the fully qualified host name that you assigned to this Workplace Services Express server.

Archived

Administering Workplace Services Express

This chapter explains Workplace Services Express administration. In this chapter, you learn how to perform the following tasks:

- ▶ Start and stop the Workplace Services Express server
- ▶ Review the Workplace Services Express server configuration
- ▶ Verify whether the Workplace Services Express server is active
- ▶ Access the Workplace Services Express server via a Web browser
- ▶ Access the WebSphere Application Server Administrative Console
- ▶ Modify the password for administrative accounts
- ▶ Find and read log files
- ▶ Locate and apply fixes
- ▶ Customize the default Workplace Services Express server configuration
- ▶ Backup and recover the Workplace Services Express configuration, user data, or both
- ▶ Remove a Workplace Services Express server

5.1 Starting and stopping a Workplace Services Express server

There are two ways you can start and stop a Workplace Services Express server. The first method is to use the IBM Web Administration for iSeries interface. The second method is to use Qshell scripts. The Qshell scripts start the Workplace Services Express portal server, although they do not start the HTTP server or the document rendering server. For this reason, we recommend that you use the IBM Web Administration for iSeries interface to start and stop the Workplace Services Express server.

For more information about the Qshell scripts and other advanced administration topics, visit the IBM Workplace Services Express Version 2.5.x Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

Note: The windows shown in this chapter were taken after i5/OS V5R3 PTF SI20496 was installed. If you do not have this PTF installed on your system, you might notice slight variations on some windows. Due to the performance improvement included with PTF SI20496, we recommend that you apply this PTF. For additional information, refer to 9.5.4, “X virtual frame buffer verses virtual network computing” on page 299.

5.1.1 Starting a Workplace Services Express server

Perform the following steps to start a Workplace Services Express server using IBM Web Administration for iSeries:

1. To access IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
In this example, we type:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your Workplace Services Express server, select your server by performing the following steps:

Important: The Lightweight Directory Access Protocol (LDAP) server must be started before the Workplace Services Express server is started. If it is not started, the Workplace Services Express server will not start.

- a. Click the **Manage** tab.
- b. Click the **Application Servers** tab.
- c. In the Server drop-down list, select your Workplace Services Express server name.

5. In the upper left corner, click the green square with a white triangle, as shown in Figure 5-1, to start the Workplace Services Express server.

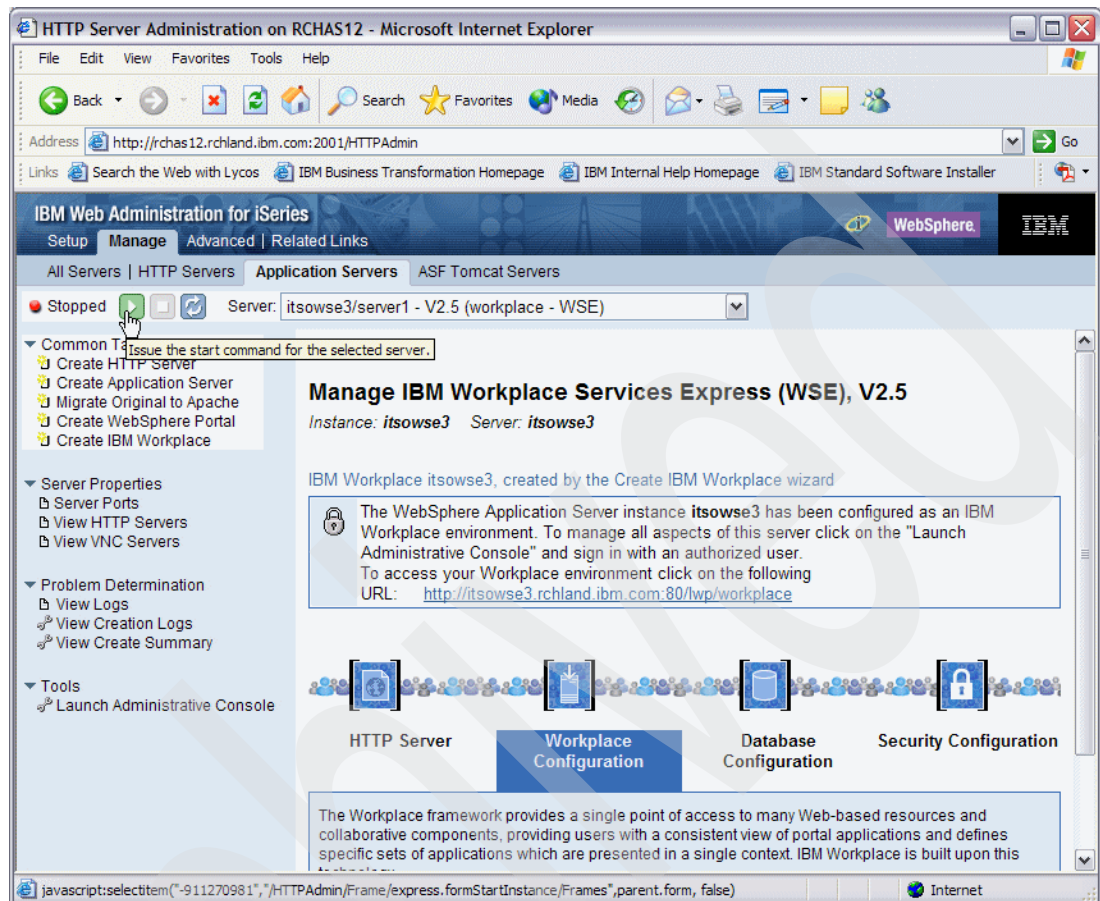


Figure 5-1 Starting a Workplace Services Express server

6. Select the Document Rendering server of your choice and click **Start**. If you have PTF SI20496 installed, you see these options:

- XVFB
- VNC

If the PTF is not installed, you can only select the virtual network computing (VNC) server as the document rendering service. In that case, make sure that the VNC server is selected and click **Start**. See Figure 5-2.

Note: We suggest that you select all options to be sure that your Workplace Services Express server functions properly. However, be aware that the Server1 server is only used to access the WebSphere Application Server Administrative Console and thus is not required to be started in most cases. For further information, refer to 9.5.1, “Startup performance tuning” on page 277.

Tip: The XVFB option was created to eliminate a known performance issue with the VNC server. We recommend that you start your server with the XVFB option.



Figure 5-2 Confirming a start request of a Workplace Services Express server

7. Watch the status in the upper left corner change. You see the text automatically change from *Starting* to *Running* when completed as shown in Figure 5-3.

Tip: Starting your server takes several minutes. To reduce the amount of time needed to start the server, refer to 9.5.1, “Startup performance tuning” on page 277.

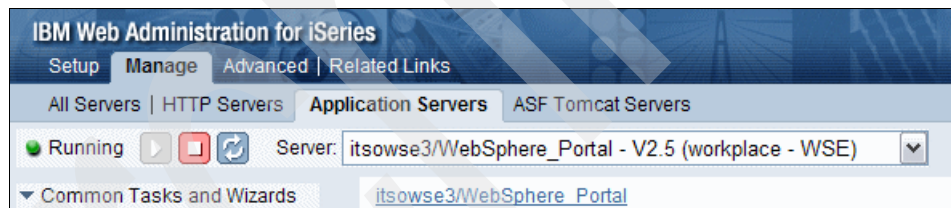


Figure 5-3 Example of running status after clicking Start

5.1.2 Stopping a Workplace Services Express server

Perform the following steps to stop a Workplace Services Express server using IBM Web Administration for iSeries:

1. To access IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
 In our example, we use:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.

4. To manage your Workplace Services Express server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. In the Server drop-down list, select your Workplace Services Express server name.
5. Click the red square with the small white square inside of it, as shown in Figure 5-4, to stop the Workplace Services Express server.



Figure 5-4 Stopping a Workplace Services Express server

6. In the next pane (Figure 5-5), review the selections and click **Stop** to stop the server.

Tip: Stopping the Workplace Services Express server using IBM Web Administration for iSeries ends all servers for you at one time. Be sure that all items are selected so all jobs and servers are ended for you.

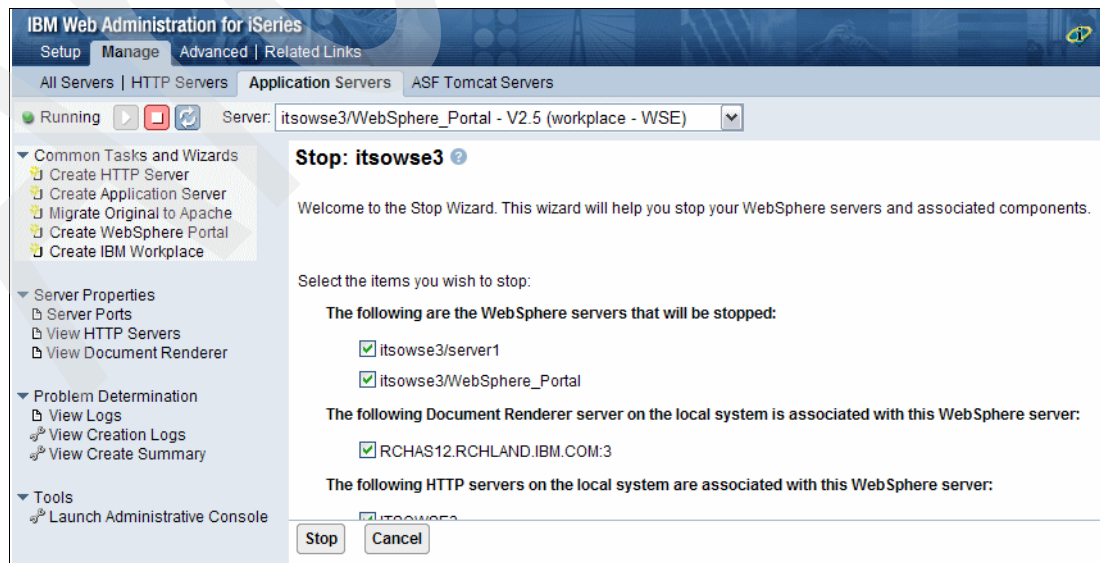


Figure 5-5 Confirming the stop request of a Workplace Services Express server

7. Watch the status in the upper left corner change. You see the text automatically change to *Stopped* when completed as shown in Figure 5-6.

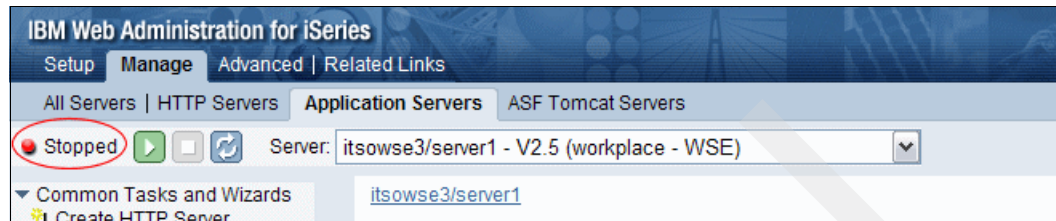


Figure 5-6 A stopped Workplace Services Express server

5.2 Reviewing the Workplace Services Express configuration

As you administer the Workplace Services Express server, you might encounter times when it can be helpful to review the options taken during the iSeries Create IBM Workplace wizard. One common reason to review this information is to determine the database schema names being used by your Workplace Services Express server. For example, it is important to know the database names before you begin disaster recovery planning for your server. To find the configuration summary, you can display the printable summary page generated by the iSeries Create IBM Workplace wizard.

There are two ways to access the printable summary:

- ▶ You can locate the file in the integrated file system on the iSeries server. The file name and path of the printable summary file is `/QIBM/UserData/WebAS5/Base/WSEServerName/logs/IBMWizPrintableSummary.html`. Here *WSEServerName* represents your Workplace Services Express server name.
- ▶ You can also use IBM Web Administration for iSeries to view the printable summary.

Perform the following steps to locate the printable summary using IBM Web Administration for iSeries:

1. To access IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
In this example, we enter:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your Workplace Services Express server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. Select your Workplace Services Express server name in the Server drop-down list.

5. As shown in Figure 5-7, in the left pane, click **View Create Summary**.

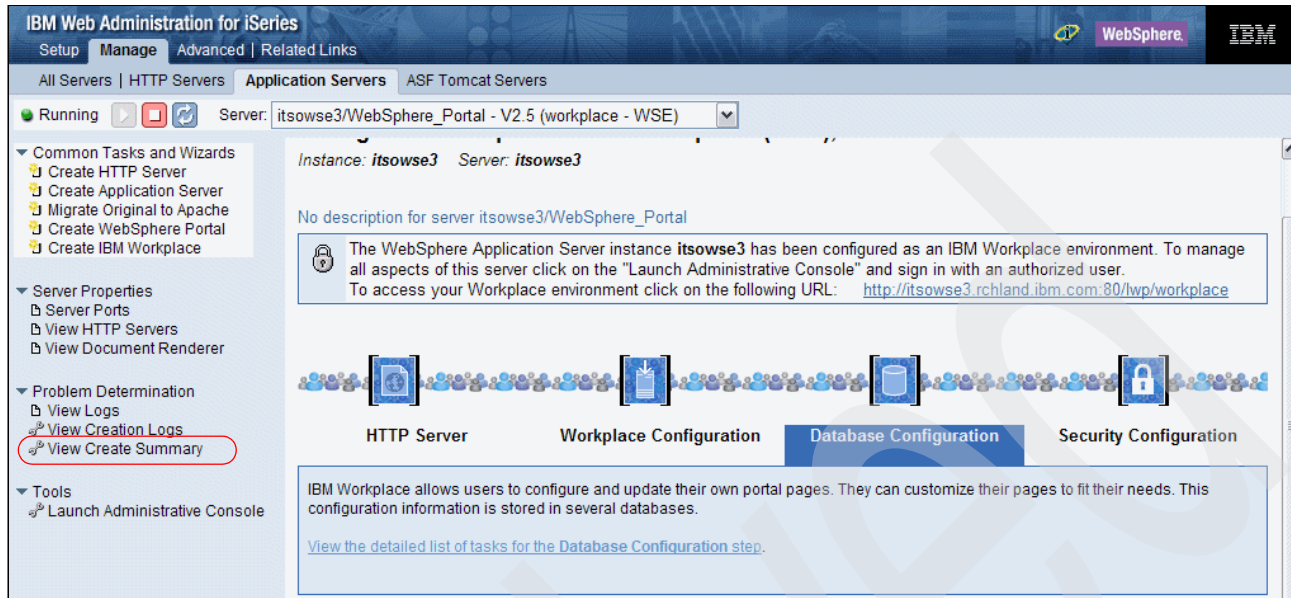


Figure 5-7 Selecting the creation summary from IBM Web Administration for iSeries

6. Using either method mentioned earlier in this section, a printable summary page opens in your browser (Figure 5-8). You might want to review the following items in the summary:
- The database user profile name
 - The portal database (also known as the *portal schema*)
 - The name of the IBM HTTP for iSeries server
 - DB2 Universal Database database file names
 - Document rendering server host name and display number

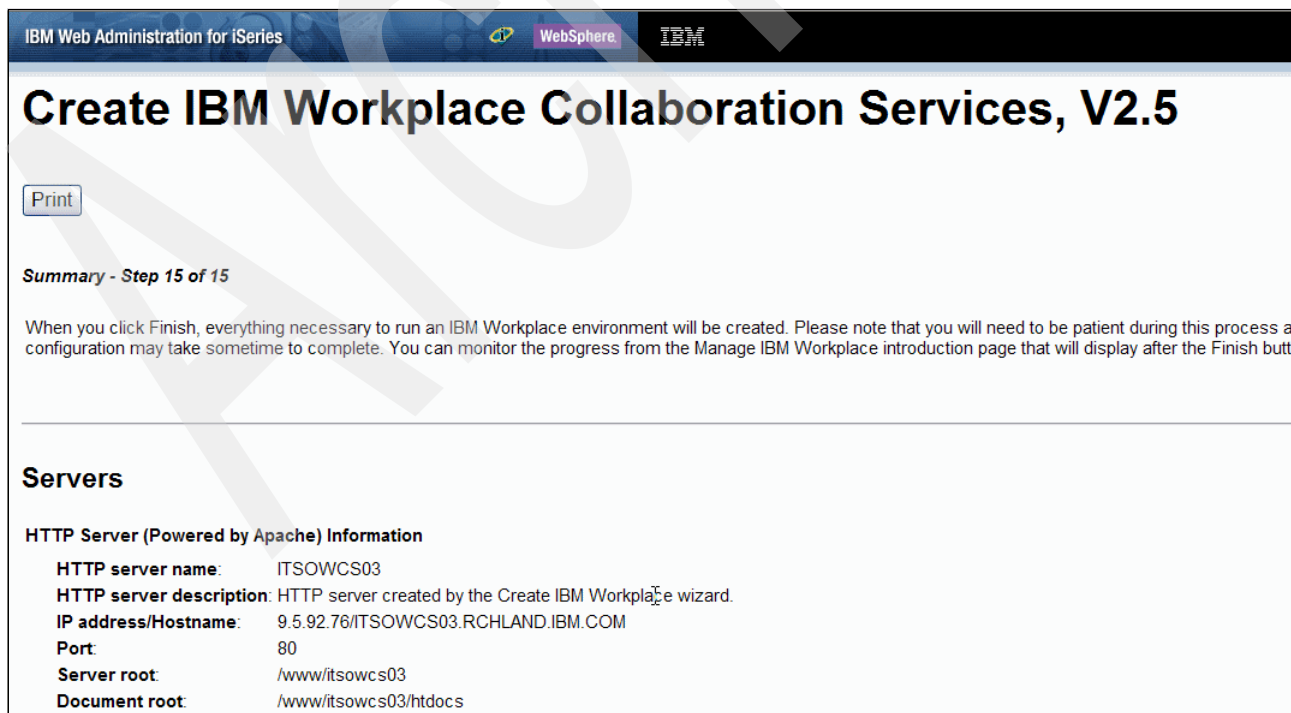


Figure 5-8 iSeries Create IBM Workplace wizard printable summary

5.3 Verifying a Workplace Services Express server is active

After you start the Workplace Services Express server, you can verify that all of the jobs are active and running normally. To be sure the Workplace Services Express server is fully functional, you must verify that multiple servers are running. These servers include the LDAP server, the external HTTP server, the document rendering server, and the Workplace Services Express Server.

The LDAP server should be running before you start the Workplace Services Express server; we do not cover that here. Refer to your LDAP server's documentation for information about starting the LDAP server and the steps to verify that the LDAP server is running.

In Chapter 4, "Installing and configuring Workplace Services Express" on page 71, we show how to configure the IBM HTTP Server for iSeries within the iSeries Create IBM Workplace wizard. In the wizard, the HTTP server name defaults to the same name as the Workplace Services Express server name.

After the IBM HTTP Server being used by your Workplace Services Express server starts, you see five jobs running under the QHTTPSVR subsystem with your Workplace Services Express server name. To determine the name of the IBM HTTP Server for iSeries instance being used, refer to 5.2, "Reviewing the Workplace Services Express configuration" on page 110. For information about starting and stopping an IBM HTTP Server for iSeries instance, see 5.4, "Managing an IBM HTTP Server for iSeries server" on page 123.

The document rendering server is started in the background when you start the Workplace Services Express server via IBM Web Administration for iSeries. To verify that the document rendering server is active, you must know the display number for your document rendering server. You can find this in the printable summary document created by the iSeries Create IBM Workplace wizard. For information about locating the display number of the document rendering server, refer to 5.2, "Reviewing the Workplace Services Express configuration" on page 110.

Perform the following steps to verify that the document rendering server is active:

1. Log onto the iSeries server with a 5250 session.
2. Enter the following CL command to access the Portable Application Solutions Environment (PASE):

```
call qp2term
```

3. Enter the following PASE command to verify that the job is active:

```
ps gauwx | grep :DisplayNumber
```

Here *DisplayNumber* represents the display number of your document rendering server. See Figure 5-9.

```
$
> ps gauwx | grep :1
qejsvr 1787 0.0 0.0 3024 0 - A 13:26:23 0:17 /QOpenSys/QIBM/ProdData/DeveloperTools/icewm/bin/icewm
qejsvr 1772 0.0 0.0 4976 0 - A 13:26:20 0:06 /QOpenSys/QIBM/ProdData/DeveloperTools/vnc/Xvnc :1
-desktop X -httpd
/
dalandon 5658 0.0 0.0 7028 0 - A 12:08:17 0:00 /QOpenSys/usr/bin/-sh -i
$

==>
F3=Exit    F6=Print  F9=Retrieve F11=Truncate/Wrap
F13=Clear  F17=Top   F18=Bottom F21=CL command entry
```

Figure 5-9 Verifying that a document rendering server is active

A Workplace Services Express server runs in the QEJBAS5 subsystem. In this subsystem, you should see three active jobs for each Workplace Services Express server running. These jobs are QJVAEXEC, SERVER1, and WEBSPHERE_PORTAL (WEBSPHERE_).

- ▶ The QJVAEXEC job is started by the WEBSPHERE_PORTAL job and is required for instant messaging functionality.
- ▶ The SERVER1 job is used during the initial configuration process to configure the Workplace Services Express server. It is also used to administer the server via the WebSphere Application Server Administrative Console.
- ▶ The WEBSPHERE_PORTAL job is responsible for responding to all Workplace Services Express user requests.

There are multiple ways to determine which jobs comprise the Workplace Service Express server. The following sections explain three different methods to determine which jobs belong to your Workplace Services Express server.

- ▶ Method 1 uses iSeries Navigator to view job logs and open integrated file system files. It uses the job log and open integrated file system files to determine which jobs belong to your Workplace Services Express server. For information about this method, refer to 5.3.1, “Using iSeries Navigator to view active jobs (method 1)” on page 114.
- ▶ Method 2 uses iSeries Navigator to view job logs and the time a job entered the system. It uses the job log and the time stamp to determine which jobs belong to your Workplace Services Express server. For information about this method, refer to 5.3.2, “Using iSeries Navigator to view active jobs (method 2)” on page 117.
- ▶ Method 3 uses i5/OS CL commands to view job logs and job numbers. It uses the job log and job number to determine which jobs belong to the Workplace Services Express server. For information about this method, refer to 5.3.3, “Using i5/OS commands to view active jobs (method 3)” on page 120.

5.3.1 Using iSeries Navigator to view active jobs (method 1)

Perform the following steps to find the jobs that make up the Workplace Services Express server using iSeries Navigator:

1. From iSeries Navigator, in the left pane, click **My Connections** → **iSeries system name** → **Work Management** → **Subsystems** → **Active Subsystems** → **Qejbas5** as shown in Figure 5-10. Here you see a Qjvaexec, Server1, and Wepsphere_Portal (WebSphere_) job for each running Workplace Services Express server.

Note: You might not see an even number of Server1, WebSphere_, and Qjvaexec jobs if you are running other WebSphere Application Servers in the QEJBAS5 subsystem.

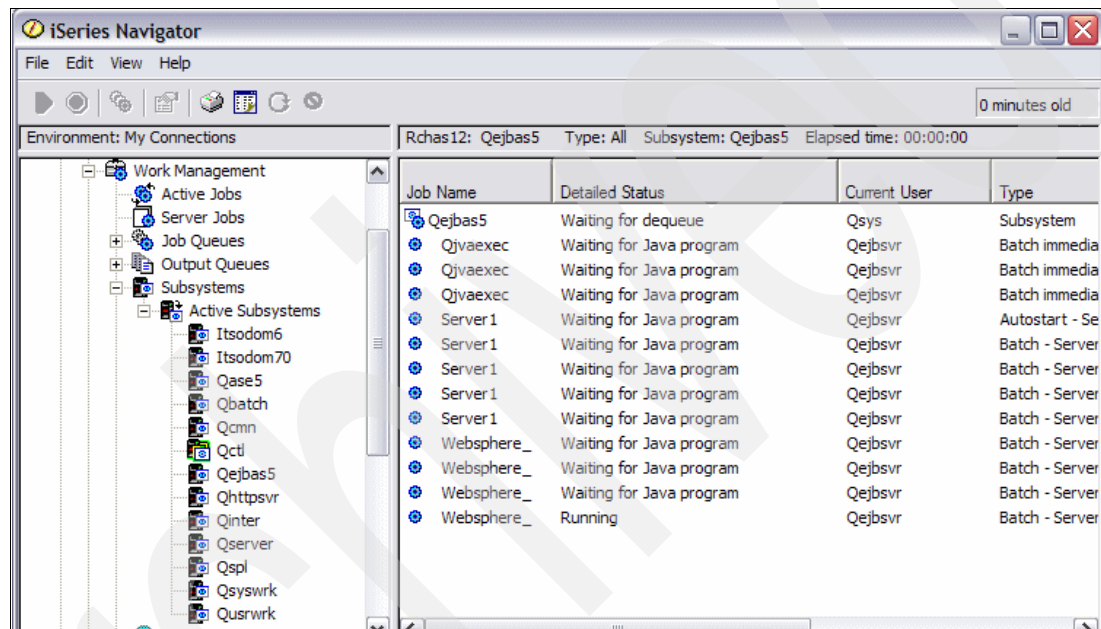


Figure 5-10 Viewing active jobs in the Qejbas5 subsystem with Series Navigator

2. If you are running multiple Workplace Services Express servers, you must know which jobs are associated with each Workplace Services Express server. Right-click a **WebSphere_** job and click **Job Log**. The job log contains the Workplace Services Express server name as shown in Figure 5-11.

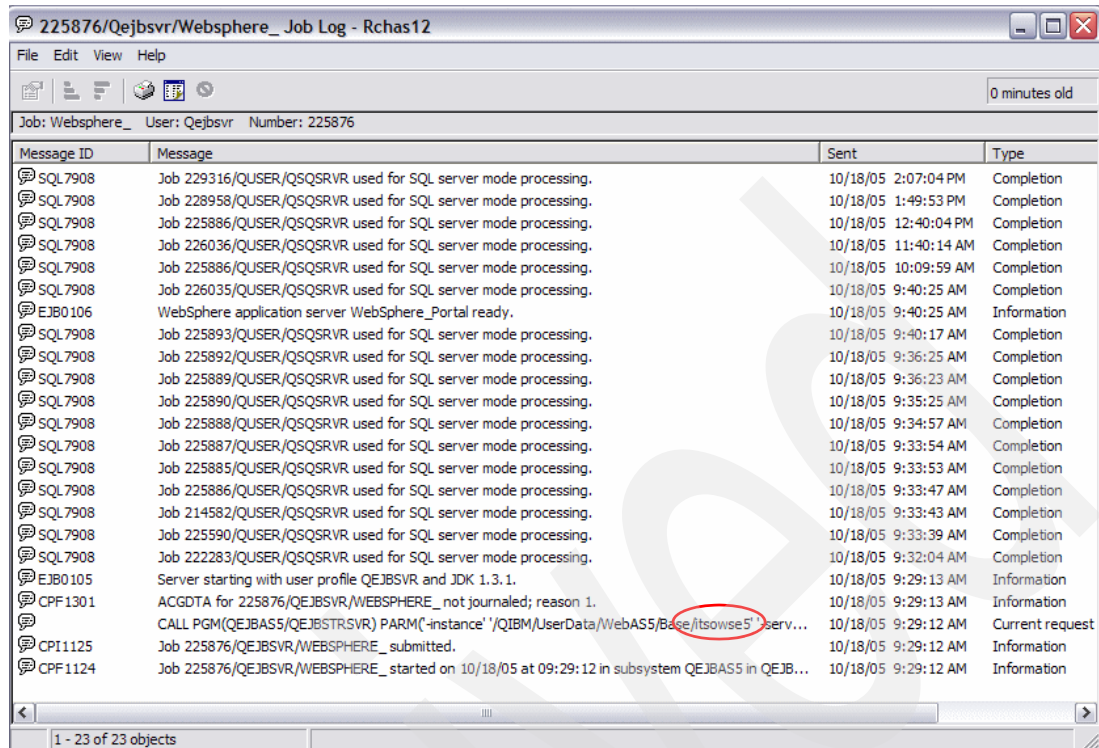


Figure 5-11 Viewing the WebSphere_ job log with iSeries Navigator

- To find the correct Server1 job, you can also review the job log as you did with the WebSphere_Portal (WebSphere_) job.
- Unfortunately, you cannot use this method to find the Qjvaexec job because the job log for the Qjvaexec job does not contain the Workplace Services Express server name. To determine which Qjvaexec job belongs to your Workplace Services Express server, you can view the open integrated file system objects for the job. You should see files for your Workplace Services Express server in the Qjvaexec job's file system objects list. Right-click **Qjvaexec** and then click **Details** → **Open Files** → **File System Objects** as shown in Figure 5-12.

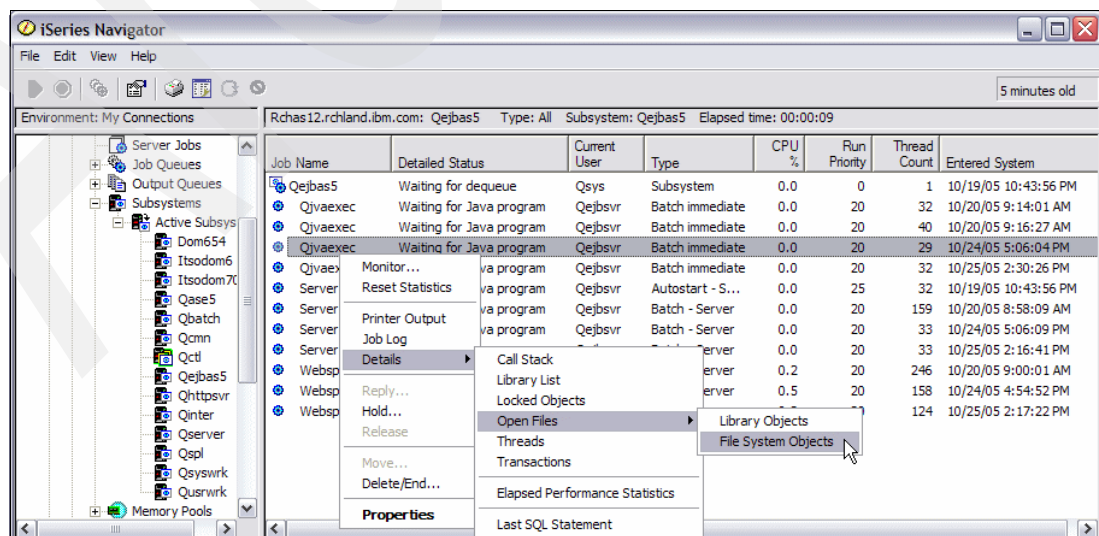


Figure 5-12 Opening file system objects for the Qjvaexec job with iSeries Navigator

- In the Qjvaexec File System Objects window, review the list of open files. The list is long and you must scroll down to find the group of files containing the Workplace Services Express server name. You should now be able to determine whether this is the correct job for your Workplace Services Express server as shown in Figure 5-13.

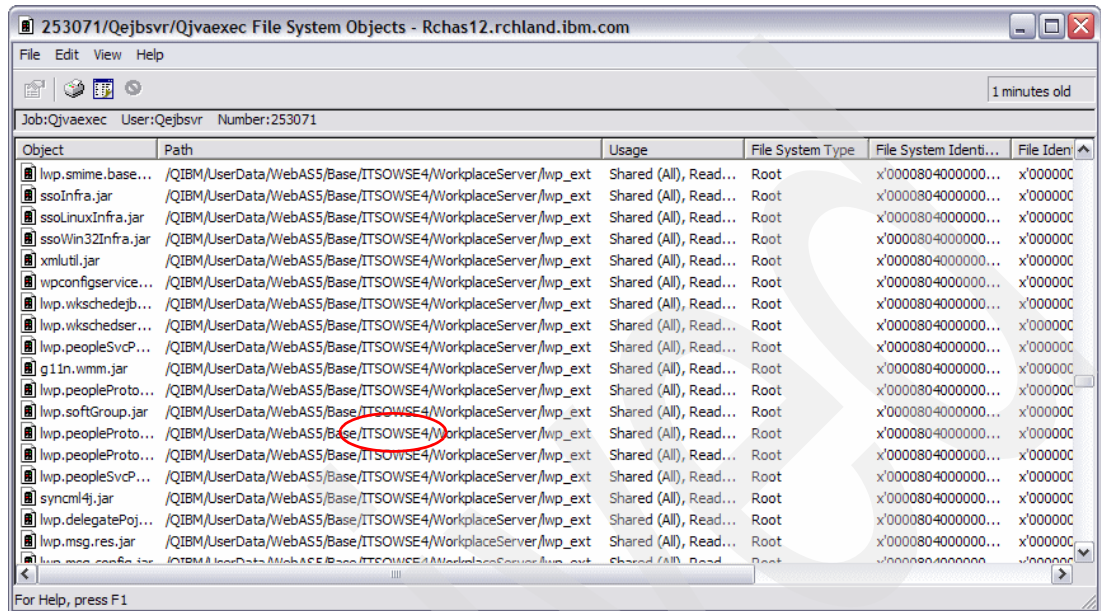


Figure 5-13 Viewing the open file system objects for the Qjvaexec job with iSeries Navigator

- To view the IBM HTTP Server jobs, in the left pane of iSeries Navigator, click **My Connections** → **iSeries system name** → **Work Management** → **Subsystems** → **Active Subsystems** → **Qhttpsvr**. You see five jobs with the name of your IBM HTTP Server as shown in Figure 5-14. These jobs compose the IBM HTTP Server for iSeries.

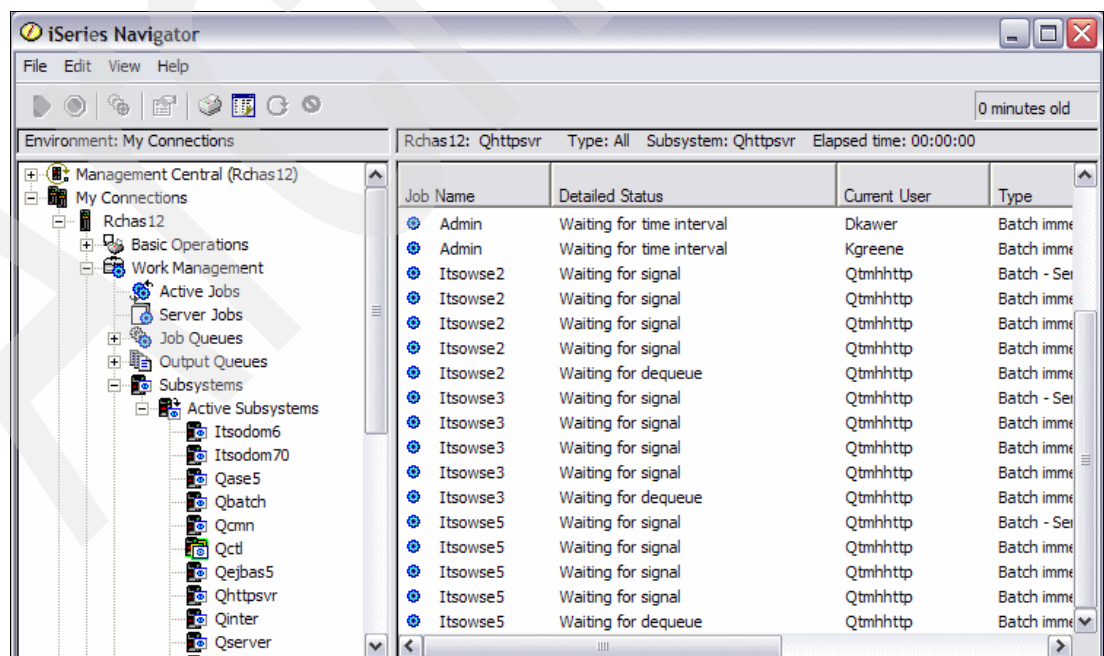


Figure 5-14 Viewing the active jobs in the Qhttpsvr subsystem with iSeries Navigator

5.3.2 Using iSeries Navigator to view active jobs (method 2)

Perform the following steps to find the jobs that make up the Workplace Services Express server using iSeries Navigator:

1. From iSeries Navigator, in the left pane, click **My Connections** → **iSeries system name** → **Work Management** → **Subsystems** → **Active Subsystems** → **Qejbas5** as shown in Figure 5-15. Here you see a Qjvaexec, Server1, and WebSphere_Portal (WebSphere_) job for each running Workplace Services Express server.

Note: You might not see an even number of Server1, WebSphere_, and Qjvaexec jobs if you are running other WebSphere Application Servers in the QEJBAS5 subsystem.

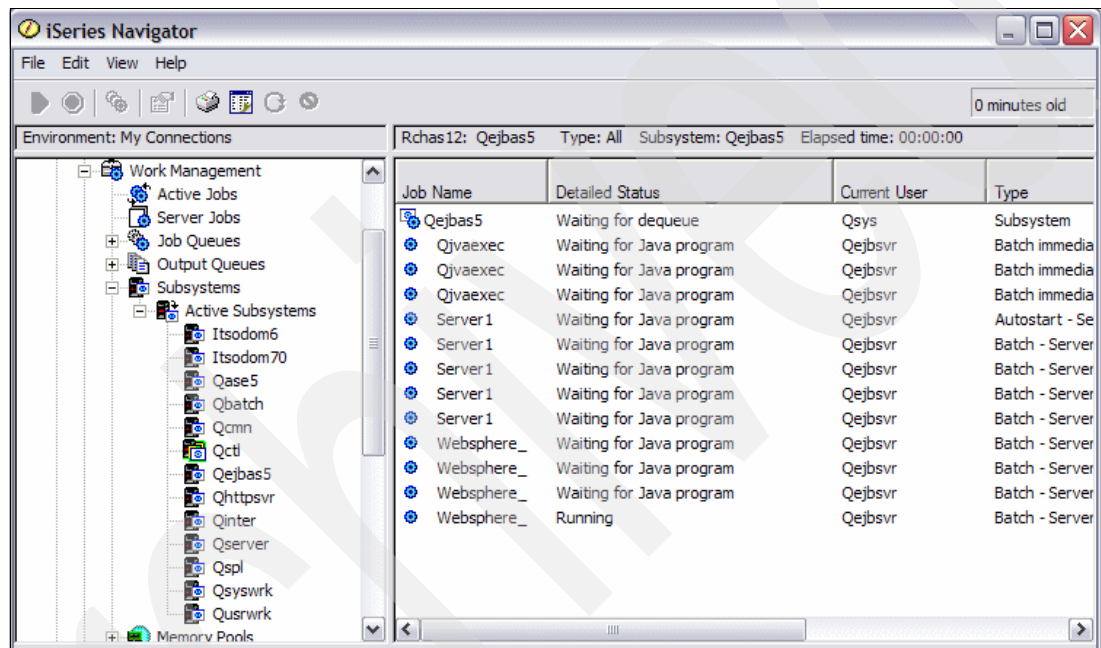


Figure 5-15 Viewing active jobs in the Qejbas5 subsystem with iSeries Navigator

- If you are running multiple Workplace Services Express servers, you must know which jobs are associated with each Workplace Services Express server. Right-click a **WebSphere_** job and click **Job Log**. The job log contains the Workplace Services Express server name as shown in Figure 5-16.

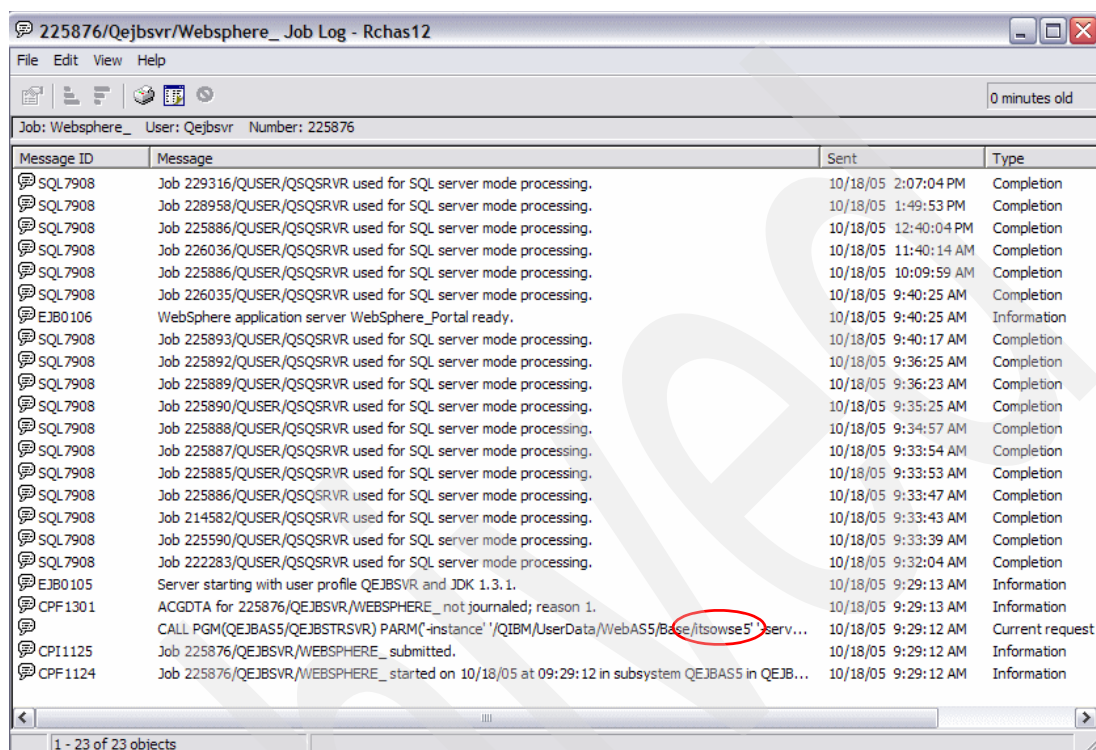


Figure 5-16 Viewing the WebSphere_ Job Log with iSeries Navigator

- To find the correct Server1 job, you can also review the job log as you did with the WebSphere_Portal (WebSphere_) job.
- Unfortunately, you cannot use this method to find the Qjvaexec job because the job log for the Qjvaexec job does not contain the Workplace Services Express server name. To determine which Qjvaexec job belongs to your Workplace Services Express server, you can find the Qjvaexec job that was started at approximately the same time as the Server1 and WebSphere_ jobs. To do this, add a column to the default active jobs view so you can see the date and time each job entered the system. Perform the following steps to add a column:
 - From iSeries Navigator, select **View** → **Customize this view** → **Columns** or press F12 as shown in Figure 5-17.

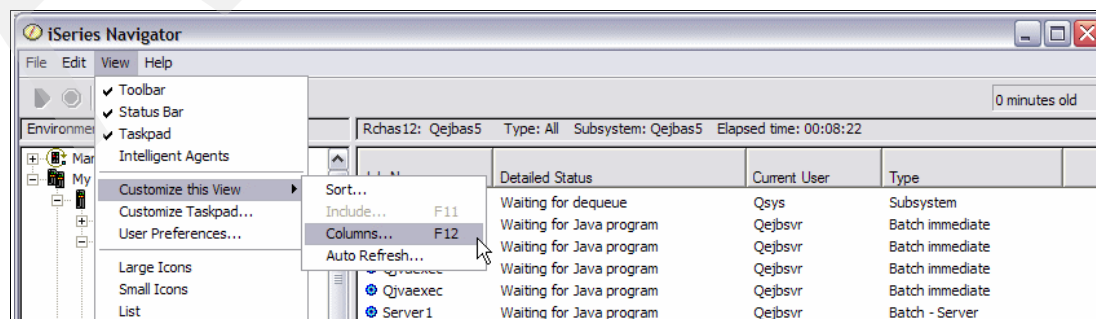


Figure 5-17 Customizing the iSeries Navigator view

- b. In the Active Jobs - Columns window (Figure 5-18), make the following changes:
 - i. Under Columns available to display, select **Entered System**.
 - ii. Under Columns to be displayed, select **Thread Count**.
 - iii. Click **Add After**.
 - iv. Click **OK** to finish adding the column.

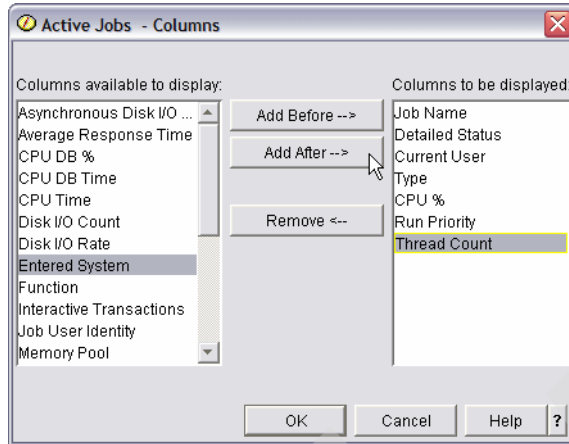


Figure 5-18 Active Jobs - Columns window

5. In iSeries Navigator, scroll to the right and click the **Entered System** heading to sort the jobs by the time they entered the system. You might have to resize some of the columns in order for all columns to fit in the window. After you do this, you can see the Workplace Services Express server jobs grouped together as shown in Figure 5-19.

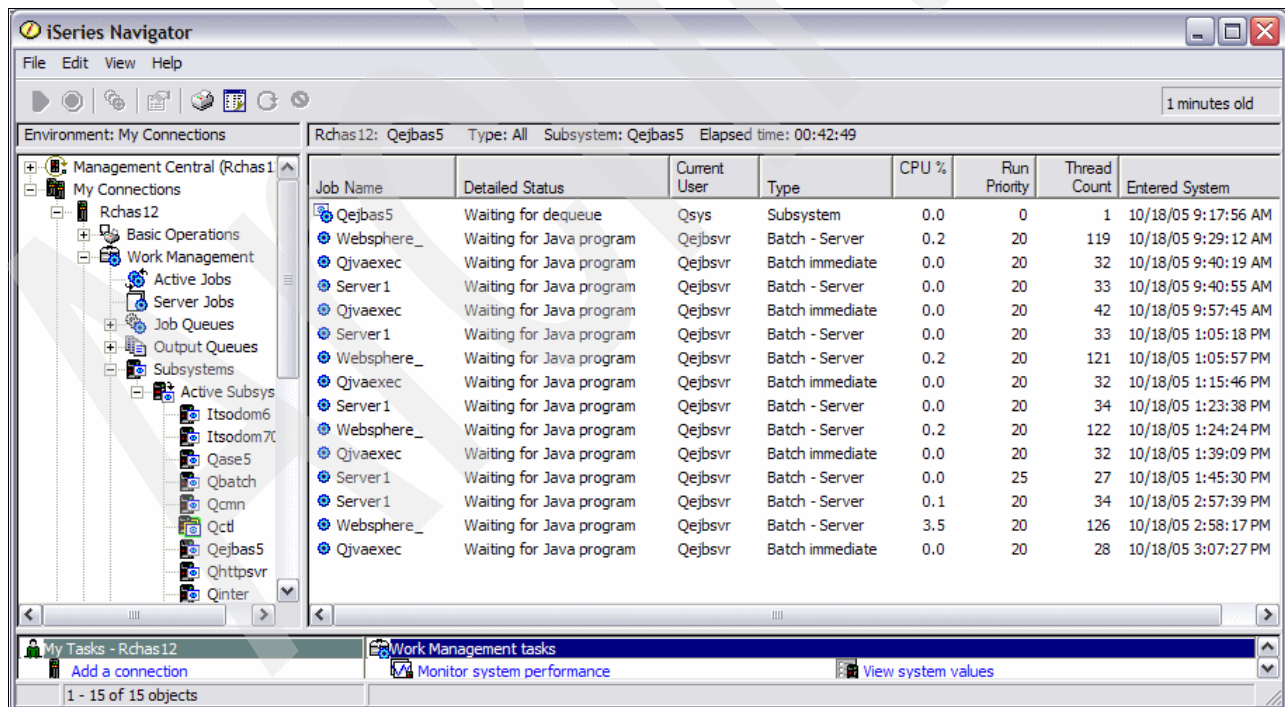


Figure 5-19 Qejbas5 subsystem jobs sorted by the time they entered the system

- To view the IBM HTTP Server jobs, in the left pane of iSeries Navigator, click **My Connections** → **iSeries system name** → **Work Management** → **Subsystems** → **Active Subsystems** → **Qhttpsvr**. You see five jobs with the name of your IBM HTTP Server as shown in Figure 5-20. These jobs compose the IBM HTTP Server for iSeries.

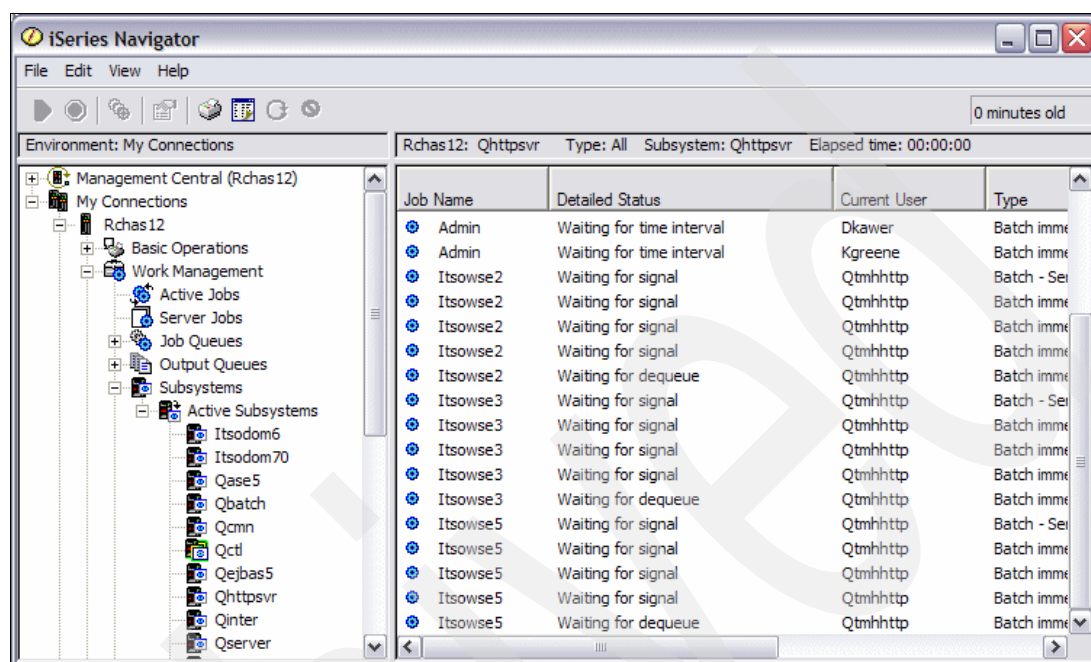


Figure 5-20 Viewing the active jobs in the Qhttpsvr subsystem with Series Navigator

5.3.3 Using i5/OS commands to view active jobs (method 3)

Perform the following steps to find the jobs that make up the Workplace Services Express server using i5/OS CL commands:

- To view all active jobs on the iSeries server, from an i5/OS command line, enter the Work with Active Jobs (WRKACTJOB) command. All active jobs are visible here and are organized by subsystem. You can find the QJAVEXEC, WEBSPPHRE_, and SERVER1 jobs under the QEJBAS5 subsystem. The IBM HTTP Server jobs run in the QHTTPSVR subsystem. See Figure 5-21.

```

Work with Active Jobs
RCHAS12
10/19/05 09:18:08
CPU %: .0 Elapsed time: 00:00:00 Active jobs: 330

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
   SERVER1 QEJBSVR BCH .0 PGM-QEJBSTRSVR JVAW
   SERVER1 QEJBSVR BCH .0 PGM-QEJBSTRSVR JVAW
   WEBSPHERE_ QEJBSVR BCH .0 * -COMMIT JVAW
   WEBSPHERE_ QEJBSVR BCH .0 * -COMMIT JVAW
   WEBSPHERE_ QEJBSVR BCH .0 * -COMMIT JVAW
   WEBSPHERE_ QEJBSVR BCH .0 * -COMMIT JVAW
   WEBSPHERE_ QEJBSVR BCH .0 * -COMMIT JVAW
   QHTTSPVR QSYS SBS .0 DEQW
   ADMIN QTMHHTTP BCH .0 PGM-QZHBMAIN SIGW

Parameters or command
===>
F3=Exit F5=Refresh F7=Find F10=Restart statistics
F11=Display elapsed data F12=Cancel F23=More options F24=More keys
More...

```

Figure 5-21 Using WRKACTJOB to find active Workplace Services Express jobs

2. If you are running multiple Workplace Services Express servers, you must know which jobs are associated with each Workplace Services Express server. Enter option 5 (Work with) next to the WEBSPHERE_ job and press Enter.
3. On the Work with Job display, enter option 10 (Display job log, if active or on job queue) to view the job log. The first line in the job log contains the Workplace Services Express server name as shown in Figure 5-22. In our example, the name of the Workplace Services Express server is **itsowse3**.

```

Display Job Log
System: RCHAS12
Job . . : WEBSPHERE_ User . . : QEJBSVR Number . . . : 225876

>> CALL PGM(QEJBAS5/QEJBSTRSVR) PARM('-instance' '/QIBM/UserData/WebAS5/Base/
      itsowse3' '-server' 'WebSphere_Portal')

Bottom

Press Enter to continue.

F3=Exit F5=Refresh F10=Display detailed messages F12=Cancel
F16=Job menu F24=More keys

```

Figure 5-22 Viewing the job log for the WebSphere_Portal (WEBSPHERE_) job

4. Press F3 (Exit) to exit the job log. You should now see the Work with Active Jobs display.
5. To find the correct Server1 job, you can also review the job log as you did with the WebSphere_Portal (WEBSPHERE_) job.

- Unfortunately you cannot use this method to find the QJVAEXEC job because the job log for the QJVAEXEC job does not contain the Workplace Services Express server name. To determine which QJVAEXEC job belongs to your Workplace Services Express server, you can find the QJVAEXEC job that was started at the same time as the SERVER1 and WEBSPHERE_ jobs.

Review the job log of the SERVER1 job of your Workplace Services Express server and make a note of the job number. Within i5/OS, jobs are started with a unique and sequential job number.

- To find the jobs that were started at approximately the same time as the WEBSPHERE_ and SERVER1 jobs of your Workplace Services Express server, you can sort the jobs on the WRKACTJOB display by job number. To view the job numbers in the Work with Active Jobs display, press F11 twice. Figure 5-23 shows how your display should look now.

```

                                Work with Active Jobs
                                RCHAS12
                                10/19/05 09:46:48
CPU %:      5.3      Elapsed time:  00:28:39      Active jobs:  333

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      Number  Type  CPU %  Threads
-----
SERVER1  QEJBSVR      231202  BCH    .0     33
SERVER1  QEJBSVR      234830  BCH    .0     34
WEBSPHERE_ QEJBSVR      225876  BCH    .5    268
WEBSPHERE_ QEJBSVR      228776  BCH    .2    123
WEBSPHERE_ QEJBSVR      229196  BCH    .5    153
WEBSPHERE_ QEJBSVR      231279  BCH    .5    154
WEBSPHERE_ QEJBSVR      234795  BCH    1.0    149
QHTTSPVR  QSYS          199725  SBS    .0      1
ADMIN     QTMHHTTP      232284  BCH    .0      1

More...

Parameters or command
===>
F3=Exit   F5=Refresh   F7=Find   F10=Restart statistics   F11=Display status
F12=Cancel F17=Top      F18=Bottom F23=More options        F24=More keys

```

Figure 5-23 Work with Active Jobs display showing job numbers

8. To sort all of the jobs by job number, place your cursor on the Number column and press F16. You should now find a QJVAEXEC job that started at approximately at the same time as the SERVER1 or WEBSPHERE_ job as shown in Figure 5-24.

| Work with Active Jobs | | | | | | |
|---|---------------|---------------|------------------------|--------------------|-------|---------|
| | | | RCHAS12 | | | |
| | | | 10/19/05 09:53:13 | | | |
| CPU %: | 7.3 | Elapsed time: | 00:35:04 | Active jobs: | 333 | |
| 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 | Number | Type | CPU % | Threads |
| | QJVAEXEC | QEJBSVR | 226818 | BCI | .0 | 42 |
| | QSQSRVR | QUSER | 226802 | PJ | .0 | 1 |
| | QSQSRVR | QUSER | 226791 | PJ | .0 | 1 |
| | QSQSRVR | QUSER | 226790 | PJ | .0 | 1 |
| | QSQSRVR | QUSER | 226787 | PJ | .0 | 1 |
| | QSQSRVR | QUSER | 226775 | PJ | .0 | 1 |
| | SERVER1 | QEJBSVR | 226233 | BCH | .0 | 161 |
| | QJVAEXEC | QEJBSVR | 226037 | BCI | .0 | 42 |
| | QSQSRVR | QUSER | 226035 | PJ | .0 | 1 |
| | | | | | | More... |
| Parameters or command | | | | | | |
| ===> | | | | | | |
| F3=Exit | F5=Refresh | F7=Find | F10=Restart statistics | F11=Display status | | |
| F12=Cancel | F17=Top | F18=Bottom | F23=More options | F24=More keys | | |

Figure 5-24 Viewing all active jobs sorted by job number in the Work with Active Jobs display

5.4 Managing an IBM HTTP Server for iSeries server

You can use IBM Web Administration for iSeries to access the IBM HTTP Server for iSeries configuration. You might have to update the configuration for performance reasons, and you must understand where to manage the server configuration. To manage your IBM HTTP Server for iSeries, perform the following steps:

1. To access IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
<http://iSeriesHostName.domain:2001>
 In our example, we enter:
<http://rchas12.rchland.ibm.com:2001>
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your HTTP server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **HTTP Servers** tab.
 - c. In the Server field, select your HTTP server name. If you do not know the name of your IBM HTTP Server for iSeries server name, refer to 5.2, "Reviewing the Workplace Services Express configuration" on page 110.

- d. You can now manage your IBM HTTP Server for iSeries server by selecting any of the options in the left pane. You can also determine if the server is running or stopped by reviewing the status in the upper left corner of the pane as shown in Figure 5-25.

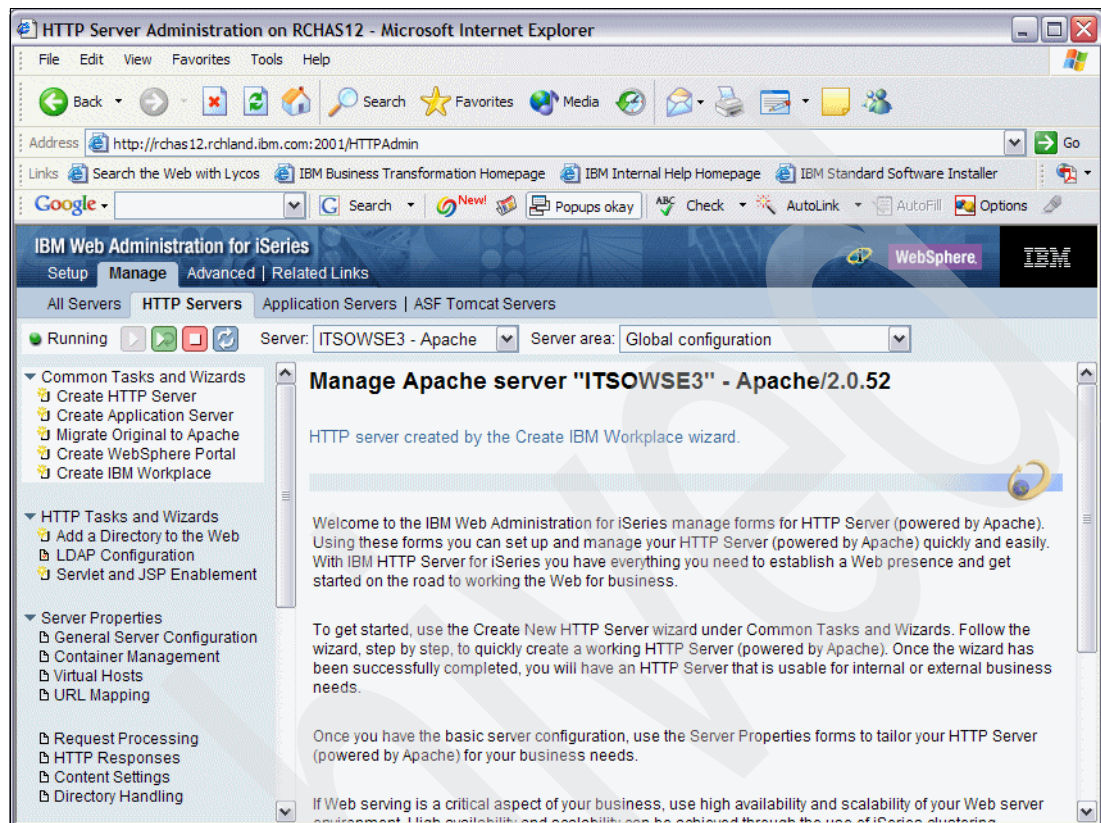


Figure 5-25 Managing the IBM HTTP Server for iSeries server

5.5 Accessing a Workplace Services Express server

The only client available for use with a Workplace Services Express server is a Web browser. For information regarding supported Web browsers, refer to 2.7, “Client requirements” on page 31. The URL that you should use to access the Workplace Services Express server is provided for your reference in IBM Web Administration for iSeries. Perform the following steps:

1. To access IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
 In our example, we use:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.

4. If you must select your Workplace Services Express server, in IBM Web Administration for iSeries, follow these steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. In the Server drop-down list, select your Workplace Services Express server name.
5. In the middle of the right pane, you see a box that gives you the URL to access the Workplace Services Express server as shown in Figure 5-26. Click the URL link or type the URL manually into a Web browser. In the following example, you substitute your own details for the items in *italics*:

`http://host.domain:port/lwp/workplace`

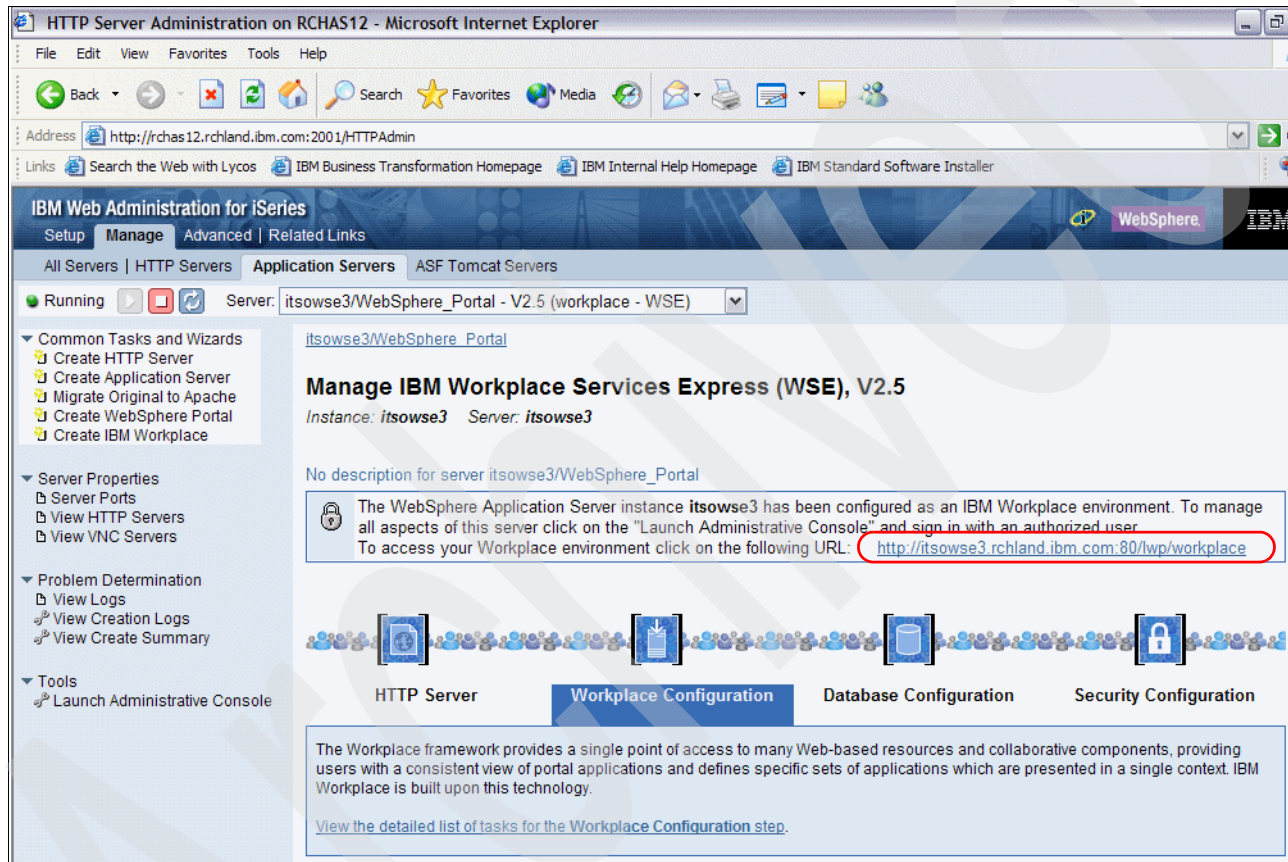


Figure 5-26 Managing the Workplace Services Express server in the IBM Web Administration for iSeries tool

- The window that opens first when you access the Workplace Services Express server is blank, except for the banner at the top of the page. In the upper right corner of the pane, you have the option to Log In or Sign up. See Figure 5-27.

Note: The Sign up link is displayed only if you allowed write access to the LDAP directory. If you do not want your users to Sign up, refer to 5.10, “Removing the Sign up and Edit my profile links” on page 156.

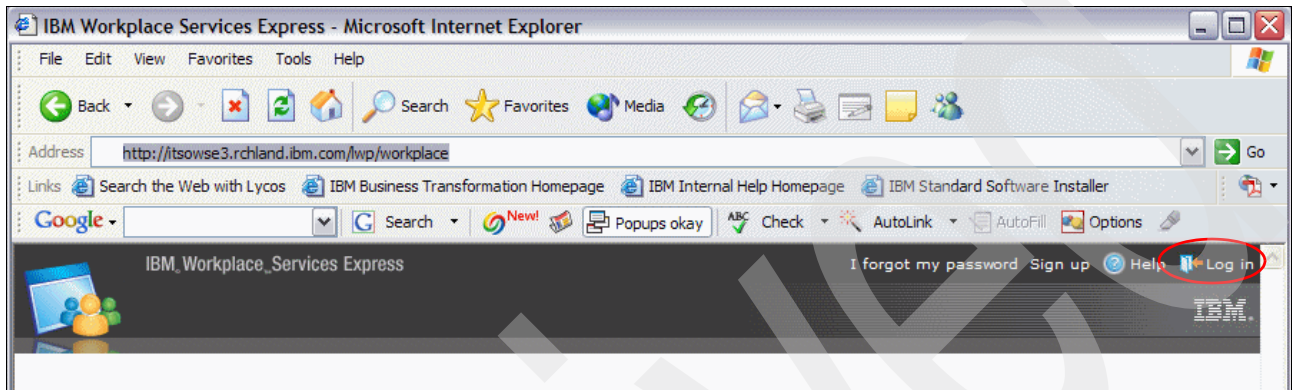


Figure 5-27 Logging into Workplace Services Express

- In the next pane, click **Log in** to log in to the Workplace Services Express server. Any user in the LDAP directory with a proper user ID and password can now log into the server. You can optionally log in as the Workplace Services Express administrator to administer the Workplace Services Express server as shown in Figure 5-28.

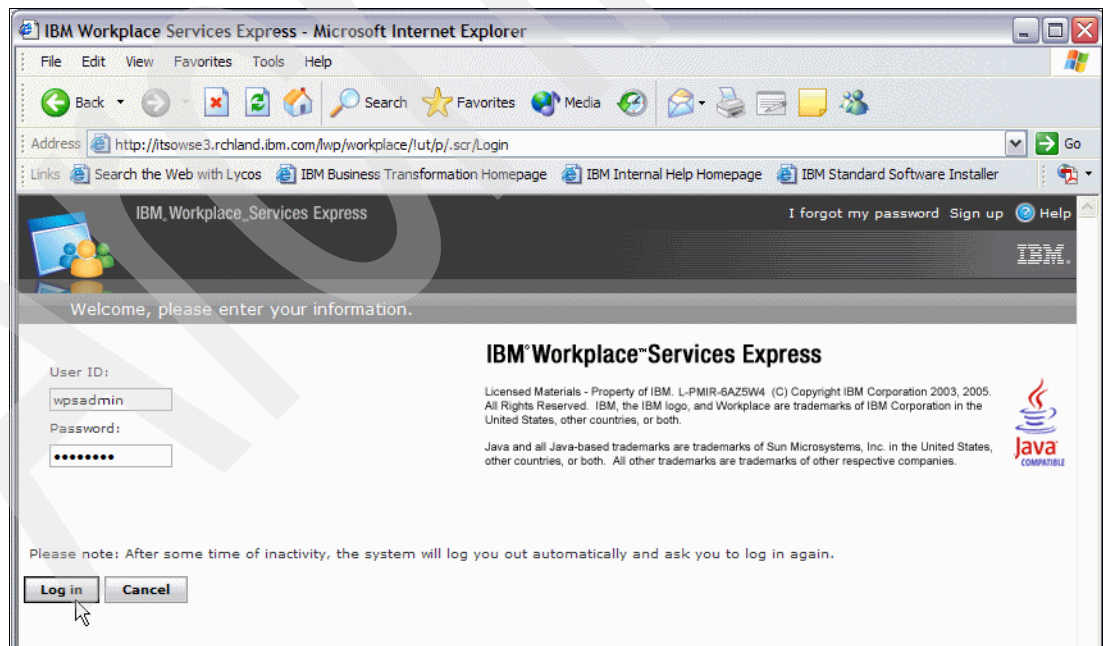


Figure 5-28 Logging into Workplace Services Express as the administrator, wpsadmin

After you log into Workplace Services Express, you see a window similar to the example in Figure 5-29.

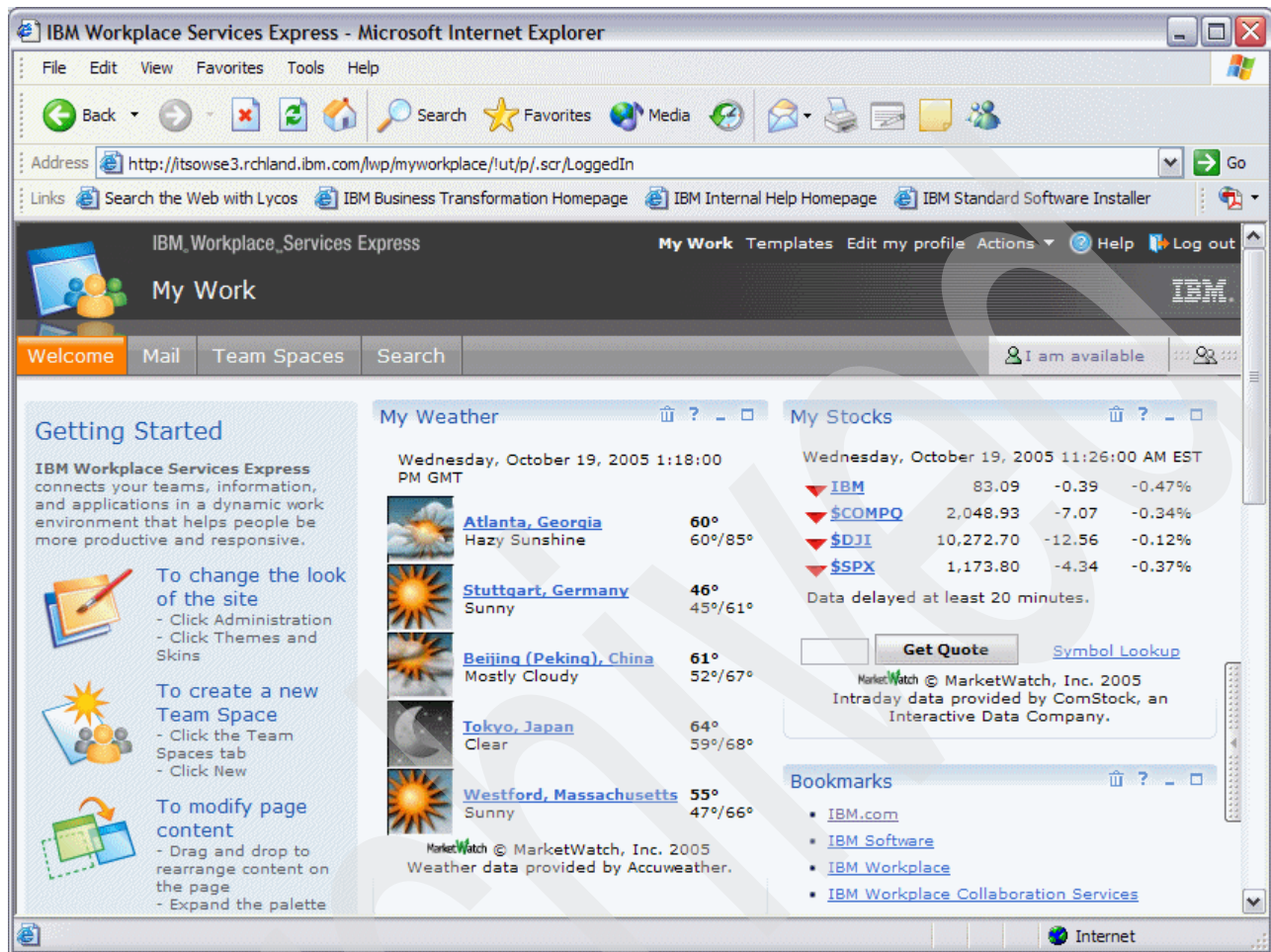


Figure 5-29 Initial default window after logging into Workplace Services Express

5.6 Accessing the WebSphere Application Server Administrative Console

The administrative console for the WebSphere Application Server is where you make modifications to the Workplace Services Express configuration. You can make changes in regard to:

- ▶ User policies
- ▶ Security (such as configuring single sign-on (SSO))
- ▶ Performance

If you know the URL to access the WebSphere Application Server Administrative Console, you can enter it into your Web browser manually. Alternatively, you can use a link that is provided for you in IBM Web Administration for iSeries. To access the WebSphere Application Server Administrative Console from IBM Web Administration for iSeries, perform the following steps:

1. To access IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
 In our example, we enter:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your Workplace Services Express server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. In the Server drop-down list, select your Workplace Services Express server name.
5. In the left pane, click **Launch Administrative Console** to launch the WebSphere Application Server Administrative Console. See Figure 5-30.

Note: Be aware that selecting Launch Administrative Console from either one of the Workplace Services Express servers, Server1 or WebSphere_Portal, brings you to the same place.

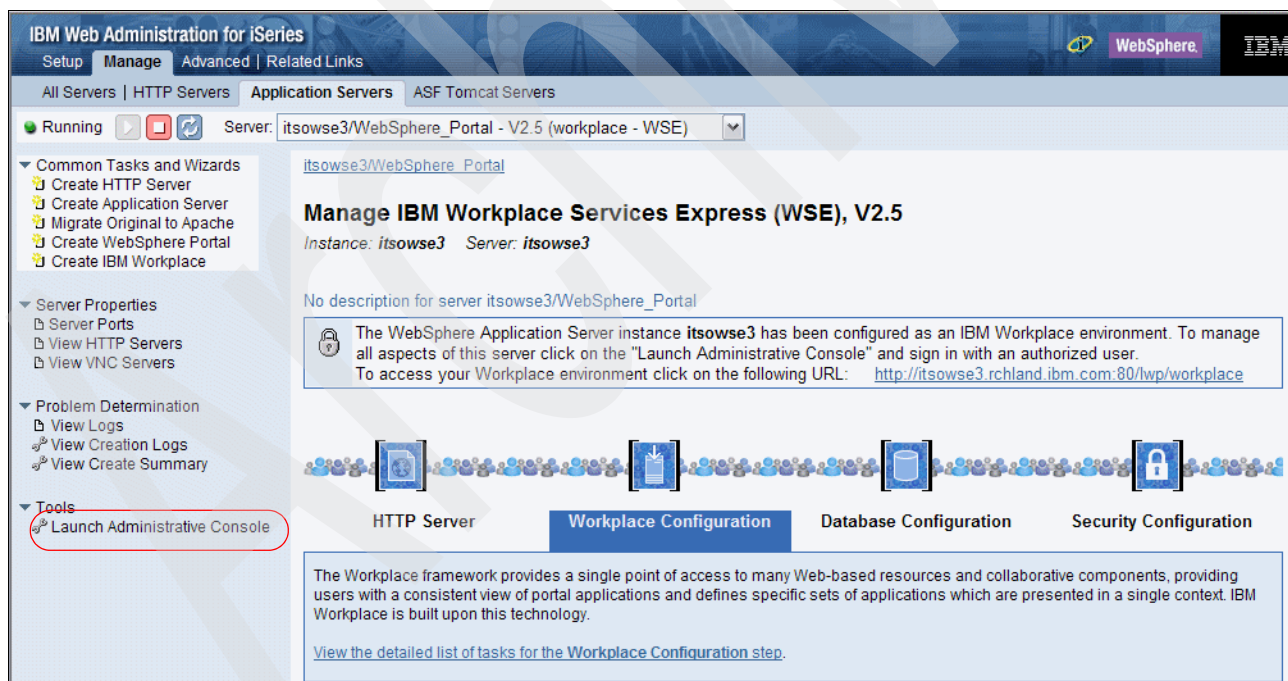


Figure 5-30 Launching the WebSphere Application Server Administrative Console for Workplace Services Express

6. A new Web browser window opens with a logon page for the WebSphere Application Server Administrative Console (Figure 5-31). You must log into the console using the administrator user ID and password that you chose as part of the configuration process of the Workplace Services Express server. For our example, this is wpsadmin.

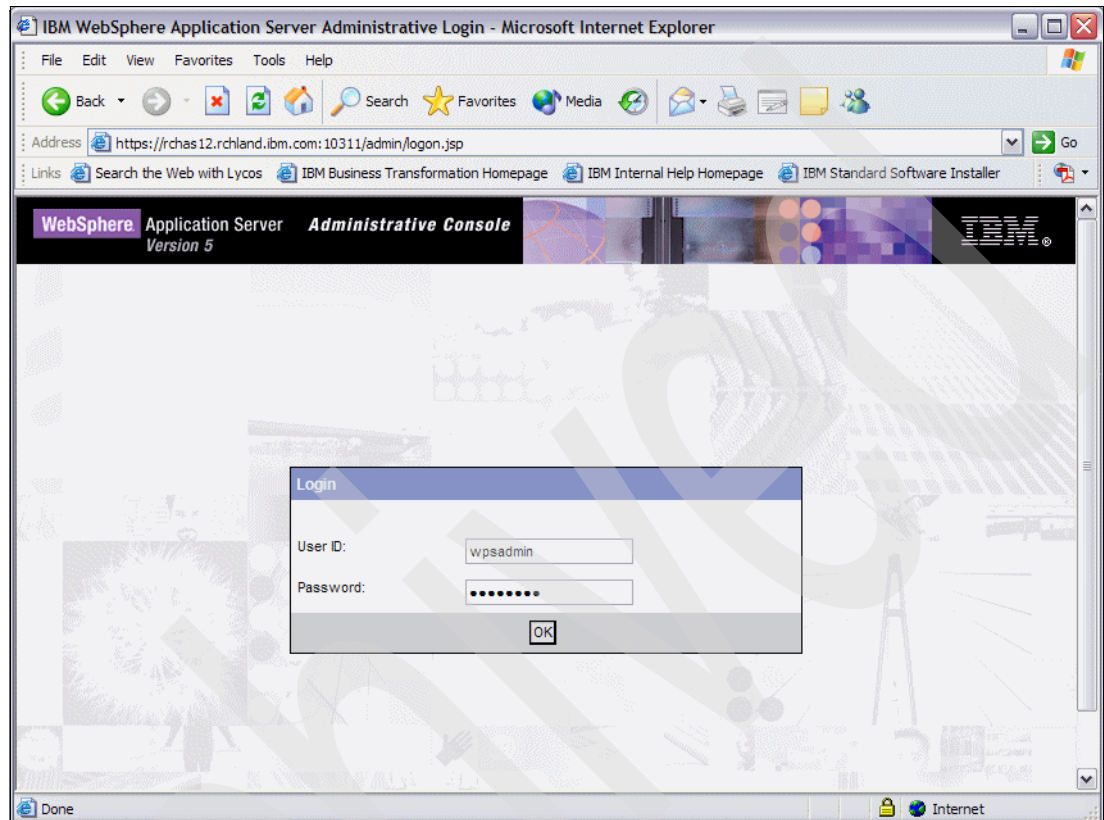


Figure 5-31 Login page for the WebSphere Application Server Administrative Console

At this point in this redbook, we do not explain how to modify the server configuration. However, the remainder of this redbook assumes that you know how to access the WebSphere Application Server Administrative Console as demonstrated in this section.

For more information about administering Workplace Services Express, refer to the IBM Workplace Services Express Version 2.5.x Information Center at:

<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>

5.7 Changing administrator account passwords

You must make necessary Workplace Services Express server configuration modifications to change the password for the following users:

- ▶ Database administrator (DB2 Universal Database database owner user profile)
- ▶ Workplace Services Express administrator
- ▶ LDAP administrator password

5.7.1 Changing the database administrator password

Use the following steps to change the database administrator password.

Tip: If your company's security policy requires that you change all passwords periodically, but you do not know which user profile is being used by your Workplace Services Express server, refer to 5.2, "Reviewing the Workplace Services Express configuration" on page 110.

Important: We recommend that you perform this procedure after normal business hours.

1. End the HTTP server being used by your Workplace Services Express server to prevent user interaction with Workplace Services Express while you perform the password changes.
2. Change the password for the database owner's user profile. You can use the Change User Profile (CHGUSRPRF) CL command to update the password, for example:

```
CHGUSRPRF USRPRF(WSEDBUSER) PASSWORD(new1pass) STATUS(*ENABLED)
```

Here *WSEDBUSER* represents the name of the database user ID, and *new1pass* represents the new password for the database user.

3. Open the WebSphere Application Server Administrative Console and log in as the Workplace Services Express administrator. For help on how to access the administrative console, refer to 5.6, "Accessing the WebSphere Application Server Administrative Console" on page 127.
4. From the WebSphere Application Server Administrative Console, in the left pane, click **Security** → **JAAS Configuration** → **J2C Authentication Data**. See Figure 5-32.



Figure 5-32 J2C Authentication Data Entries

5. In the J2C Authentication Data Entries pane, click each of the aliases in the following list, highlight the old password, and then enter the new password. Click **Apply** and then click **OK** to update the entry.

- *WSEServerName/LWPComm*
- fbkDBAuth
- wmmDBAuth
- wpsDBAuth

Figure 5-33 shows an example of modifying the *WSEServerName/LWPComm* entry, where *WSEServerName* represents your Workplace Services Express server name.

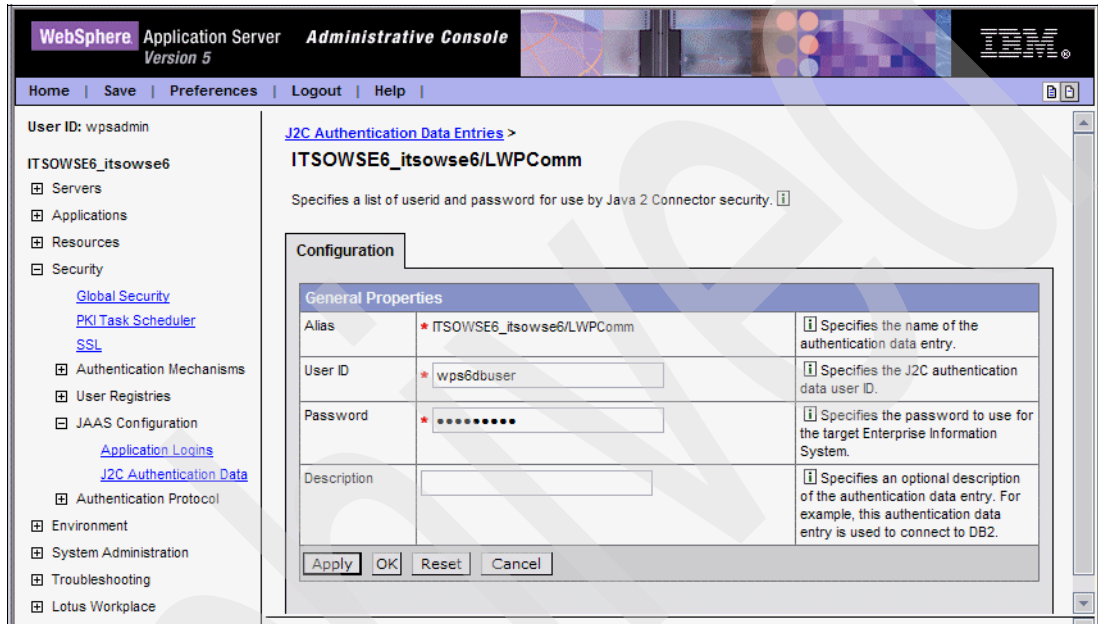


Figure 5-33 Modifying the password in the *WSEServerName/LWPComm* data entry

6. Click **Save** to apply the changes to the master configuration.

- When you see the Save to Master Configuration box (Figure 5-34), click the **Save** button to complete the save.

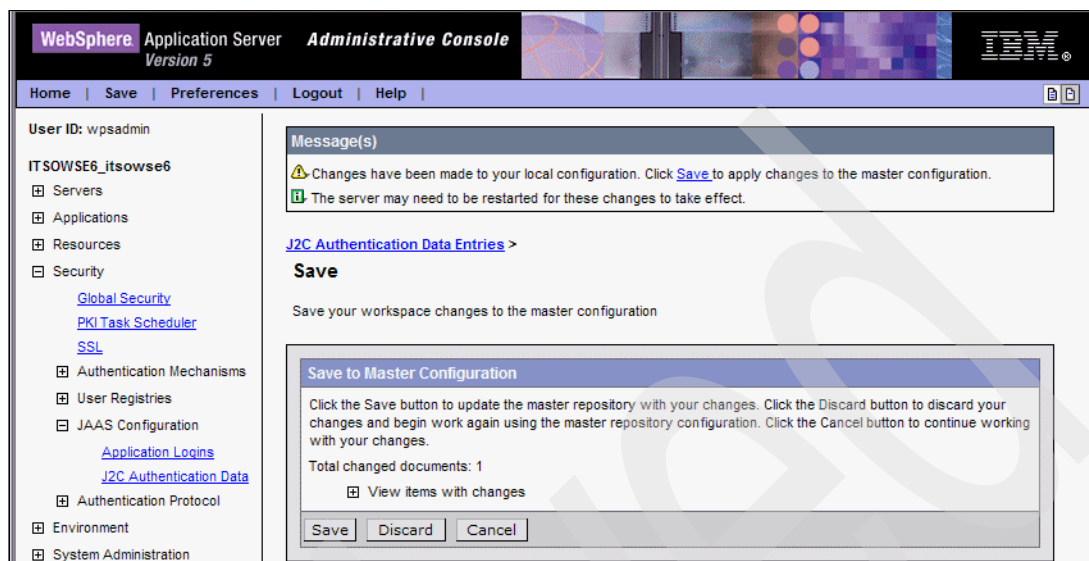


Figure 5-34 Saving changes to the master configuration

- In the left pane, click **Resources** → **JDBC™ Providers**. In the JDBC Providers pane, scroll down and you see details like the example in Figure 5-35. At the bottom of the JDBC Providers pane, click **wpcp50JDBC**.

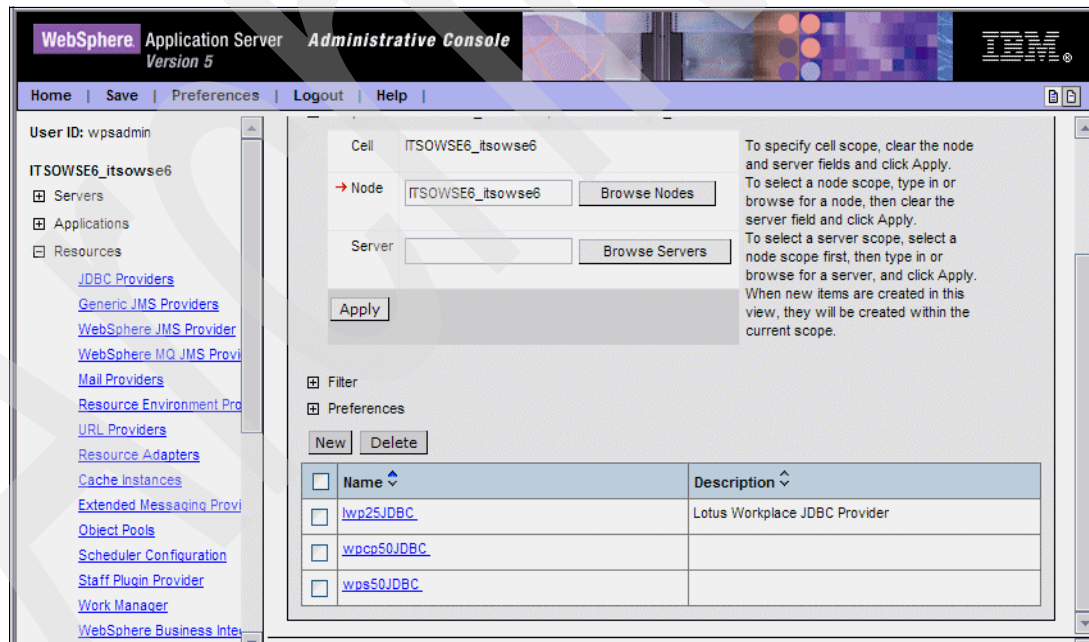


Figure 5-35 JDBC Providers pane

- In the wpcp50JDBC pane, scroll to the bottom of the pane and click **Data Sources (Version 4)**.

10. You now see the Data Sources (Version 4) pane (Figure 5-36). Click each of the following names, highlight the old password, and enter the new password. Click **Apply** and then click **OK** to update the password.

- feedbackDS
- perDS
- wcmDS

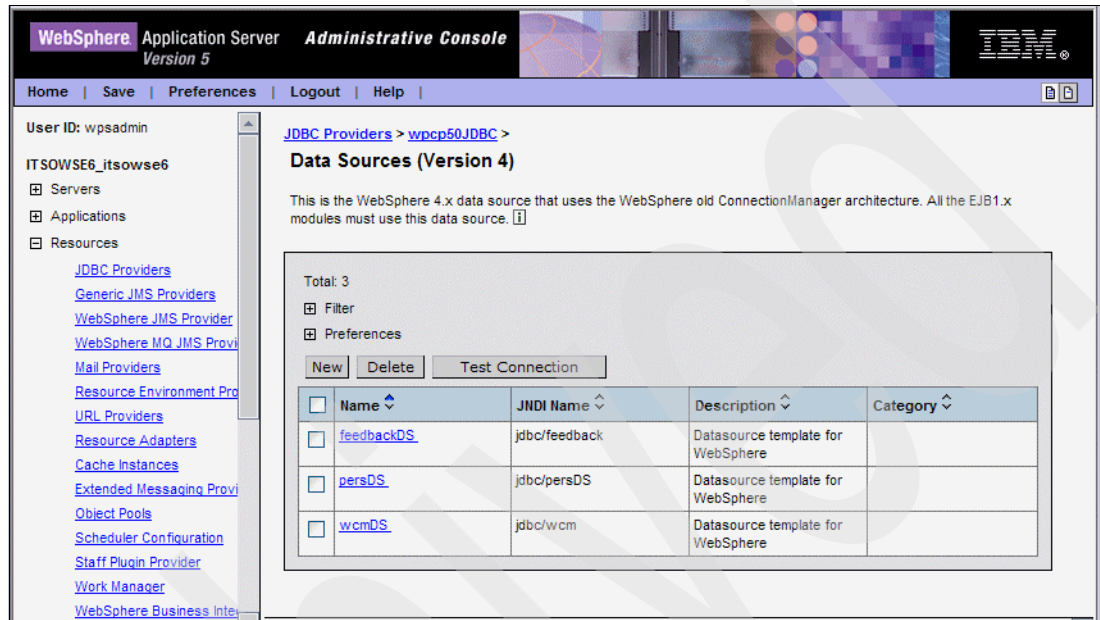


Figure 5-36 wpcp50JDBC Data Sources (Version 4) page

Figure 5-37 shows changes that are made to the feedbackDS entry.

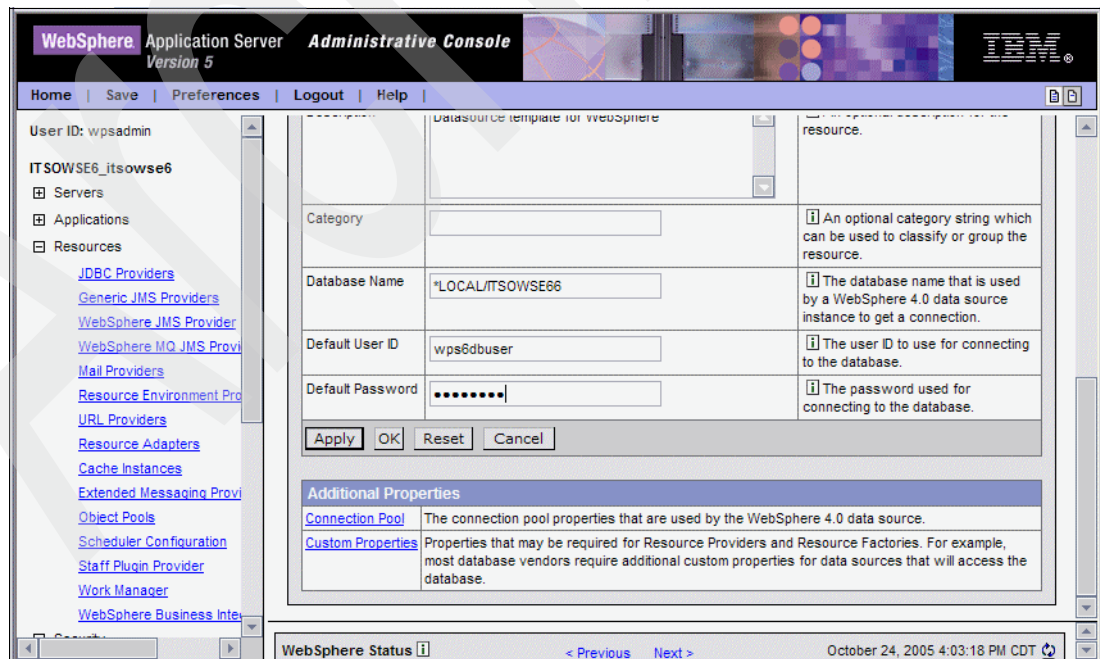


Figure 5-37 Modifying the password for the feedbackDS data source

11. Click **Save** to apply changes to the master configuration.

12. When you see the Save to Master configuration box, click the **Save** button to complete the save.
13. Log out of the WebSphere Application Server Administrative Console.
14. Modify the WCM.properties file to include the new password:
 - a. Map a drive to the root directory of the iSeries server integrated file system.
 - b. Open the WCM.properties file in WordPad or the text editor of your choice. The file is located in the directory /QIBM/UserData/WebAS5/Base/*WSEServerName*/wpcp/config/WebSphere_Portal/author, where *WSEServerName* represents your Workplace Services Express server name.
 - c. Modify the wcm.database.password entry to contain the new password as shown in Figure 5-38.
 - d. Save and close the WCM.properties file.

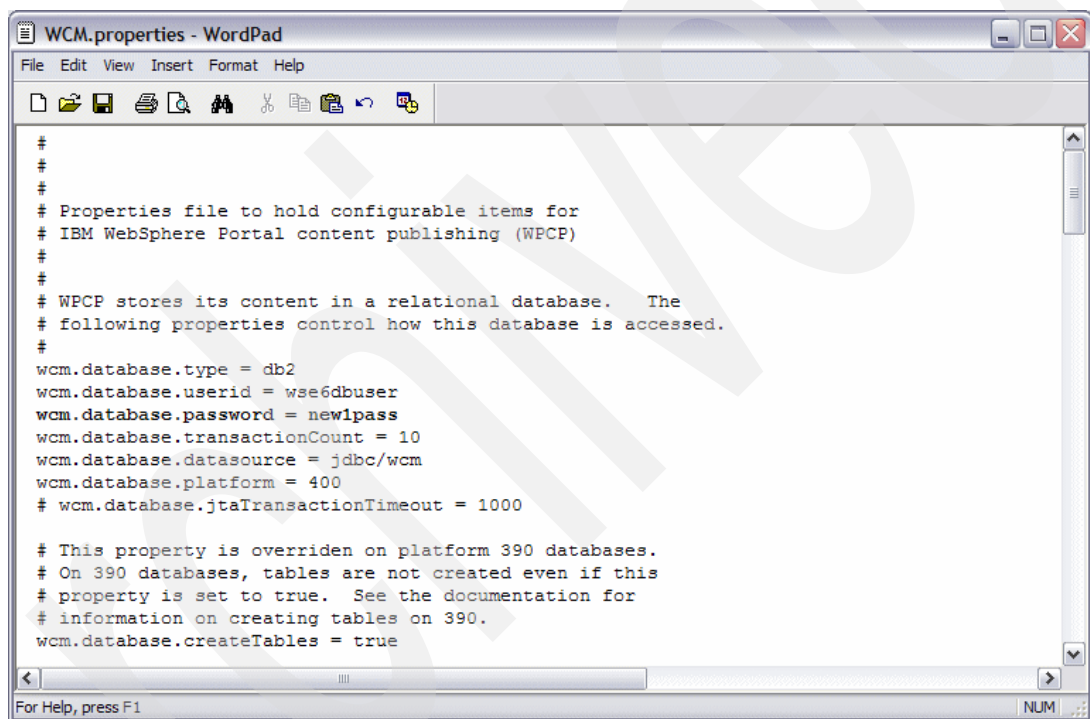


Figure 5-38 Modifying the password in the WCM.properties file

15. Stop your Workplace Services Express server. For assistance with stopping your server, see 5.1.2, "Stopping a Workplace Services Express server" on page 108.
16. Start your Workplace Services Express server. For assistance with starting your server, refer to 5.1.1, "Starting a Workplace Services Express server" on page 106.
17. Test your Workplace Services Express environment to verify that the changes were successfully applied.

5.7.2 Changing the Workplace Services Express administrator password

To modify the Workplace Services Express administrator password, follow these steps.

Important: We recommend that you perform this procedure after normal business hours.

1. End the HTTP server being used by your Workplace Services Express server to prevent user interaction with Workplace Services Express while you perform the password changes.
2. Open the WebSphere Application Server Administrative Console and log in as the Workplace Services Express administrator. For help on how to access the WebSphere Application Server Administrative Console, refer to 5.6, “Accessing the WebSphere Application Server Administrative Console” on page 127.

Note: Keep this Web browser session open and active until you are told to exit the WebSphere Application Server Administrative Console.

3. Modify the password for the Workplace Services Express administrator in the LDAP directory. For assistance with changing the password, refer to your LDAP server's product documentation.
4. From the left pane of the WebSphere Application Server Administrative Console, click **Security** → **User Registries** → **LDAP**.
5. In the LDAP User Registry pane (Figure 5-39), scroll down and click **Advanced LDAP Settings**.

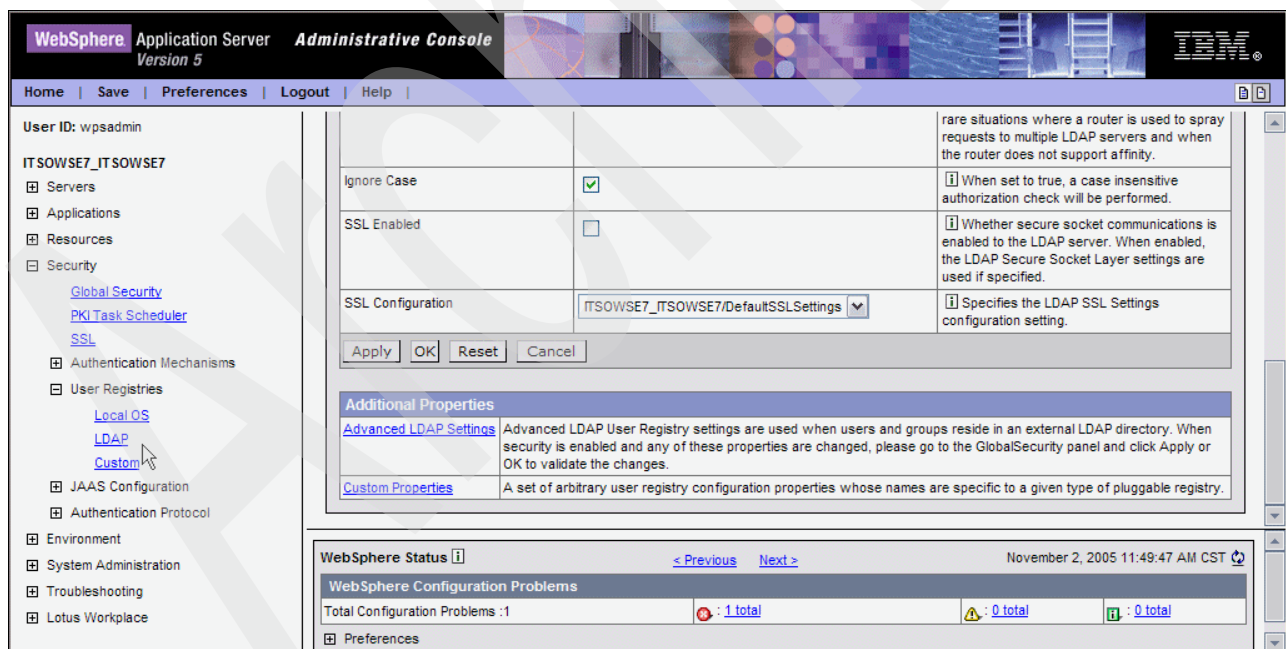


Figure 5-39 Accessing the Advanced LDAP Settings via the WebSphere Application Server Administrative Console

- In the Advanced LDAP Settings pane (Figure 5-40), note all the values. We recommend that you print a copy of this page for your reference. We also recommend that you copy and paste the values from the User Filter and Group Filter fields into a text document to simplify the process of restoring the values in a future step.

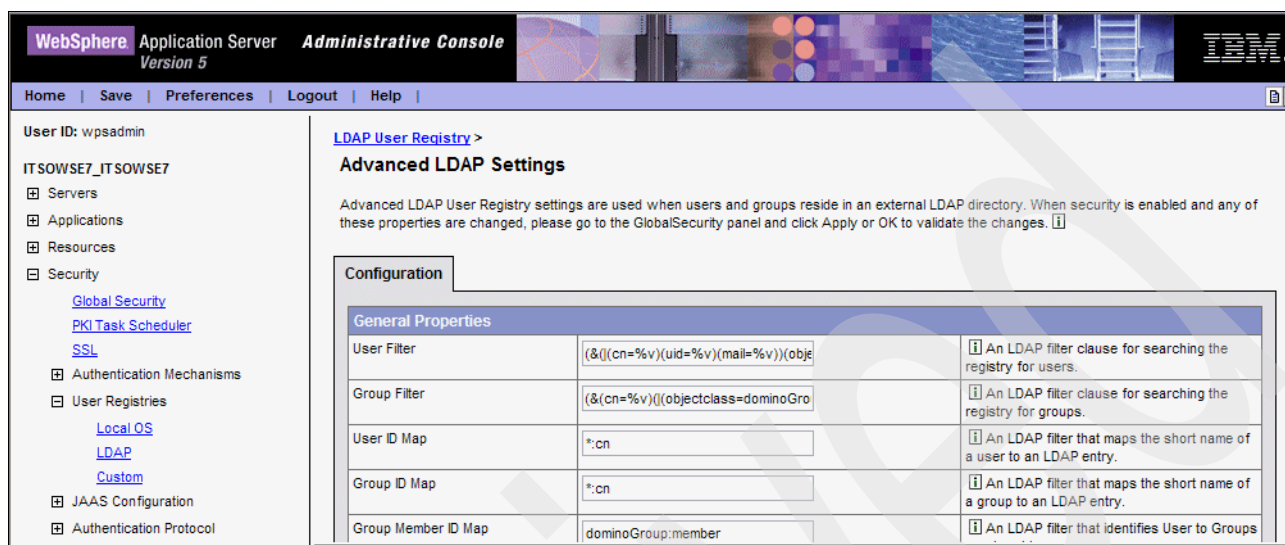


Figure 5-40 Advanced LDAP Settings in the WebSphere Application Server Administrative Console

- Scroll to the bottom of the Advanced LDAP Settings pane and click **Cancel**.
- From the left pane of the WebSphere Application Server Administrative Console, click **Security** → **User Registries** → **LDAP**. Refer to Figure 5-39 on page 135.
- Under the General Properties section, change the password in the following fields (Figure 5-41):
 - Server User Password
 - Bind Password

Click **OK** to save the new values.

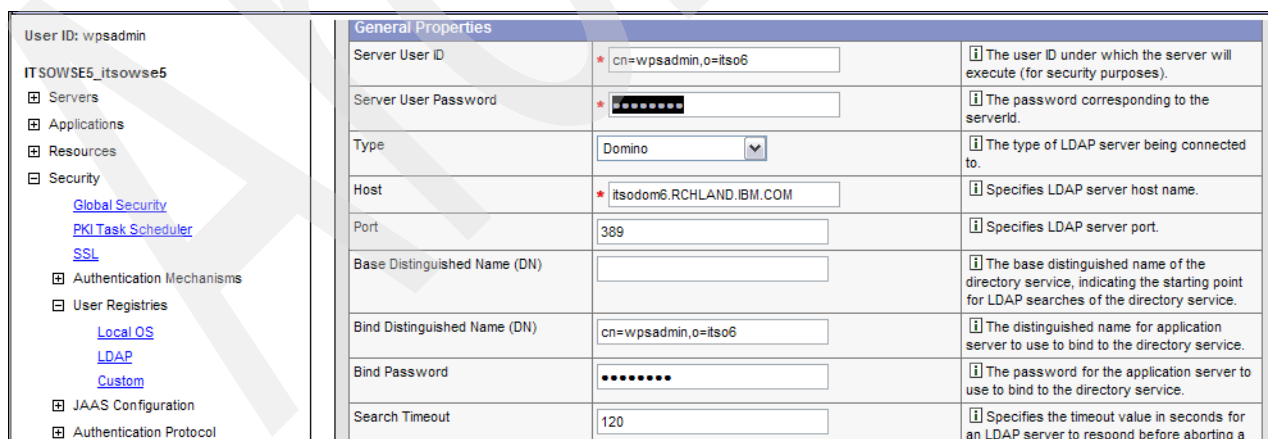


Figure 5-41 Changing the Server User Password and Bind Password in the LDAP User Registry page

- From the left pane of the WebSphere Application Server Administrative Console, click **Security** → **User Registries** → **LDAP**. Refer to Figure 5-39 on page 135.
- Scroll down and click **Advanced LDAP Settings**. You see a page similar to the one shown in Figure 5-40.

12. Restore the values of the fields from the recorded values noted in step 6 and click **OK**.
13. Click **Save** to apply changes to the master configuration.
14. When you see the Save to Master configuration box, click the **Save** button to complete the save.
15. From the left pane of the WebSphere Application Server Administrative Console, click **Security** → **User Registries** → **Custom**.
16. In the Custom User Registry pane, change the Server User Password (Figure 5-42).

User ID: wpsadmin

ITSOWSE5_itsowse5

- [-] Servers
- [-] Applications
- [-] Resources
- [-] Security
 - [Global Security](#)
 - [PKI Task Scheduler](#)
 - [SSL](#)
 - [-] Authentication Mechanisms
 - [-] User Registries
 - [Local OS](#)
 - [LDAP](#)
 - [Custom](#)
 - [-] JAAS Configuration
 - [-] Authentication Protocol

Custom User Registry

A custom user registry that implements the com.ibm.websphere.security.UserRegistry interface. For backward compatibility, a custom user registry that implemented the com.ibm.websphere.security.CustomRegistry interface are also supported. When security is enabled and any of these properties are changed, please go to the GlobalSecurity panel and click Apply or OK to validate the changes. ⓘ

Configuration

| General Properties | | |
|---------------------------|------------------------------------|---|
| Server User ID | * wpsadmin | ⓘ The user ID under which the server will execute (for security purposes). |
| Server User Password | * | ⓘ The password corresponding to the serverid. |
| Custom Registry Classname | * com.ibm.websphere.wmm.registry.V | ⓘ A dot-separated class name that implements the com.ibm.websphere.security.UserRegistry interface. |
| Ignore Case | <input type="checkbox"/> | ⓘ When set to true, a case insensitive authorization check will be performed. |

Figure 5-42 Changing the Server User Password field in the Custom User Registry settings

17. Click **Save** to apply changes to the master configuration.
18. When you see the Save to Master configuration box, click the **Save** button to complete the save.
19. From the left pane of the WebSphere Application Server Administrative Console, click **Applications** → **Enterprise Applications**.

20. For each of the following Enterprise Applications, complete the steps that follow:

- LWP_CAI
- LWP_Discussion_Service
- LWP_Security
- LWP_Team_Task_List
- LWP_Template_Infrastructure

a. Select one of the applications from the previous list (Figure 5-43).



Figure 5-43 Selecting an Enterprise Application

b. Scroll down to the Additional Properties section and click **Map security roles to users/groups** (Figure 5-44).



Figure 5-44 Selecting Map security roles to users/groups

- c. Select the **wpsRunAsAdmin** role and click **Lookup groups** (Figure 5-45).

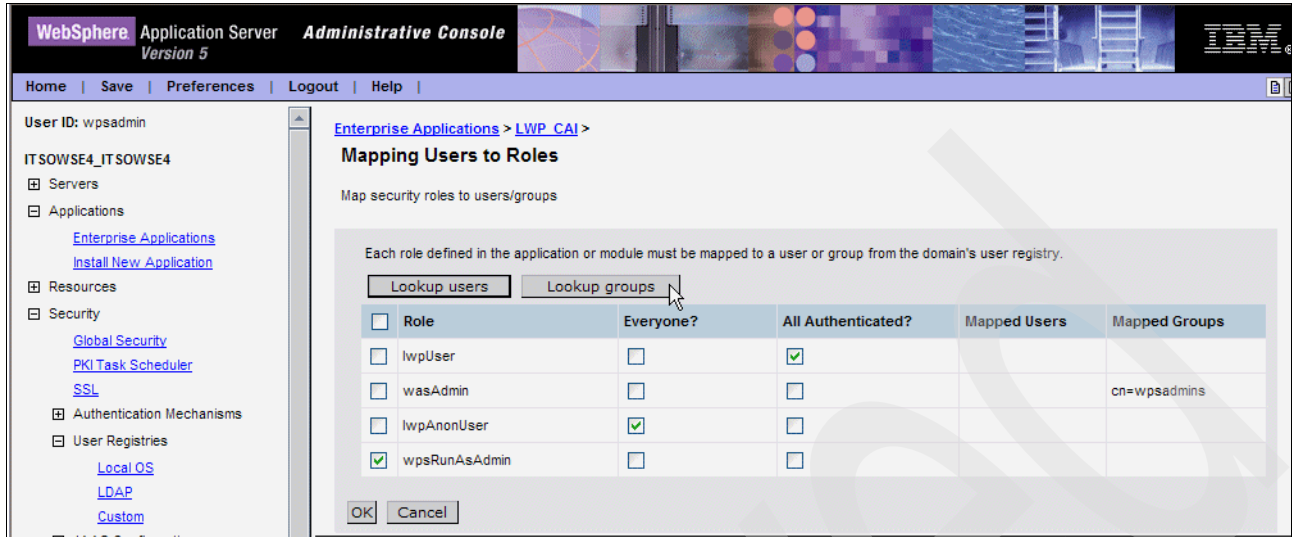


Figure 5-45 Lookup groups for the wpsRunAsAdmin role

- d. In the Search String field, type your Workplace Services Express administrator group and click **Search**. For our example, we search for a group called wpsadmins.
- e. Select your administrator group and click **>>** to select the group as shown in Figure 5-46. Click **OK**.

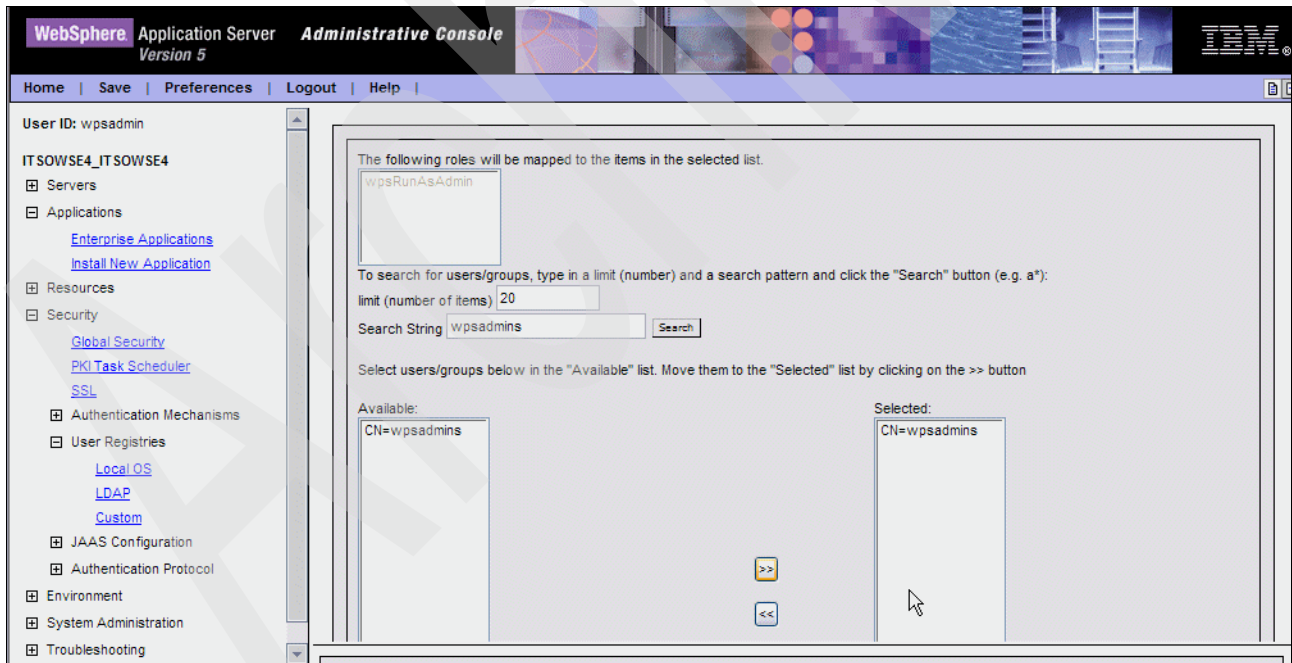


Figure 5-46 Selecting the wpsadmins group

- f. In the Mapping Users to Roles pane, click **OK**.
- g. Scroll down to Additional Properties. Click **Map RunAs roles to users**. See Figure 5-44.

- h. In the Mapping RunAs Roles to Users pane (Figure 5-47), complete these steps:
 - i. Select the **wpsRunAsAdmin** role.
 - ii. In the username field, enter your Workplace Services Express administrator ID.
 - iii. In the password field, enter the new administrator password.
 - iv. Click **Apply**.
 - v. Click **OK**.

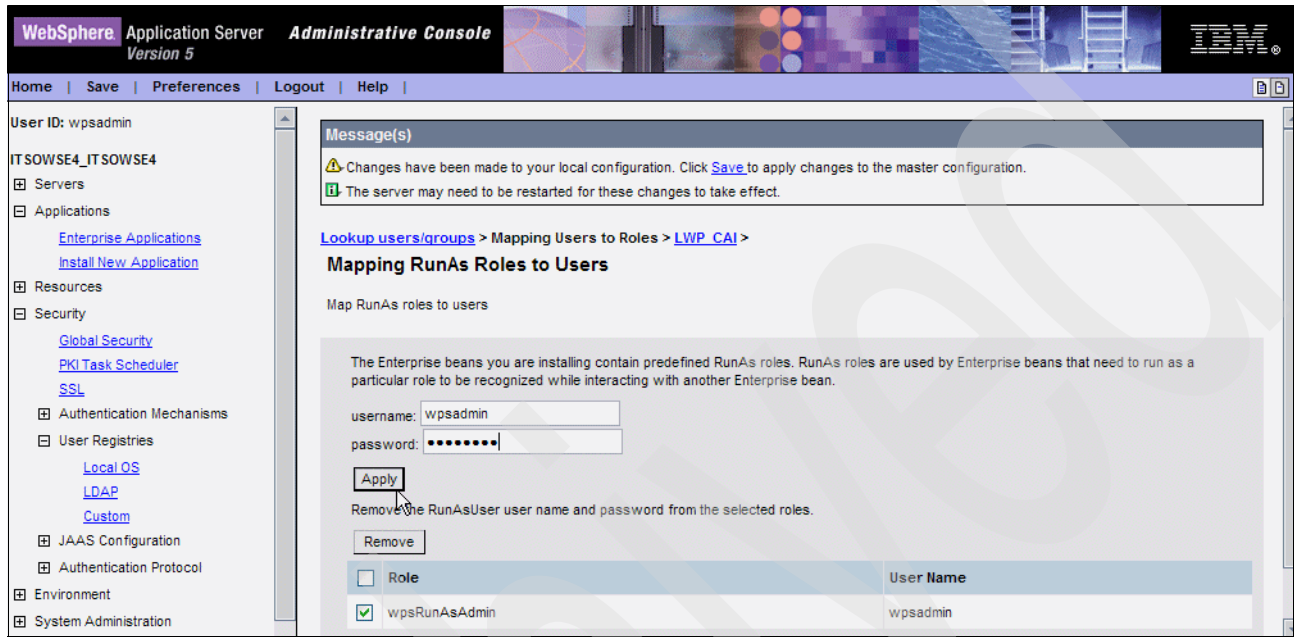


Figure 5-47 Modifying the wpsadmin password for an enterprise application

- i. Click **OK**.
 - j. Return to step a to modify all of the enterprise applications listed. Do *not* save your changes at this time.
21. After you change all of the enterprise applications, click **Save** to apply changes to the master configuration.
22. When you see the Save to Master configuration box, click the **Save** button to complete the save.
23. Click **Logout** to exit the WebSphere Application Server Administrative Console.
24. End the Workplace Services Express server. For assistance, refer to 5.1.2, "Stopping a Workplace Services Express server" on page 108.
25. Map a network drive to the root directory of your iSeries server.
26. Navigate to the integrated file system directory, \QIBM\UserData\WebAS5\Base\WSEServerName\config\cells\WSEServerName_WSEServerName, where WSEServerName represents your Workplace Services Express server name.
27. Open the security.xml file with WordPad or the editor of your choice.

28. Find the security:CustomUserRegistry section and copy the value of “serverPassword” as shown in Figure 5-48. This is the encrypted form of the new password for your Workplace Services Express administrator.

```
<?xml version="1.0" encoding="UTF-8"?>
<security:Security xmi:version="2.0" xmlns:xmi="http://www.omg.org/XMI" xmlns:orb.securityprotocol="http://www.ibm.com/websphere/appserver/sc
<authMechanisms xmi:type="security:SWAMAuthentication" xmi:id="SWAMAuthentication_1" OID="No OID for this mechanism" authContextImplClass="
<authMechanisms xmi:type="security:LTPA" xmi:id="LTPA_1" OID="oid:1.3.18.0.2.30.2" authContextImplClass="com.ibm.ISecurityLocalObjectTokenB
<trustAssociation xmi:id="TrustAssociation_1" enabled="false">
  <interceptors xmi:id="TAInterceptor_1" interceptorClassName="com.ibm.ws.security.web.WebSealTrustAssociationInterceptor"/>
</trustAssociation>
<singleSignon xmi:id="SingleSignon_1" requiresSSL="false" domainName="RCHLAND.IBM.COM" enabled="true"/>
<private xmi:id="Key_1131696605158" byteArray="9GcCNHCQjHOKHoyTRMvMI7pmw9ttJA2HSbznhihBA5qM6UgVl+DfbLGXAeBRPIJVh8JhFYM4UFUVHDP2Kczj8dAdn
<public xmi:id="Key_1131696605159" byteArray="AO6lj8bmjVDxScpjJ9WnrkAby+QyrjEl9y2p/vAedpPZ55LMfQcKm4GF2oh6YLz2rvokCvTlMSru7plrQeq3VRLBei7
<shared xmi:id="Key_1131696605160" byteArray="kL3blEVirYoLCRbDSScVvLWlSaRqmXcQp7ji+BJPSDM="/>
</authMechanisms>
<userRegistries xmi:type="security:LocalOSUserRegistry" xmi:id="LocalOSUserRegistry" serverId="" serverPassword="{xor}MToobi8+LCw="
<userRegistries xmi:type="security:CustomUserRegistry" xmi:id="CustomUserRegistry_1" serverId="wpsadmin" serverPassword="{xor}MToobi8+LCw="
  <properties xmi:id="Property_1117099786674" name="cur_LOGGING" value="FALSE" required="false"/>
  <properties xmi:id="Property_1117099786973" name="cur_ENCRYPTIONKEY" value="rZ15ws0ely9yHk3zCs3sTMv/h08f17s" required="true"/>
  <properties xmi:id="Property_1131692669641" name="db_CONNECTIONPOOL_SIZE" value="" required="false"/>
  <properties xmi:id="Property_1131692670727" name="db_CONNECTIONPOOL_TIMEOUT" value="" required="false"/>
  <properties xmi:id="Property_1131692673968" name="db_DRIVER" value="com.ibm.db2.jdbc.app.DB2Driver" required="true"/>
  <properties xmi:id="Property_1131692674850" name="db_DRIVER_LOCATION" value="/QIBM/ProdData/Java400/ext/db2_classes.jar" required="false"/>
  <properties xmi:id="Property_1131692675771" name="db_URL" value="jdbc:db2:*LOCAL/ITSONSE4" required="true"/>
  <properties xmi:id="Property_1131692676723" name="db_USERID" value="wse4dbuser" required="false"/>
  <properties xmi:id="Property_1131692677612" name="db_PASSWORD" value="afacWlqg1tr1bNupQsppiw==" required="false"/>
</userRegistries>
<userRegistries xmi:type="security:LDAPUserRegistry" xmi:id="LDAPUserRegistry_1" serverId="cn=wpsadmin,o=its070" serverPassword="{xor}MToobi8+LCw="
  <searchFilter xmi:id="LDAPSearchFilter_1" userFilter="( (& ( (cn=&v) (uid=&v) (mail=&v) ) (objectclass=dominoPerson) )" groupFilter="( (& (c
  <hosts xmi:id="EndPoint_1131696615639" host="its070.rchland.ibm.com" port="389"/>
</userRegistries>
<applicationLoginConfig xmi:id="JAASConfiguration_1">
  <entries xmi:id="JAASConfigurationEntry_1" alias="ClientContainer">
    <loginModules xmi:id="JAASLoginModule_1" moduleClassName="com.ibm.ws.security.common.auth.module.proxy.WSLoginModuleProxy" authenticati
    <options xmi:id="Property_1" name="delegate" value="com.ibm.ws.security.common.auth.module.WSClientLoginModuleImpl"/>
  </loginModules>
  </entries>
  <entries xmi:id="JAASConfigurationEntry_2" alias="WSLogin">
    <loginModules xmi:id="JAASLoginModule_2" moduleClassName="com.ibm.ws.security.common.auth.module.proxy.WSLoginModuleProxy" authenticati
    <options xmi:id="Property_2" name="delegate" value="com.ibm.ws.security.common.auth.module.WSLoginModuleImpl"/>
  </loginModules>
</applicationLoginConfig>
```

Figure 5-48 Copying the serverPassword from the security.xml file

29. Exit the security.xml file without saving any changes.

30. Using your mapped drive to the iSeries server, navigate to the directory, \QIBM\UserData\WebAS5\Base\WSEServerName\properties\, where WSEServerName represents your Workplace Services Express server name.

31. Open the soap.client.props file in WordPad or the editor of your choice.

32. Modify the following entries as demonstrated in Figure 5-49:

- com.ibm.SOAP.loginUserId=wpsadmin

Here wpsadmin represents your Workplace Services Express administrator.

- com.ibm.SOAP.loginPassword=newpassword

Here newpassword represents the encrypted form of the new Workplace Services Express administrator password that you copied from the security.xml file.

```
#-----
# SOAP Client Security Enablement
#
# - security enabled status ( false[default], true )
#-----
com.ibm.SOAP.securityEnabled=false

# JMX SOAP connector identity|
com.ibm.SOAP.loginUserId=wpsadmin
com.ibm.SOAP.loginPassword={xor}MToobi8+LCw=
#-----
```

Figure 5-49 Modifying the soap.client.props file

33. Save and close the soap.client.props file.
34. Start your Workplace Services Express server. For help, refer to 5.1.1, “Starting a Workplace Services Express server” on page 106.
35. Log into Workplace Services Express as the administrator with the new password.
36. At the top of the Workplace Services Express pane, click **Administration**.
37. In the Administration pane, click the **Access** tab.
38. In the left pane, click **Credential Vault** (Figure 5-50).

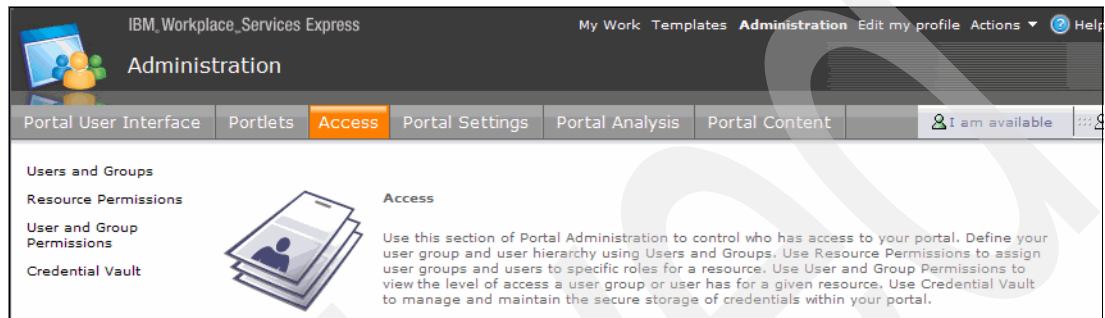


Figure 5-50 Accessing the credential vault for the Workplace Services Express server

39. In the Credential Vault pane, click **Manage system vault slots** (Figure 5-51).

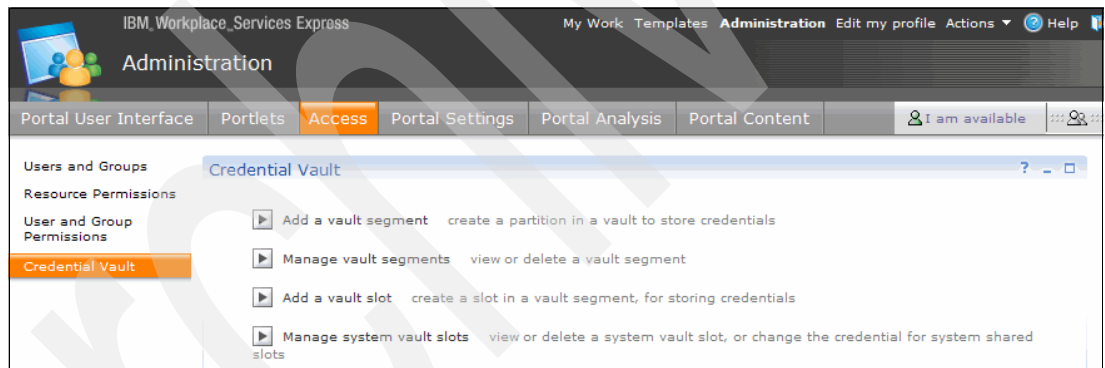


Figure 5-51 Selecting Manage system vault slots

40. Select **Modify Shared Slot** for the deployment.user Vault Slot Name as shown in Figure 5-52.

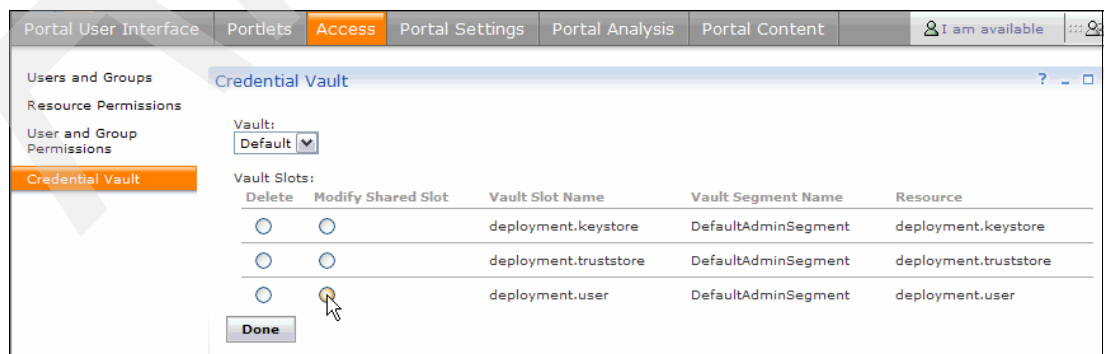


Figure 5-52 Selecting Modify Shared Slot for the deployment.user Vault Slot Name

41. In the Shared password and Confirm password fields, enter the new password for the administrator (Figure 5-53). Click **OK**.

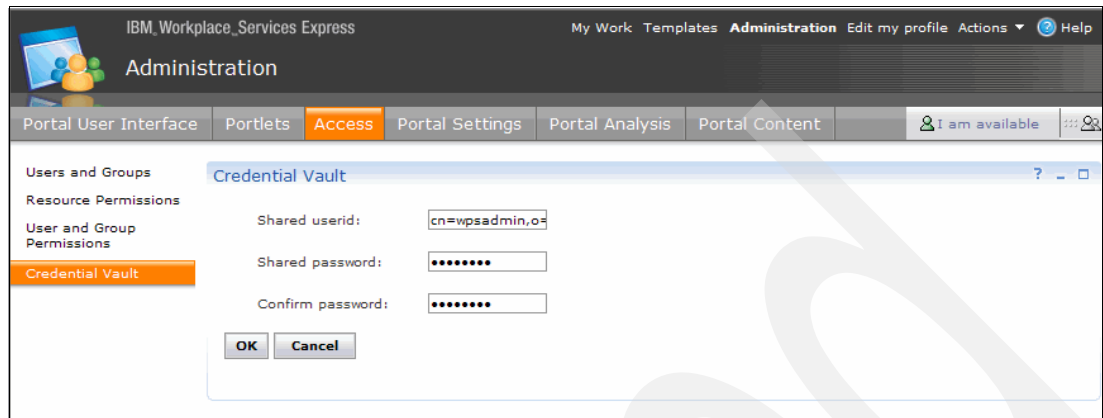


Figure 5-53 Modifying the password for the shared user ID

42. Back in the Credential Vault pane, click **Done**.
43. Log out of the Workplace Services Express server.
44. Stop your Workplace Services Express server. For help, refer to 5.1.2, “Stopping a Workplace Services Express server” on page 108.
45. Start your Workplace Services Express server. For help, refer to 5.1.1, “Starting a Workplace Services Express server” on page 106.

5.7.3 Changing the LDAP administrator password

To modify the LDAP administrator password:

1. Stop your Workplace Services Express server. For help, refer to 5.1.2, “Stopping a Workplace Services Express server” on page 108.
2. Change the LDAP administrator password in the LDAP directory.
3. Log on to your iSeries server with a 5250 emulation session.
4. Enter the following Add Link (ADDLNK) CL command to create a symbolic link needed to run the wmm_encrypt.sh script in a future step:

```
ADDLNK OBJ('/qibm/proddata/webas5/pme/bin/setupCmdLine')
        NEWLNK('/qibm/proddata/webas5/pme/bin/setupCmdLine.sh')
```
5. Start the Qshell environment using the STRQSH CL command.
6. Enter the following Qshell command:

```
cd /QIBM/ProdData/WebAS5/PME/wmm/bin
```

7. Enter the following Qshell command as demonstrated in Example 5-1.

```
wmm_encrypt.sh Newpassword
```

Here *Newpassword* represents the new password for your LDAP administrator.

Example 5-1 Running the wmm_encrypt.sh script

```
cd /QIBM/ProdData/WebAS5/PME/wmm/bin
$
wmm_encrypt.sh Newpassword
IBM*
Licensed Materials - Property of IBM
5697-A16
(C) Copyrights by IBM and by other(s) 1978, 2003. All Rights Reserved.
* Trademark of International Business Machines Corp.
ASCII encrypted string : 8XL0qpqSJeTwNYcRSpVpKg==
HEX encrypted string : 38584C30717071534A6554774E596352537056704B673D3D0A
$
```

8. Copy the ASCII encrypted string returned from the wmm_encrypt.sh script.
9. From a mapped drive to the iSeries root directory, open the wmm.xml file located in the integrated file system directory, \QIBM\UserData\WebAS5\Base\ITSOWSE4\PortalServer\shared\app\wmm\wmm.xml, with WordPad or the editor of your choice.
10. Paste the password into the adminPassword field (Figure 5-54).

Tip: Scroll to the right to find the adminPassword field.

```
ptions="false" adminId="cn=Notes Administrator, o=its070" adminPassword="8XL0qpqSJeTwNYcRSpVpKg==" ldapHost="itsodom70.rchland.
```

Figure 5-54 Modifying the wmm.xml file

11. Save and close the wmm.xml file.
12. Start your Workplace Services Express server. For help, refer to 5.1.1, "Starting a Workplace Services Express server" on page 106.

5.8 Accessing the Workplace Services Express logs

If you have never administered a WebSphere Portal server in the past, troubleshooting Workplace Services Express might seem overwhelming. In this section, we explain where data is logged. The log files that you want to review most often include:

- ▶ *iSeries Create IBM Workplace wizard log files* as discussed in 5.8.1, "iSeries Create IBM Workplace wizard log files" on page 145
- ▶ *WebSphere Portal Server standard output and standard error log files* as discussed in 5.8.2, "WebSphere Portal Server standard output and standard error logs" on page 147
- ▶ *WebSphere Application Server standard output and standard error log files* as discussed in 5.8.3, "WebSphere Application Server standard output and standard error logs" on page 149

The standard output and standard error log files are:

| | |
|--------------------------|--|
| SystemOut.log | Log where you find general output from the Workplace application or other portlets running on your Workplace Services Express server |
| SystemErr.log | Log where you find errors from the Workplace application or other portlets running on your Workplace Services Express server |
| native_stdout.log | Log where you find information regarding the internal startup and shutdown of the WebSphere Portal server |
| native_stderr.log | Log where you find errors regarding the internal startup and shutdown of the WebSphere Portal server; this file is typically blank |

5.8.1 iSeries Create IBM Workplace wizard log files

The iSeries Create IBM Workplace wizard provides logs to confirm the completion of each step it performs for you. If there is a problem during the configuration of a Workplace Services Express server, you can review the iSeries Create IBM Workplace wizard log files to find the problem. Finding the iSeries Create IBM Workplace wizard log files is easy from the IBM Web Administration for iSeries, as explained in the following steps.

1. To access the IBM Web Administration for iSeries, point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
In our example, we enter:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. From the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your Workplace Services Express server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. In the Server drop-down list, select your Workplace Services Express server name.

5. You can view the creation log files in two ways. The first way is to click **View Creation Logs** in the left pane as shown in Figure 5-55.

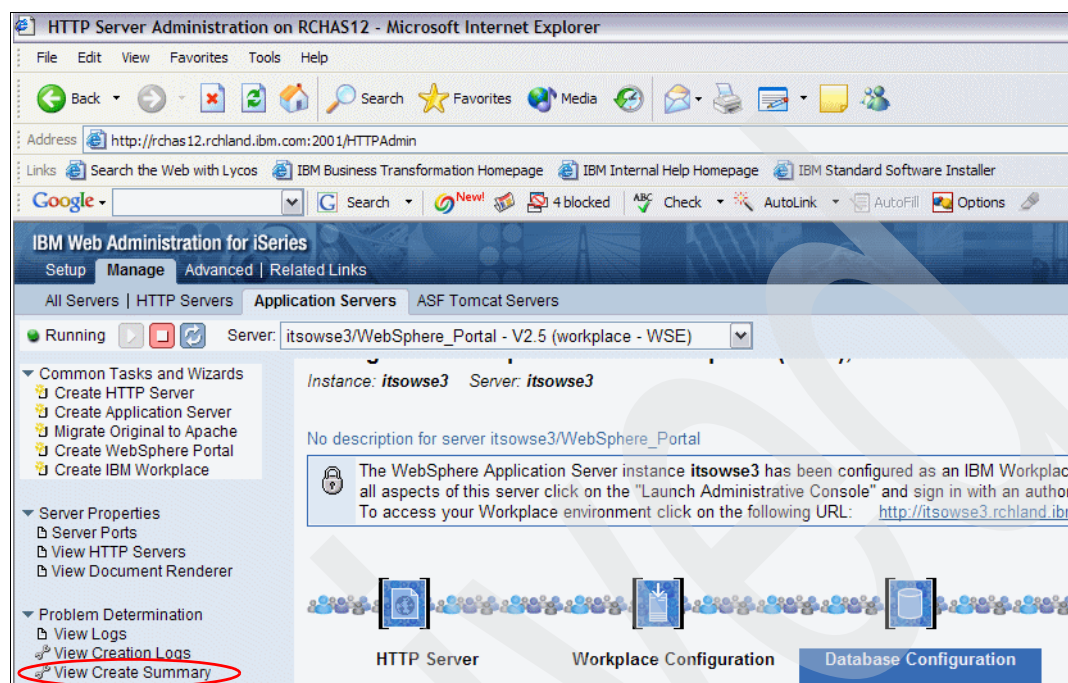


Figure 5-55 Selecting to view the creation log files for a Workplace Services Express server

Alternately, you can view the logs for a specific configuration step. For example, if the database configuration step fails, you want to review the logs for that task:

- a. Click **Database Configuration** in the right pane and then click **View the detailed list of tasks for the Database Configuration**.
- b. In the new window that opens (Figure 5-56), click the file that you want to display.

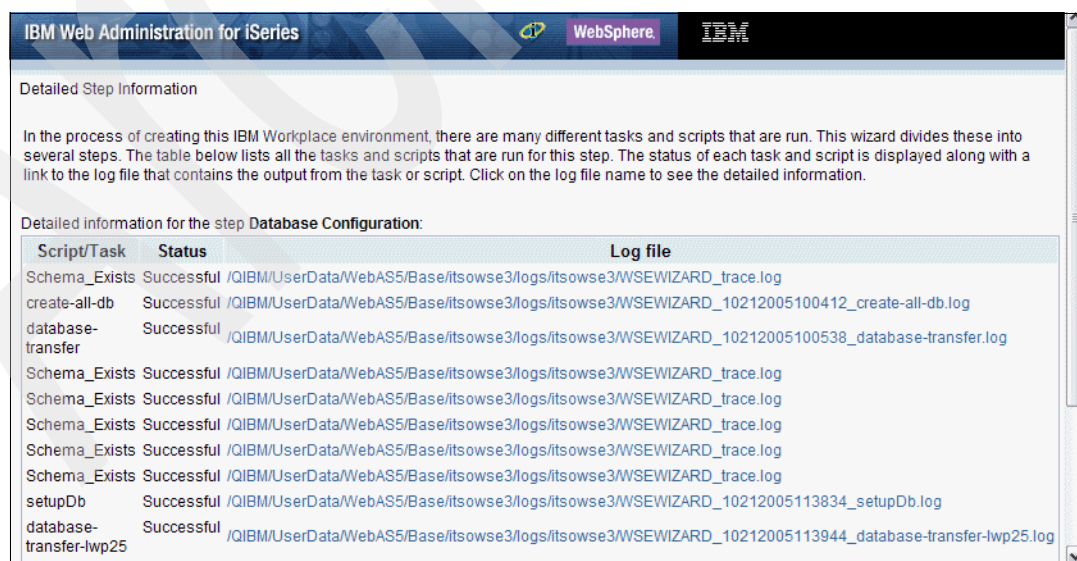
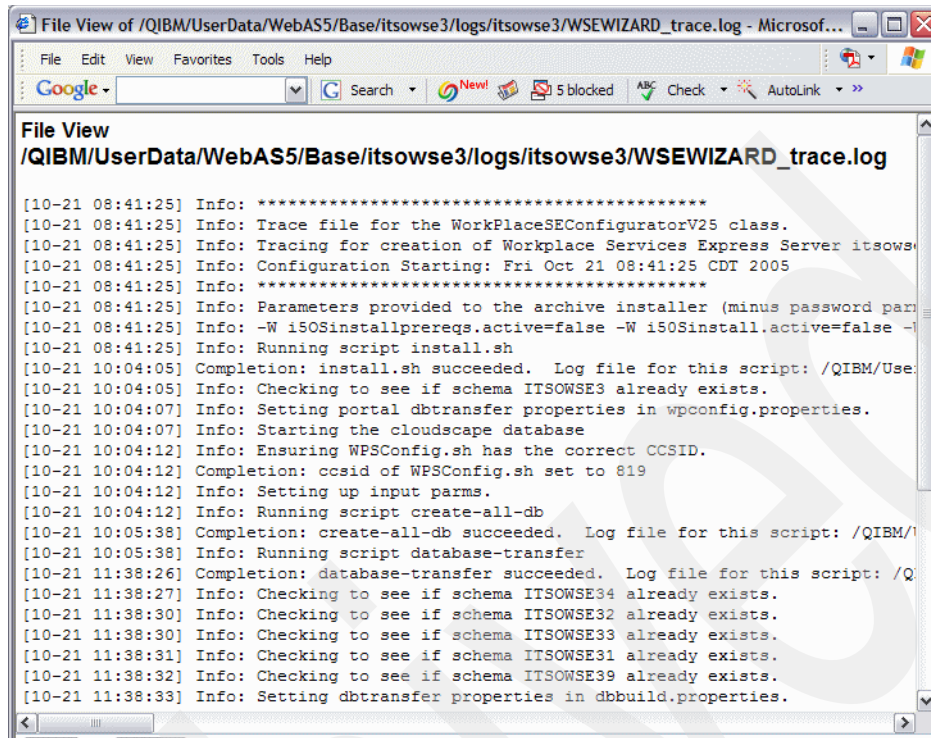


Figure 5-56 Detailed step information for the Database Configuration

Figure 5-57 shows the first file, the WSEWIZARD_trace.log file.



```
[10-21 08:41:25] Info: *****
[10-21 08:41:25] Info: Trace file for the WorkplaceSEConfiguratorV25 class.
[10-21 08:41:25] Info: Tracing for creation of Workplace Services Express Server itsowse3
[10-21 08:41:25] Info: Configuration Starting: Fri Oct 21 08:41:25 CDT 2005
[10-21 08:41:25] Info: *****
[10-21 08:41:25] Info: Parameters provided to the archive installer (minus password parm
[10-21 08:41:25] Info: -W i5OSinstallprereqs.active=false -W i5OSinstall.active=false -W
[10-21 08:41:25] Info: Running script install.sh
[10-21 10:04:05] Completion: install.sh succeeded. Log file for this script: /QIBM/User
[10-21 10:04:05] Info: Checking to see if schema ITSOWSE3 already exists.
[10-21 10:04:07] Info: Setting portal dbtransfer properties in wpconfig.properties.
[10-21 10:04:07] Info: Starting the cloudscape database
[10-21 10:04:12] Info: Ensuring WPSConfig.sh has the correct CCSID.
[10-21 10:04:12] Completion: ccsid of WPSConfig.sh set to 819
[10-21 10:04:12] Info: Setting up input parms.
[10-21 10:04:12] Info: Running script create-all-db
[10-21 10:05:38] Completion: create-all-db succeeded. Log file for this script: /QIBM/
[10-21 10:05:38] Info: Running script database-transfer
[10-21 11:38:26] Completion: database-transfer succeeded. Log file for this script: /Q
[10-21 11:38:27] Info: Checking to see if schema ITSOWSE34 already exists.
[10-21 11:38:30] Info: Checking to see if schema ITSOWSE32 already exists.
[10-21 11:38:30] Info: Checking to see if schema ITSOWSE33 already exists.
[10-21 11:38:31] Info: Checking to see if schema ITSOWSE31 already exists.
[10-21 11:38:32] Info: Checking to see if schema ITSOWSE39 already exists.
[10-21 11:38:33] Info: Setting dbtransfer properties in dbbuild.properties.
```

Figure 5-57 View of the WSEWIZARD_trace.log file

5.8.2 WebSphere Portal Server standard output and standard error logs

The standard output and standard error logs are where the applications running in the WebSphere Portal Server place their output. These logs are where you find output from the Workplace Services Express application that you might want to review for errors.

Another reason to review the log files is to determine the cause of a failure if the Workplace Services Express server does not start. For example, if you try to start the Workplace Services Express server and the LDAP server is not running, the Workplace Services Express server seems to start and then stop. In this case, the SystemOut.log shows an error stating that the Workplace Services Express server could not connect to the LDAP server.

You can access the WebSphere Portal Server standard output and standard error logs in two ways:

- ▶ Open the files in the integrated file system of the iSeries server. The log files are written to the directory `/QIBM/UserData/WebAS5/Base/WSEServerName/PortalServer/log`, where `WSEServerName` represents your Workplace Services Express server name.
- ▶ Select the log files from the IBM Web Administration for iSeries.

To select the log files from the IBM Web Administration for iSeries, perform the following steps:

1. Access IBM Web Administration for iSeries. Point your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
 In our example, we enter:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your Workplace Services Express server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. In the Server drop-down list, select your Workplace Services Express server name.
5. In the left pane, click **View Logs** and then click the **Portal Logs** tab.
6. You see a number of logs appear as shown in Figure 5-58. From this pane, you can click the log that you would like to view. In our example, we selected **/QIBM/UserData/WebAS5/Base/WSEServerName/PortalServer5/SystemOut.log** to view the standard output log file.

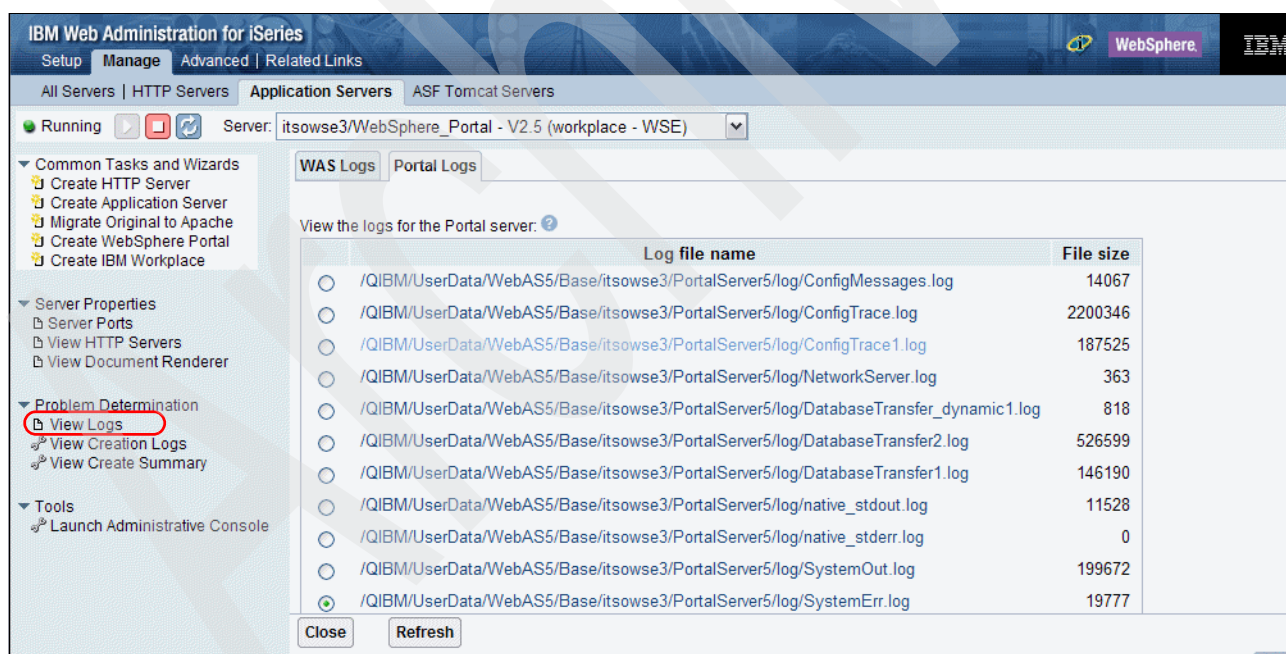


Figure 5-58 Viewing the WebSphere Portal Server logs

Example 5-2 shows the SystemOut.log for our scenario with the relevant errors received when the LDAP server was not running during startup. In our example, we use a Domino LDAP server called itsodom6.

Example 5-2 Example SystemOut.log

```

10/26/05 15:37:43:803 CDT] 75ea547 LdapRegistryI E SECJ0352E: Could not get the users matching the pattern
cn=wpsadmin,o=itsod6 because of the following exception javax.naming.CommunicationException:
itsodom6.RCHLAND.IBM.COM:389. Root exception is java.net.ConnectException: A remote host refused an
attempted connect operation.

[10/26/05 15:37:43:807 CDT] 75ea547 LdapRegistryI E SECJ0336E: Authentication failed for user
cn=wpsadmin,o=itsod6 because of the following exception
[10/26/05 15:37:43:810 CDT] 75ea547 LTPAServerObj E SECJ0369E: Authentication failed when using LTPA. The
exception is itsodom6.RCHLAND.IBM.COM:389.
[10/26/05 15:37:43:819 CDT] 75ea547 JaasLoginHelp E SECJ4001E: Login failed for
cn=wpsadmin,o=itsod6/itsodom6.RCHLAND.IBM.COM:389
[10/26/05 15:37:43:870 CDT] 75ea547 ContextManage E SECJ0270E: Failed to get actual credentials. The
exception is .
[10/26/05 15:37:43:971 CDT] 75ea547 SecurityCompo E SECJ0007E: Error during security initialization. The
exception is .
[10/26/05 15:37:44:133 CDT] 2c294d10 mta A CLHBN0002I: MailService stopped::SITUATION:
OtherSituation::CLHBN::E95BB299704B2B2A5C5E0040466011DA::9.5.92.90::IPV4::thread=Thread-0
[10/26/05 15:37:49:276 CDT] 75ea547 ObjectPoolSer I OBPL0011I: The Object Pool service is stopping.
[10/26/05 15:37:49:277 CDT] 75ea547 ExtendedMessa I EMSG0203I: The Extended Messaging service is stopping.
[10/26/05 15:37:49:300 CDT] 75ea547 SchedulerServ I SCHD0040I: The Scheduler Service is stopping.
[10/26/05 15:37:49:300 CDT] 75ea547 SchedulerServ I SCHD0002I: The Scheduler Service has stopped.
[10/26/05 15:37:49:310 CDT] 75ea547 AppProfileCom I ACIN0009I: The application profiling service is
stopping.
[10/26/05 15:37:49:311 CDT] 75ea547 ActivitySessi I WACS0049I: The ActivitySession service is stopping.
[10/26/05 15:37:49:356 CDT] 75ea547 TraceNLS u Unable to load ResourceBundle
com.ibm.ws.handlerfw.resources.handlerframework
[10/26/05 15:37:49:356 CDT] 75ea547 HandlerFramew I HANDFW: stopped
[10/26/05 15:37:49:457 CDT] 75ea547 StaffServiceI I STFF0002I: Staff Service stopping.
[10/26/05 15:37:49:724 CDT] 75ea547 WsServer E WSVR0003E: Server WebSphere_Portal failed to start

```

5.8.3 WebSphere Application Server standard output and standard error logs

The WebSphere Application Server standard output and standard error logs are used to log information about the initial startup and shutdown of the WebSphere_Portal server. The output and error logs for the WebSphere Portal Server discussed in 5.8.2, “WebSphere Portal Server standard output and standard error logs” on page 147, should contain the information for the Workplace Services Express server.

There are cases when there might be errors in the log files for the WebSphere Application Server that you should review. These cases include a Workplace Services Express server failure where no data can be found in the WebSphere Portal logs or a failure during the initial startup. You can access the standard output and standard error logs in two ways:

- ▶ Open the files in the integrated file system of the iSeries server. The log files are written to the directory `/QIBM/UserData/WebAS5/Base/WSEServerName/logs/WebSphere_Portal`, where `WSEServerName` represents your Workplace Services Express server.
- ▶ Select the log files from the IBM Web Administration for iSeries.

To select the log files from the IBM Web Administration for iSeries, follow these steps:

1. Access IBM Web Administration for iSeries. Point your Web browser to your fully qualified iSeries host name on port 2001:

`http://iSeriesHostName.domain:2001`

In our example, we enter:

`http://rchas12.rchland.ibm.com:2001`

2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. From the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. To manage your Workplace Services Express server, select your server by performing the following steps:
 - a. Click the **Manage** tab.
 - b. Click the **Application Servers** tab.
 - c. In the Server drop-down list, select your Workplace Services Express server name.
5. In the left pane, click **View Logs** and then click the **WAS Logs** tab to view the WebSphere Application Server logs as shown in Figure 5-59.



Figure 5-59 Viewing the WebSphere Application Server logs

5.8.4 Collecting logs for technical support or development

A collector script is available for your use in the integrated file system directory `/QIBM/UserData/WebAS5/Base/WSEServerName/WorkplaceServer/tools/collector`, where *WSEServerName* represents the name of your Workplace Services Express server. Use this script when collecting data for review by Lotus technical support or development. Perform the following steps to run the collector script:

Note: In these steps *WSEServerName* represents your Workplace Services Express server name.

1. Log on to the iSeries server and navigate to the QSHELL environment by entering the STRQSH CL command.
2. Navigate to the directory containing the collector script by entering the following QSHELL command:

```
cd /QIBM/UserData/WebAS5/Base/WSEServerName/  
WorkplaceServer/tools/collector/scripts/os400
```

3. Enter the following QSHELL command to run the collector script:

```
runCollector.sh
```

4. Review the output. You should see entries similar to those shown in Example 5-3.

Example 5-3 Example Qshell output from the runCollector.sh script

```
> runCollector.sh  
Lotus Workplace Data Collection  
Creating property file ...  
...  
/QIBM/UserData/WebAS5/Base/itsowse3/WorkplaceServer/tools/collector/scripts/os400/collec  
tor.property ...  
... Created property file  
QSH0005: Command ended normally with exit status 0.  
CPD4090: Printer device PRT01 not found. Output queue changed to QPRINT in library  
QGPL.  
CPC7301: File SNPSHTPF created in library QTEMP.  
CPC7301: File SNPSHTSRC created in library QTEMP.  
CPF5815: Member QPDSPSTS for file SNPSHTPF in library QTEMP not found.  
CPF3484: Member QPDSPSTS added to file SNPSHTPF in QTEMP.  
CPF3485: 15 records copied to file SNPSHTPF in QTEMP.  
CPF5815: Member QPDSPSTS for file SNPSHTSRC in library QTEMP not found.  
CPF2889: Member QPDSPSTS added to file SNPSHTSRC in QTEMP.  
CPC2955: 15 records copied from member QPDSPSTS.  
CPC7309: Member QPDSPSTS removed from file SNPSHTPF in QTEMP.  
CPC7309: Member QSYSPRT removed from file SNPSHTPF in QTEMP.  
CPC7309: Member QSYSPRT removed from file SNPSHTSRC in QTEMP.  
Collecting log data for instance itsowse3  
Attaching Java program to  
/QIBM/UserData/WebAS5/Base/itsowse3/WorkplaceServer/tools/collector/collector.jar.
```

Tip: If you receive an error message when running the runCollector.sh script, use the -instance parameter to see if the problem goes away, for example:

```
runCollector.sh -instance WSEServerName
```

5. You can now use a mapped drive to locate the .jar file created by the collector. You can find this file in the integrated file system directory /QIBM/UserData/WebAS5/Base/WSEServerName/WorkplaceServer/tools/collector/out.

The name of the file is *collector_yyyymmdd_hhmmss.jar*, for example collector_20051024_102226.jar. You can now send this .jar file to Lotus technical support for review.

5.9 Obtaining and applying fixes

In this section, we explain how to obtain and apply fixes in the Workplace Services Express environment. We also demonstrate how to locate and use the WebSphere Portal Update Installer.

5.9.1 Obtaining iSeries specific fixes

You should stay current on i5/OS program temporary fixes (PTFS) for Java, DB2 Universal Database, and WebSphere. There are a number of PTF groups that are available to make this easier for you. For general iSeries fixes help and ordering information, refer to:

<http://www.ibm.com/servers/eserver/support/series/fixes/index.html>

Important: Be aware that when you apply a WebSphere group PTF, the version of WebSphere Application Server is updated. While in most cases this is a good thing, it can have undesired consequences in your environment. Be sure to read the cover letters and other preventative service planning documentation that is available to understand the changes that will be made when you apply i5/OS PTFs.

For more information about iSeries PTFS, see 2.3, “Program temporary fixes” on page 16.

5.9.2 Obtaining WebSphere Portal and Workplace Services Express fixes

You can search on known problems, technical documents, and individual fixes for Workplace Services Express, as well as download necessary information from the following Workplace Services Express Web site:

<http://www.ibm.com/support/search.wss?rs=2175&tc=SSMHXX&q=2.5&dc=D400%2BD410%2BD420%2BD430&dtm>

To obtain individual fixes known as *interim fixes* (ifixes) for Workplace Services Express, you must download the WebSphere Portal Update installer, which is located on the Web at:

<http://www.ibm.com/support/docview.wss?rs=899&uid=swg24006942>

For detailed information about downloading and installing the WebSphere Portal Update Installer, refer to 5.9.3, “Obtaining and installing the WebSphere Portal Update Installer” on page 152. For information about installing an individual ifix, refer to 5.9.4, “Installing a Workplace Services Express interim fix” on page 154.

5.9.3 Obtaining and installing the WebSphere Portal Update Installer

The WebSphere Portal Update Installer is used to provide individual fixes and fixpacks related to WebSphere Portal, Workplace Services Express, or both. Perform the following steps to obtain and install the WebSphere Portal Update Installer:

1. Open a Web browser and go to the following Web site:

<http://www.ibm.com/support/docview.wss?rs=899&uid=swg24006942>

- Click the **PortalUpdateInstaller50X** download option as shown in Figure 5-60.

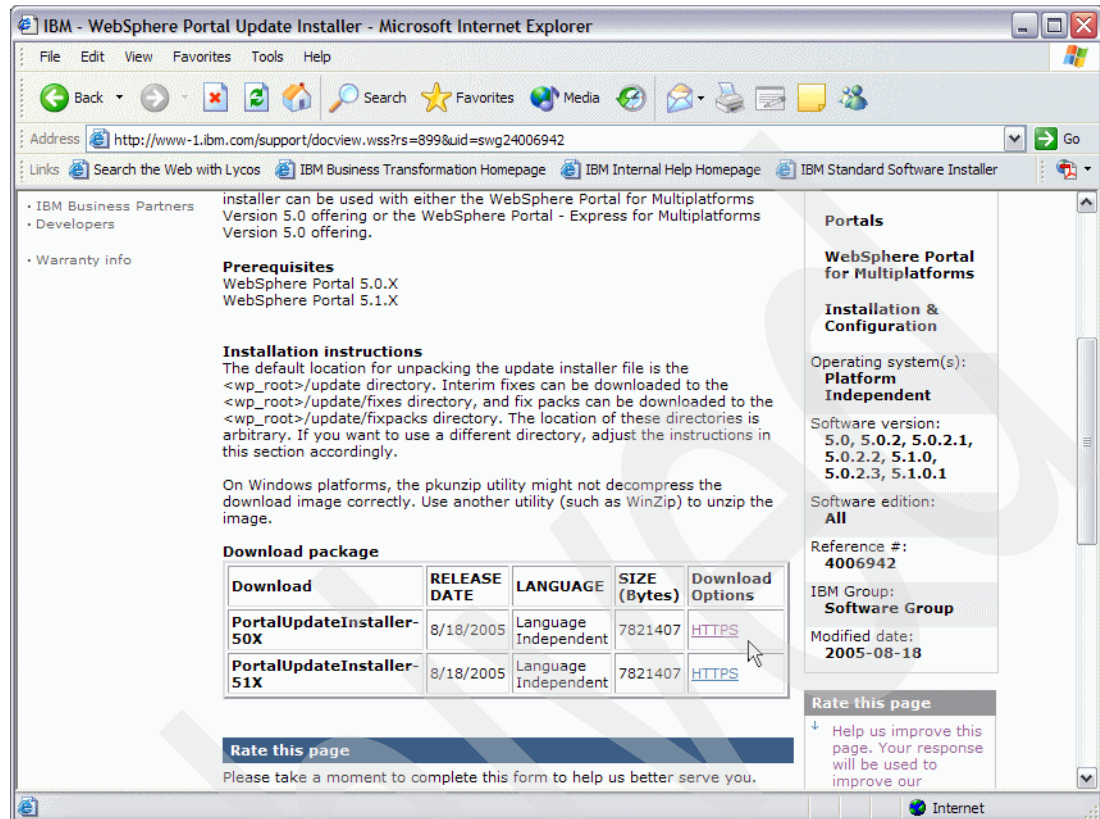


Figure 5-60 Downloading the WebSphere Portal Update Installer

- In the Terms and conditions window, click **I agree**.
- Sign in with your IBM user ID and password.
- Because of the number of files available for download from this page, we recommend that you use the Find option to look for the string WebSphere Portal for Multiplatforms Update Installer. Then click the **Download now** link as shown in Figure 5-61.

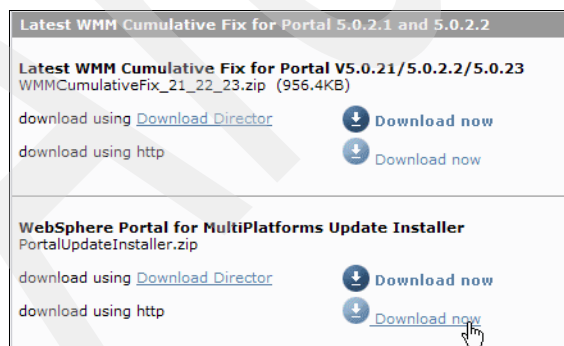


Figure 5-61 Selecting to download the WebSphere Portal for Multiplatforms Update Installer

- Save the PortalUpdateInstaller.zip file to your workstation.
- Map a network drive to the root directory of the iSeries server integrated file system.

8. Create a new folder or directory in the iSeries integrated file system to place the WebSphere Portal Update Installer files. For our example, we named the folder PortalUpdateInstaller.
9. Extract all of the files from PortalUpdateInstaller.zip to the new directory on your iSeries (/PortalUpdateInstaller).
10. Change the authority of the directory and all subdirectories and files to allow *PUBLIC *RWX authority. Perform the following steps to update the authority:
 - a. From an i5/OS command line, enter:
STRQSH
 - b. From the QSHHELL command line, enter:
cd /
 - c. From the QSHHELL command line, enter:
chmod -R o+rx PortalUpdateInstaller

5.9.4 Installing a Workplace Services Express interim fix

After you install the WebSphere Portal Update Installer, you can download and apply interim fixes. To help you understand the process, we demonstrate how to download and apply the ifix LOCJAC8 for SPR LLGO6CJAC8. For information about this problem, see:

<http://www.ibm.com/support/docview.wss?uid=swg24009928>

Perform the following steps to install an ifix:

1. Back up your Workplace Services Express configuration data. For assistance, refer to 5.11.1, "Saving a Workplace Services Express server: sample CL program" on page 161.
2. Download the ifix to your workstation.
3. Map a drive to the iSeries server integrated file system root directory.
4. Create a directory on your iSeries server to temporarily place the fix. For our example, we created a directory called fixes in our PortalUpdateInstaller directory.
5. Extract the files in the zip file that you download (LOCJAC8.zip in this example) to your fixes directory.
6. Sign onto the iSeries server and open a QSHHELL window using the STRQSH CL command.
7. Modify the authorities on the .jar file so that the file is executable:
 - a. Change to the directory that contains your fix .jar file, for example:
cd /PortalUpdateInstaller/fixes
 - b. Modify the permissions of the .jar file with the **chmod** command, for example:
chmod 755 LOCJAC8.jar
8. Shut down the Workplace Services Express server where you want to install the fix.
9. To avoid a possible timeout error when installing the fix, increase the timeout value in the soap.client.properties file:
 - a. Use your mapped network drive to navigate to the integrated file system directory, \QIBM\UserData\WebAS5\Base\WSEServerName\properties directory, for your Workplace Services Express server. In the directory name, *WSEServerName* represents your actual Workplace Services Express server name.
 - b. Open the **soap.client.props** file in any text editor.

- c. Change the value in the `com.ibm.SOAP.requestTimeout` to 6000 as shown in Figure 5-62.

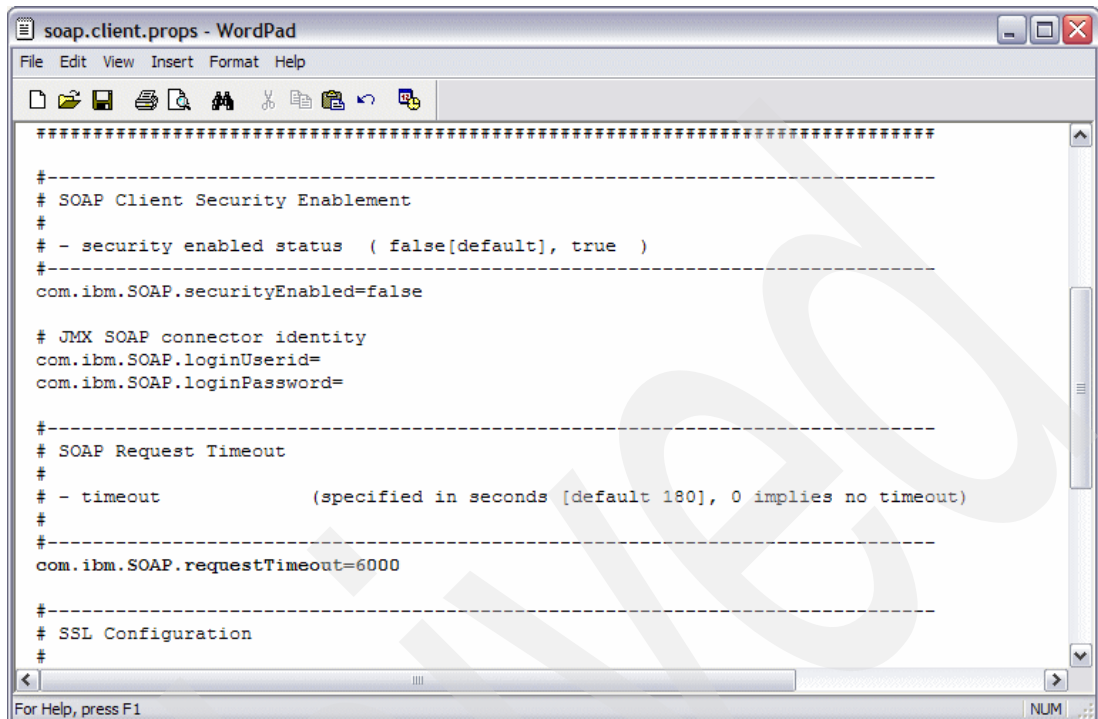


Figure 5-62 Modifying the `soap.client.props` file

10. In order for the fix to install, the `wpconfig.properties` file must contain the Workplace Services Express administrator user ID and password. The `wpconfig.properties` file is located in the integrated file system directory, `\QIBM\UserData\WebAS5\Base\WSEServerName\PortalServer\config`. In this directory name, `WSEServerName` represents your actual Workplace Services Express server name. Use your mapped drive and any text editor to modify the `wpconfig.properties` file.
11. The `WAS_PROD_HOME` environment variable must be set before you can run the installer. Enter the following command at the QSHELL command prompt:


```
export WAS_PROD_HOME=/QIBM/ProdData/WebAS5/Base
```
12. Install the fix by entering the following QSHELL command, where the `fixes` parameter value is the name of the `ifix.jar` file that you downloaded:

```

/PortalUpdateInstaller/updatePortal.sh
-installDir "/qibm/userdata/webas5/base/WSEServerName/PortalServer"
-fix -install
-fixDir /PortalUpdateInstaller/fixes
-fixes LOCJAC8
  
```

Example 5-4 shows the output received when installing an ifix.

Example 5-4 Example output received when installing an ifix

```

/PortalUpdateInstaller/updatePortal.sh
-installDir "/qibm/userdata/webas5/base/itsowse7/PortalServer"
-fix -install
-fixDir /PortalUpdateInstaller/fixes -fixes LOCJAC8
  
```

Start of [`/PortalUpdateInstaller/updatePortal.sh`]

Build 20050906_0958

Verifying installer jar:
[PortalUpdateInstaller.jar]

/qibm/userdata/webas5/base/itsowse7/PortalServer
rm: 001-2103 Error found getting information for file or directory
/qibm/userdata/webas5/base/itsowse7/PortalServer/version/EXPRESS.product. No such path
or directory.

/qibm/userdata/webas5/base/itsowse7/PortalServer

Fix update specified

Installation specified

Fix directory: /PortalUpdateInstaller/fixes

Fix JAR file: LOCJAC8.jar

Target product directory: /qibm/userdata/webas5/base/itsowse7/PortalServer

Copyright (c) IBM Corporation 2002; All rights reserved.

WebSphere Portal Version 5

Update Installer Version 1.5, Dated 9/24/03

Configuration Properties:

WAS Home:/QIBM/UserData/WebAS5/Base/ITSOWSE7

UserInstallRoot:/QIBM/UserData/WebAS5/Base/ITSOWSE7

CellName:ITSOWSE7_ITSOWSE7

NodeName:ITSOWSE7_ITSOWSE7

ServerName:WebSphere_Portal

WAS DMgr processing:false

Checking the status of all Application Servers

Checking status of server server1

Checking status of server WebSphere_Portal

Fix: LOCJAC8

Task 1 out of 3; Begin (1 of 1) Installing fix LOCJAC8; preparing for installation

Task 1 out of 3; End (1 of 1) Installing fix LOCJAC8; preparing for installation

Task 2 out of 3; Begin (1 of 1) Installing fix LOCJAC8; installing component 1 of 1

Quiet Mode: Logging to

/qibm/userdata/webas5/base/itsowse7/PortalServer/version/log/20051021_200652_LOCJAC8_Lot
us Collaborative Components_install.log

Task 2 out of 3; End (1 of 1) Installing fix LOCJAC8; installing component 1 of 1

Task 3 out of 3; Begin (1 of 1) Installing fix LOCJAC8; completing installation

Task 3 out of 3; End (1 of 1) Installing fix LOCJAC8; completing installation

Fix installation completed successfully.

End of [/PortalUpdateInstaller/updatePortal.sh]

-
13. In step 10 you modified the wpconfig.properties file to include the Workplace Services Express administrator and password. Now remove the password from this file to protect the integrity of the password.

5.10 Removing the Sign up and Edit my profile links

By default, Workplace Services Express allows a user to sign up (or self register) and edit their profile. The Sign up option creates a new user in the back-end LDAP server. The Edit my profile option modifies the entry for the user in the back-end LDAP server. Some companies find this undesirable.

Note: If you only allowed read access to the LDAP directory during configuration, the Sign up and Edit my profile links should have been removed for you by the iSeries Create IBM Workplace wizard. Therefore, you do not have to perform the following steps.

Important: Be aware that performing these steps only removes the link from the Workplace Services Express environment. If you set up your Workplace Services Express server with an LDAP user and password that has write access to the LDAP directory, changes to the LDAP server can still be made manually when you enter the URL to access the Sign up page directly.

To modify the Workplace Services Express server's access to the LDAP directory, modify the authority of the Workplace Services Express administrator account. As part of the configuration process performed by the iSeries Create IBM Workplace wizard, the Workplace Services Express administrator was granted either read or read/write authority to the LDAP directory. We recommend that you manually remove the Workplace Services Express administrator's write authority to the LDAP server to prevent all changes to the LDAP server by Workplace Services Express.

The following steps explain you how to remove the Sign up and Edit profile links from your Workplace Services Express server:

1. Stop your Workplace Services Express server. For assistance with stopping your server, refer to 5.1.2, "Stopping a Workplace Services Express server" on page 108.
2. Log on to the iSeries server via a 5250 emulation session and enter the STRQSH CL command.

3. Change to the configuration directory for the Workplace Services Express server:

```
cd /QIBM/UserData/WebAS5/Base/WSEServerName/PortalServer/config
```

Here *WSEServerName* represents your Workplace Services Express server name.

4. You can now run the WPSconfig script to update the Workplace Services Express server:

```
WPSconfig.sh action-fixup-signup-link
```

You see output similar to what is shown in Example 5-5.

Example 5-5 Updating the Workplace Services Express server to remove the sign up link

```
WPSconfig.sh action-fixup-signup-link
```

```
Licensed Materials - Property of IBM
```

```
5724-E76, 5724-E77
```

```
(C) Copyright IBM Corp. 2001, 2004 All Rights Reserved.
```

```
Running WebSphere Portal 5.0.2.2 configuration
```

```
Executing native2ascii with native encoding 'ISO8859_1': wpconfig.properties ->
```

```
wpconfig_ascii.properties
```

```
Native2ascii execution was successful!
```

```
Setting cfg.file.name.original to wpconfig.properties
```

```
Setting cfg.file.name to wpconfig_ascii.properties
```

```
Adding ENTITY for property_file_updates
```

```
Adding ENTITY for d57415
```

```
Adding ENTITY for CM_502
```

```
Adding ENTITY for d63026
```

```
Adding ENTITY for d70013
```

```
Adding ENTITY for PQ78657
```

```
Adding ENTITY for WP_PTF_5021
```

```
Adding ENTITY for d66191
```

```
Adding ENTITY for Likeminds_502
```

```
Adding ENTITY for d61137
```

```

Adding ENTITY for d15446
Adding ENTITY for d63750
Adding ENTITY for d63852
Adding ENTITY for d60351
Adding ENTITY for d63291
Adding ENTITY for d64954
Adding ENTITY for d66322
Adding ENTITY for d66323
Adding ENTITY for d50062
Adding ENTITY for d68644
Adding ENTITY for PQ85659
Adding ENTITY for WP_PTF_502
Adding ENTITY for d74818
Adding ENTITY for LWP_25
Adding ENTITY for L007957
Adding ENTITY for iseries_arcfixups
Adding ENTITY for iseries_dglfixups
Adding ENTITY for lwp_arcfixup
Adding ENTITY for lwp_migrate_fixup
Adding ENTITY for postfixup
Adding entity include for property_file_updates
Adding entity include for d57415
Adding entity include for CM_502
Adding entity include for d63026
Adding entity include for d70013
Adding entity include for PQ78657
Adding entity include for WP_PTF_5021
Adding entity include for d66191
Adding entity include for Likeminds_502
Adding entity include for d61137
Adding entity include for d15446
Adding entity include for d63750
Adding entity include for d63852
Adding entity include for d60351
Adding entity include for d63291
Adding entity include for d64954
Adding entity include for d66322
Adding entity include for d66323
Adding entity include for d50062
Adding entity include for d68644
Adding entity include for PQ85659
Adding entity include for WP_PTF_502
Adding entity include for d74818
Adding entity include for LWP_25
Adding entity include for L007957
Adding entity include for iseries_arcfixups
Adding entity include for iseries_dglfixups
Adding entity include for lwp_arcfixup
Adding entity include for lwp_migrate_fixup
Adding entity include for postfixup
Setting build file name to
/QIBM/UserData/WebAS5/Base/itsowse3/PortalServer/config/wpconfig_dynamic.xml
Buildfile:/QIBM/UserData/WebAS5/Base/itsowse3/PortalServer/config/wpconfig_dynamic.xml

action-iseries-switch-user:
[switchprofile] Unable to extract user profile from WAS server.xml file
[switchprofile] WAS server.xml file is
/QIBM/UserData/WebAS5/Base/itsowse3/config/cells/ITSOWSE3_ITSOWSE3/nodes/ITSOWSE3_ITSOWS
E3
/servers/ITSOWSE3/server.xml

```

```

[switchprofile] Processing will proceed with default user profile (QEJBSVR)
[logmsg] 2005.10.25 11:07:59.707 iseries-switch-user
[logmsg] EJPC5000I Switched to user "QEJBSVR".
iseries-switch-back:
[switchprofile] Switching back to original user= AHOERLE

action-update-wpconfig-dynamic:

iseries-switch-to-was-user:
[switchprofile] Unable to extract user profile from WAS server.xml file
[switchprofile] WAS server.xml file is
/QIBM/UserData/WebAS5/Base/ITSOWSE3/config/cells/ITSOWSE3_ITSOWSE3/nodes/ITSOWSE3_ITSOWSE3
/servers/ITSOWSE3/server.xml
[switchprofile] Processing will proceed with default user profile (QEJBSVR)

iseries-switch-user:

init-jsp-backup:

action-backup-jsp:
[echo] Backing up original JSP
/QIBM/UserData/WebAS5/Base/ITSOWSE3/installedApps/ITSOWSE3_ITSOWSE3/wps.ear/wps.war/themes/html/workplace/ToolBarInclude.jsp
[copy] Copying 1 file to
/QIBM/UserData/WebAS5/Base/ITSOWSE3/installedApps/ITSOWSE3_ITSOWSE3/wps.ear/wps.war/themes/html/workplace
action-copy-orig-backup:

action-fixup-signup-link:
[echo] Commenting out the Sign Up Link from in
/QIBM/UserData/WebAS5/Base/ITSOWSE3/installedApps/ITSOWSE3_ITSOWSE3/wps.ear/wps.war/themes/html/workplace/ToolBarInclude.jsp
[replace] Replaced 1 occurrences in 1 files.
[replace] Replaced 1 occurrences in 1 files.
[replace] Replaced 1 occurrences in 1 files.

BUILD SUCCESSFUL
Total time: 5 seconds

```

5. Start your Workplace Services Express server. For assistance with starting your server, see 5.1.1, “Starting a Workplace Services Express server” on page 106.

5.11 Backup and recovery

The backup and recovery of a Workplace Services Express server can be complex if you do not understand where the data is stored. When planning for backup and recovery of your Workplace Services Express server, you must plan for all of the components that complete the Workplace Services Express environment. Three servers, the LDAP server, HTTP server and the Workplace Services Express Server, make up the Workplace Services Express environment.

The data for the LDAP server is stored in different places depending on the LDAP server that you are using. Refer to the product documentation for the LDAP server that you are using for information about backup and recovery.

If you are using the IBM Directory Server for iSeries as your LDAP server, you can find information in the iSeries Information Center:

<http://publib.boulder.ibm.com/infocenter/iseries/v5r3/topic/rzahy/rzahybup-rf.htm#rzahybup-rf>

Tip: When you save the IBM Directory Server, do not save the QDIRSRV2 library because the contents cannot be restored in any usable way. Also be aware that the /QIBM/UserData/OS400/Dirsrv directory can only be restored on the same release of OS/400 or i5/OS on which it was saved.

For information about saving a Domino server on iSeries, refer to the IBM Redbook *Domino 6 for iSeries Best Practices Guide*, SG24-6937.

The default HTTP server used by the Workplace Services Express server is the IBM HTTP Server for iSeries (powered by Apache). Unless you changed the defaults when running the iSeries Create IBM Workplace wizard, the data is stored within the iSeries server integrated file system in the /www/WSEServerName directory.

The Workplace Services Express data is stored in several places. The product code, user data and configuration data are all stored in different places.

The Workplace Services Express product code is stored in the QWSE25 library and /QIBM/ProdData/Workplace/WSE25 directory. The data here is only changed after applying PTFs, and therefore, only must be saved periodically. This can be done as part of a weekly, monthly, or quarterly complete system save.

The Workplace Services Express user data is stored within DB2 Universal Database. The names of the libraries that contain the data depends on the naming option chosen in the iSeries Create IBM Workplace wizard. The default naming option is based on the server name of the Workplace Services Express server. Therefore, you see WSEServerName1, WSEServerName2, and so on type libraries on your system. If you have not chosen the default naming, refer to 5.2, "Reviewing the Workplace Services Express configuration" on page 110, to determine the library names. Save the libraries that contain the DB2 Universal Database data often. We recommend that you save these libraries daily.

Important: At this time, there is no way to save and restore individual documents. All backup and recovery must be done at the database level. The functionality to restore individual documents will be added to a future release of Workplace Services Express.

The configuration data is stored within the integrated file system in the /QIBM/UserData/WebAS5/Base/WSEServerName directory, where WSEServerName represents your Workplace Services Express server name. To ensure easy recovery, if necessary, we recommend that you back up this directory daily or weekly. There is also some configuration data stored in the WebSphere Portal Server database. This database can be included in your backup procedure when backing up all user data. An example of configuration data that is stored in the DB2 Universal Database database is user policies.

Table 5-1 summarizes the information to be saved and the recommended frequency of the backup.

Table 5-1 Summary of backup recommendations for Workplace Services Express

| Component to be saved | Where data is stored | Frequency of backup |
|---|---|-------------------------------|
| Workplace Services Express product data | QWSE25 library and /QIBM/ProdData/Workplace/WSE25 | Weekly, monthly, or quarterly |
| IBM HTTP Server for iSeries | /www/WSEServerName | Daily or weekly |
| Workplace Services Express configuration data | /QIBM/UserData/WebAS5/Base/WSEServerName | Daily or weekly |
| Workplace Services Express user data | DB2 Universal Database libraries | Daily |

5.11.1 Saving a Workplace Services Express server: sample CL program

You should now understand where the Workplace Services Express data is stored. To assist you in backing up the Workplace Services Express server configuration data and user data along with the IBM HTTP Server, we provide a sample CL program, called *SAVEWSE25.txt*, for you to use. This program performs the following actions:

- ▶ Ends the HTTP server
- ▶ Ends the Workplace Services Express server
- ▶ Ends the QEJBAS5 subsystem
- ▶ Monitors the QEJBAS5 subsystem to make sure it has ended
- ▶ Saves the /www/WSEServerName directory
- ▶ Saves the /QIBM/UserData/WebAS5/Base/WSEServerName directory
- ▶ Saves the DB2 Universal Database libraries (assuming the default naming convention)
- ▶ Starts the HTTP server
- ▶ Starts the Workplace Services Express server

In the directory name, *WSEServerName* represents your Workplace Services Express server name.

Tip: In a future version of Workplace Services Express, scripts will be provided that will back up and recover a Workplace Services Express server.

Example 5-6 shows the sample CL program, *SAVEWSE25.txt*. You can also download a copy of this CL program, as explained in Appendix C, “Additional material” on page 359.

This CL program expects the following parameters:

- ▶ The Workplace Services Express server name
- ▶ The administrator user ID
- ▶ The administrator user ID password

The following command shows an example call to the CL program. Here *itsowse3* represents the Workplace Services Express server name, *wpsadmin* represents the administrator user ID, and *password* represents the password for the administrator.

```
CALL PGM(SAVEWSE25) PARM('itsowse3' 'wpsadmin' 'password')
```

Important: The password is case sensitive. To ensure that the correct case is passed to the program, you must use single quotation marks around each parameter value. If you do not specify the single quotation marks, the text is converted to all uppercase and the program is unable to end the Workplace Services Express server. For example, the following command does not work:

```
CALL PGM(SAVEWSE25) PARM(ITSOWSE3 WPSADMIN PASSWORD)
```

Here is the command again with the parameters passed correctly to the CL program:

```
CALL PGM(SAVEWSE25) PARM('itsowse3' 'wpsadmin' 'password')
```

Example 5-6 Sample CL program to save a Workplace Services Express server

```
/*This program is a basic example of backing up a Workplace Services Express */
/*server. This program assumes that you are running one Workplace Service Express */
/*server and that you are not running any stand-alone WebSphere Application Servers */
/*in the QEJBAS5 subsystem. If you are, that is not a problem, but be aware it will*/
/*be ended when this program executes. Also, this program assumes that you */
/*are using the default naming scheme for the data libraries. If you have */
/*chosen the option to name the libraries based on their purpose, you will */
/*need to modify this program to use the correct library names. */
/*Please be aware that this program does not backup the LDAP directory. */
/*
PGM          PARM(&INSTANCE &USER &PASSWORD)
DCL          VAR(&INSTANCE) TYPE(*CHAR) LEN(10)
DCL          VAR(&CMD) TYPE(*CHAR) LEN(300)
DCL          VAR(&COUNT) TYPE(*DEC) LEN(2 0) VALUE(0)
DCL          VAR(&USER) TYPE(*CHAR) LEN(12)
DCL          VAR(&PASSWORD) TYPE(*CHAR) LEN(12)
DCL          VAR(&MSG) TYPE(*CHAR) LEN(250)

/* End the HTTP server and Workplace Services Express instance */

ENDTCPSVR    SERVER(*HTTP) HTTPSVR(&INSTANCE)
MONMSG      MSGID(TCP1A77) /* HTTP server already ended */

CHGVAR       VAR(&CMD)
             VALUE('/qibm/userdata/WebAS5/Base/' *TCAT +
                 &INSTANCE *TCAT +
                 '/PortalServer/rootscripts/subtasks/stopPort+
                 talServer.sh -user' *BCAT &USER *BCAT +
                 '-password' *BCAT &PASSWORD)

QSH          CMD(&CMD) /* run script to end server */
MONMSG      MSGID(QSH0006) EXEC(DO)
SNDPGMMSG    MSG('Error trying to end the Workplace +
                 services express instance. The backup +
                 was aborted.')

GOTO        CMDLBL(END)
ENDDO

MONMSG      MSGID(QSH0007) EXEC(DO)
SNDPGMMSG    MSG('Error trying to end the Workplace +
                 Services Express instance. The backup +
                 was aborted.')

GOTO        CMDLBL(END)
ENDDO

/*End the QEJBAS5 subsystem */
```



```

        ENDSBS      SBS(QEJBAS5) DELAY(1800) /* Allow 30 minutes +
                   for the server to end before ending the +
                   subsystem immediately */
        MONMSG      MSGID(CPF0000)

/*Begin loop to verify that all jobs have ended before starting backup */

LOOP:

        ALCOBJ      OBJ((QEJBAS5/QEJBAS5 *SBSD *EXCL)) WAIT(600) +
                   /* Wait 10 minutes to get subsystem */
        MONMSG      MSGID(CPF1002) EXEC(DO)
        CHGVAR      VAR(&COUNT) VALUE(&COUNT +1)
        IF          COND(&COUNT = 6) THEN(GOTO CMDLBL(LOOP))
        SNDPGMMSG    MSG('The QEJBAS5 subsystem failed to end +
                   after 1 hour. Backup is aborted.')

        GOTO END
        ENDDO

/*Save the HTTP and WSE instance data followed by DB2 data to tape device tap01*/

        SAV          DEV('/qsys.lib/tap01.devd') OBJ(((('/www/' +
                   *CAT &INSTANCE)) +
                   ((('/qibm/userdata/WebAS5/Base/' *CAT +
                   &INSTANCE)))
        MONMSG      MSGID(CPF0000)
        SAVLIB      LIB((&INSTANCE *TCAT '*')) DEV(TAP01)
        MONMSG      MSGID(CPF0000)
        DLCOBJ      OBJ((QEJBAS5/QEJBAS5 *SBSD *EXCL))

/*Restart the HTTP and WSE server*/

        STRTCPSVR    SERVER(*HTTP) HTTPSVR(&INSTANCE)
        STRSBS      SBS(QEJBAS5/QEJBAS5)

        CHGVAR      VAR(&CMD) +
                   VALUE('/qibm/userdata/WebAS5/Base/' *TCAT +
                   &INSTANCE *TCAT +
                   '/PortalServer/rootscripts/startWorkplaceSe+
                   rvices.sh')
        QSH          CMD(&CMD) /* run script to start server */

END:
ENDPGM

```

5.11.2 Restoring a Workplace Services Express server

This section explains how to restore the IBM HTTP Server for iSeries (powered by Apache) server, user data, and configuration data used by a Workplace Services Express server. Before you can understand the restore process, you must understand private authorities.

Private authorities are the authorities to an object for any user other than the owner. For example in Figure 5-63, ITSouser is the owner, and QTMMHTTP has *X authority to the /www/itsowse3 directory. The authority QTMMHTTP has to the object is considered a private authority. If we lose the private authorities to this directory, the IBM HTTP Server for iSeries server itsowse3 will no longer start because the QTMMHTTP authority no longer exists. This becomes important because, depending on how the data is restored to the system, the private authorities might not be recovered.

```

Work with Authority

Object . . . . . : /www/itsowse3
Owner . . . . . : ITSUSER
Primary group . . . . . : *NONE
Authorization list . . . . . : *NONE

Type options, press Enter.
  1=Add user   2=Change user authority   4=Remove user

Opt User      Data      --Object Authorities--
      Authority Exist Mgt Alter Ref

      *PUBLIC      *X
      ITSUSER *RWX      X      X      X      X
      QTMHHTTP      *X

Parameters or command
===>
F3=Exit   F4=Prompt   F5=Refresh      F9=Retrieve
F11=Display detail data authorities   F12=Cancel   F24=More keys
(C) COPYRIGHT IBM CORP. 1980, 2003.

```

Figure 5-63 Work with Authority display for the /www/itsowse3 object

There are two methods to restore the private authorities. The first option takes the following approach:

- ▶ Restore user profiles (RSTUSRPRF *ALL)
- ▶ Restore data (IBM HTTP Server or configuration data)
- ▶ Restore authorities (RSTAUT)

The second option is to manually rebuild the private authorities. We use this approach in our examples because saving and restoring user profiles are beyond the scope of this redbook. For additional information, refer to the iSeries Information Center at:

<http://publib.boulder.ibm.com/infocenter/iseres/v5r3/index.jsp?topic=/rzaui/rzauiicbackup.htm>

Restoring an IBM HTTP Server for iSeries (powered by Apache) server

Before you can restore the IBM HTTP Server for iSeries (powered by Apache) server, you must end it, although you are not required to end the Workplace Services Express server. However, without an HTTP server, the Workplace Services Express server is not functional. Therefore, in our example, we end both servers. Perform the following steps to restore the HTTP server. Notice that *WSEServerName* represents the Workplace Services Express server name.

1. End the IBM Workplace Services Express server. For information about ending the Workplace Services Express server, refer to 5.1.2, “Stopping a Workplace Services Express server” on page 108.
2. End the IBM HTTP Server using the following End TCP/IP Server (ENDTCPSVR) CL command. Do this step only if you did not end the HTTP server with the Workplace Services Express server in the previous step.

```
ENDTCPSVR SERVER(*HTTP) HTTPSVR(WSEServerName)
```

3. Restore the IBM HTTP Server data directory from tape:

```
RST DEV('/qsys.lib/tap01.devd') OBJ((' /www/WSEServerName'))
```

4. Restore the private authorities for the IBM HTTP Server files and directories:

```
CHGAUT OBJ('/www/WSEServerName/conf') USER(QTMHHTTP) DTAAUT(*X)
CHGAUT OBJ('/www/WSEServerName/htdocs') USER(QTMHHTTP) DTAAUT(*RX)
CHGAUT OBJ('/www/WSEServerName/logs') USER(QTMHHTTP) DTAAUT(*RWX)
CHGAUT OBJ('/www/WSEServerName/conf/httpd.conf') USER(QTMHHTTP) DTAAUT(*R)
CHGAUT OBJ('/www/WSEServerName/htdocs/index.html') USER(QTMHHTTP) DTAAUT(*R)
```

5. Start the IBM HTTP Server using the following CL command:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(WSEServerName)
```

Restoring Workplace Services Express server configuration data

This section explains how to restore the Workplace Services Express configuration data.

Important: Some configuration data is also stored within the DB2 Universal Database database. If you are unsure about whether the configuration data that you need is stored in the integrated file system directory or in DB2 Universal Database, we recommend that you also follow the steps outlined in “Restoring Workplace Services Express server user data” on page 165. An example of configuration data that is stored in the DB2 Universal Database database is user policies.

Perform the following steps:

1. End the IBM Workplace Services Express server. For information about ending the server, refer to 5.1.2, “Stopping a Workplace Services Express server” on page 108.
2. Restore the Workplace Services Express configuration data directory from tape:

```
RST DEV('/qsys.lib/tap01.devd') OBJ((' /QIBM/UserData/WebAS5/Base/WSEServerName'))
```

Note: Because of the large numbers of small files that must be created, the restore time is longer than that of the save time. During our testing, we have observed restore times between one and two hours.

3. Restore the private authorities or you will lose the link between your HTTP server and the Workplace Services Express server:

```
CHGAUT OBJ('/QIBM/UserData/WebAS5/Base/WSEServerName/config/cells/plugin-cfg.xml')
USER(QTMHHTTP) DTAAUT(*RX)
CHGAUT OBJ('/QIBM/UserData/WebAS5/Base/WSEServerName/config/cells') USER(QTMHHTTP)
DTAAUT(*RX)
CHGAUT OBJ('/QIBM/UserData/WebAS5/Base/WSEServerName/config') USER(QTMHHTTP) DTAAUT(*RX)
```

4. Start your Workplace Services Express server. For assistance with starting your server, refer to 5.1.1, “Starting a Workplace Services Express server” on page 106.

Restoring Workplace Services Express server user data

You might want to restore Workplace Services Express server user data if a user makes a fatal error and deletes data that they needed. You might also have to restore the DB2 Universal Database data if an undesired configuration change is made that is stored in the WebSphere Portal configuration database and you do not understand what was changed.

Important: In Workplace Services Express, there is *no* functionality to restore a single document, team space, and so on. At this time, you must restore the entire database. This limitation will be addressed in a future release of Workplace Services Express.

Use the following steps to restore the DB2 Universal Database data. Here *WSEServerName* represents your Workplace Services Express server name.

1. End the IBM Workplace Services Express server. For information about ending the Workplace Services Express server, refer to 5.1.2, “Stopping a Workplace Services Express server” on page 108.

2. Delete the existing DB2 Universal Database data libraries:

- a. Enter the following Work Library CL command:

```
wrklib WSEServerName*
```

Note: We presume that you are using the default naming convention based on the Workplace Services Express server name. If you did not select this option, see 5.2, “Reviewing the Workplace Services Express configuration” on page 110, for information about the database naming conventions.

- b. On the Work with Libraries display (Figure 5-64), type option 4 (Delete) next to each library and press Enter.

Work with Libraries

Type options, press Enter.

| | | | |
|-------------------------------|----------------------|------------|----------|
| 1=Create | 2=Change | 3=Copy | 4=Delete |
| 8=Display library description | 9=Save | 10=Restore | 6=Print |
| 11=Save changed objects | 12=Work with objects | 14=Clear | |

| Opt | Library | Attribute | ASP Device | Text |
|-----|------------|-----------|------------|-----------------------------|
| 4 | ITSOWSE5 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE51 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE518 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE52 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE53 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE54 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE55 | PROD | | COLLECTION - created by SQL |

Bottom

Parameters for options 1, 2, 3, 5, 8, 9, 10, 11 and 12 or command
 ==>

| | | | |
|------------|------------------------|-----------------|------------------------|
| F3=Exit | F4=Prompt | F5=Refresh | F9=Retrieve |
| F12=Cancel | F16=Repeat position to | F17=Position to | F11=Display names only |

Figure 5-64 Deleting all libraries associated with the Workplace Services Express server ITSOWSE5

- c. On the Confirm Delete of Libraries display, press Enter to confirm the deletion request.

- d. You might see a Display Program Messages display with the error message “Receiver QSQJRN0001 in LibraryName never fully saved. (I C)” when you delete the DB2 Universal Database libraries. If you see this message, type I to allow the deletion to continue. This might occur multiple times as shown in Figure 5-65.

```

Display Program Messages

Job 241463/AHOERLE/QPADEV0006 started on 10/20/05 at 08:48:45 in subsystem Q
Maximum number of records reached for file QSYSPT. (C R NOMAX 1-999999)
NOMAX
Receiver QSQJRN0001 in ITSOWSE55 never fully saved. (I C)
I
Receiver QSQJRN0002 in ITSOWSE55 never fully saved. (I C)
I
Receiver QSQJRN0002 in ITSOWSE54 never fully saved. (I C)
I
Receiver QSQJRN0001 in ITSOWSE52 never fully saved. (I C)
I
Receiver QSQJRN0001 in ITSOWSE54 never fully saved. (I C)

F3=Exit  F12=Cancel

```

Figure 5-65 Error message ‘Receiver QSQJRN0001 in ITSOWSE55 never fully saved. (I C)’

3. Restore the libraries by entering the following Restore Library (RSTLIB) CL command (see Figure 5-66):

```
RSTLIB SAVLIB(WSEServerName*) DEV(TAP01)
```

```

Command Entry
Request level: 1
RCHAS12

Previous commands and messages:
> wrklib itsowse*
> RSTLIB SAVLIB(ITSOWSE*) DEV(TAP01)
  325 objects restored from ITSOWSE33 to ITSOWSE33.
  79 objects restored from ITSOWSE34 to ITSOWSE34.
  316 objects restored from ITSOWSE35 to ITSOWSE35.
  113 objects restored from ITSOWSE36 to ITSOWSE36.
  94 objects restored from ITSOWSE37 to ITSOWSE37.
  29 objects restored from ITSOWSE38 to ITSOWSE38.
  6 libraries restored at 10/20/05 12:45:03.

Type command, press Enter.
===>

F3=Exit  F4=Prompt  F9=Retrieve  F10=Include detailed messages
F11=Display full  F12=Cancel  F13=Information Assistant  F24=More keys
Bottom

```

Figure 5-66 Example output from the RSTLIB command

4. Start your Workplace Services Express server. For assistance with starting your server, refer to 5.1.1, “Starting a Workplace Services Express server” on page 106.

5.12 Removing a Workplace Services Express server

There might be a time when you want to remove a Workplace Services Express server. The steps in this section explain how to remove a Workplace Services Express server using the IBM Web Administration for iSeries tool.

As part of the deletion process, you are expected to know several configuration options that you selected in the iSeries Create IBM Workplace wizard. We recommend that you print a copy of the Printable Summary generated by the iSeries Create IBM Workplace wizard and keep it with you when performing these steps. To access the printable summary, refer to 5.2, “Reviewing the Workplace Services Express configuration” on page 110. Perform the following steps:

1. Access the IBM Web Administration for iSeries by pointing your Web browser to your fully qualified iSeries host name on port 2001:
`http://iSeriesHostName.domain:2001`
In our example, we use:
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password, log on to the IBM Web Administration for iSeries. Click **OK**.
3. On the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. Within the IBM Web Administration tool, manage all the application servers:
 - a. Click the **Manage** tab.
 - b. Click the **All Servers** tab.
 - c. Click the **All Application Servers** tab as shown in Figure 5-67.

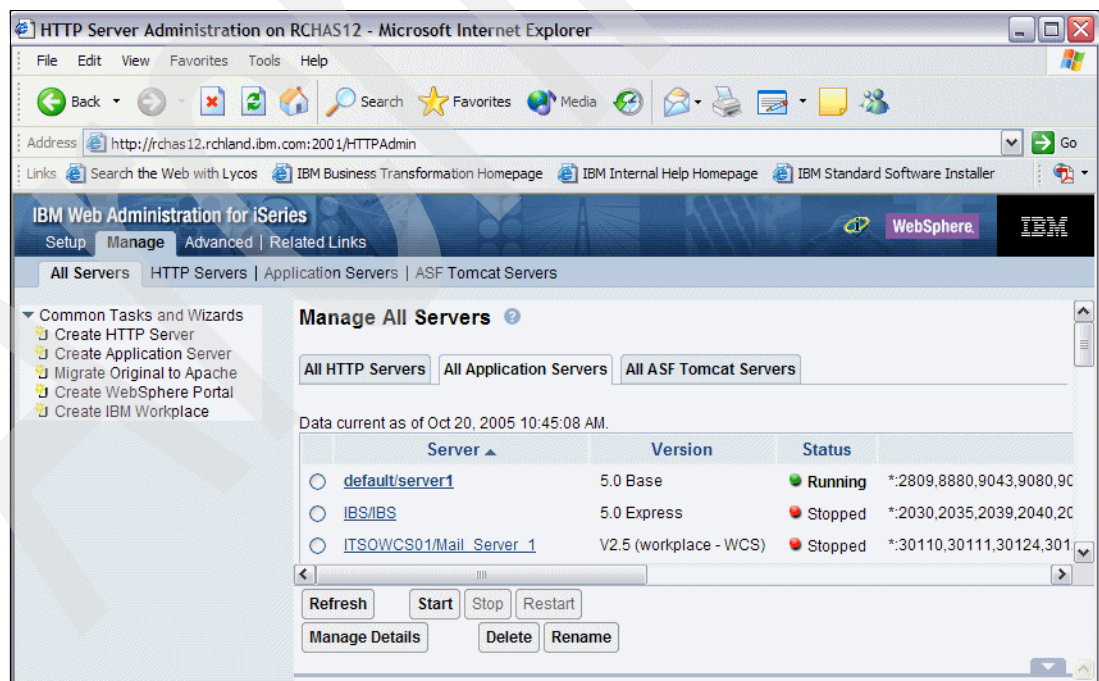


Figure 5-67 Managing all application servers with the IBM Web Administrator for iSeries tool

5. Scroll through the list of application servers to find the Workplace Services Express server you want to remove. Select either the **Server1** or **WebSphere_Portal** entry for your Workplace Services Express server, and click **Delete** as shown in Figure 5-68.

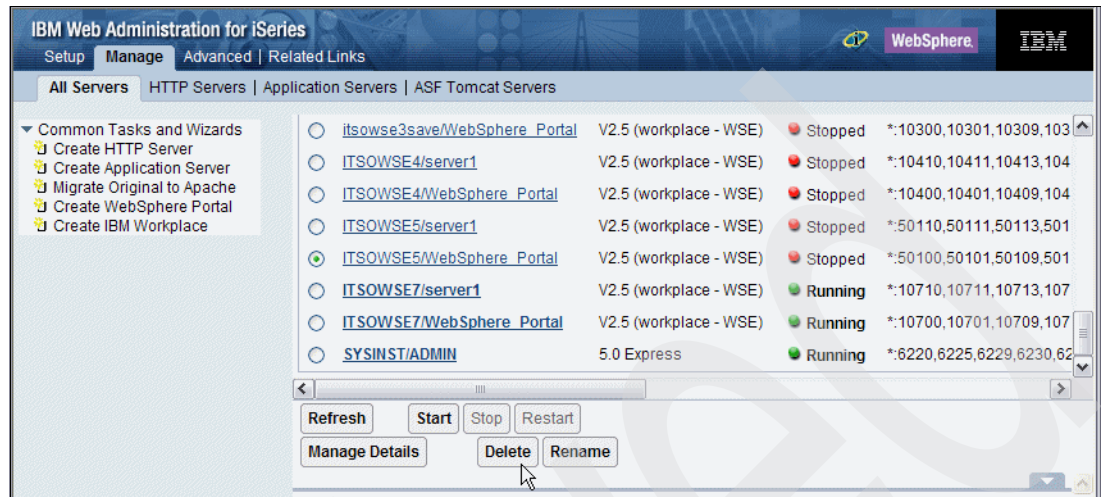


Figure 5-68 Deleting a Workplace Services Express server

6. Using the Delete wizard (Figure 5-69), we recommend that you remove the HTTP server with the Workplace Services Express server. The Delete wizard does not remove the DB2 Universal Database databases by default. Select each of the local database collections, libraries, or schemas that are associated with this Workplace Services Express server to allow the Delete wizard to remove them from the system. Click **Next**.

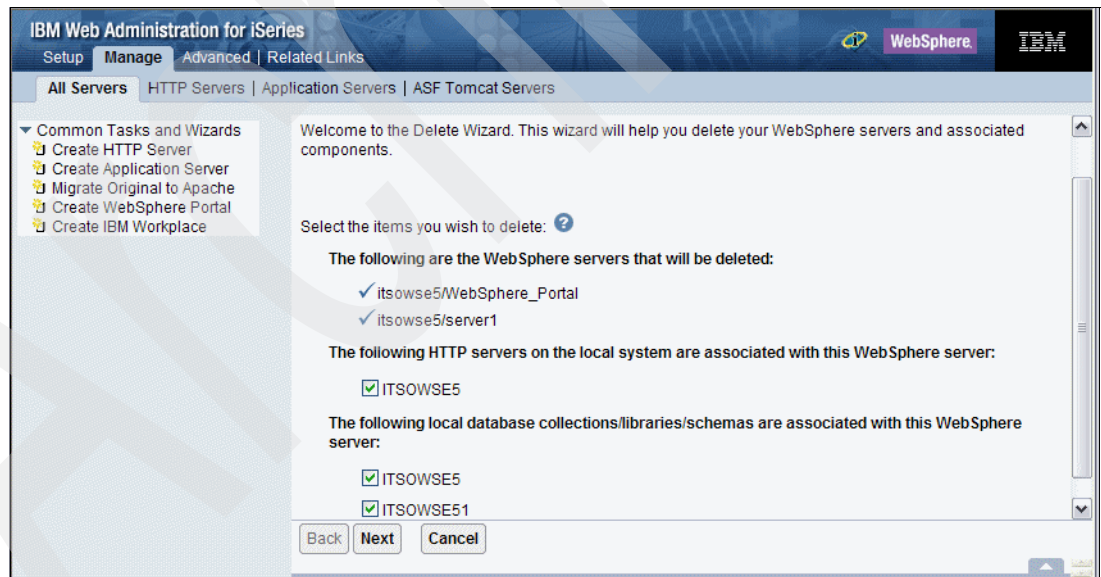


Figure 5-69 Confirming selections for deletions within the Delete wizard

7. In the Delete summary pane (Figure 5-70), click **Delete** to finish removing the Workplace Services Express server.

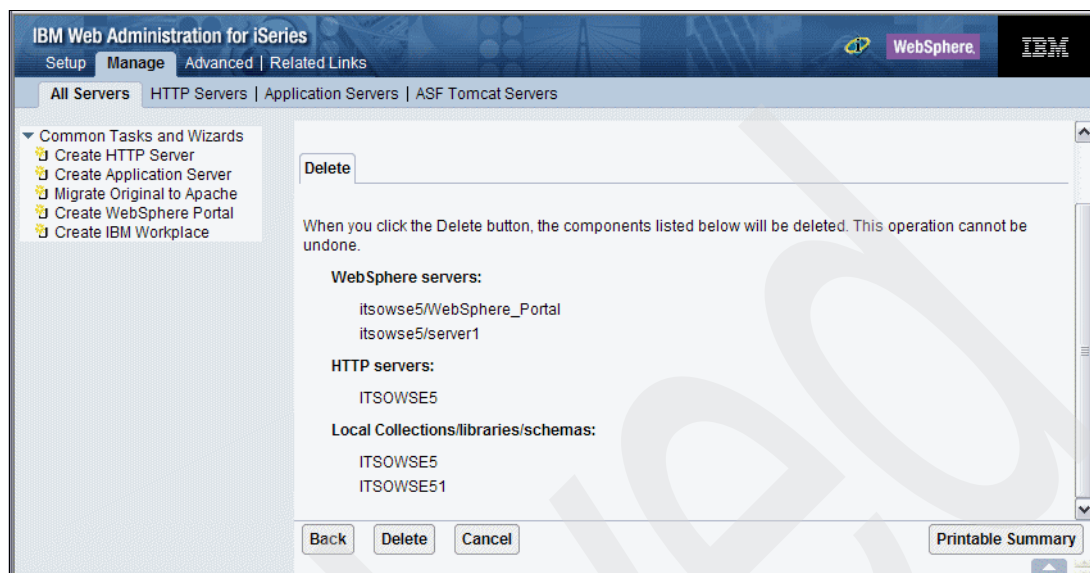


Figure 5-70 Deletion summary pane

8. At this point, the deletion is in process. You should return to the Manage All Servers pane. You should see that your Workplace Services Express server has a status of *Deleting* as shown in Figure 5-71.

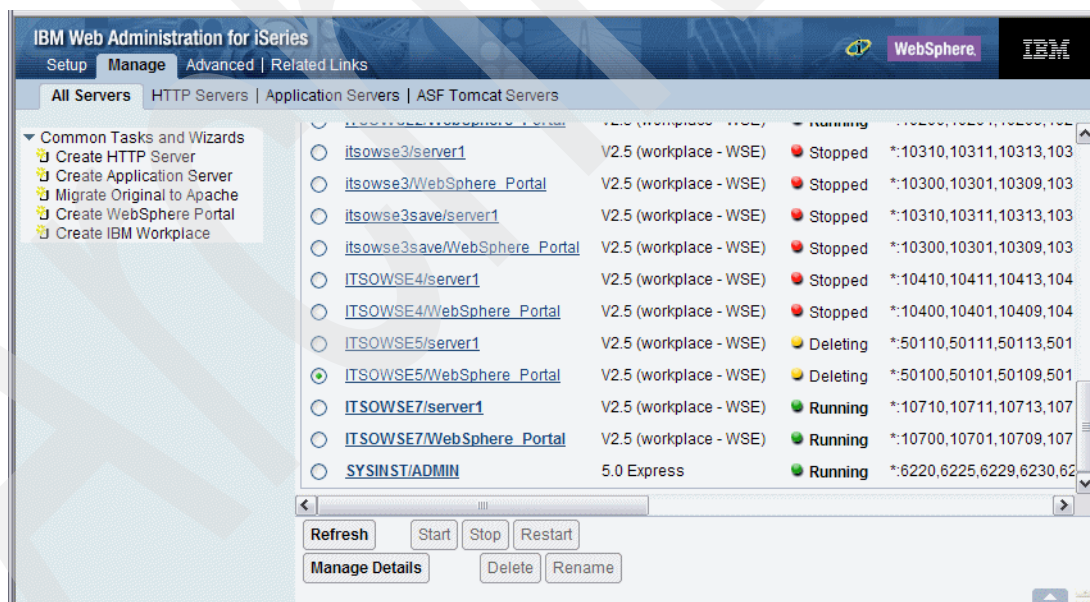


Figure 5-71 Manage All Application Servers: Deleting a Workplace Services Express server

9. When the Delete wizard completes, no status message is displayed. You see the Workplace Services Express server disappear from the list or see a status of *Deleted*.

Note: In our testing, the Workplace Services Express server always disappeared. If you see the server in a *Deleted* status, a file was in use and the Delete wizard was unable to remove the /QIBM/UserData/WebAS5/Base/*WSEServerName* directory (where *WSEServerName* represents your Workplace Services Express server name). Remove the directory manually from a mapped drive, and the Workplace Services Express server then disappears from the list.

10. If you chose to delete the DB2 Universal Database data in the Delete wizard, you can skip this step. However, if you did not choose to have the Delete wizard remove the DB2 Universal Database data, you must manually delete the libraries used by your Workplace Services Express server. Using the default naming convention based on your Workplace Services Express server name, perform the following steps to remove the libraries:

Note: In our testing, we found that not all libraries were deleted. We suggest that you verify that all libraries are properly deleted.

- a. Enter the following Work with Libraries (WRKLIB) CL command:

```
wrklib WSEServerName*
```

Here *WSEServerName* represents your Workplace Services Express server name.

- b. On the Work with Libraries display (Figure 5-72), type option 4 (Delete) next to each library and press Enter.

Work with Libraries

Type options, press Enter.

| | | | | | |
|-------------------------------|----------------------|------------|----------|-----------|---------|
| 1=Create | 2=Change | 3=Copy | 4=Delete | 5=Display | 6=Print |
| 8=Display library description | 9=Save | 10=Restore | | | |
| 11=Save changed objects | 12=Work with objects | 14=Clear | | | |

| Opt | Library | Attribute | ASP Device | Text |
|-----|------------|-----------|------------|-----------------------------|
| 4 | ITSOWSE5 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE51 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE518 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE52 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE53 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE54 | PROD | | COLLECTION - created by SQL |
| 4 | ITSOWSE55 | PROD | | COLLECTION - created by SQL |

Bottom

Parameters for options 1, 2, 3, 5, 8, 9, 10, 11 and 12 or command
 ===>

| | | | | |
|------------|------------------------|-----------------|-------------|------------------------|
| F3=Exit | F4=Prompt | F5=Refresh | F9=Retrieve | F11=Display names only |
| F12=Cancel | F16=Repeat position to | F17=Position to | | |

Figure 5-72 Deleting all libraries associated with the ITSOWSE5 Workplace Services Express server

- c. On the Confirm Delete of Libraries display, press Enter to confirm the deletion request.

- d. You might see a Display Program Messages display with the error message “Receiver QSQJRN0001 in LibraryName never fully saved. (I C)” when you delete the DB2 Universal Database libraries. If that happens, type I to allow the deletion to continue. This might occur multiple times as shown in Figure 5-73.

```
Display Program Messages

Job 241463/AHOERLE/QPADEV0006 started on 10/20/05 at 08:48:45 in subsystem Q
Maximum number of records reached for file QSYSPRT. (C R NOMAX 1-999999)
NOMAX
Receiver QSQJRN0001 in ITSOWSE55 never fully saved. (I C)
I
Receiver QSQJRN0002 in ITSOWSE55 never fully saved. (I C)
I
Receiver QSQJRN0002 in ITSOWSE54 never fully saved. (I C)
I
Receiver QSQJRN0001 in ITSOWSE52 never fully saved. (I C)
I
Receiver QSQJRN0001 in ITSOWSE54 never fully saved. (I C)

F3=Exit  F12=Cancel
```

Figure 5-73 Error message ‘Receiver QSQJRN0001 in ITSOWSE55 never fully saved. (I C)’

11. If you used a separate user profile to own all objects used by this Workplace Services Express server, you can delete it now. The Delete wizard does not delete the user profile. Enter the following Delete User Profile (DLTUSRPRF) CL command:

```
DLTUSRPRF USRPRF(DB2OwnerProfile) OWNBJOPT(*DLT)
```

Here *DB2OwnerProfile* represents the name of the user profile that you specified during the configuration of the Workplace Services Express server.

Attention: The OWNBJOPT(*DLT) parameter in the previous DLTUSRPRF command removes all objects owned by that user profile. If you are using the same user profile to own the DB2 Universal Database data for other Workplace Services Express server, do *not* delete the profile at this time.

You should now have no remaining references to the Workplace Services Express server.



Integrating the Domino portlets

The purpose of this chapter is to:

- ▶ Introduce you to the portlets provided with Workplace Services Express
- ▶ Show you how to integrate Domino Web Access with Workplace Services Express
- ▶ Demonstrate how to create a Domino discussion database and integrate it with Workplace Services Express using the Domino Application portlet

6.1 Supplied portlets with Workplace Services Express

Workplace Services Express provides many portlets that you can deploy in your Workplace Services Express environment. These portlets provide a vast number of functions. While some of the portlets are the core of Workplace Services Express, others provide functionality that is not provided in the base Workplace Services Express product.

For example, portlets are available to access Domino and other mail systems because the Workplace Services Express product does not include user mail and calendar functionality. Workplace Services Express is sold in conjunction with a WebSphere Portal server license. Because of this, you can download and install any portlet that runs on WebSphere Portal Server Version 5.0.2.2. For a list of all available portlets for download, visit the IBM WebSphere Portal solutions catalog at:

<http://catalog.lotus.com/wps/portal/portal>

To find portlets that are available for download specifically for Workplace Services Express, visit the IBM Workplace Services Express solutions catalog at:

<http://catalog.lotus.com/wps/portal/wse>

The following portlets are included with and available to deploy with Workplace Services Express:

- ▶ *About IBM Workplace Services Express*: This portlet provides information about the installed product and by default is only enabled for users with administrative access.
- ▶ *Bookmarks*: The IBM Bookmarks portlet displays bookmarks defined by the user in a Web browser. The user can add, delete, and edit bookmarks.
- ▶ *Company Tracker portlet*: This portlet allows you to select and manage a list of companies whose performance you are interested in tracking. It includes details on quotes, charts, news, and profile data.
- ▶ *Domino Application portlet*: The Domino Application portlet enables you to integrate any Web-enabled Domino application into WebSphere Portal. For information about deploying this portlet, refer to 6.4, “Using the Domino Application portlet” on page 192.
- ▶ *Document Search*: This portlet is installed but not placed on a page. It provides users access to the Portal Search Engine. Before Document Search can perform searches, the administrator must build the search index using Manage Search Index in Portal administration.
- ▶ *Domino Web Access*: This portlet helps users to view a Domino Web Access or iNotes™ mail file in Workplace Services Express. For information about deploying this portlet, refer to 6.2, “Configuring the Domino Web Access portlet” on page 175.
- ▶ *Internet Mail Box*: This portlet enables users to connect to an Internet Message Access Protocol (IMAP) or Post Office Protocol Version 3 (POP3) Internet-based mail server to receive, compose, and send Internet e-mail.
- ▶ *Microsoft Exchange portlet application*: This portlet application provides connectivity to the Microsoft Exchange server and consists of the following portlets:
 - MS Exchange Mail portlet
 - MS Exchange Calendar portlet
 - MS Exchange Tasks portlet
 - MS Exchange Contacts portlet
 - MS Exchange Notes portlet
- ▶ *My News*: This portlet provides top headlines from a wide array of general, business, and industry news categories.

- ▶ *My Stock*: The My Stock portlet displays financial performance and fundamental investment data for selected companies, investments, symbols, and indices.
- ▶ *My Weather*: The My Weather portlet displays weather-related data and forecasts for user-selected cities.
- ▶ *My Vertical News*: This portlet provides top headlines from a wide array of general, business, and industry news categories.
- ▶ *Retirement Planner*: The Retirement Planner is a goal-based tool that estimates your desired retirement income and estate and evaluates the savings plan required to fund that need.

6.2 Configuring the Domino Web Access portlet

This section explains how to configure the Domino Web Access portlet in the Workplace Services Express environment.

Note: The steps to configure the Domino Web Access portlet are the same for Domino 6.x and Domino 7.x.

6.2.1 Setting up Domino for use with the Domino Web Access portlet

Before you can use the Domino Web Access portlet in Workplace Services Express, make sure that your Domino configuration meets the requirements for use with this portlet. Perform the following steps:

1. Verify that all mail files to be accessed from the portlet are using the Domino Web Access or iNotes template:
 - a. Open the Domino Administrator client and connect to your Domino server.
 - b. Click the **Files** tab.
 - c. Click the folder that contains your mail files. Typically this is the mail folder.
 - d. Scroll to the right and review the template name as shown in Figure 6-1. If you do not see *iNotes6* or *DWA7* in this column, you must convert your user's mail file to use a Domino Web Access (inotes6.ntf or dwa7.ntf) template.

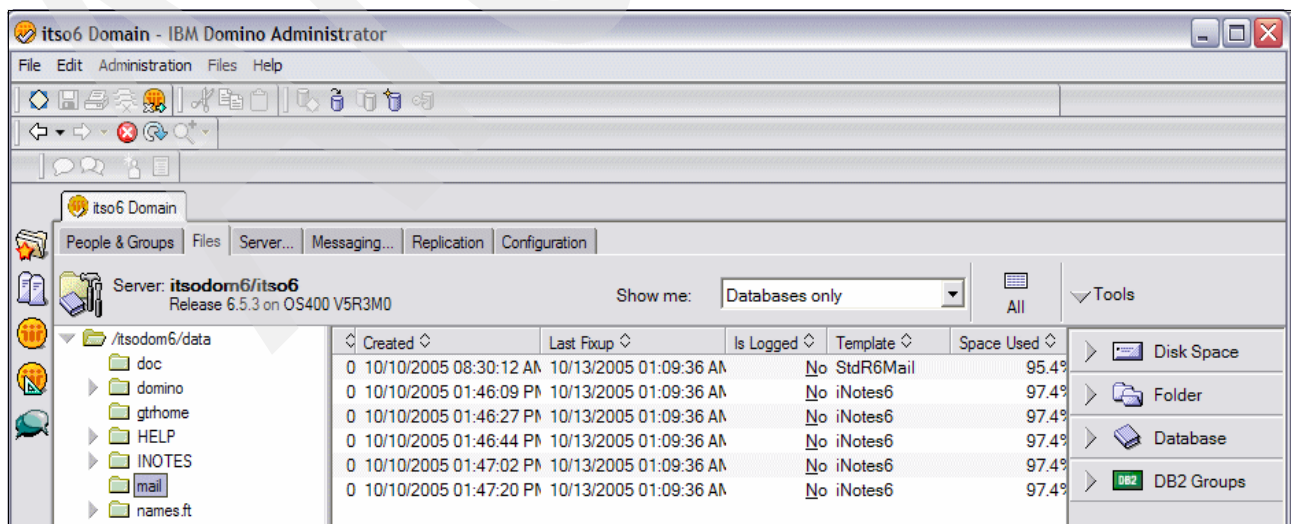


Figure 6-1 Viewing the mail file template name in the Files tab of the Domino Administrator

2. If necessary, update the design of the mail file to inotes6.ntf or dwa7.ntf using one of the following **convert** commands on the Domino server console. In this command, *FileName* represents the mail file name (see Example 6-1).

- For Domino 6.x, type the following command:

```
load convert mail/FileName.nsf * inotes6.ntf
```

- For Domino 7.x, type the following command:

```
load convert mail/FileName.nsf * dwa7.ntf
```

Tip: You can convert all files in the mail folder at one time by using one of the following commands:

- For Domino 6.x:

```
load convert mail/* * inotes6.ntf
```

- For Domino 7.x:

```
load convert mail/* * dwa7.ntf
```

Example 6-1 Domino load convert utility

```
> Load convert mail/nadminis.nsf * inotes6.ntf
Load convert mail/nadminis.nsf * inotes6.ntf
10/13/2005 15:04:53 Mail Conversion Utility starting
10/13/2005 15:04:53 Mail Convert: Started replacing design template '*' with 'iNotes6'
in 'mail/nadminis.nsf'
10/13/2005 15:04:55 Adding 'DOLS Configuration Settings' to database 'Notes
Administrator' from template 'Domino Web Access (6)'
10/13/2005 15:04:55 Adding '(ToggleUpdate Tasks)' to database 'Notes Administrator'
from template 'Domino Web Access (6)'
10/13/2005 15:04:55 Adding '($Journal)' to database 'Notes Administrator' from
template 'Domino Web Access (6)'
10/13/2005 15:04:55 Adding '($Users)' to database 'Notes Administrator' from template
'Domino Web Access (6)'
10/13/2005 15:04:57 Mail Convert: Finished replacing design template in
'mail/nadminis.nsf'
10/13/2005 15:04:57 Mail Conversion Utility shutdown
```

3. Add the appropriate fields to the Global Configuration document to allow LDAP queries for the HTTP host name, mail server, and mail file name fields:
 - a. From the Domino Administrator client, click the **Configuration** tab.
 - b. In the left frame, click **Server** → **Configurations**.
 - c. Double-click the **Global Configuration document** to open it. The global configuration document has a server name of * - [All Servers].

Tip: You might have to scroll up to see the Global Configuration document.

- d. In the Global Configuration document, click the **LDAP** tab.

- e. The following fields should be listed under the LDAP Attribute Types column as shown in Figure 6-2:

- HTTP-HostName
- MailFile
- MailServer

Tip: These fields are listed only if you followed the steps in 3.4.2, “Modifying the LDAP configuration” on page 61.

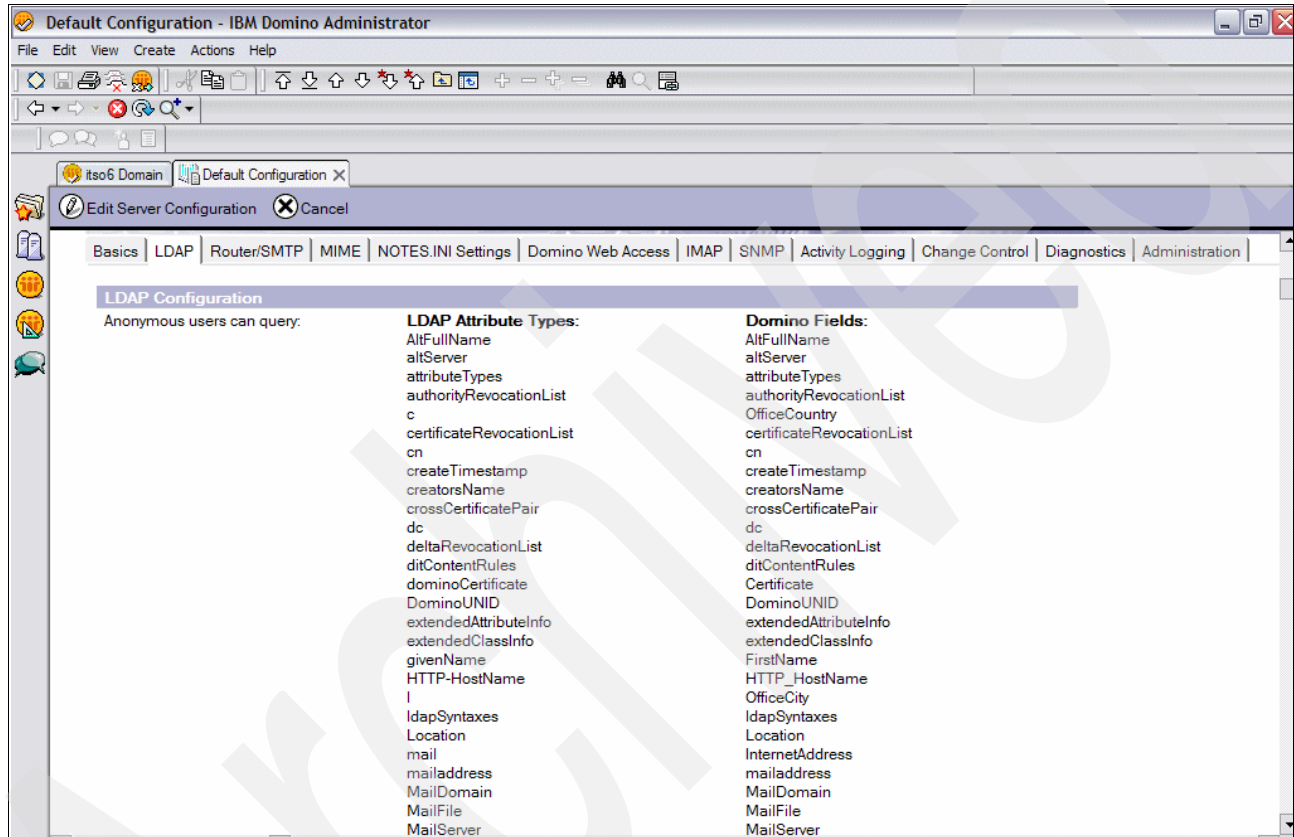


Figure 6-2 LDAP tab of the Global Configuration document

If these fields are not listed, perform the following steps to add them:

- Click **Edit Server Configuration**.
- Click **Select Attribute Types**.
- In the ObjectClasses field, type an asterisk (*).
- Click **Display Attributes**.
- Select the attributes **HTTP-HostName**, **MailFile** and **MailServer**.
- Click **Add**.
- Click **OK** to exit the LDAP Attribute Type Selection window.
- Save and close the configuration document.
- End the Domino server.
- After the Domino server successfully ends, restart the Domino server.

6.2.2 Configuring Workplace Services Express to use Domino Web Access portlet

To use the Domino Web Access portlet, you must make changes to the wpconfig.properties file as explained in the following steps:

1. Stop the Workplace Services Express WebSphere Portal server:

Tip: You can alternatively end the Workplace Services Express WebSphere Portal server using the IBM Web Administration for iSeries interface. See 5.1.2, “Stopping a Workplace Services Express server” on page 108.

- a. In an i5/OS command line, enter the STRQSH CL command to start the Qshell environment.
- b. In the Qshell command line, enter the following command, replacing *WSEServerName* with the name of your Workplace Services Express server:

```
cd /qibm/userdata/webas5/Base/WSEServerName/PortalServer/rootscripts/subtasks
```
- c. In the Qshell command line, enter the following command using the proper administrator ID and password for your Workplace Services Express server as shown in Example 6-2:

```
stopPortalServer.sh -user wpsadmin -password password
```

Example 6-2 Stopping the Workplace Services Express WebSphere Portal server

```
stopPortalServer.sh -user wpsadmin -password password
ADMU0116I: Tool information is being logged in file
           /QIBM/UserData/WebAS5/Base/itsowse2/logs/WebSphere_Portal/stopServer.log
ADMU3100I: Reading configuration for server: WebSphere_Portal
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server WebSphere_Portal stop completed.
$
```

Note: It might take several minutes for the WebSphere Portal server to end.

2. After the Workplace Services Express WebSphere Portal server ends, edit the wpconfig.properties file to modify the Lotus Collaborative Components (LCC) properties:
 - a. Map a drive to your iSeries server.
 - b. Navigate to the /QIBM/UserData/WebAS5/Base/*WSEServerName*/PortalServer/config directory, where *WSEServerName* represents the name of your Workplace Services Express server.
 - c. Open the wpconfig.properties file in WordPad or another text editor program of your choice.
 - d. Modify the **LCC.DominoDirectory.Enabled** and **LCC.DominoDirectory.Server** properties to the following values:
 - i. Set LCC.DominoDirectory.Enabled to true.
 - ii. Set LCC.DominoDirectory.Server to match your Domino server name. In our environment, the Domino server is named itsodom6.rchland.ibm.com.

Example 6-3 shows the settings for our example.

Note: In our tests, we used a Domino Version 6.5.3 server and a Domino Version 7.0 server. We saw no differences in the setup or configuration between the two Domino versions.

Example 6-3 Modified wpconfig.properties file

```
# LCC.DominoDirectory.Enabled: Is Lotus Domino Directory enabled in the environment?
# { true | false }
LCC.DominoDirectory.Enabled=true

# LCC.DominoDirectory.Server: The Lotus Domino Directory server name.
# { hostname | ip address }
LCC.DominoDirectory.Server=itsodom6.rchland.ibm.com
```

- e. Save and close the wpconfig.properties file.
3. Run the configuration script to update your Workplace Services Express server with the new values that you entered in the wpconfig.properties file:
 - a. Return to the Qshell command line, or in an i5/OS command line, enter the command **STRQSH** to start Qshell.
 - b. In the Qshell command line, enter the following command, replacing *WSEServerName* with the name of your Workplace Services Express server:
`cd /qibm/userdata/webas5/Base/WSEServerName/PortalServer/config`
 - c. In the Qshell command line, enter the following command to update the configuration:
`WPSconfig.sh lcc-configure-dominodirectory`
You know that the command has completed when you see the message “BUILD SUCCESSFUL” as shown in Figure 6-3.

```
QSH Command Entry

action-lcc-server-notcontacted-warning:

action-lcc-ssl-property-isboolean-test:

action-lcc-validate-ssl-property-isboolean:
[logmsg] 2005.10.14 15:09:14.820 action-lcc-update-dominodirectory-property
ies
[logmsg]  EJPC2543I Lotus Collaborative Services property file updates co
mpleted for Lotus Domino Directory.

BUILD SUCCESSFUL
Total time: 1 minute 8 seconds
$

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

Figure 6-3 Successful completion of the WPSConfig.sh lcc-configure-dominodirectory command

4. Start the Workplace Services Express WebSphere Portal server:

Tip: Alternatively, you can start the Workplace Services Express WebSphere Portal server via the IBM Web Administration for iSeries interface. See 5.1.1, “Starting a Workplace Services Express server” on page 106.

- a. If Qshell is not already started, enter the STRQSH command on an i5/OS command line to start Qshell.
- b. In the Qshell command line, enter the following command, replacing *WSEServerName* with the name of your Workplace Services Express server:

```
cd /qibm/userdata/webas5/Base/WSEServerName/PortalServer/rootscripts/subtasks
```

- c. In the Qshell command line, enter the following command to start the Workplace Services Express WebSphere Portal server.

```
startPortalServer.sh
```

- d. You see the message “Application server started”, as shown in Figure 6-4, when your Workplace Services Express WebSphere Portal server successfully starts.

Note: It takes several minutes for the Workplace Services Express WebSphere Portal server to start.

```
QSH Command Entry

ADMU0116I: Tool information is being logged in file
          /QIBM/UserData/WebAS5/Base/ITSOWSE2/logs/WebSphere_Portal/stopServ
er.log
ADMU3100I: Reading configuration for server: WebSphere_Portal
ADMU3201I: Server stop request issued. Waiting for stop status.
ADMU4000I: Server WebSphere_Portal stop completed.
$
> startportalserver.sh
CPC1221: Job 217018/QEJBVR/WEBSPPHERE_ submitted to job queue QEJBJOBQ in
library QEJBAS5.
EJB6123: Application server started.
Cause . . . . . : Application server WebSphere_ in PME instance ITSOWSE2
has started and is ready to accept connections on admin port 10210.
$

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

Figure 6-4 Workplace Services Express WebSphere Portal server successfully started

6.2.3 Configuring the Domino Web Access portlet

Use the following steps to help you add the Domino Web Access portlet to the Mail tab of a Workplace Services Express server:

1. Log into the Workplace Services Express server with the Workplace Services Express administrator user ID and password, for example wpsadmin.

Tip: If you log into Workplace Services Express as the Workplace Services Express administrator and configure the Domino Web Access portlet, the portlet is then ready for use by all users. If you log in as a user to perform the steps that follow, the portlet is configured only for that user.

2. Click the **Mail** tab and click the **Add Content portlet**, which is the bar on the lower right side of the pane as shown in Figure 6-5.

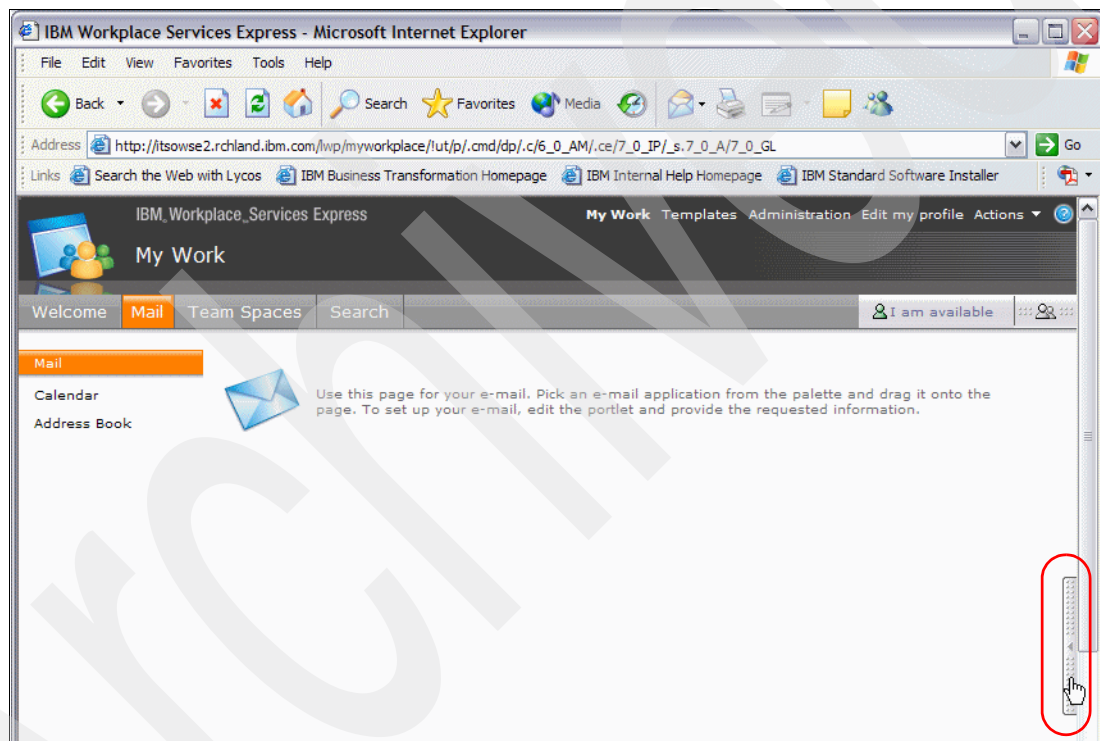


Figure 6-5 Selecting the Add Content portlet

3. Scroll to the bottom of Add Content portlet pane and click **Add** as shown in Figure 6-6.

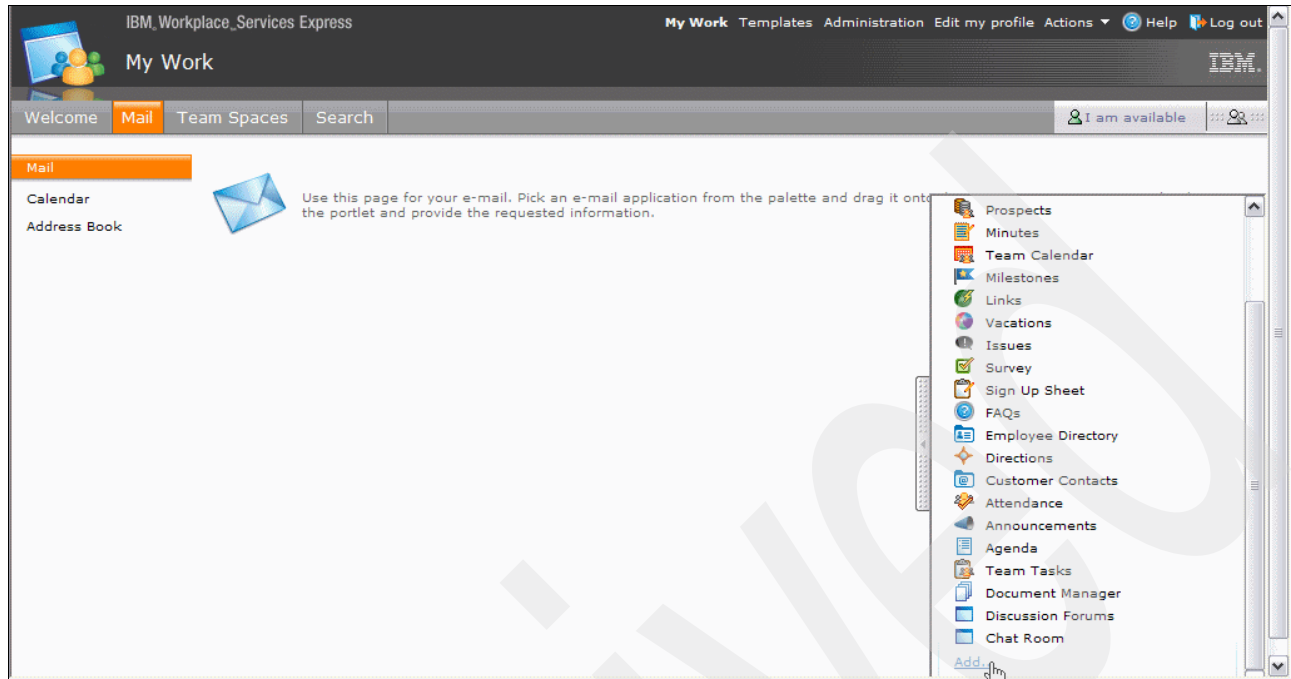


Figure 6-6 Clicking Add in the Add Content portlet pane

4. In the Add Content pane, in the Title contains field, type Domino and click **Search** as shown in Figure 6-7.

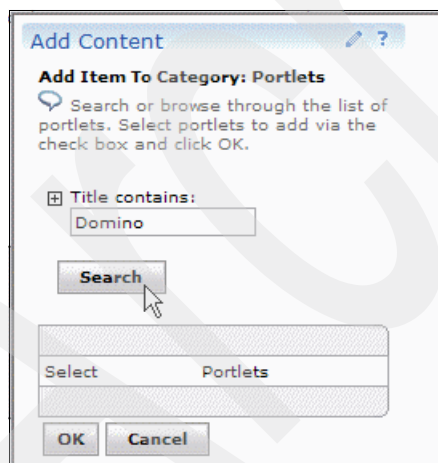


Figure 6-7 Searching for Domino portlets in the Add Content portlet pane

5. Select **Domino Web Access** and click **OK** as shown in Figure 6-8.

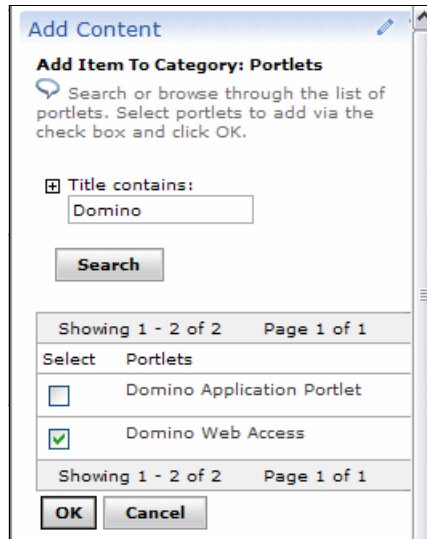


Figure 6-8 Selecting the Domino Web Access portlet

6. You should now see Domino Web Access in the list of available portlets as shown in Figure 6-9. Drag the **Domino Web Access** portlet to the **Mail** tab.

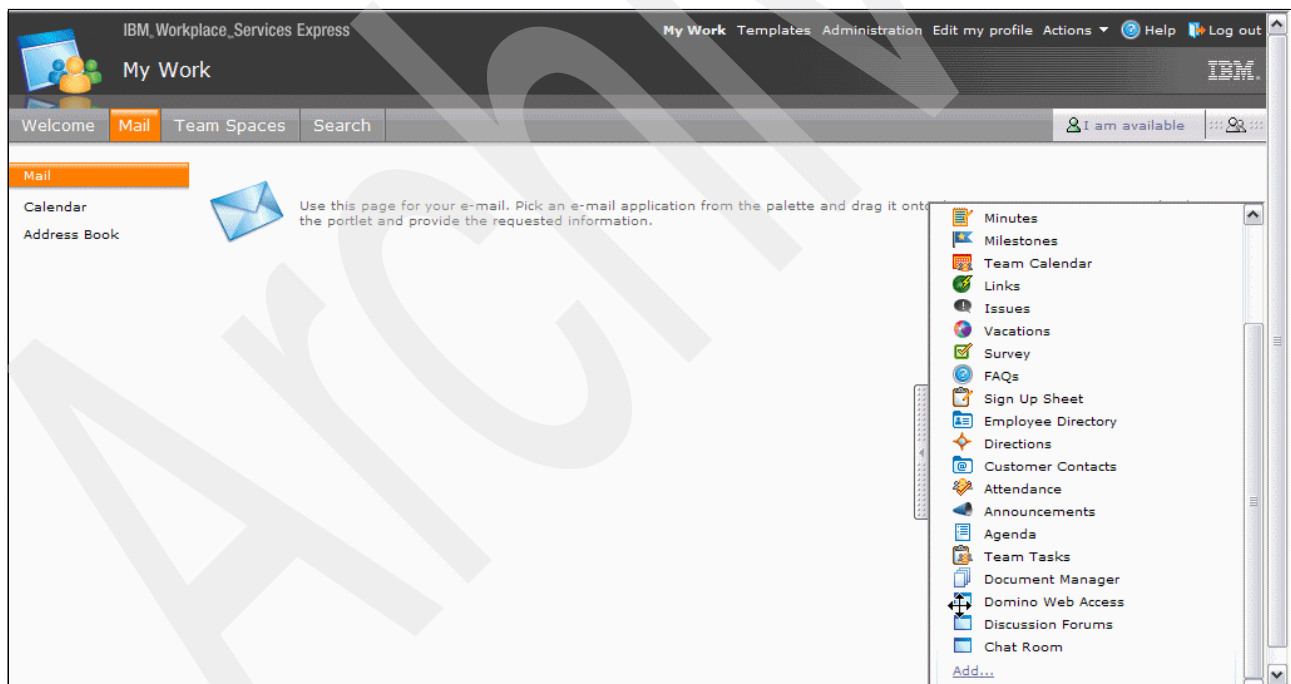


Figure 6-9 The Add Content portlet pane after Domino Web Access is added

You see an orange bar when you are in the proper place to drop the portlet as shown in Figure 6-10.

Note: After you drop the portlet onto the page, you might not see any activity in the Web browser. Be patient. The pane changes and the new portlet appears in a moment.

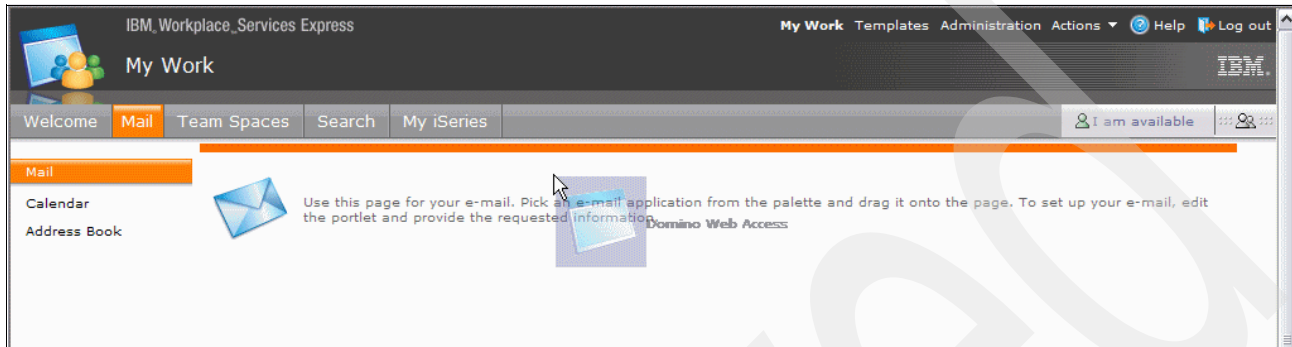


Figure 6-10 Dragging and dropping the Domino Web Access portlet to the Mail tab

7. Your page changes to one of three possible choices:
 - If your Workplace Services Express administrator has a mail file, it begins to load. If you *have not* configured single sign-on (SSO), you are prompted to enter a Domino user ID and password as shown in Figure 6-11. For information about configuring SSO, refer to Chapter 8, “Enabling SSO between Workplace Services Express and Domino” on page 237.

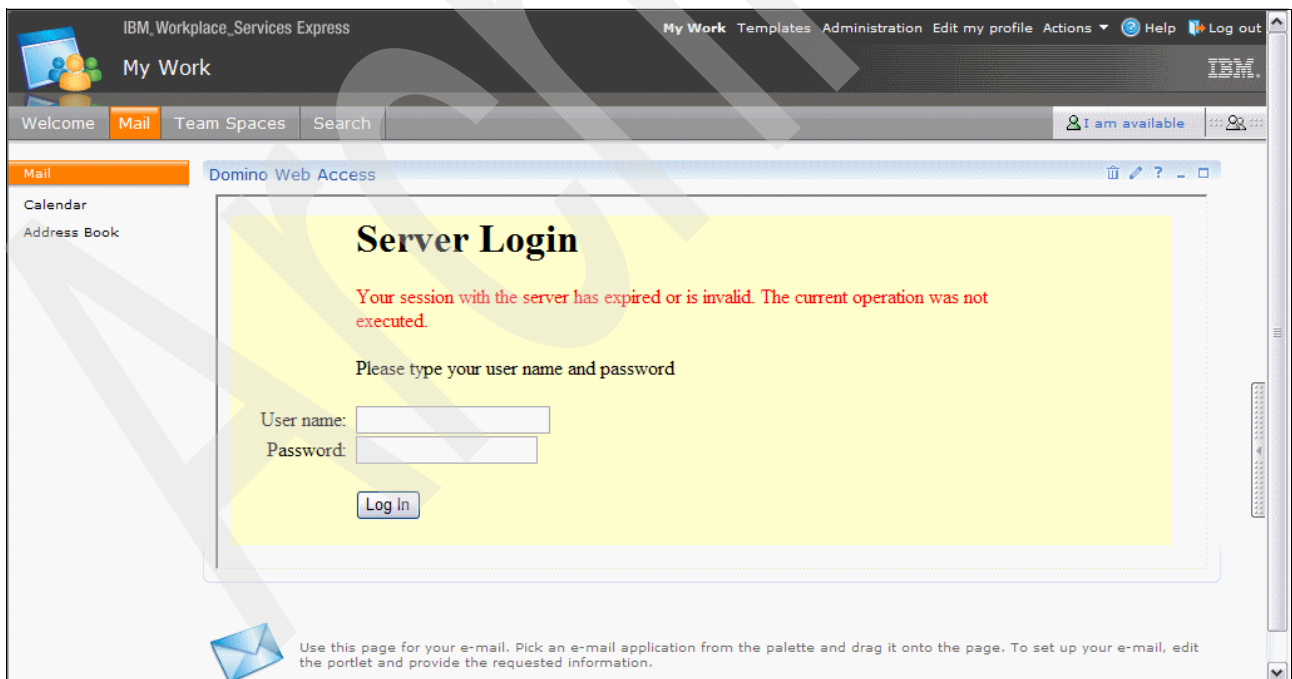


Figure 6-11 Domino Web Access portlet prompting for a user name and password

- If your Workplace Services Express administrator has a mail file, it begins to load. If you *have* configured SSO, the mail file is displayed as shown in Figure 6-12.

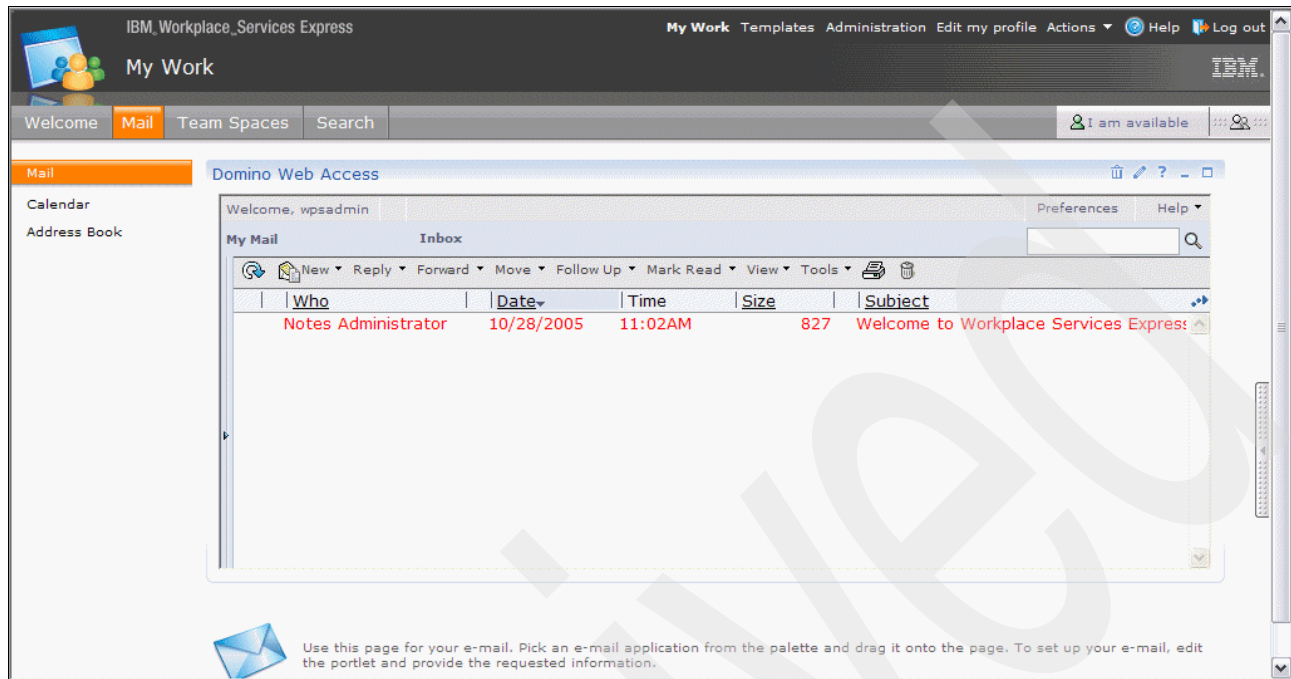


Figure 6-12 Viewing the mail file for the Workplace Services Express administrator via the Domino Web Access portlet

- If your Workplace Services Express administrator does not have a mail file, you see a page like the example in Figure 6-13. If you want to test the portlet, log off Workplace Services Express and log in as a user with a valid mail file. You should see a page similar to the examples in Figure 6-11 or Figure 6-13.

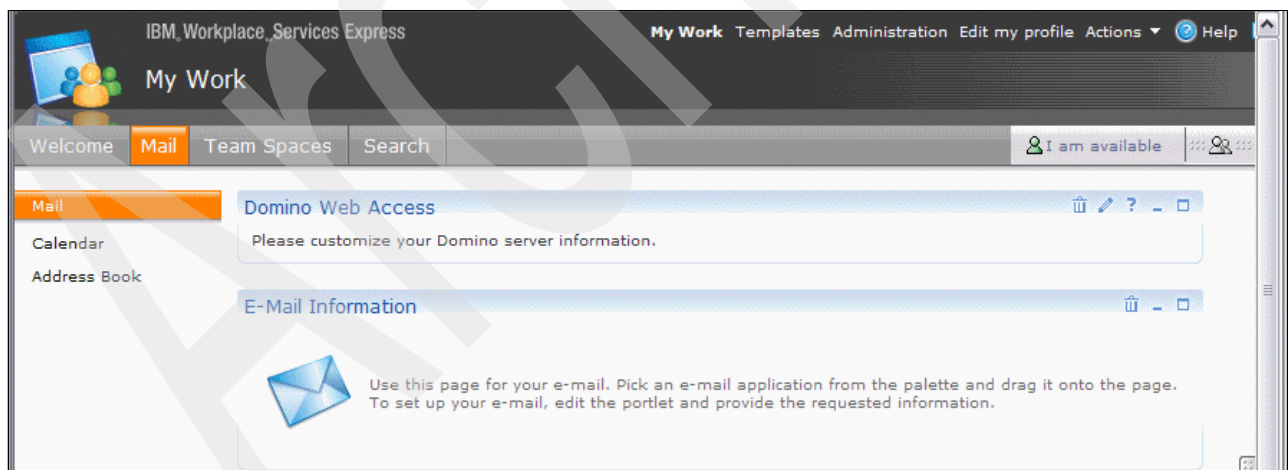


Figure 6-13 Domino Web Access portlet for the Workplace Services Express administrator with no Domino mail file

8. By default, the Domino Web Access portlet tries to automatically locate the mail file. This is why we had add the HTTP-HostName, MailServer and MailFile fields to the LDAP schema in Domino. If you do not want Workplace Services Express to automatically locate the mail file, you can edit the portlet to manually select the mail file. Be aware that if you choose this option, you must manually configure the portlet for every user in the Workplace Express environment.

If you choose to let the server automatically find the mail file, you can configure one and have it work for everyone with a valid mail file name in the Person document on the Domino server. If you plan to let the portlet automatically detect the mail file, you can skip to step 9 on page 187. To manually configure the portlet, perform the following steps:

- Click the edit icon (the pencil) located in the top right corner of the portlet page. This loads a page that allows you to modify the configuration of the Domino Web Access portlet.
- In the Domino Web Access pane, click **Let me manually select my mail database**.
- Click your Domino server name if it appears in the Server list, or enter the fully qualified Internet host name of the Domino server. In our example, the Domino server's fully qualified host name is `itsodom70.rchland.ibm.com`. After you select or enter the Domino server's host name, click the check mark to select the server as shown in Figure 6-14.

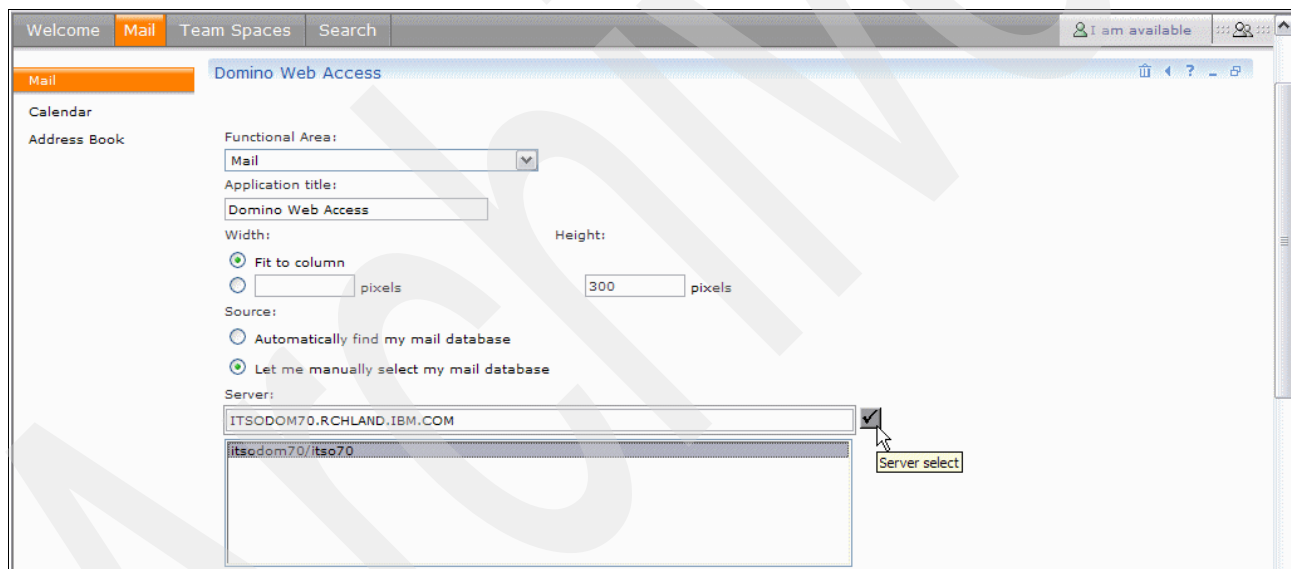


Figure 6-14 Selecting the Domino server's host name when editing the Domino Web Access portlet

- d. In the Database field, you now see an error message that indicates that the database was not found or could not be retrieved. Ignore this message.

In the Database filename field, enter the path to the mail database. For example, our mail file is named `wpsadmin.nsf` and is located in the mail directory of the Domino server. The value that we enter in the Database filename field is `mail/wpsadmin.nsf` as shown in Figure 6-15.

Application title:
Domino Web Access

Width: ☐ Fit to column ☐ pixels

Height: pixels

Source:
☐ Automatically find my mail database
☒ Let me manually select my mail database

Server:
 ☒

Database filename:

Database:

Figure 6-15 Entering the mail database filename for the Domino Web Access portlet

- e. Click **Save** to save your changes.
- f. You are either prompted to log into the Domino server, or if you have configured SSO, the mail file is displayed. Refer to Figure 6-11 on page 184 or Figure 6-13 on page 185. For assistance in configuring SSO, refer to Chapter 8, “Enabling SSO between Workplace Services Express and Domino” on page 237.
9. At this time, a user can now use the Domino Web Access portlet to send and receive mail. However, the user does not have access to calendar or address book functionality. The remaining steps explain how to configure the Domino Web Access portlet to access the calendar and address book (contacts). We start with the calendar function. Under the Workplace Services Express Mail tab, click **Calendar** as shown in Figure 6-16.

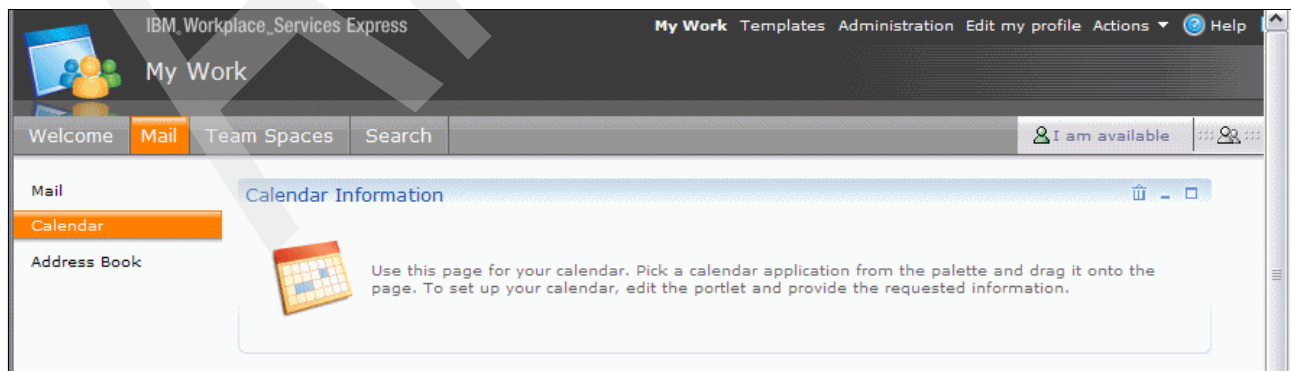


Figure 6-16 Workplace Services Express Calendar page

10. Click the **Add Content** portlet window. Drag the **Domino Web Access** portlet to the **Calendar Information** page. You see an orange bar when you are in a place where you can drop the portlet. For assistance with this step, refer to step 6 on page 183.
11. Edit the Domino Web Access portlet to view the calendar information. Click the **edit** icon (the pencil) located in the upper right corner of the portlet window.
12. In the Domino Web Access pane (Figure 6-17), for Functional Area field, select **Calendar** and optionally change the Start with field. In our example, we set the Start with field to **One Week**. If you are not allowing the server to automatically select the mail file, you must manually select the mail file. For assistance with manually selecting the mail file, refer to step 8 on page 186. Click **Save** to save your changes.

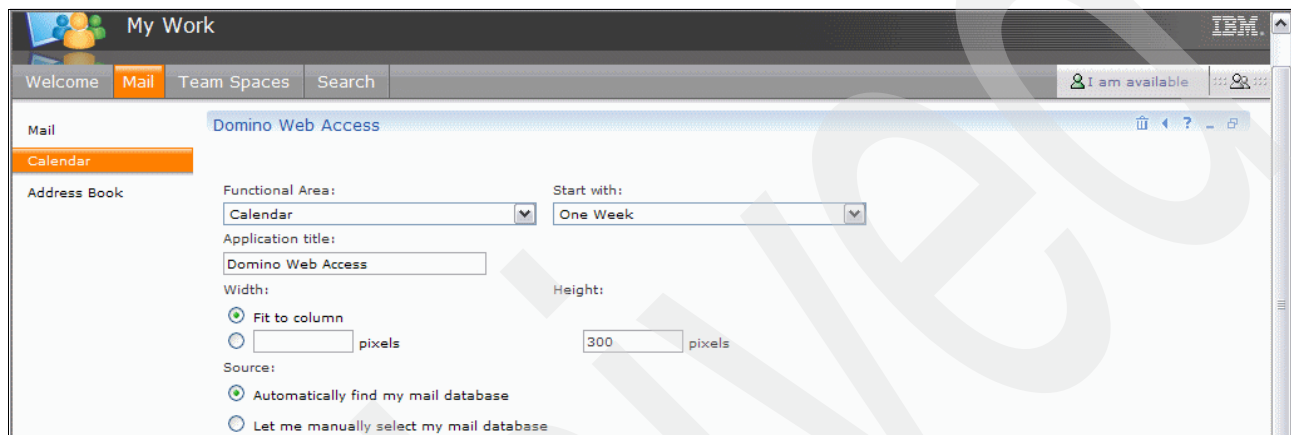


Figure 6-17 Editing the Domino Web Access portlet for calendar use

You should now be able to access your personal calendar as shown in Figure 6-18.

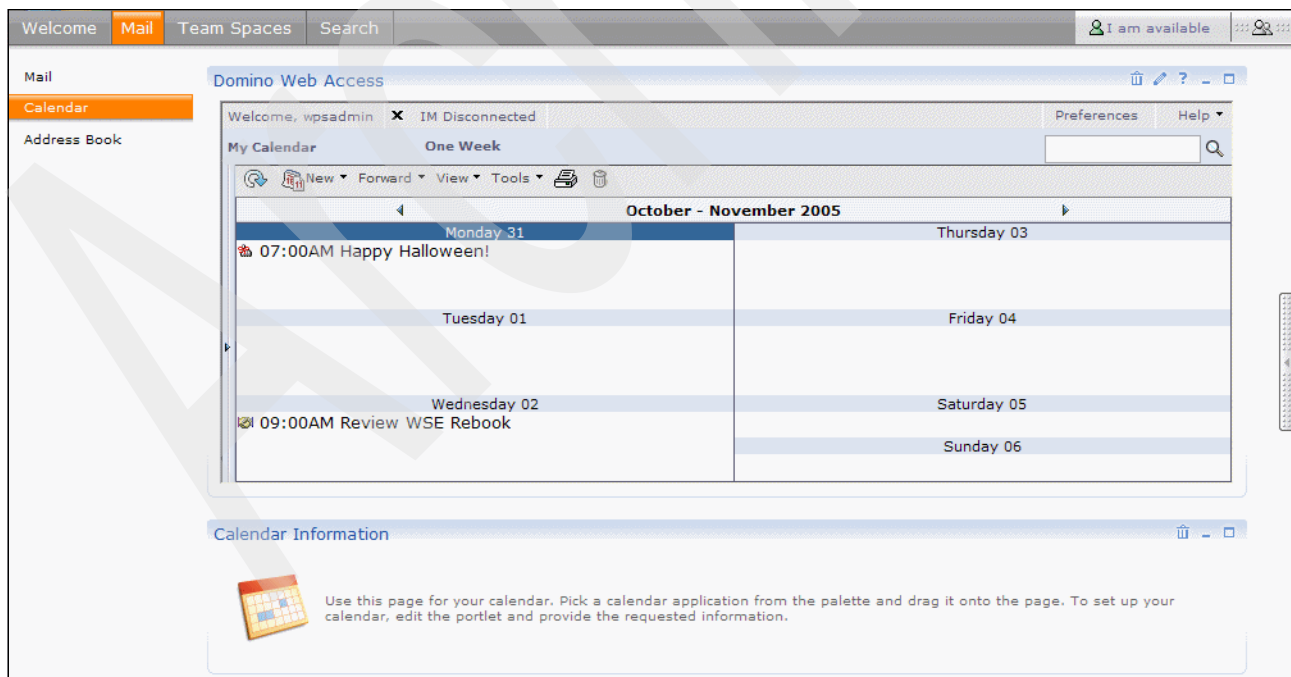


Figure 6-18 Viewing the calendar via the Domino Web Access portlet

13. Configure the address book. Under the Workplace Services Express Mail tab, click **Address Book**.

14. Click the **Add Content** portlet window. Drag the **Domino Web Access** portlet to the **Address Book** page. You see an orange bar appear when you are in a place where you can drop the portlet. For assistance with this step, refer to step 6 on page 183.
15. Edit the Domino Web Access portlet to view the address book information. Click the **edit** icon (the pencil) located in the upper right corner of the portlet window.
16. In the Domino Web Access pane (Figure 6-19), for Functional Area, select **Contacts**. If you are not allowing the server to automatically select the mail file, you must manually select the mail file. For assistance on manually selecting the mail file, refer to step 8 on page 186. Click **Save** to save your changes

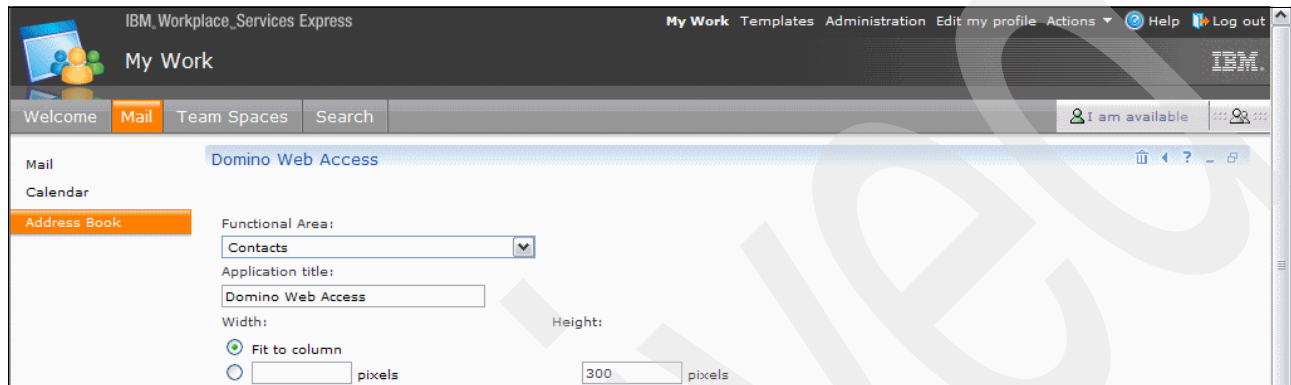


Figure 6-19 Configuring the Domino Web Access portlet to view contacts

You should now be able to access your personal contacts as shown in Figure 6-20.

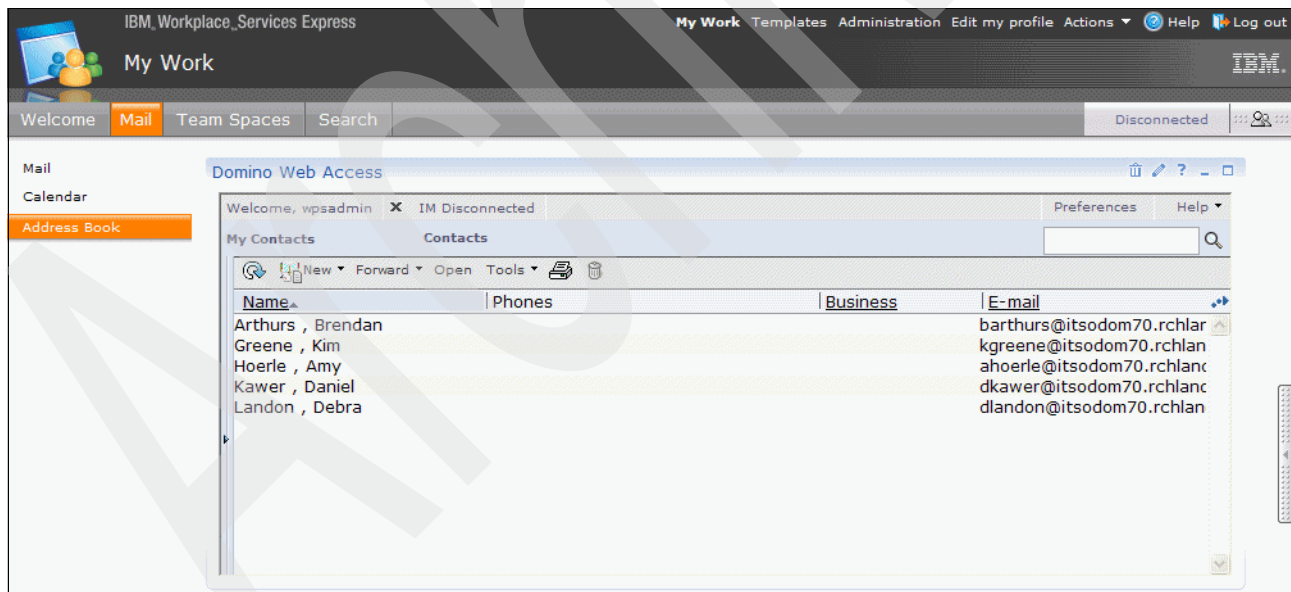


Figure 6-20 Viewing the address book via the Domino Web Access portlet

17. Now that you have configured the Domino Web Access portlet on the Mail, Calendar and Address Book pages, you might want to have the informational message displayed in the Information portlet that appears on each of those pages to be removed. Since you are currently on the Address Book page, we show you how to edit the Address Book page to remove the Address Book Information portlet. You can then use the same steps to edit the Mail and Calendar pages to remove their Information portlets.

To edit the Address Book page, click **Actions** → **Edit Page** as shown in Figure 6-21.

Tip: An alternate method to remove the Address Book Information portlet is to use the trash can in the portlet title bar. If you use this option, you can skip to step 22 on page 191.

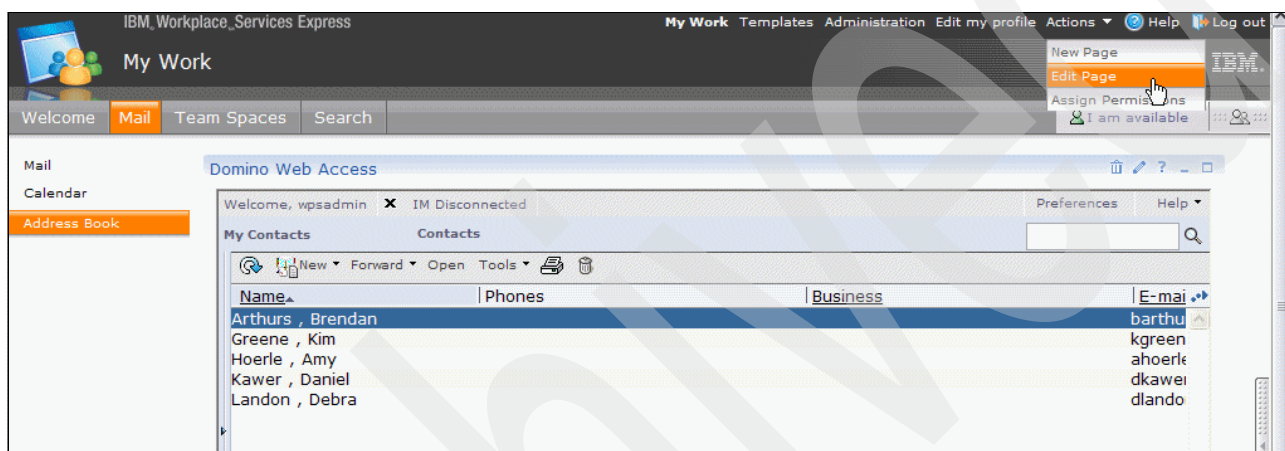


Figure 6-21 Selecting the Edit Page option for the Address Book page

18. Click the **trash can** icon, next to the Address Book Information portlet, to remove the Address Book Information portlet from the Address Book page. See Figure 6-22.

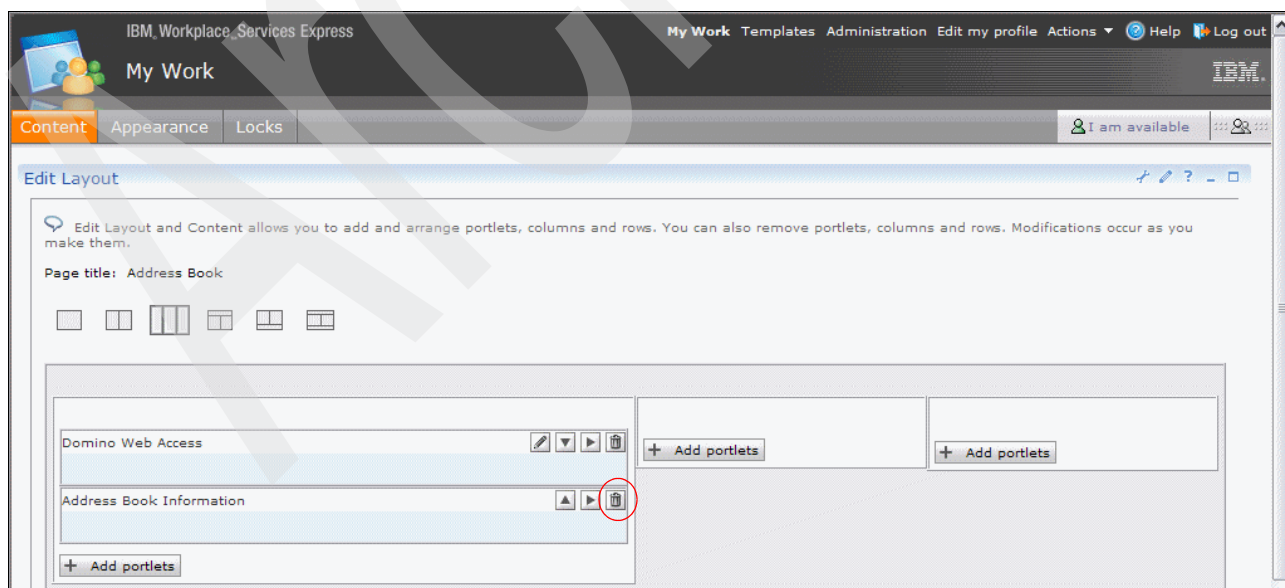


Figure 6-22 Removing the Address Book Information portlet

19. You are prompted to confirm that you want to remove the Address Book Information portlet as shown in Figure 6-23. Click **OK** to remove the portlet.

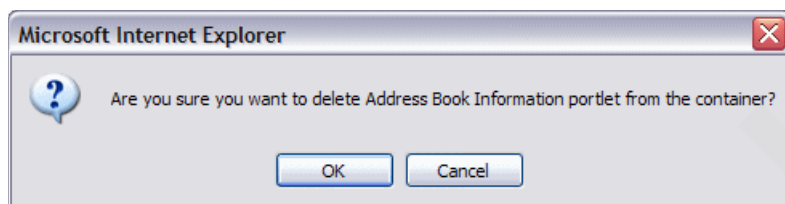


Figure 6-23 Confirming deletion of the Address Book Information portlet

20. On the Edit Layout page, click **Done** to complete your changes.
21. You return to the Address Book page where you can confirm that you no longer see the Address Book Information portlet on the Address Book page.
22. Edit the following pages to remove the Information portlets as explained in the previous steps:
- Mail
 - Calendar

6.3 Portalizing Domino applications

Customers with previous investments in a Domino infrastructure might have existing Domino applications. There are several techniques that allow those applications to be displayed and used inside Workplace Services Express, therefore leveraging the investment made on the Domino infrastructure. These techniques insert the application into a portlet, which is then displayed according to the user's role and context inside the portal.

This section discusses the different options to portalize an existing Domino application. It shows an example of portalizing a Domino application using the Domino Application portlet. This portlet provides a way to display an existing Domino application and does not require a programming effort.

For more information about the Domino Application portlet, refer to the IBM Redpaper *IBM Lotus Domino Application Portlet: Configuration and Tips*, REDP-3917.

6.3.1 Options for portalizing Domino applications

To portalize an existing Domino application, consider the options in the following list. Choosing one depends on the application, the user's expertise, and whether changes to the application code are necessary.

► Existing Domino portlets

Several existing Domino specific-portlets are available to access typical Domino databases, such as a mail file database. If a portlet already exists, this is a good choice for portalizing the application. An example of this technique is the Domino Web Access portlet, which is used to access the user's mail file.

- Domino Application portlet

You can configure this portlet to access a Domino application on a Domino server. This portlet has some advantages, including SSO authentication and caching options. This option does not require a programming effort and can be easily deployed.

When this portlet is called, the portal makes a request to the Domino server. The retrieved information is transformed to redirect any references to the Domino server to the portal server. The modified content is then displayed in the Web browser. For details about this option, see 6.4, “Using the Domino Application portlet” on page 192.

- Exposing Domino applications as a Web service

To expose Domino applications as a Web service, a Web service must be created that accesses the Domino information. Then a new portlet is programmed that consumes that Web service. This has the advantage that if the Domino application is already exposed as a Web service, the portlet programmer does not need Domino experience since the objective is only to consume a Web service.

- Using the Lotus Collaborative Services application programming interface (API)

Another option is to program a new portlet that uses the Lotus Collaborative Services API. By using this option, programmers can include typical collaborative functions present in the Domino environment on their applications.

6.4 Using the Domino Application portlet

The Domino Application portlet is one of the options for portalizing Domino applications. This portlet is installed by default on the Workplace Services Express server, and to be used, it must only be deployed and configured.

Perform the following steps to configure a new discussion database in Domino and to access that database using the Domino Application portlet:

1. In our example, we create a new discussion database. From the Lotus Notes client, press Ctrl+N or select **File** → **Database** → **New**.
2. In the New Database window, complete the values as shown in Figure 6-24. Make sure you are saving the database on the Domino server. For our example, we use a Domino server called *dom654*, which is in the organization called *itso654*. After you complete the information, click **OK**. The discussion database is now created on the Domino server.

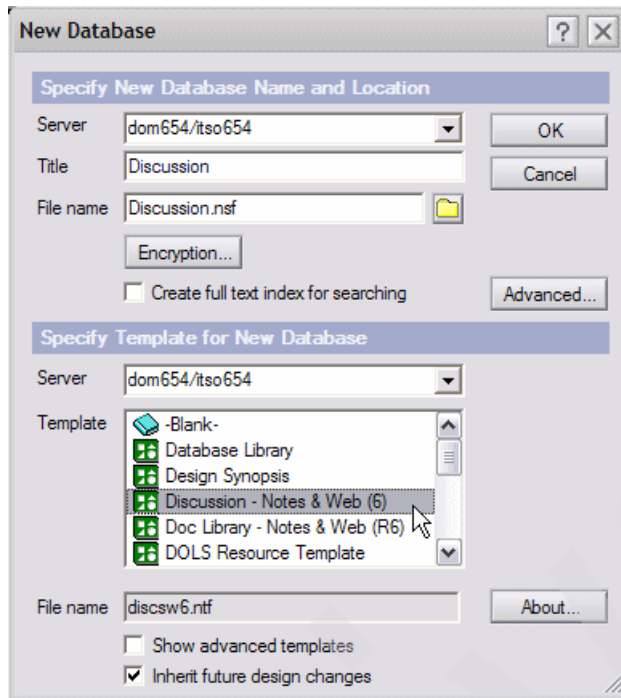


Figure 6-24 Creating a new discussion database on the Domino server

3. To test the new discussion database, open it and write a new message.

To open the database from the Lotus Notes client:

- a. Select **File** → **Database** → **Open**.
- b. Select the correct Domino server and file name.
- c. Click **Open**.

4. After the Discussion database opens, click **New Main Topic** and write a new topic. Figure 6-25 shows an example.

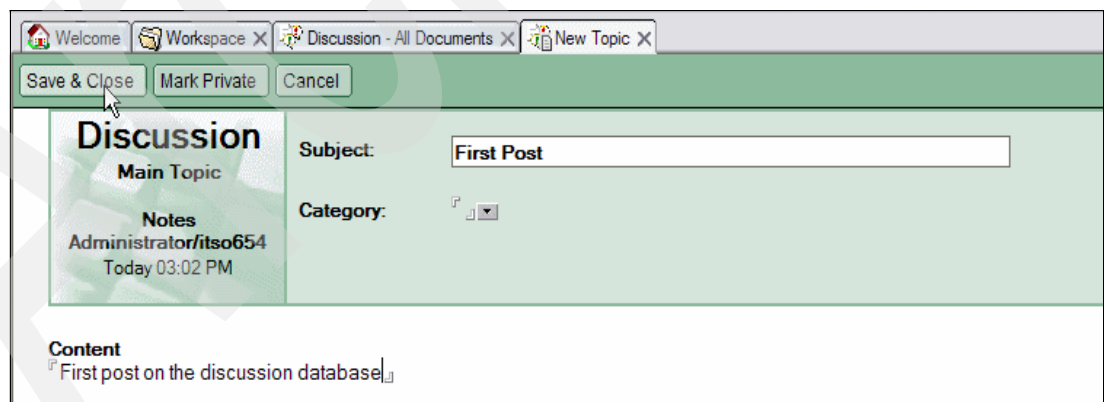


Figure 6-25 Creating a new topic in the discussion database

5. After you create and test the database, open a Web browser and log into the Workplace Services Express server with an administrative account. In our example, we use wpsadmin as shown in Figure 6-26.

IBM Workplace Services Express

I forgot my password Sign up Help

Welcome, please enter your information.

User ID:
wpsadmin

Password:
.....

Please note: After some time of inactivity, the system will log you out automatically and ask you to log in again.

Log in Cancel

IBM Workplace Services Express

Licensed Materials - Property of IBM. L-PMIR-6AZ5W4 (C) Copyright IBM Corporation 2003, 2005. All Rights Reserved. IBM, the IBM logo, and Workplace are trademarks of IBM Corporation in the United States, other countries, or both.

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both. All other trademarks are trademarks of other respective companies.

IBM

Java COMPATIBLE

Figure 6-26 Logging in to the Workplace Services Express server as the administrator

6. It is considered a best practice to clone the Domino Application portlet before you deploy it, since details of the Domino server and database which the portlet should access are stored in the portlet's global configuration. Cloning the portlet allows you to have several instances of the Domino Application portlet, each with its own configuration pointing to a different Domino application.

To make a clone of the portlet:

- a. Navigate to **Administration** → **Portlets** → **Manage Portlets**.
- b. Find the Domino Application portlet in the list (or search for it) and select it.
- c. Click **Copy**.

A new clone of the portlet is generated. See Figure 6-27 for an example.

Important: If you do not clone the portlet and the same portlet is later deployed, there can be a conflict to which database the portlet is pointing to. Therefore, we recommend that you always clone the portlet before you deploy it.

Show all portlets

Search for portlets

Title contains

Show:

☐ Active portlets

☐ Inactive portlets

☒ Active/inactive portlets

Go

Portlets:

| | |
|-----------------------------------|--------|
| Custom 3_0_AH | Active |
| Customer Contacts 3_0_AL | Active |
| Directions 3_0_AM | Active |
| Directory Search 3_0_9I | Active |
| Discussion Forums 3_0_AC | Active |
| Document Libraries 3_0_AD | Active |
| Document Library Home 3_0_AE | Active |
| Document Manager 3_0_41 | Active |
| Document Search 3_0_40 | Active |
| Domino Application Portlet 3_0_B8 | Active |

Activate/Deactivate

Copy

Modify parameters

Show Info

Delete

Figure 6-27 Copying a portlet

- You see a message (Figure 6-28) stating that the portlet cloned successfully on top of the page.

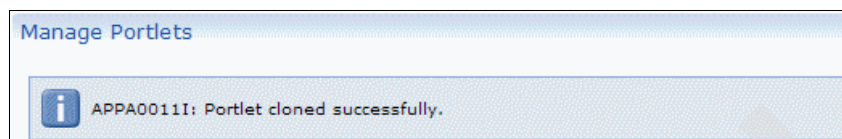


Figure 6-28 Portlet cloned successfully message

- Modify the parameters. Make sure you have selected the new portlet from the list, and click **Modify parameters**, as shown in Figure 6-29.

Note: To make sure you are selecting the new clone, check the portlet's unique number after its name. The new clone has a different end letter, lower than the original. In our case, the original portlet had 3_0_B8, and the new one has 3_0_CI.

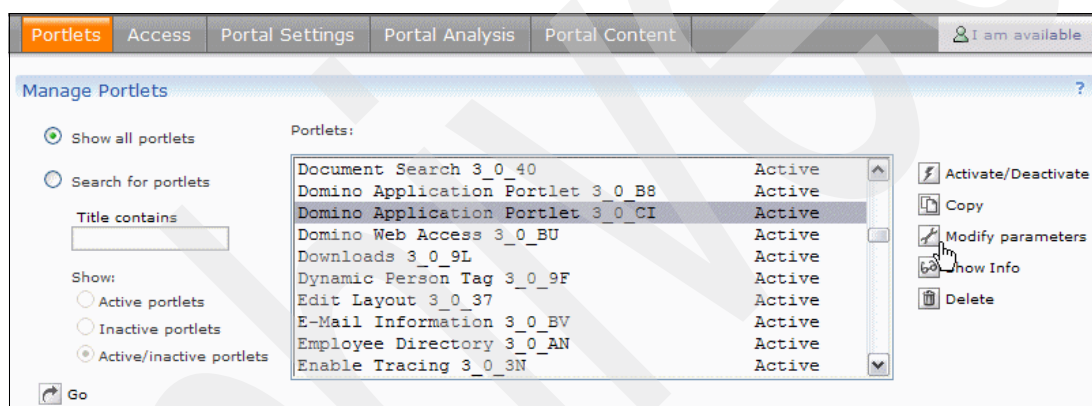


Figure 6-29 Modifying a portlet's parameters

- The parameter to change is the title of the portlet. Although it is not necessary to make this change, it is considered a best practice to do so. Using a different name makes the portlet easier to search for and provides a name relative to its use. In the Modify parameters page, scroll down to the Edit Locale Specific Titles section and make sure **English** is selected. Then click **Set title for selected locale**. See Figure 6-30.

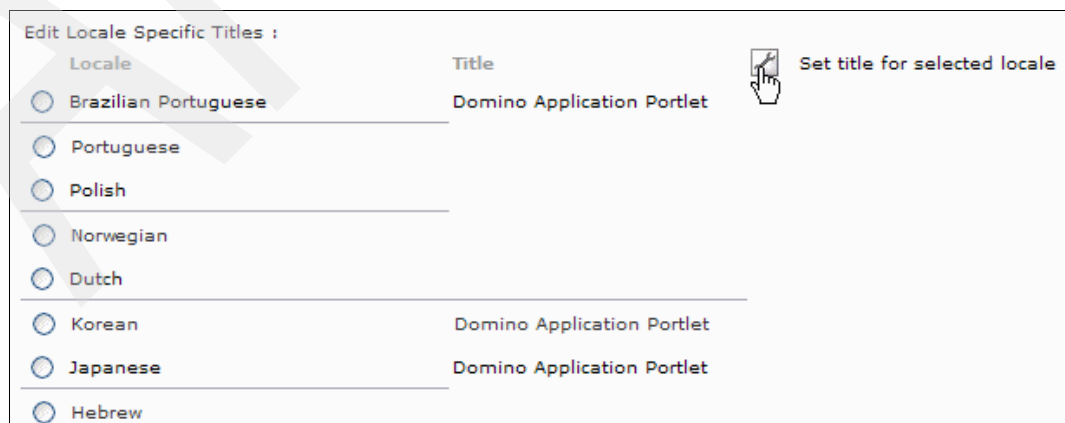


Figure 6-30 Modifying a portlet's title

10. Type a new name for the portlet and click **OK** as shown in Figure 6-31.

Important: This step only changes the title for the English language. If users will access the portal in other languages, we recommend that you also change those titles.

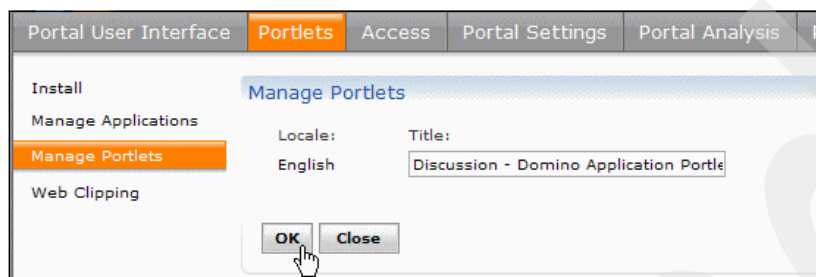


Figure 6-31 Typing a new name for the cloned portlet

11. On the Parameters page, click **Save**.

12. Add the portlet to a page. A new label and page are created for this purpose. From the Administrative pages of Workplace Services Express server, navigate to **Portal User Interface** → **Manage Pages** and select the **My portal** link. This places you inside the portal hierarchy of pages.

13. Click **New label**. See Figure 6-32.

Note: Your portal hierarchy of pages can be different than the example shown in Figure 6-32 if changes were made to the default configuration of pages.

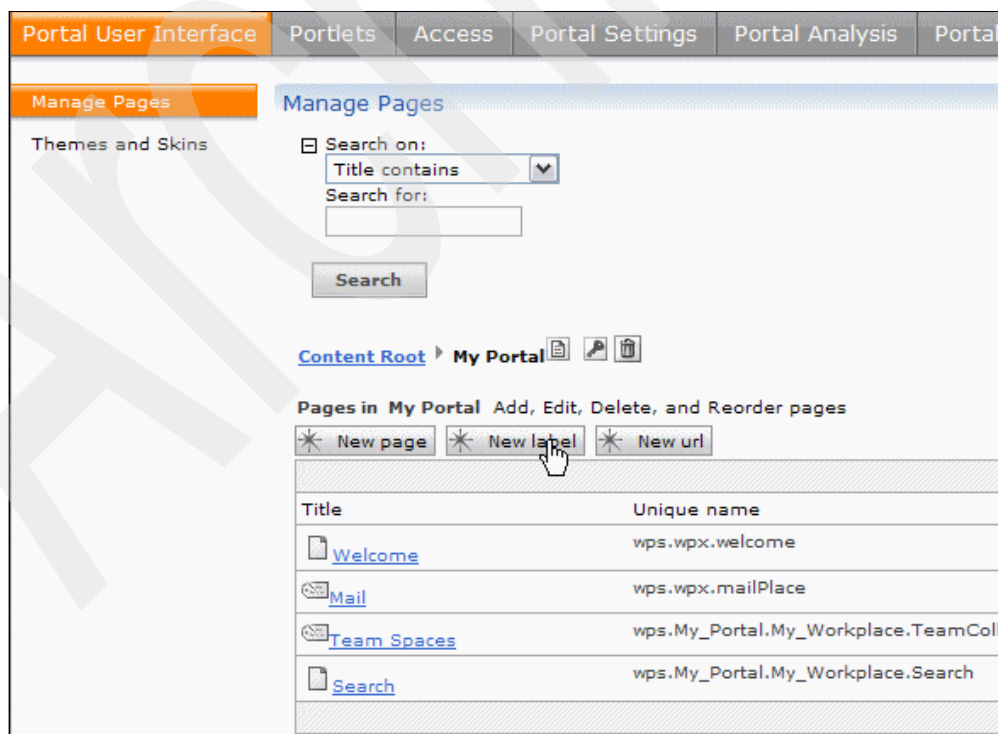


Figure 6-32 Creating a new label

14. On the Page Properties pane (Figure 6-33), type a new name for the label and click **OK**.



Figure 6-33 Naming the new label

15. A message confirms the creation of the label as shown in Figure 6-34.

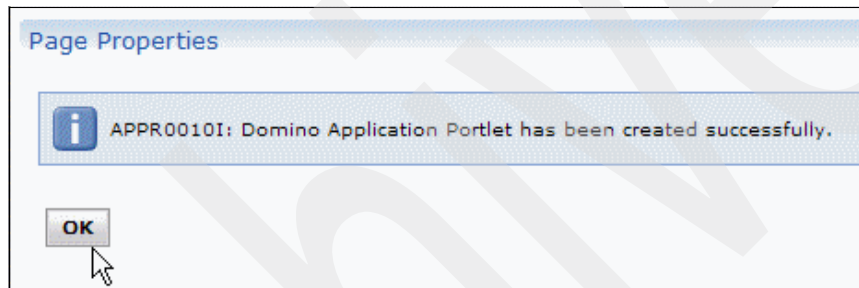


Figure 6-34 Confirming the creation of the new label

16. Create a new page within the new label. Click the newly created label as shown in Figure 6-35.



Figure 6-35 Accessing the new label

17. In the Manage Pages pane (Figure 6-36), click **New Page**.

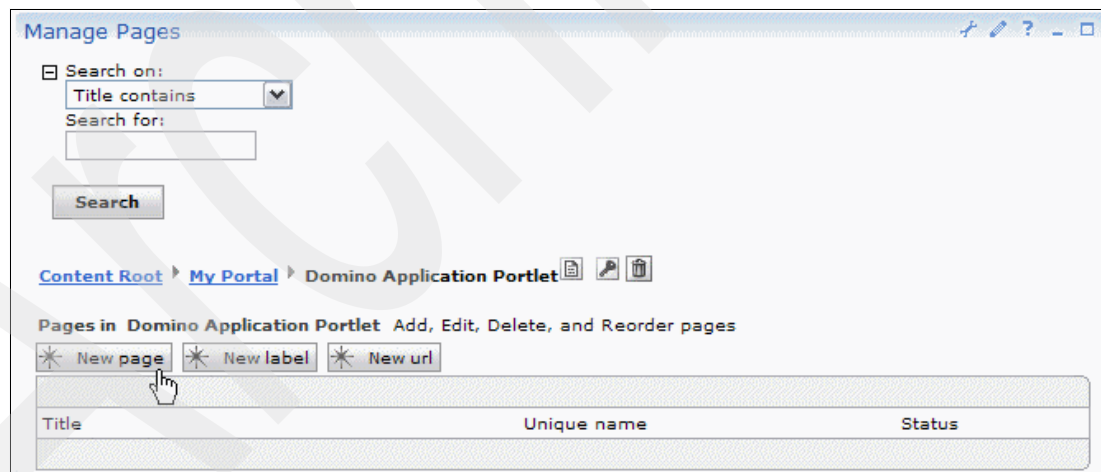


Figure 6-36 Creating a new page

18. In the Page Properties pane (Figure 6-37), for Title, type Discussion for the new page and click **OK**.

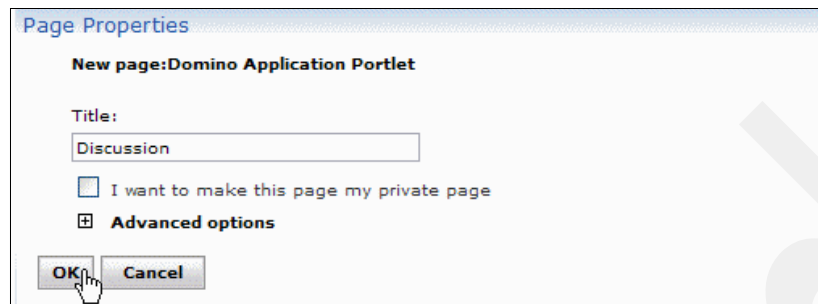


Figure 6-37 Naming the new page

19. A message confirms that the page is successfully created as shown in Figure 6-38.

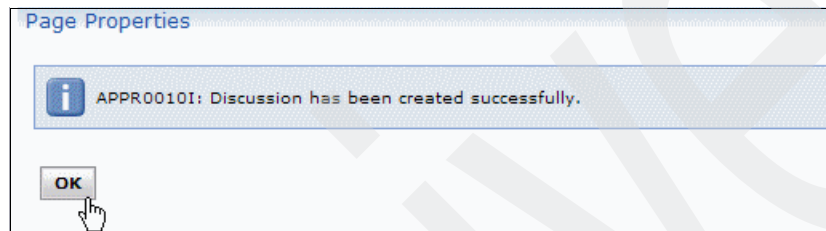


Figure 6-38 Message confirming creation of the new page

20. Navigate to the new page. Click the **My Work** link and select the **Domino Application Portlet → Discussion** page.

21. The portlet that we just created is not in the portlet list, so we must add it to the page as shown in Figure 6-39.

- a. Open the portlet list on the right side of the page.
- b. Click **Search** at the bottom of the panel.
- c. Type domino.
- d. Select **Discussion - Domino Application Portlet**.
- e. Click **OK**.

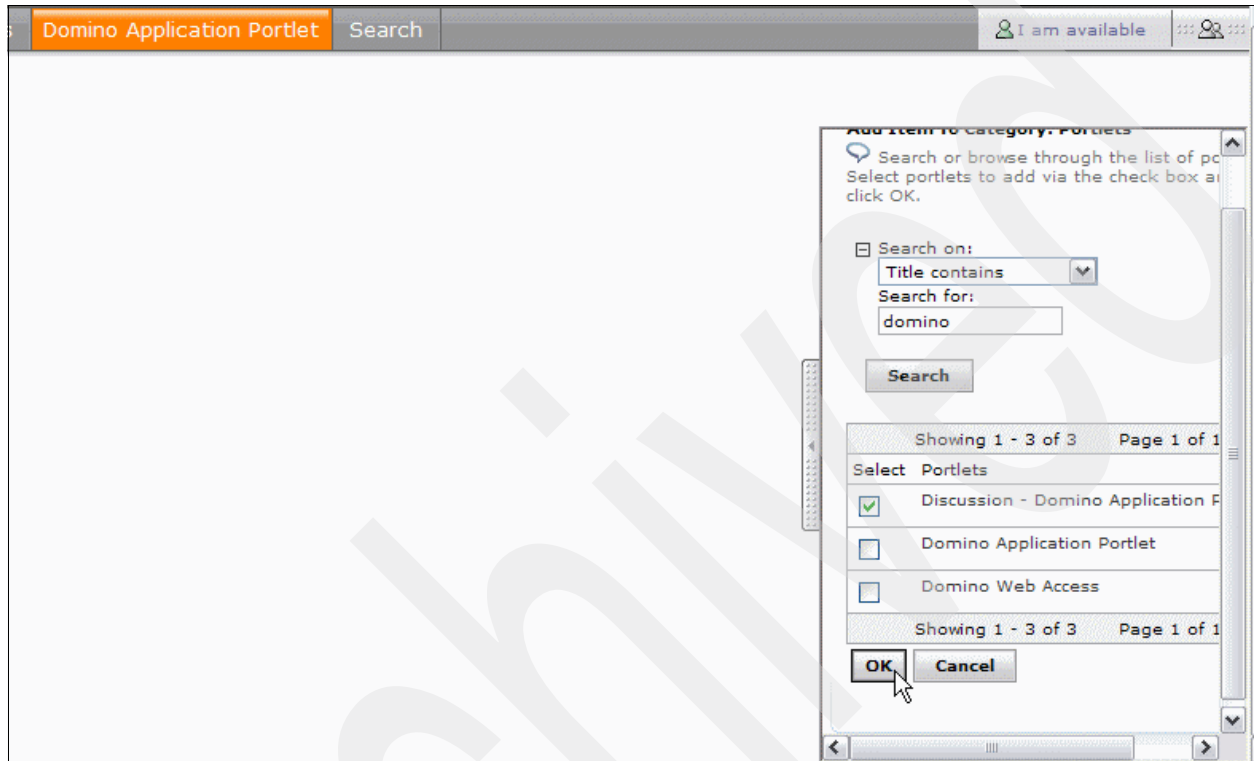


Figure 6-39 Selecting the new portlet

22.The new portlet is now displayed in the list, as shown on Figure 6-40.

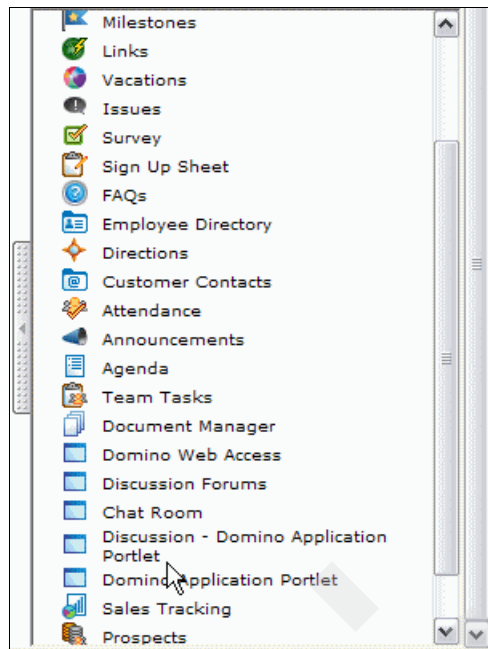


Figure 6-40 Selecting the new portlet

Drag it to the top of the page to deploy it. See Figure 6-41.



Figure 6-41 Dropping the new portlet into the page to deploy it

23.With the new portlet now deployed onto the page, configure it.

- a. Click the **wrench** icon located in the upper right side of the portlet as shown on Figure 6-42.

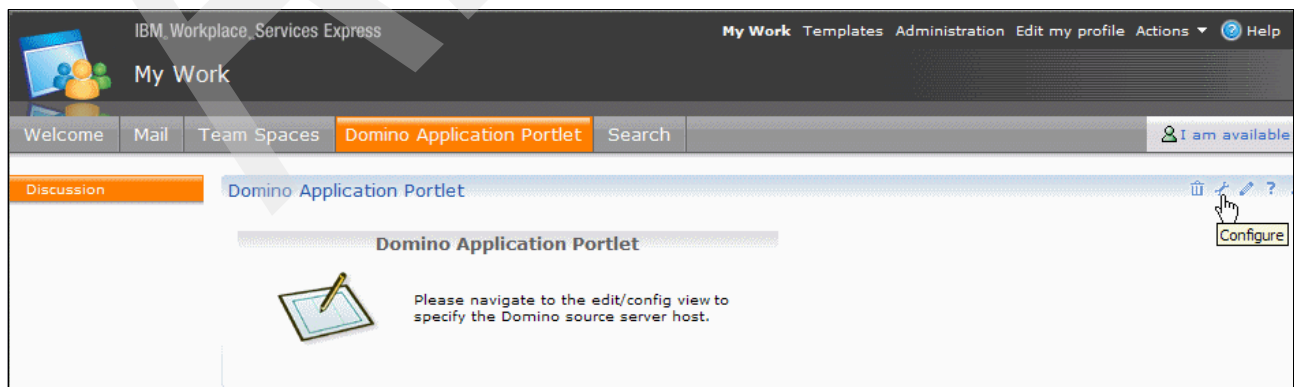


Figure 6-42 Accessing the portlet configuration mode

- b. On the **Source and Display** tab, set the source and display properties. This is the host name of the Domino server and the name and path of the Domino database that we are accessing. We use the values shown in Figure 6-43.

The screenshot shows the 'Domino Application Portlet' configuration window. The 'Discussion' portlet is selected on the left. The 'Source and Display' tab is active. The 'Domino Source Server' section has the following settings: Protocol is HTTP (selected), Host is dom654.rchland.ibm.com, Port is 80, and Path and filename is discussion.nsf. Each of these four settings has a green checkmark in the 'Show in edit mode' column. The 'Proxy Source Server' section has empty fields for Host and Port.

| Domino Source Server | |
|----------------------|--|
| Protocol: | <input checked="" type="radio"/> HTTP <input type="radio"/> HTTPS(SSL) |
| Host: | dom654.rchland.ibm.com |
| Port: | 80 |
| Path and filename: | discussion.nsf |

| Proxy Source Server | |
|---------------------|--|
| Host: | |
| Port: | |

Figure 6-43 Configuring source and display options

- c. Click the **Authentication** tab. In our environment, SSO is already configured. Therefore we choose **Single Sign-On (SSO)** as the authentication mechanism. Click **Save**. See Figure 6-44.

Note: For more information about configuring SSO, refer to Chapter 8, “Enabling SSO between Workplace Services Express and Domino” on page 237.

The screenshot shows the 'Domino Application Portlet' configuration window with the 'Authentication' tab selected. The 'Authentication Model' section has four radio buttons: 'None', 'Basic', 'Session', and 'Single Sign-On (SSO)'. The 'Single Sign-On (SSO)' option is selected and highlighted with a dashed box. Below this, the 'Credential Vault Settings' section has three radio buttons: 'Private Slot', 'Shared Slot', and 'System Slot'. The 'Private Slot' option is selected. To the right of these settings are two checkboxes: 'Show in edit mode' and a checkbox for 'System Slot Identifier'. The 'System Slot Identifier' checkbox is checked, and there is a text input field next to it. At the bottom of the window are 'Save' and 'Close' buttons. A mouse cursor is pointing at the 'Save' button.

Figure 6-44 Configuring authentication

- d. If you see a warning security message (Figure 6-45), click **Yes**.

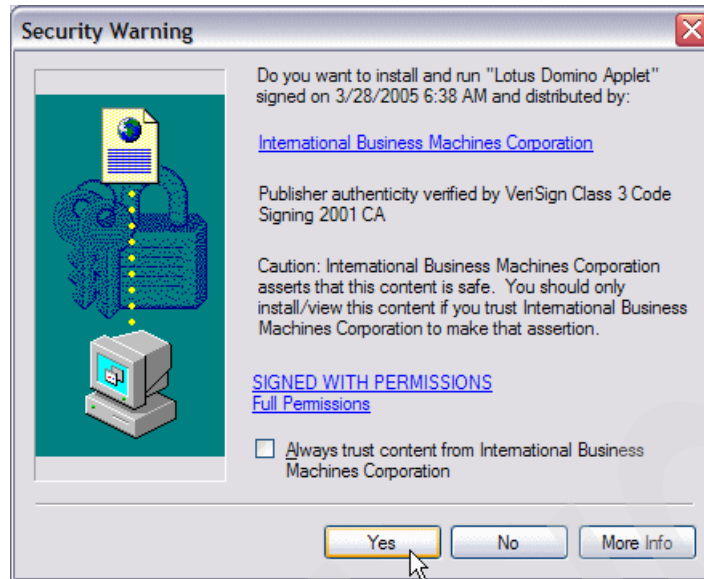


Figure 6-45 Security warning

- e. The new portlet is configured and displayed on the page (Figure 6-46). You can see that the topic posted in the Discussion database, as done in step 3 on page 193, is displayed.

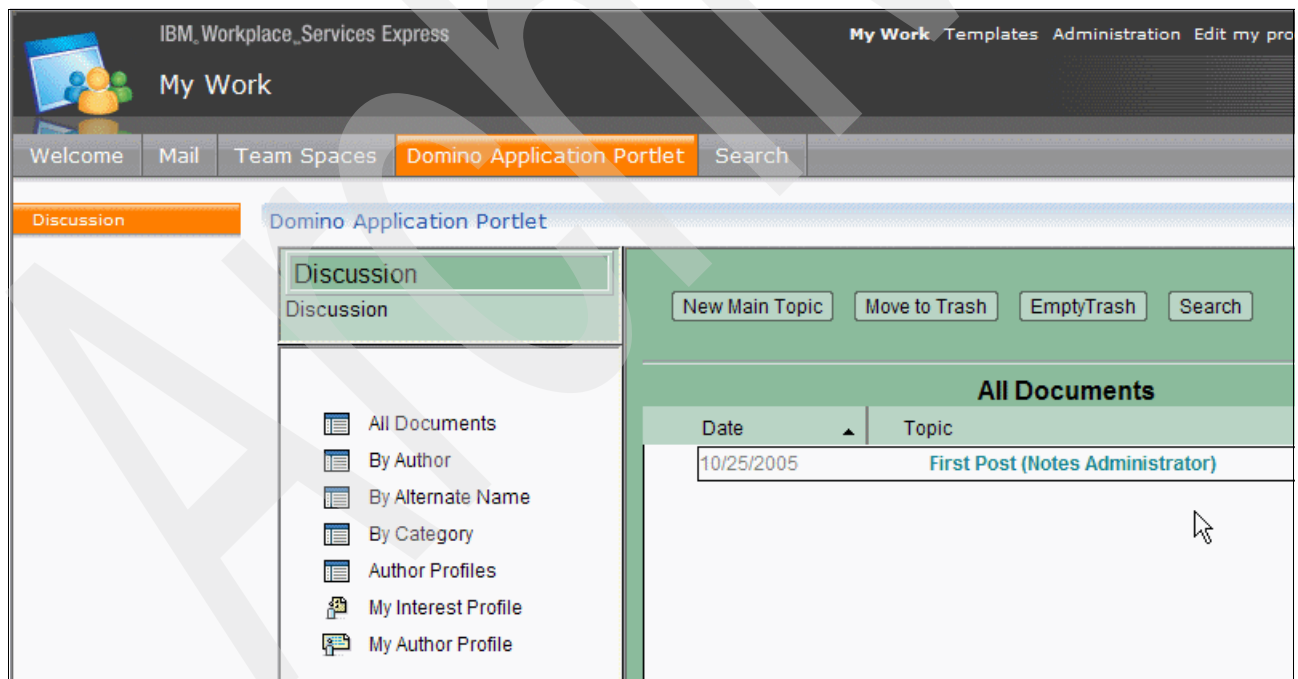


Figure 6-46 Domino Application portlet displaying Discussion database

24. To test the portlet using a non-administrator user:

- Log out of Workplace Services Express server and login again with another user.
- Navigate to the **Domino Application Portlet** tab and click **New Main topic**.
- Write a subject and some content.
- Click **Save & Close**, as shown in Figure 6-47.

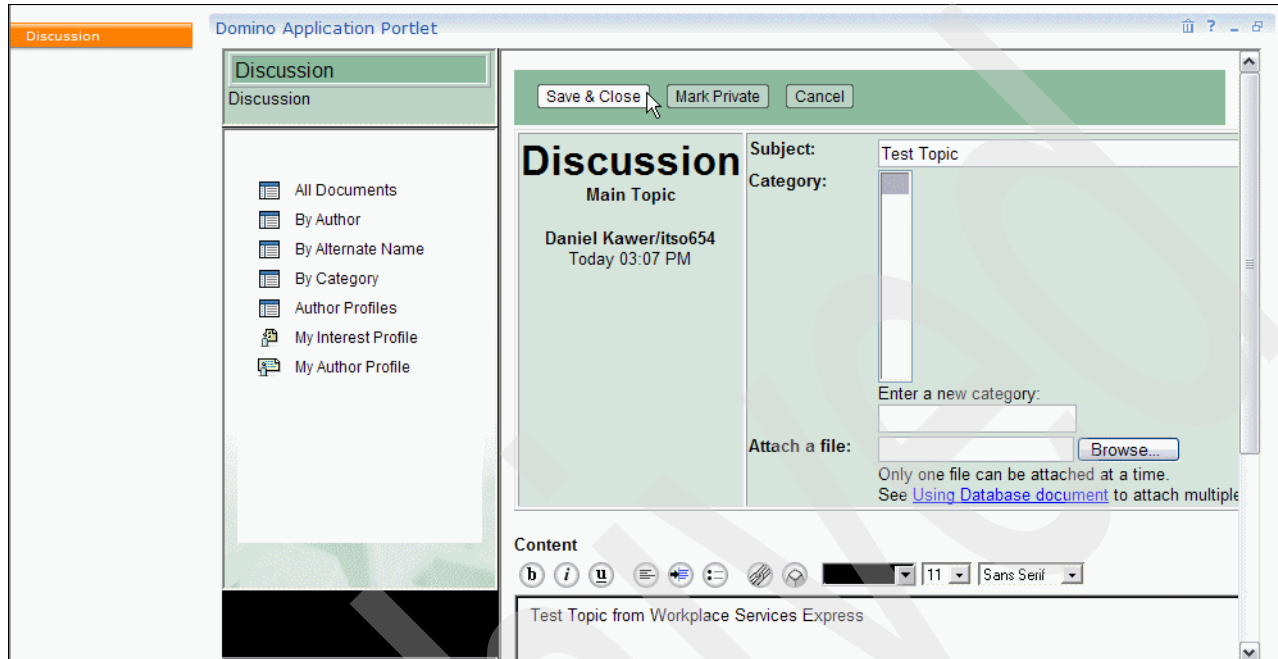


Figure 6-47 Creating a new topic in the Domino Discussion database

25. Both topics should now appear in the view (Figure 6-48). The same view is shown from the Lotus Notes client in Figure 6-49. Note that both views are the same; the difference is the client.

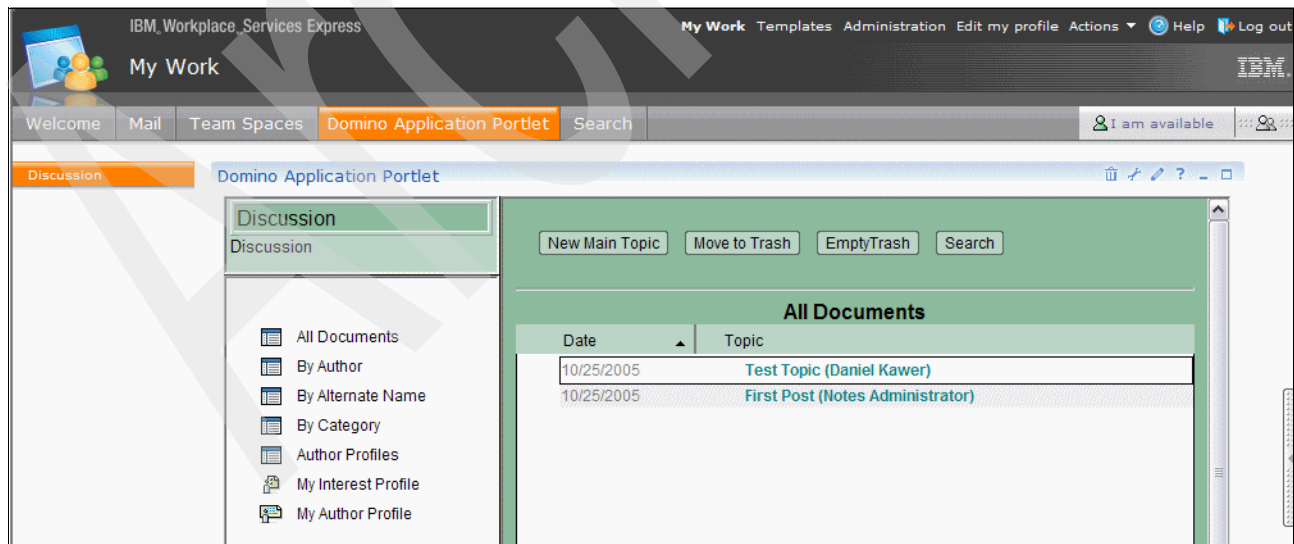


Figure 6-48 Discussion database view from Workplace Services Express

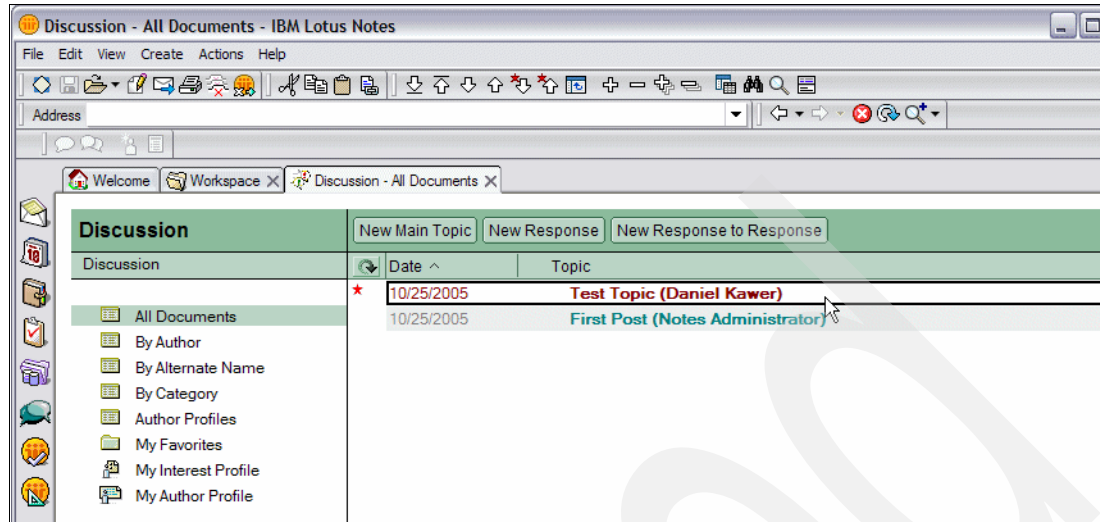


Figure 6-49 Discussion database view from the Lotus Notes client

6.5 Portalizing non-Domino applications

Although this chapter explains how to portalize an existing Domino application, the concepts covered here can be applied to non-Domino applications, such as RPG or COBOL applications. There are several techniques to portalize other applications:

- ▶ To create portlets to run RPG and COBOL applications on your iSeries server, you can create a new portlet using the WebSphere Development Studio Client for iSeries. For more information, see the following Web site:
<http://www.ibm.com/software/awdtools/wdt400/>
- ▶ Expose the application as a set of Web services and build a portlet that consumes those Web services.
- ▶ Build a new portlet based either on the IBM Portlet API or the JSR 168 standard. For more information about building new portlets, refer to the IBM Redbook *IBM Rational Application Developer V6 Portlet Application Development and Portal Tools*, SG24-6681.
- ▶ Use an existing portlet. Many portlets are available in the IBM Workplace Solution Catalog on the Web at:
<http://catalog.lotus.com/wps/portal/portal>
- ▶ Use a portlet builder. Several companies provide portlet builders. These are applications that generate a customized portlet based on specified input, such as data sources and types. Some of these applications are also portlets, so the new portlets can be built inside Workplace Services Express.

Choosing which technique to use depends on the existing application, whether there are available portlets to access that application, and your knowledge and experience of J2EE development.

Integrating iSeries Access for Web portlets

The V5R3 release of iSeries Access for Web provides a number of portlets that you can use in a Workplace Services Express on iSeries environment. These portlets can help to quickly integrate your existing 5250 character-based applications into your Workplace Services Express environment and provide a portlet-based interface to administer your iSeries server.

iSeries Access for Web V5R3 provides the following portlets:

- ▶ 5250 portlet
- ▶ Commands portlet
- ▶ Database tables and SQL portlets
- ▶ iFrame portlet
- ▶ Integrated file system browsing portlets
- ▶ Printer portlets

The process of integrating the iSeries Access for Web portlets into a Workplace Services Express environment varies depending on the following criteria:

- ▶ The authentication method that you plan to use with the portlets
- ▶ Whether you already have iSeries Access for Web configured on a separate WebSphere Application Server instance
- ▶ Whether you selected the iSeries Access for Web portlets component when configuring your Workplace Services Express server

Figure 7-1 shows the choices that you must make when configuring the iSeries Access for Web portlets.

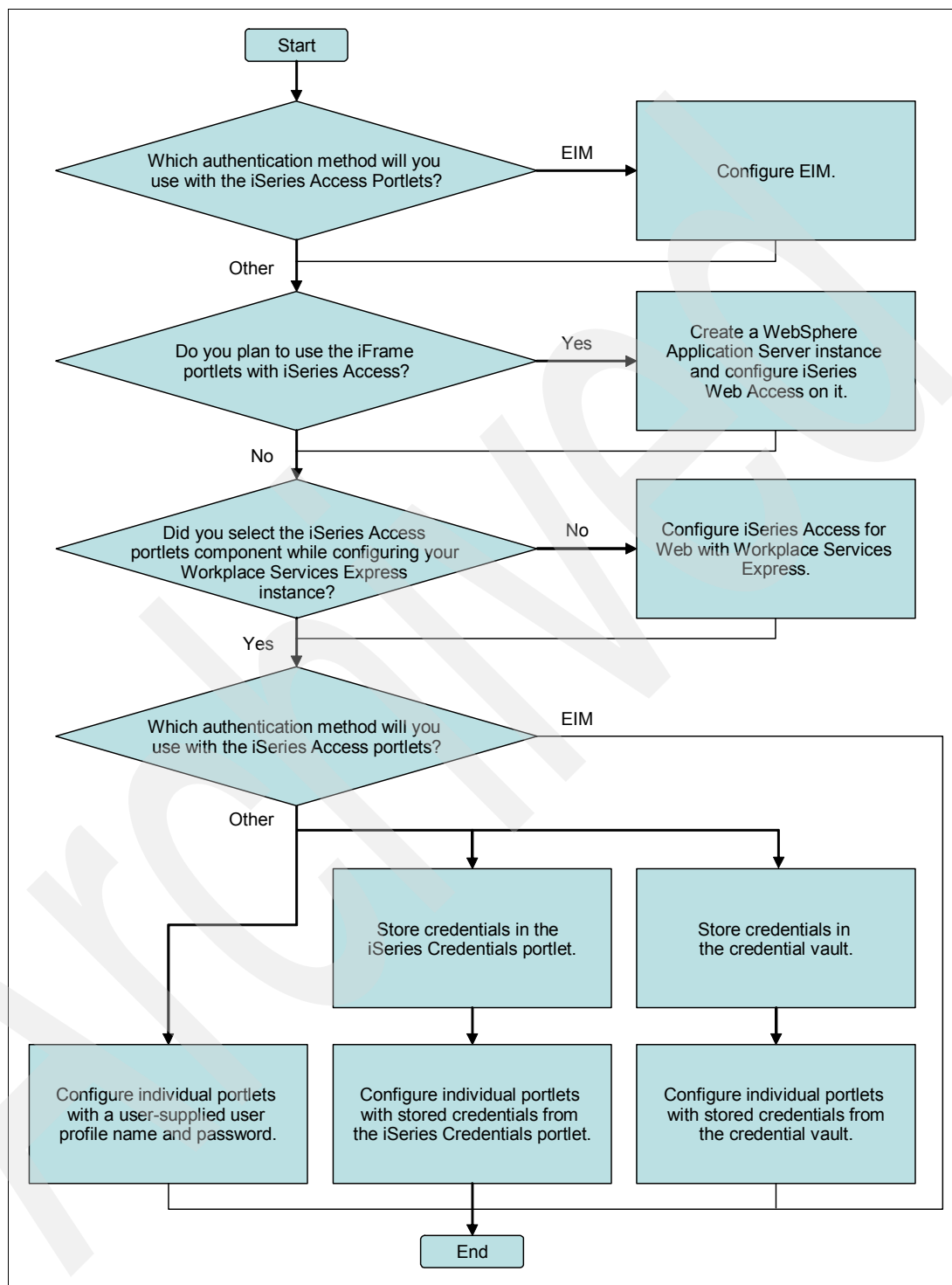


Figure 7-1 Integrating iSeries Access for Web portlets into a Workplace Services Express environment

Since the Workplace Services Express user directory is managed separately from the i5/OS user profile registry, the iSeries Access for Web portlets must authenticate users to your i5/OS server before they can access the iSeries Access for Web portlets.

The iSeries Access for Web portlets can authenticate users with any of the following methods:

- ▶ Using a credential specific to a particular portlet window
- ▶ Using a credential set with the iSeries credentials portlet
- ▶ Using a shared credential set by the Workplace Services Express administrator
- ▶ Using the current user's Workplace Services Express credential mapped to an i5/OS user profile by Enterprise Identity Mapping (EIM)

The first three methods involve using a user name and password, which are either entered directly by the user or set by the Workplace Services Express administrator. The fourth method associates i5/OS user profiles with Workplace Services Express users by using EIM. If you use this method of authentication, after a user has authenticated to Workplace Services Express, they do not have to provide any further credentials to allow the iSeries Access for Web portlets to access information about your iSeries server.

If you plan on using Workplace Services Express user credentials mapped to i5/OS user profiles by EIM for authentication, refer to 7.1, "Configuring EIM for use with the iSeries Access portlets" on page 209, before you configure iSeries Access for Web. If you plan to use any of the other methods, refer to 7.2, "Configuring iSeries Access for Web" on page 223, for information about how to configure authentication.

7.1 Configuring EIM for use with the iSeries Access portlets

By using EIM with Workplace Services Express and the iSeries Access for Web portlets, a user can log in to Workplace Services Express and is automatically authenticated to i5/OS with an i5/OS user profile specific to this Workplace Services Express user. EIM achieves this by mapping entries in the Lightweight Directory Access Protocol (LDAP) directory to entries in the i5/OS user profile registry.

Configuring EIM to work with the iSeries Access for Web portlets in Workplace Services Express involves:

- ▶ Configuring EIM on your iSeries server
- ▶ Creating a new EIM domain
- ▶ Adding the Workplace Services Express user registry to the EIM domain
- ▶ Creating EIM identifiers for the Workplace Services Express users
- ▶ Associating users from the Workplace Services Express user registry with entries in the i5/OS user profile registry

Perform the following steps to configure EIM for use with Workplace Services Express:

1. Make sure that the IBM Directory Server is configured on your iSeries server. IBM Directory Server is used to store EIM domain configuration data and to access information about i5/OS user profiles. See Appendix B, "Setting up IBM Directory Server for i5/OS" on page 343, for information about configuring IBM Directory Server.
2. Create an EIM domain. An EIM domain stores information about user registries, user identifiers, and the mappings between entries in the user registries. In a Workplace Services Express environment, the registries used are the Workplace Services Express user registry, stored on an LDAP server, and the i5/OS user profile registry. Perform the following steps to create a new EIM domain:

- a. Open iSeries Navigator and expand **My Connections** → **iSeries server name** → **Network** → **Enterprise Identity Mapping**.
- b. Right-click **Configuration** and select **Configure**. The EIM configuration wizard starts.
If the Configure option is not available, you can select **Reconfigure**. Be aware that reconfiguring EIM overwrites the previous EIM configuration.
- c. A Welcome window opens that describes the configuration options that are available (Figure 7-2). Select **Create and join a new domain** and click **Next**.



Figure 7-2 Selecting to create and join a new EIM domain

- d. EIM can use either a local or remote directory server to store domain configuration information. In our example, we use the local IBM Directory Server and select **On the local directory server** (Figure 7-3). Click **Next**.

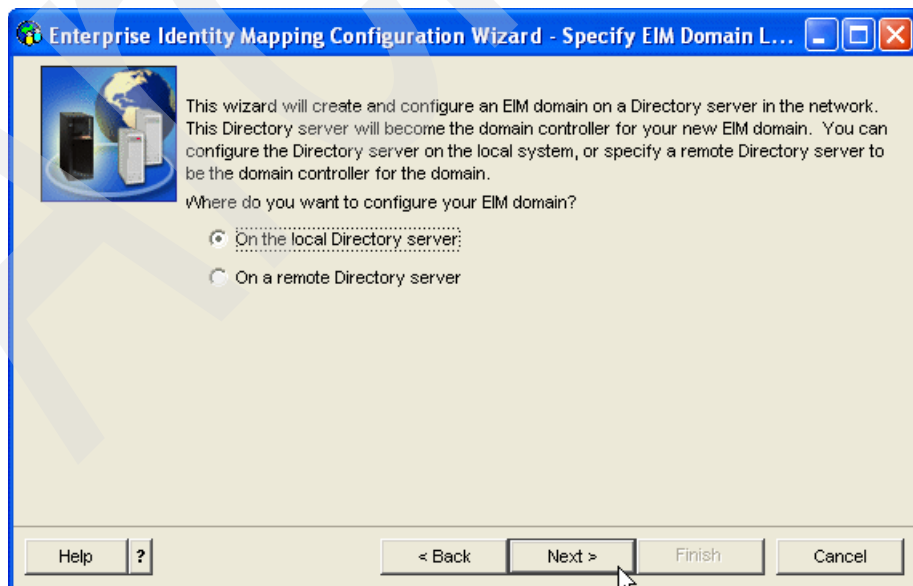


Figure 7-3 Selecting where to configure an EIM domain

- e. The wizard prompts you to choose whether to configure the Network Authentication Service (Figure 7-4). EIM can be integrated with the Kerberos Network Authentication System to allow single sign-on (SSO) from local workstations. You are not required to set up EIM to work with Workplace Services Express. If you need information about integrating EIM into a Kerberos environment, see the iSeries Information Center at

<http://publib.boulder.ibm.com/infocenter/iseries/v5r3/index.jsp>

Select **No** and click **Next**.



Figure 7-4 Selecting whether to configure the Network Authentication Service

- f. In the next window, the wizard prompts for the distinguished name and password of a user to authenticate to the directory server with while configuring EIM (Figure 7-5).

Enter the LDAP administrative user ID and password. If you do not know the LDAP administrative user's password, see "Managing the IBM Directory Server on i5/OS" on page 344 for information about how to reset the password.

After you complete the values, click **Next**.

EIM Configuration Wizard - Specify User For Connection

In order for the wizard to complete EIM configuration, the wizard must connect to the domain controller with an authorized user. What user do you want the EIM Configuration Wizard to use?

User type: Distinguished name and password

User

Distinguished name: cn=administrator

Password: *****

Confirm password: *****

Verify Connection

Help ? < Back Next > Finish Cancel

Figure 7-5 Specifying the LDAP administrator ID

- g. In the next window, enter a name for the EIM domain which you are about to create (Figure 7-6). Click **Next**.

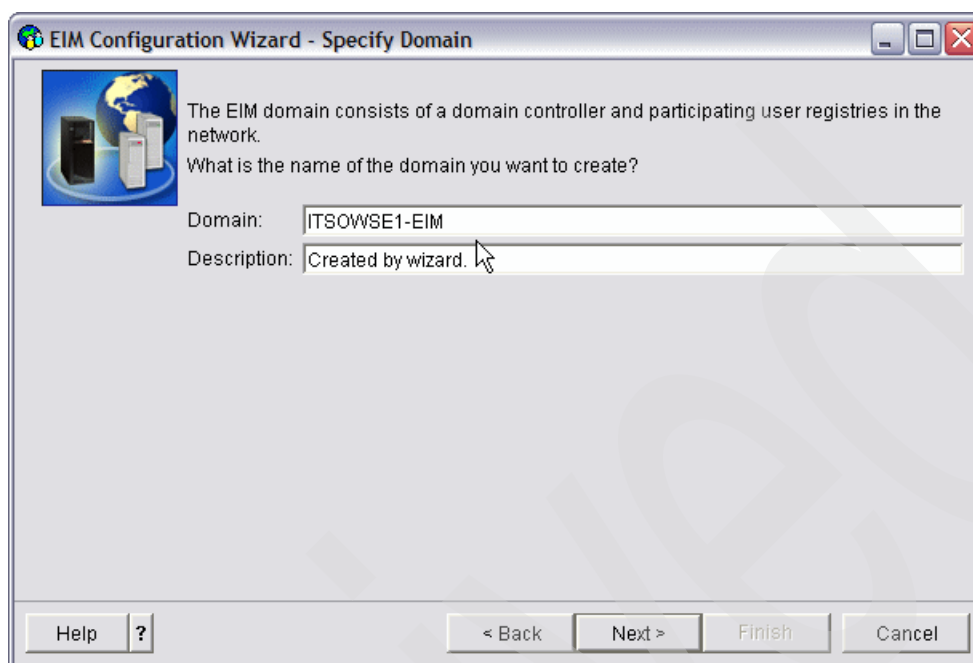


Figure 7-6 Specifying a name for the new EIM domain

- h. The EIM Configuration Wizard prompts you to enter a parent distinguished name (DN) for the EIM domain information in your LDAP directory (Figure 7-7). If you select Yes, you can specify where to store the EIM domain configuration information in your LDAP directory. Unless you have a specific reason to store the domain information in a location other than in a container in the root of your LDAP directory, select **No** and click **Next**.

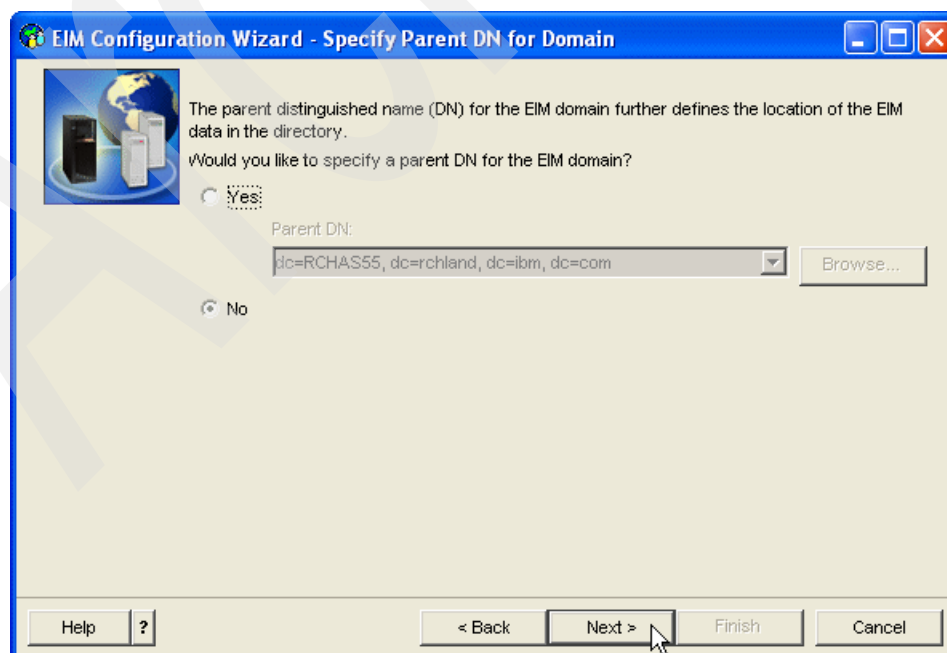


Figure 7-7 Option to specify the parent DN for the EIM domain

- i. If the directory server is started, a warning message is displayed, indicating that the wizard will restart the directory server when configuring the EIM domain. If this message appears, click **Yes**.
- j. In the window that opens, the wizard prompts you to select the user registries to add to the new EIM domain (Figure 7-8). At this point, we add the i5/OS user profile registry to the EIM domain.

Select **Local OS/400**, and enter the fully qualified host name associated with the IP address to which the IBM Directory Server is bound on your iSeries server. If you do not know which IP address the directory server is bound to, see Appendix B, “Setting up IBM Directory Server for i5/OS” on page 343. Click **Next** to continue.

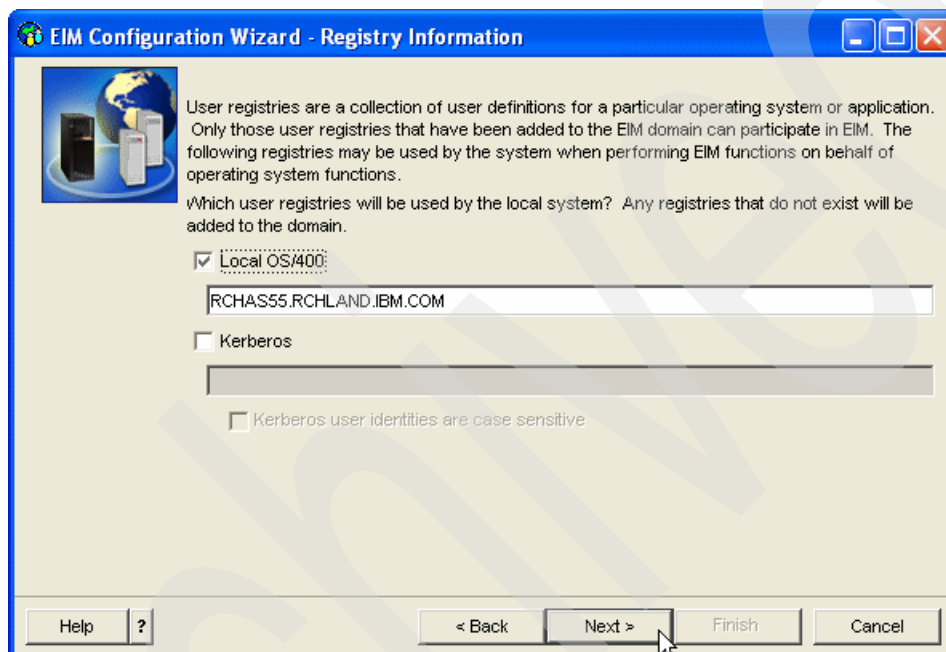


Figure 7-8 Entering the host name to which the IBM Directory Server is bound

- k. EIM is used by several i5/OS functions. To access the EIM domain controller, i5/OS must authenticate to it as an LDAP user. The wizard prompts for the distinguished name and password of the user to use (Figure 7-9).

In the Distinguished name field, enter the distinguished name of the LDAP administrative user. In the Password and Confirm password fields, enter the password for the LDAP administrative user. Then click **Next**.



Figure 7-9 Specifying an LDAP user for i5/OS to use when accessing the EIM domain

- l. In the summary page that opens, review the information and click **Finish** to start the configuration of a new EIM domain.
 - m. While the EIM domain is being configured, a progress window opens. This window closes, and you return to iSeries Navigator after the new EIM domain is configured.
3. The newly created EIM domain might not be listed in Domain Management in iSeries Navigator. If it is not, you can add the new EIM domain to Domain Management by performing the following steps:
 - a. Open iSeries Navigator and expand **My Connections** → **iSeries server name** → **Network** → **Enterprise Identity Mapping**.
If possible, expand the **Domain Management** item and check whether your new EIM domain is already added.
 - b. Right-click **Domain Management** and select **Add Domain**.

- c. In the Add Domain window (Figure 7-10), make sure that the Domain Controller field is filled in with the fully qualified host name of your iSeries server. Click **Browse** to view a list of available domains.

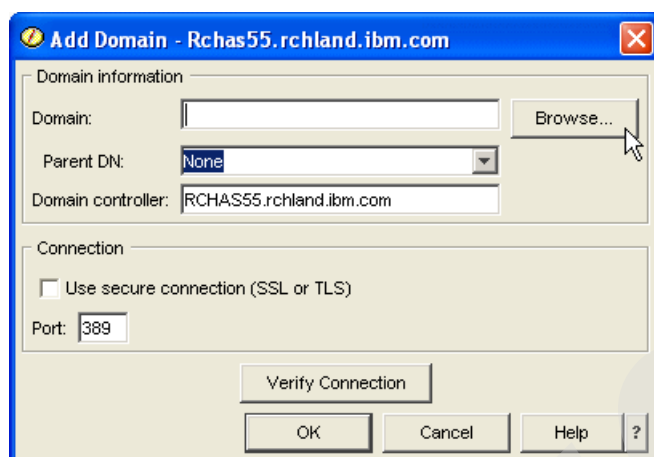


Figure 7-10 Add Domain window

- d. The window that opens prompts you for credentials with which to connect to the LDAP directory on the domain controller (Figure 7-11). Enter the LDAP administrative user's distinguished name and password. Then click **OK**.

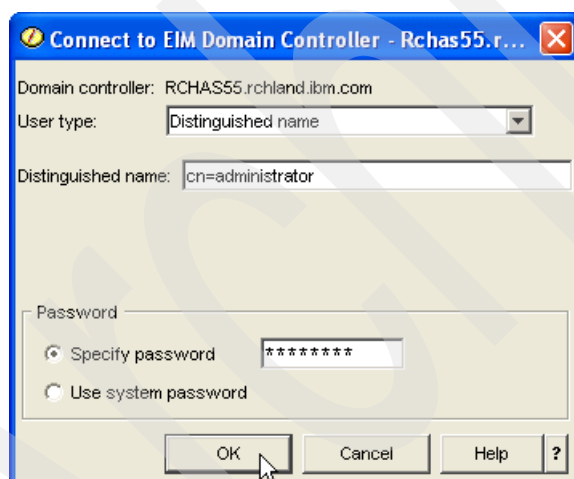


Figure 7-11 Entering credentials to connect to the EIM domain controller

- e. In the Browse EIM Domains window, a list of available EIM domains is displayed (Figure 7-12). Select the newly created EIM domain and click **OK**.

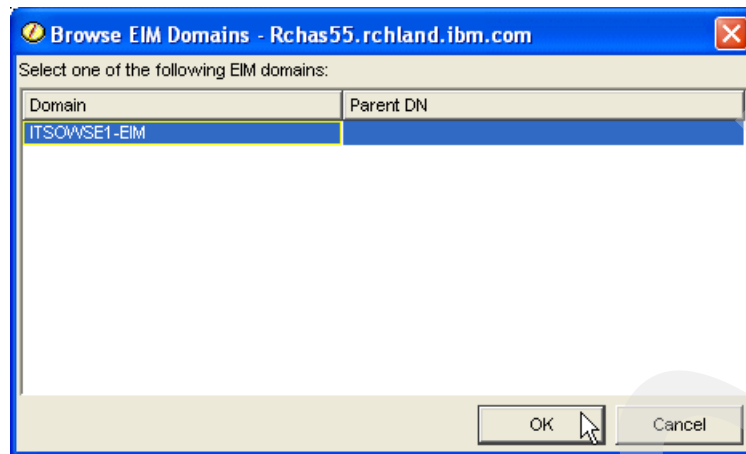


Figure 7-12 Browsing the list of EIM domains

- f. You return to the Add domain window (Figure 7-10). Click **OK** to add the EIM domain to Domain Management.
4. Add the Workplace Services Express user registry to the newly created EIM domain. User entries in the Workplace Services Express registry are mapped to entries in the i5/OS user registry to authenticate Workplace Services Express users to i5/OS.

Perform the following steps to add the user registry:

- a. Open iSeries Navigator.
- b. Expand **My Connections** → **iSeries server name** → **Network** → **Enterprise Identity Mapping** → **Domain Management** → **Domain** (where *Domain* is the name of the EIM domain that you just created). Right-click **User Registries** and select **Add Registry** → **System** (Figure 7-13).

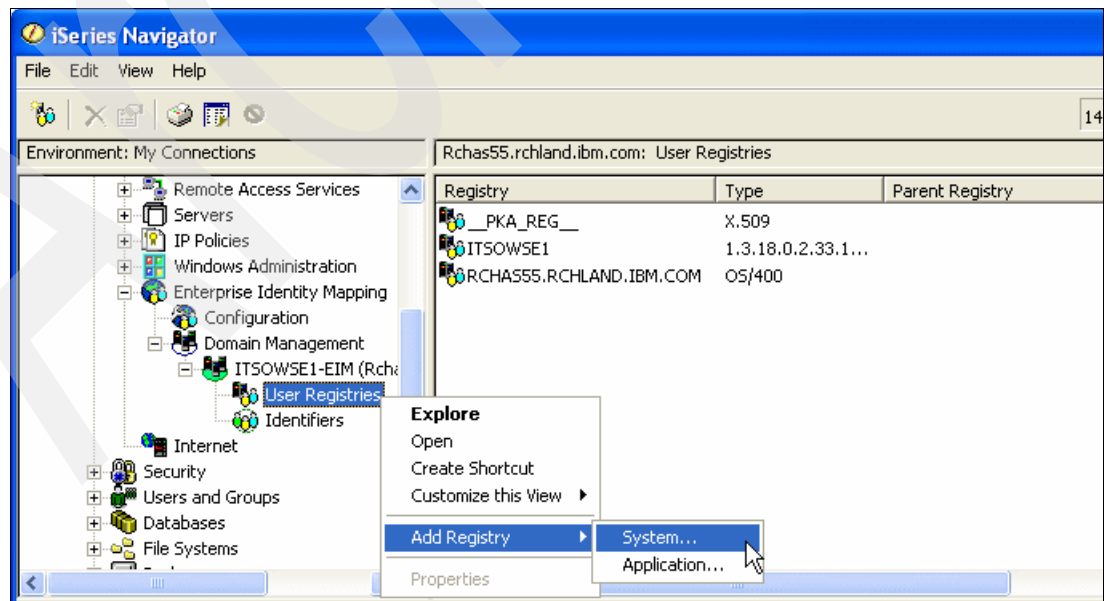


Figure 7-13 Adding a new system registry

- c. In the add registry window (Figure 7-14), complete the fields as follows:
 - i. In the Registry field, enter a name for the registry. For example, we enter Workplace Services Express Users.
 - ii. From the Type list, select **1.3.18.0.2.33.14-caselnore**.
 - iii. In the Description field, enter a description of the registry.
 - iv. Enter the Uniform Resource Locator (URL) of the location in your LDAP directory where Workplace Services Express user account information is stored. If you are using the IBM Directory server to store Workplace Services Express user information and chose the default containers, this should be in the form:


```
ldap://servername:port/cn=users,dc=server,dc=domain,dc=tld
```

Here *servername* is the fully qualified host name to which IBM Directory Server is bound. *Port* is the port to which IBM Directory Server is bound. This is 389 by default. And *server*, *domain*, and *tld* are the subcomponents of your IBM Directory Server's fully qualified host name.

If you are using Domino to store Workplace Services Express user information, the LDAP URL is in the form:

```
ldap://servername:port/o=organization
```

Here *servername* is the fully qualified host name of your Domino server. *Port* is the port to which your Domino LDAP server is bound. This is 389 by default. And *organization* is the Domino organization where your Workplace Services Express users are stored.
 - v. Click **OK**.

Add System Registry - ITSOWSE1-EIM

Domain: ITSOWSE1-EIM

Registry: ITSOWSE1 Workplace Services Express Users

Type: 1.3.18.0.2.33.14-caselnore

Description: User registry for Workplace Services Express users from ITSOWSE

User registry URL: ldap://rchas55.rchland.ibm.com:389/cn=users,dc=rchas55,dc=rchla

Address aliases

Alias:

Type: DNS host name

Add

| Alias | Type |
|-------|------|
|-------|------|

Remove

OK Cancel Help ?

Figure 7-14 Entering details of the new system registry

5. Create an EIM identifier for each Workplace Services Express user that will use the iSeries Access for Web portlets. An *EIM identifier* links an entry in the Workplace Services Express user registry to an entry in the i5/OS user registry, allowing users authenticated to Workplace Services Express to be authenticated to i5/OS with an i5/OS user profile.

Perform the following steps to create a new EIM identifier and add an association from a Workplace Services Express user to an i5/OS user profile to it:

- a. Open iSeries Navigator.
- b. Expand **My Connections** → **iSeries server name** → **Network** → **Enterprise Identity Mapping** → **Domain Management** → **Domain** (where *Domain* is the name of the EIM domain which you created in step 2). Right-click **Identifiers** and select **New Identifier** (Figure 7-15).

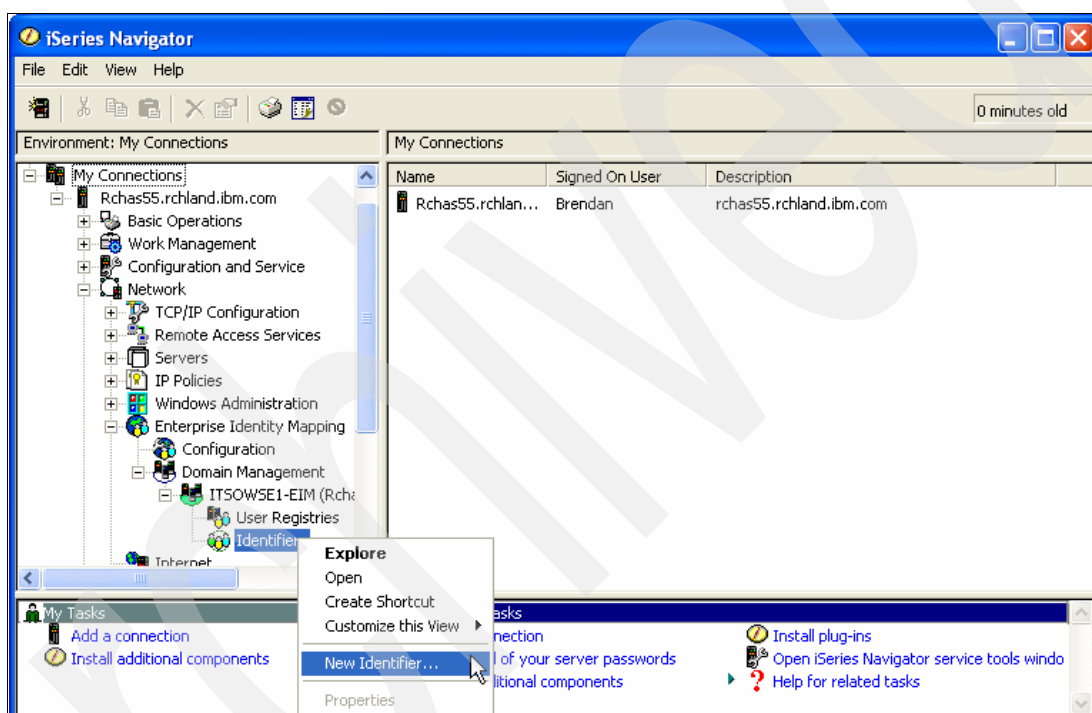


Figure 7-15 Creating a new EIM Identifier

- c. In the New Identifier window (Figure 7-16), in the Identifier field, enter a name for the new identifier. This is purely for recognition purposes and is not required to match a user's Workplace Services Express user name or their i5/OS user profile. Click **OK**.

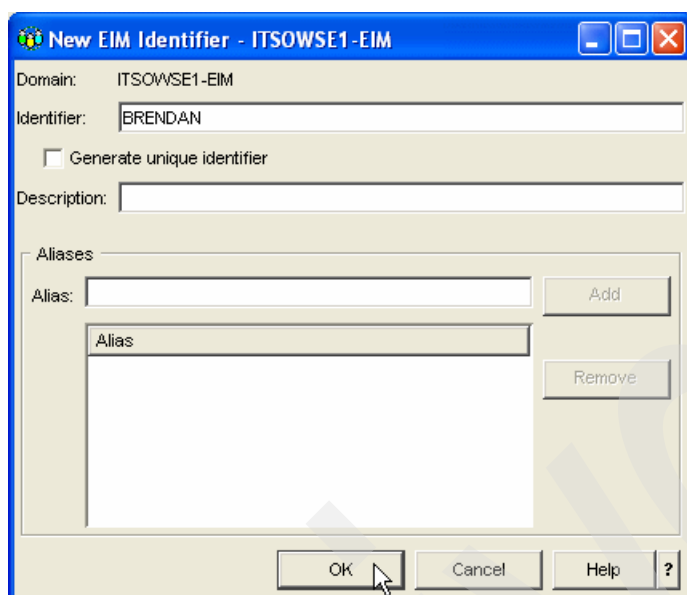


Figure 7-16 Specifying details of the new Identifier

- d. A list of identifiers is displayed in the right pane. Double-click the identifier that you just created.
- e. In the identifier Properties window (Figure 7-17), click the **Associations** tab.
- i. Click **Add** to add the source association.

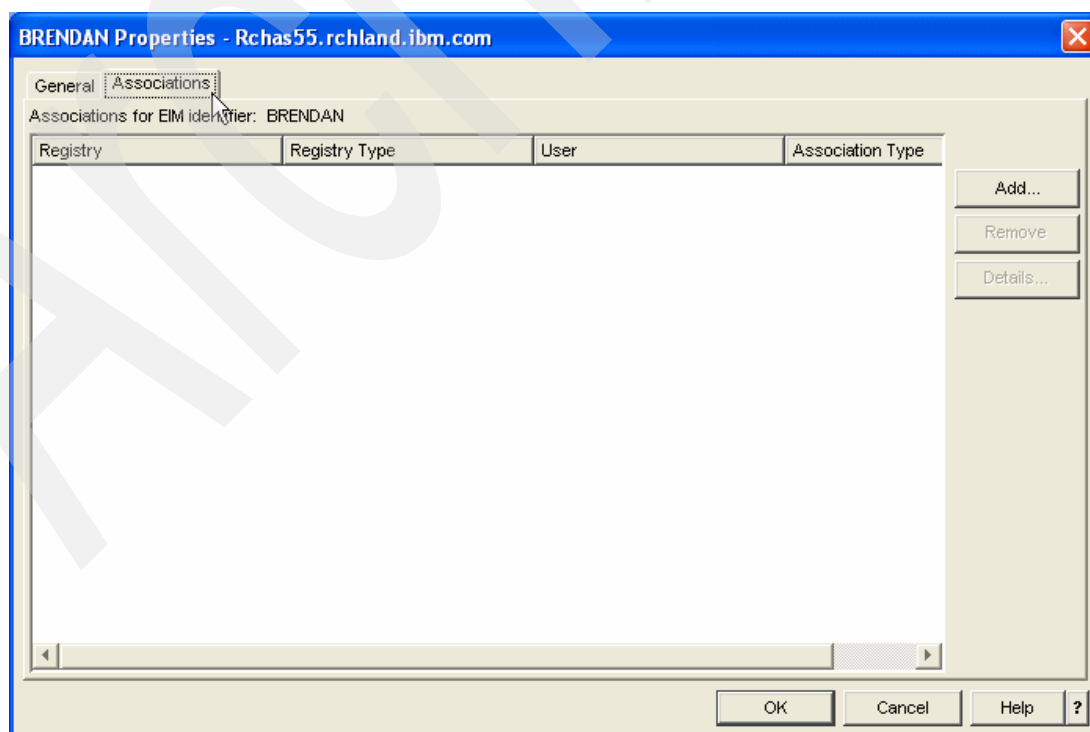


Figure 7-17 Identifier Properties window

- ii. In the Add Association window (Figure 7-18), you can specify the registry from which to retrieve the user entry, details of the user entry in the registry, and the type of association that you want to create.

Click the **Browse** button next to the Registry field to see a list of configured registries.

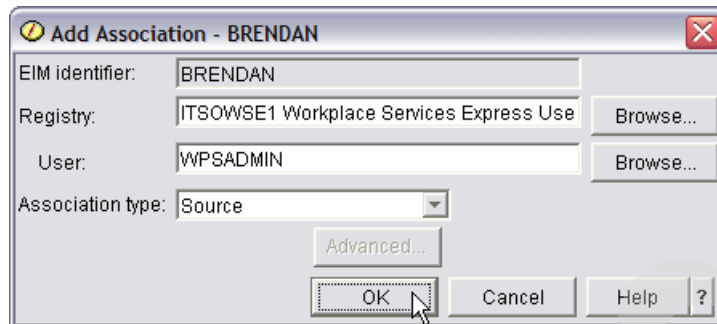


Figure 7-18 Add Association window

- iii. From the registry list (Figure 7-19), select the Workplace Services Express user registry that you created in step 4 on page 217 and click **OK**.

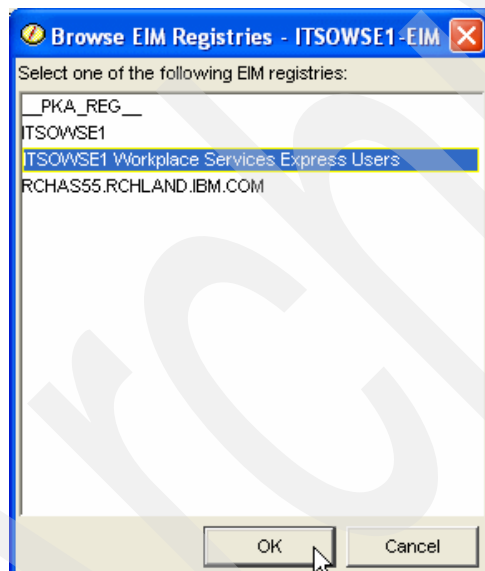


Figure 7-19 Selecting the Workplace Services Express user registry

- iv. You return to the Add Association window (Figure 7-18). In the User field, enter the Workplace Services Express user name of the user for which you are creating the association.

Note: Clicking the **Browse** button does not allow you to select the user from a list.

From the Association Type drop-down list, select **Source** and click **OK**.

- f. You return to the Identifier Properties window, in which you can now see that the Workplace Services Express source user association is now listed (Figure 7-20). Click **Add** to add a target association which associates the Workplace Services Express user with an i5/OS user profile.

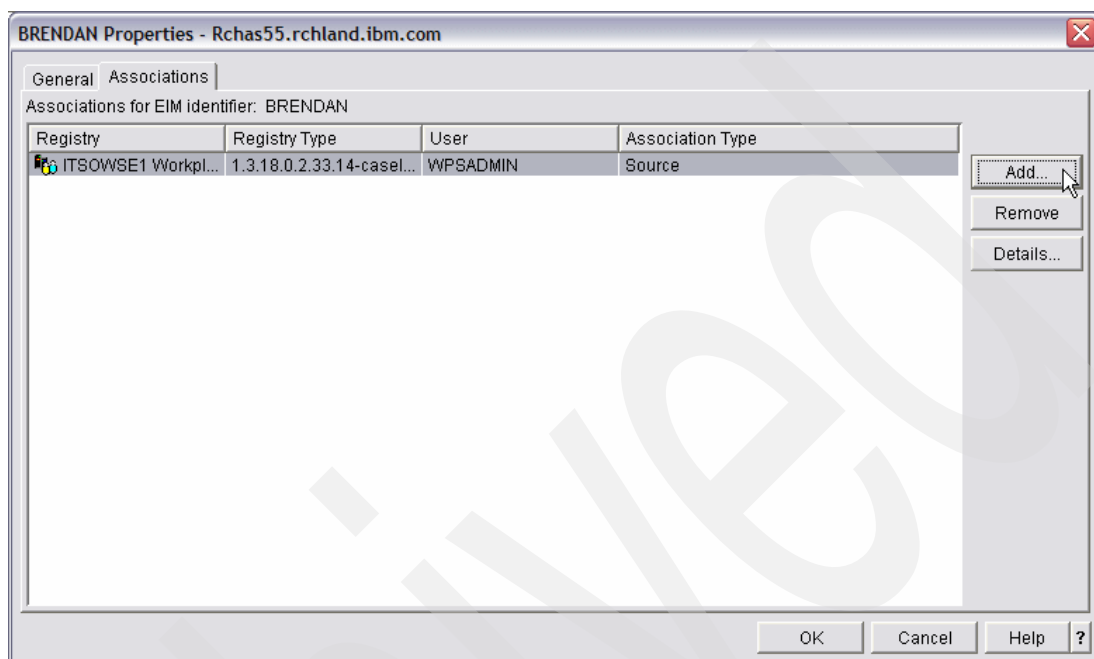


Figure 7-20 Identifier Properties window with the source association added

- i. In the Add Association window, click **Browse** next to the Registry field to see a list of configured registries.
- ii. From the registry list, select the i5/OS user registry (Figure 7-21). This typically has the same name as the fully qualified domain name of your iSeries server. Click **OK**.

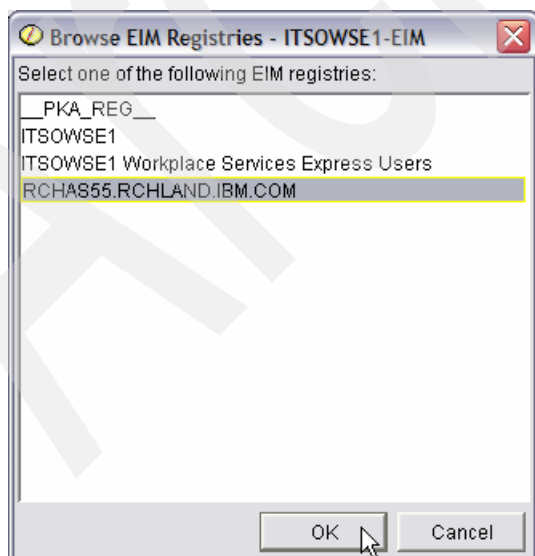


Figure 7-21 Selecting the target association registry

- iii. You return to the Add Association window. In the User field, enter the i5/OS user profile name that you want to associate with the Workplace Services Express user.

Note: Clicking the **Browse** button does not allow you to select the user profile from a list.

From the Association Type dropdown list, select **Target** and click **OK**.

g. You return to the Identifier Properties window. Click **OK** to save the identifier.

7.2 Configuring iSeries Access for Web

Some of the iSeries Access for Web portlets rely on the iSeries Access for Web servlets to provide functionality. These portlets require iSeries Access for Web to be configured on your iSeries server.

If you already have iSeries Access for Web configured with a separate WebSphere Application Server instance, your Workplace Services Express instance uses the existing configuration. If you have not yet configured iSeries Access for Web, complete these steps:

1. Access the IBM Web Administration for iSeries by pointing your Web browser to your fully qualified iSeries host name on port 2001:

`http://iSeriesHostName.domain:2001`

In our example, we enter:

`http://rchas12.rchland.ibm.com:2001`

2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. In the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. Click the **Setup** tab. Then in the Common Tasks and Wizards menu, in the left pane, select **Create Application Server**. See Figure 7-22.

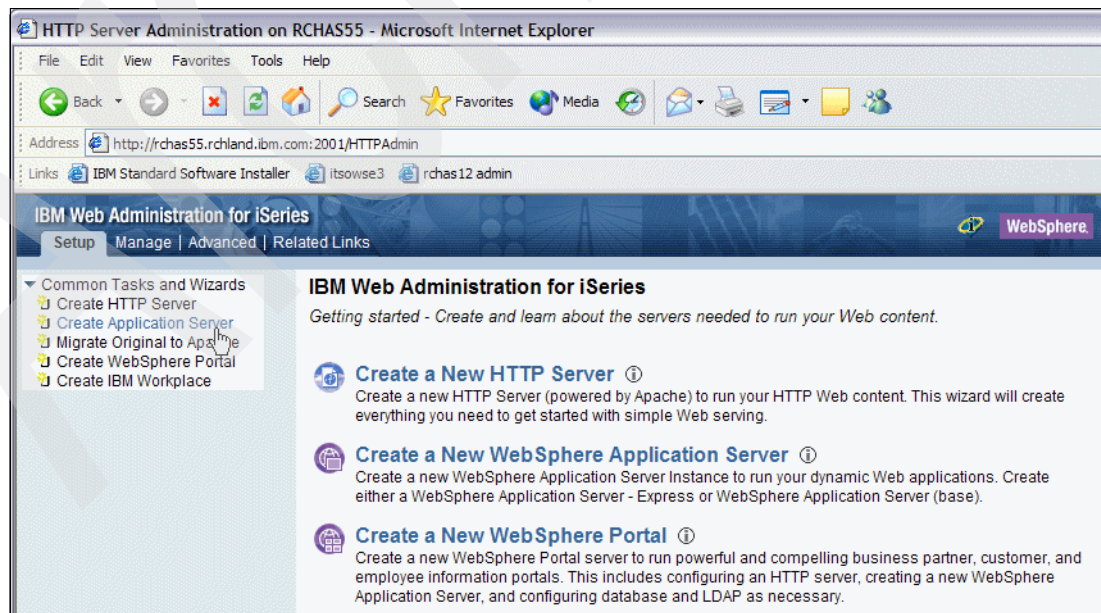


Figure 7-22 Creating a new application server

5. The next pane summarizes the process of creating a new application server (Figure 7-23). Click **Next**.

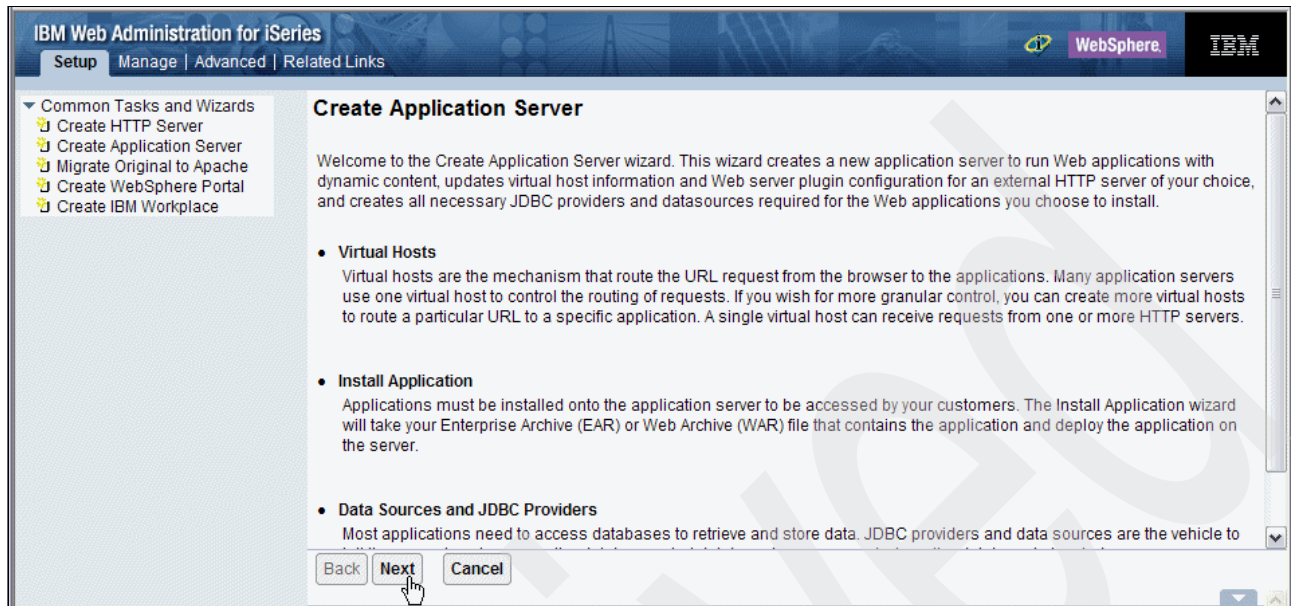


Figure 7-23 Create Application Server wizard

6. The next pane displays a list of application server versions that are available on your iSeries server (Figure 7-24). Select **V5.0 Base** from the list and click **Next**.

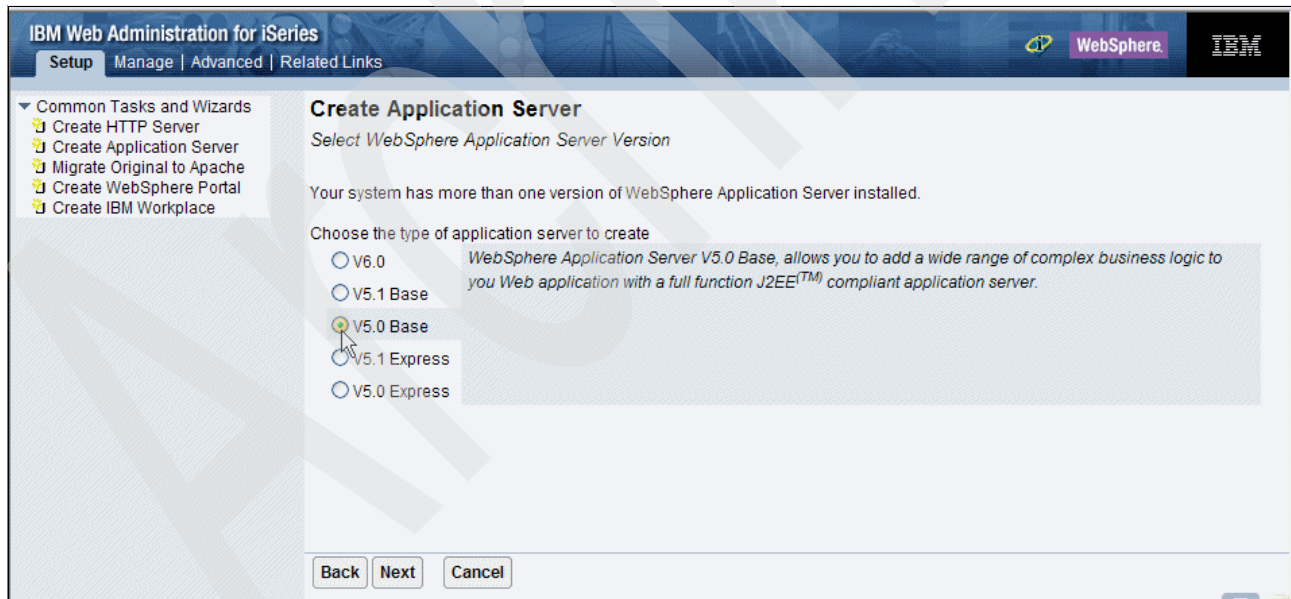


Figure 7-24 Selecting WebSphere Application Server V5.0 Base

7. In the Application Server Name field, enter a name for the new application server (Figure 7-25). For our example, we use `iSeriesWebAccess`. Take note of this value because it is required later. Click **Next**.

IBM Web Administration for iSeries

Setup | Manage | Advanced | Related Links

WebSphere IBM

Common Tasks and Wizards

- Create HTTP Server
- Create Application Server
- Migrate Original to Apache
- Create WebSphere Portal
- Create IBM Workplace

Create WebSphere Application Server, V5.0 (base)

Specify Application Server Name

Specify a unique name for the application server. ?

Application server name:

Server description:

Back Next Cancel

Figure 7-25 Entering a name for the new Application Server

8. In the Select HTTP Server Type pane (Figure 7-26), select **Create a new HTTP Server (powered by Apache)** and click **Next**.

IBM Web Administration for iSeries

Setup | Manage | Advanced | Related Links

WebSphere IBM

Common Tasks and Wizards

- Create HTTP Server
- Create Application Server
- Migrate Original to Apache
- Create WebSphere Portal
- Create IBM Workplace

Create WebSphere Application Server, V5.0 (base)

Select HTTP Server Type

The application server requires an association with a HTTP server. This HTTP server will route the incoming URL requests to this application server.

Choose the HTTP server type: ?

☒ Create a new HTTP server (powered by Apache)

☐ Select an existing HTTP server (powered by Apache)

Back Next Cancel

Figure 7-26 Selecting to create a new HTTP server

9. In the HTTP server Name field, enter a name for the new HTTP Server (Figure 7-27). For our example, we use IWAHTTP. Take note of this value because it is required later. Leave the default values in the other fields in this pane. Click **Next**.

IBM Web Administration for iSeries

Setup | Manage | Advanced | Related Links

Common Tasks and Wizards

- Create HTTP Server
- Create Application Server
- Migrate Original to Apache
- Create WebSphere Portal
- Create IBM Workplace

Create WebSphere Application Server, V5.0 (base)

Create a new HTTP server (powered by Apache)

A new HTTP server (powered by Apache) will be created and configured to be used by this application server. ?

HTTP server name:

HTTP server description:

Your HTTP server may listen for requests on a specific IP address or on all IP addresses of the system.

On which IP address and TCP port would you like your HTTP server to listen?

IP address:

Port:

Back Next Cancel

Figure 7-27 Entering a name for the new HTTP server

10. In the next pane, the wizard prompts for a port range to use with the new Application server. Retain the default value and click **Next**.
11. The wizard then prompts for sample applications to install (Figure 7-28). Deselect all the check boxes that are enabled and click **Next**.

IBM Web Administration for iSeries

Setup | Manage | Advanced | Related Links

Common Tasks and Wizards

- Create HTTP Server
- Create Application Server
- Migrate Original to Apache
- Create WebSphere Portal
- Create IBM Workplace

Select Business and Sample Applications

You may optionally install business and sample applications for this application server. Choose the applications that you want installed and the wizard will deploy them for you.

Select which business applications to install:

Note: Installing an IBM business application automatically installs the IBM Welcome Page application.

- ☐ IBM Telephone Directory - An online phone book, providing powerful search capabilities with an easy to use interface.
- ☐ IBM Survey Creator - An online survey tool used to create, configure, and manage Web-based surveys.

Select which sample applications to install:

- ☒ Default Applications - A set of samples, including SnoopServlet, that may be used to verify your application server is working.
- ☒ IVTApp - An application that may be accessed by the install verification test (IVT) program to verify your server installation.
- ☐ DB2 Web Services - A set of samples that demonstrate using the Web Services Object Runtime Framework to deploy web services.

Back Next Cancel

Figure 7-28 Selecting sample applications to deploy to the new Application Server

12. In the next pane, the wizard prompts you to configure Identity Tokens. Select **Do not Configure Identity Tokens**. EIM cannot be used with the iSeries Access for Web servlets when they are used inside the iFrame portlets. Click **Next** to continue.

13. A summary page (Figure 7-29) is displayed. Click **Finish** to create the new Application Server.

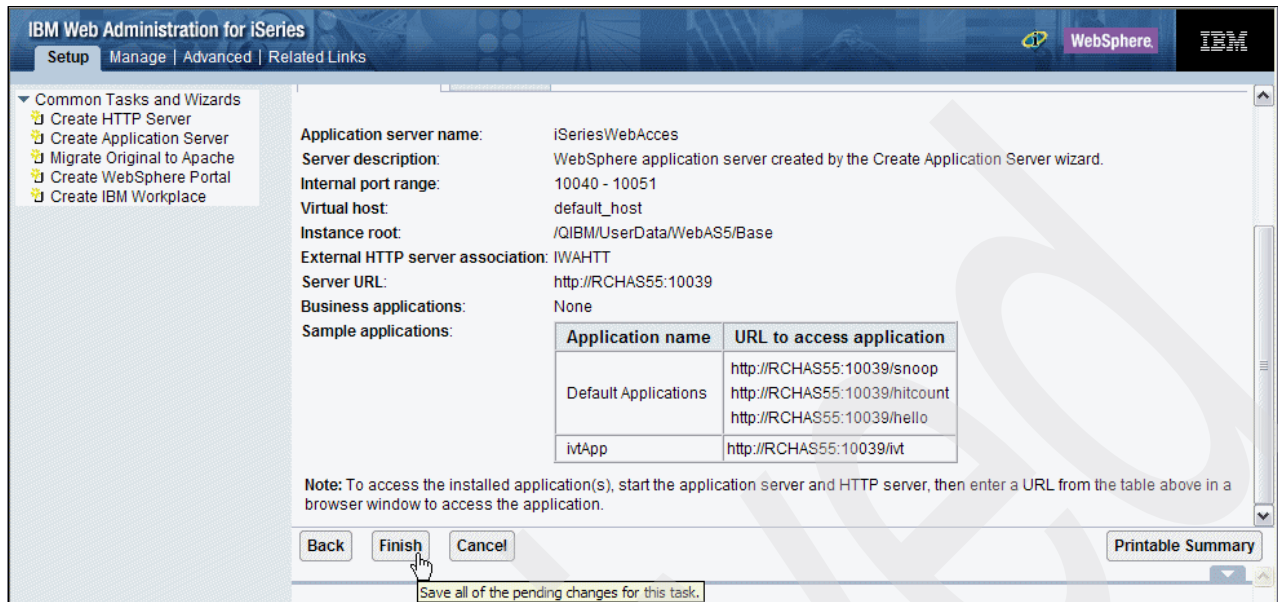


Figure 7-29 Summary page

14. The wizard creates the new Application server. After the server is created, click the **start** button to start the server (Figure 7-30).

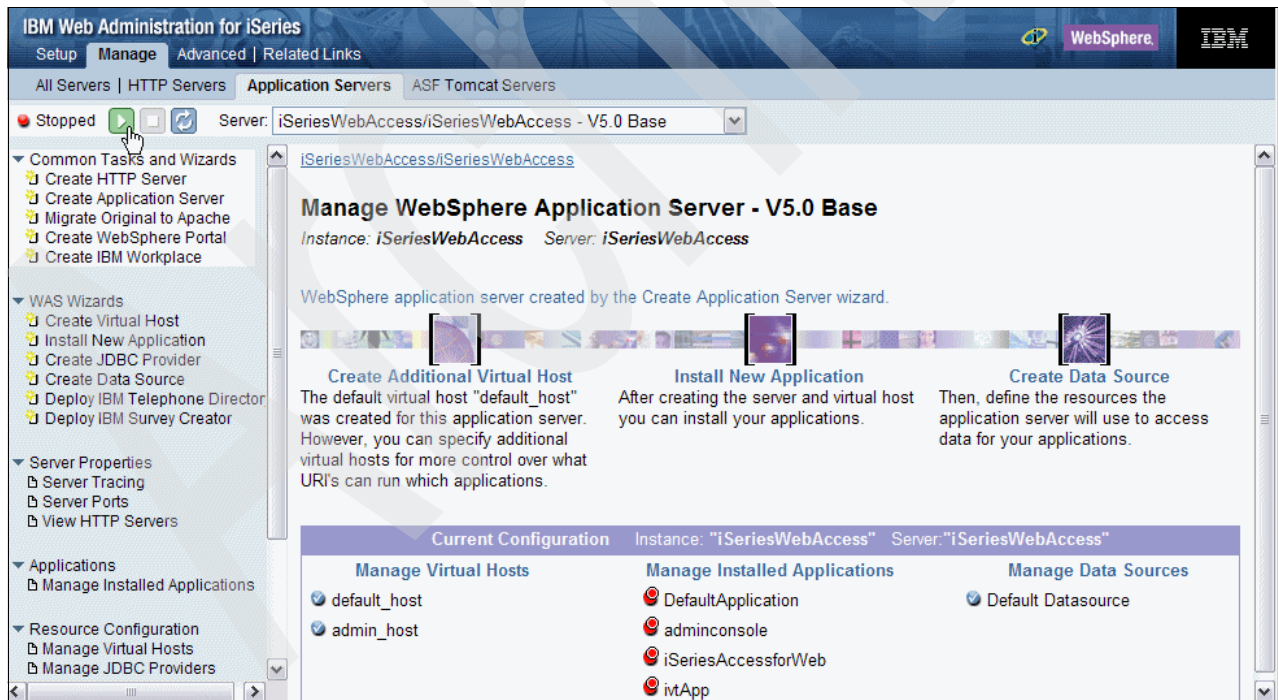


Figure 7-30 Starting the new application server

15. Open a 5250 emulation session and log on to your iSeries server.

16. Enter the following CL command to configure the iSeries Access for Web servlets on the newly created Application server:

```
QIWA2/CFGACCWEB2 APPSVRTYPE(*WAS50) WASINST(iSeriesWebAccess) APPSVR(iSeriesWebAccess)  
NODENAME(iSeriesServer_iSeriesWebAccess)
```

Here *iSeriesWebAccess* is the name of your new application server, and *iSeriesServer* is the short name of your iSeries server host name. For our example, we use this command:

```
QIWA2/CFGACCWEB2 APPSVRTYPE(*WAS50) WASINST(iSeriesWebAccess) APPSVR(iSeriesWebAccess)  
NODENAME(RCHAS55_iSeriesWebAccess)
```

17. The CFGACCWEB2 command runs and displays some output. After it finishes, return to the IBM Web Administration for iSeries page in your Web browser.
18. Click the **stop** button to shut down the newly created application server.
19. Click the **start** button to restart the newly created application server.

7.3 Installing the iSeries Access for Web portlets

Important: If you selected the iSeries Access for Web portlets option when configuring your Workplace Services Express server (see Figure 4-20 on page 89), the portlets are already installed in your Workplace Services Express server and you can skip this section.

If you did not select the iSeries Access for Web portlets when configuring your Workplace Services Express server, you can install the portlets on an existing Workplace Services Express server by performing the following steps:

1. Make sure that your Workplace Services Express server is running. You can do this through the IBM Web Administration for iSeries interface. See 5.3 “Verifying a Workplace Services Express server is active” on page 112, for details.
2. Open a 5250 emulation session and log on to your iSeries server.
3. Enter the STRQSH CL command to start the Qshell environment.
4. Change directory to the iSeries Access for Web install directory by entering the following command:

```
cd /QIBM/ProdData/Access/Web2/install
```

5. Run the **cfgaccweb2** command as follows to configure iSeries Access for Web to work with your Workplace Services Express server:

```
cfgaccweb2 -appsvrtype *WSE -wasinst INSTANCE -wpusrid WPSADMIN -wppwd WPPASSWORD -wpurl  
server:port/lwp/config -wppag *YES
```

You must substitute the following parameters in the **cfgaccweb2** command with your environment's respective information:

- *INSTANCE*: The name of the Workplace Services Express server for which you are configuring iSeries Access for Web
- *WPSADMIN*: The Workplace Services Express administrative user ID which you specified when configuring your Workplace Services Express server
- *WPPASSWORD*: The password which you assigned to the Workplace Services Express administrative user
- *server*: The fully qualified host name of the HTTP server which you assigned to your Workplace Services Express server

- *port*: The port on which the HTTP server assigned to this Workplace Services Express instance is running

This is typically port 80, unless you specified a nonstandard port when configuring your Workplace Services Express server.

For our example, we entered the following command:

```
cfgaccweb2 -appsvrtype *WSE -wasinst ITSOWSE1 -wpusrid wpsadmin -wppwd password -wpurl  
itsowse1.rchland.ibm.com/lwp/config -wppag *YES
```

6. The **cfgaccweb2** command runs and several messages are displayed (Figure 7-31). After the **cfgaccweb2** command completes, iSeries Access for Web is configured on your Workplace Services Express server.

```
QSH Command Entry

Configuring iSeries Access for Web

Preparing to perform the configuration changes.

Calling Portal Server to perform the configuration changes.

Refer to the following log file for additional success/failure information:
/QIBM/UserData/Access/Web2/wse/itsowse1/logs/cfgwseiwa.log

Refer to the following log file for additional success/failure information:
/QIBM/UserData/Access/Web2/wse/itsowse1/logs/cfgwseiwapage.log

iSeries Access for Web command has completed.

===>

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

Figure 7-31 Output of the **cfgaccweb2** command

7.4 Configuring the iSeries Access for Web portlets

After the iSeries Access portlets are installed, you see a new My iSeries tab in your Workplace Services Express server. See Figure 7-32.

Depending on the method of authentication which you choose to use with the iSeries Access for Web portlets, you might have to perform some configuration before using the portlets. If you configured EIM, as explained in 7.1, “Configuring EIM for use with the iSeries Access portlets” on page 209, no further configuration is needed. You can start using the portlets to access information on your iSeries server. If you did not configure EIM, you must set some authentication information in the portlet’s configuration mode.

There are three methods of providing authentication information to the iSeries Access for Web portlets if you are not using EIM:

- ▶ Using a credential specific to a particular portlet window
See 7.4.1, “Authenticating using credentials specific to a portlet window” on page 230.
- ▶ Using a credential set with the iSeries credentials portlet
See 7.4.2, “Authenticating by using credentials set in the iSeries credentials portlet” on page 232.
- ▶ Using a shared credential set by the Workplace Services Express administrator
See 7.4.3, “Authenticating using shared credentials” on page 233.

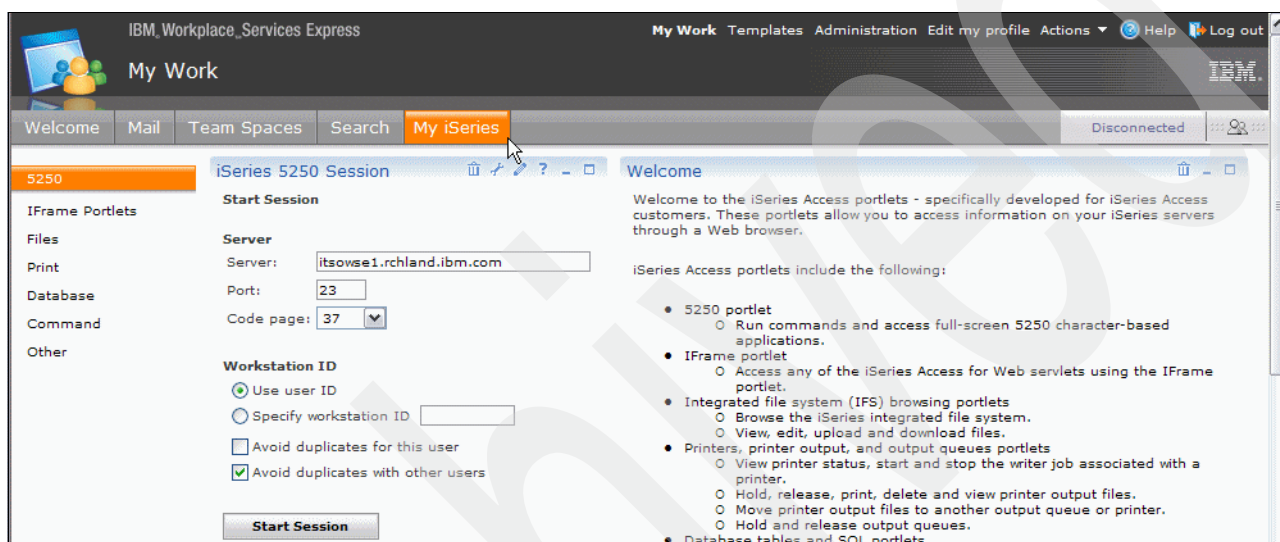


Figure 7-32 My iSeries tab added to Workplace Services Express server

7.4.1 Authenticating using credentials specific to a portlet window

This method of authentication allows a user to authenticate to i5/OS by entering their own credentials. It does not allow any other users to use these credentials, nor does it allow the user who enters them to reuse them in other portlets without re-entering them.

To use portlet window-specific credentials to authenticate to i5/OS, perform the following steps:

1. Log in to the Workplace Services Express server and click the **My iSeries** tab.
2. Select the sub-category tab which you want to use. In this example, we click **Files**.
3. Select the portlet for which you want to set the authentication information and click the **edit mode** icon (Figure 7-33).



Figure 7-33 Selecting the edit mode icon

4. The portlet is displayed in edit mode (Figure 7-34). Under Authentication, complete these steps:
 - a. Select **Use credential specific to this portlet window**.
 - b. In the User field, type the name of the i5/OS user profile for which you want to authenticate to your iSeries server.
 - c. In the Password field and in the Confirm password field, type the password of the i5/OS user profile for which you want to authenticate to your iSeries server.
 - d. Click **OK**.

Figure 7-34 Setting portlet window specific credentials

The portlet returns to view mode and should authenticate to your iSeries server successfully (Figure 7-35).

| Name | Size (bytes) | Type | Modified |
|-------------------------------|--------------|-----------|----------------------|
| best | | Directory | 4/25/05 5:49:14 PM |
| bin | | Directory | 10/19/04 11:31:33 PM |
| CALAB | | Directory | 11/21/04 3:38:01 PM |
| dev | | Directory | 10/19/04 11:31:32 PM |
| domino | | Directory | 12/7/04 8:25:45 AM |
| etc | | Directory | 7/27/05 6:22:14 PM |
| home | | Directory | 10/20/05 7:52:11 PM |
| IBM | | Directory | 4/13/05 8:33:49 PM |
| InstallShield | | Directory | 3/28/05 9:44:47 AM |
| IS5702LAB | | Directory | 5/5/05 10:27:17 AM |

Figure 7-35 iSeries File List portlet authenticating to an iSeries server

5. Repeat these steps for each of the iSeries Access for Web portlets that you want to use.

7.4.2 Authenticating by using credentials set in the iSeries credentials portlet

By storing credentials in the iSeries credentials portlet, you can reuse them in all the iSeries Access for Web portlets without re-entering the i5/OS user profile name and password for each portlet. To store credentials in the iSeries credentials portlet, follow these steps:

1. Log in to Workplace Services Express server and click the **My iSeries** tab.
2. Select the **Other** subcategory.
3. In the iSeries Credentials portlet, click **New Credential** (Figure 7-36).

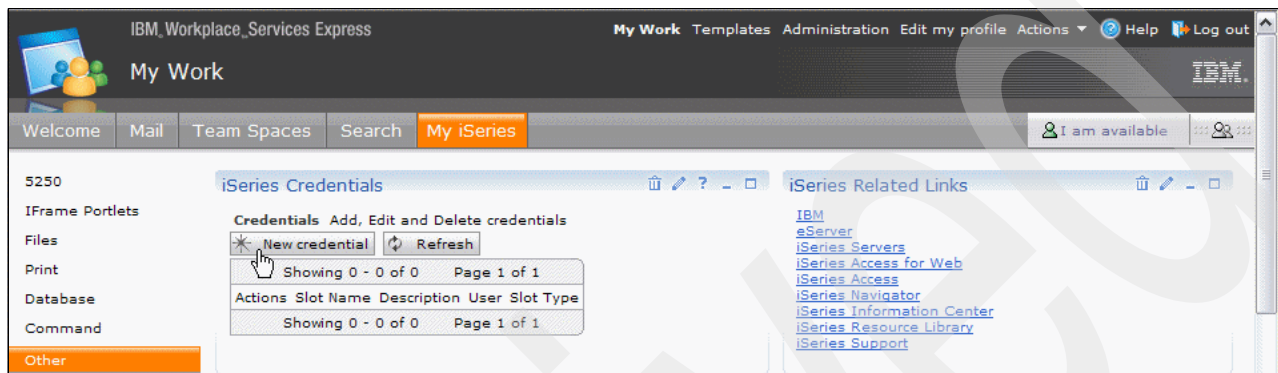


Figure 7-36 Storing a new credential using the iSeries Credentials portlet

4. In the next pane, complete these steps:
 - a. In the Slot Name field, type a name for the new credential. It is convenient to set this to the name of the i5/OS user profile for which you are storing credentials.
 - b. In the Description field, type a description of the new credential.
 - c. In the User field, type the i5/OS user profile name.
 - d. In the Password and Confirm Password fields, type the password for the i5/OS user profile.
 - e. Click **OK**.

The new credential should be displayed in the iSeries Credentials portlet (Figure 7-37).

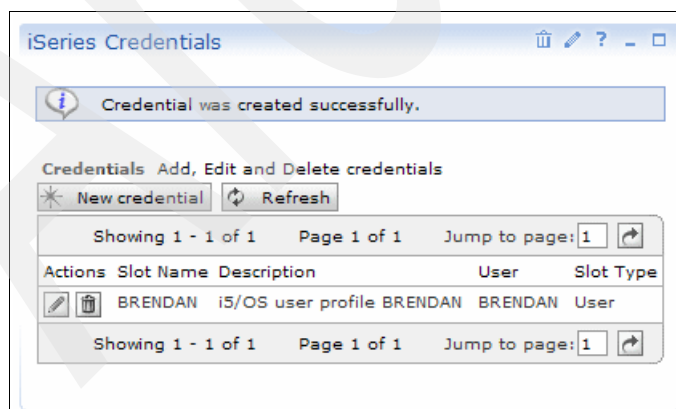
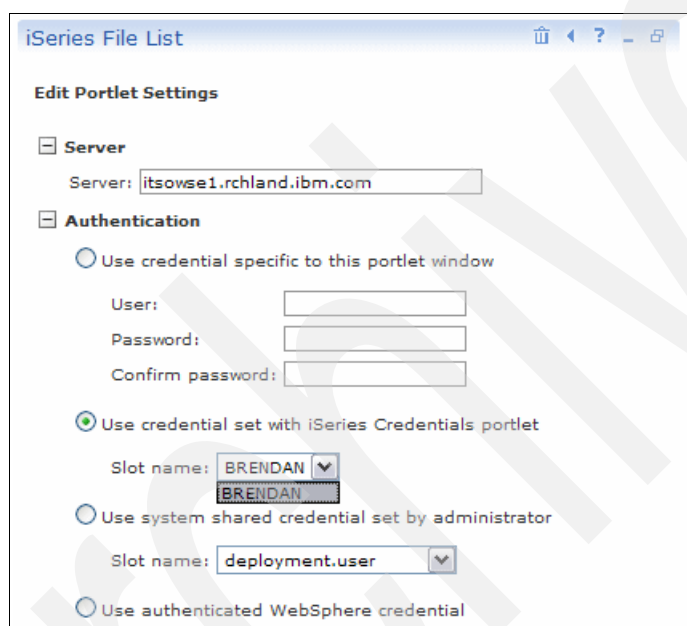


Figure 7-37 iSeries Credentials portlet

To use the newly stored credentials to authenticate to i5/OS in an iSeries Access for Web portlet, perform the following steps:

1. Log in to Workplace Services Express server and click the **My iSeries** tab.
2. Select the subcategory that you want to use. In this example, we click **Files**.
3. Select the portlet which you want to set the authentication information for and click the **edit mode** icon (Figure 7-33 on page 230).
4. The portlet is displayed in edit mode (Figure 7-38). Under the Authentication section, complete these steps:
 - a. Select **Use credential set with iSeries Credentials portlet**.
 - b. From the Slot name dropdown list, select the name of the user profile for which you want to authenticate to your iSeries server.
 - c. Click **OK**.



iSeries File List

Edit Portlet Settings

☒ **Server**

Server:

☒ **Authentication**

☐ Use credential specific to this portlet window

User:

Password:

Confirm password:

☒ Use credential set with iSeries Credentials portlet

Slot name:

☐ Use system shared credential set by administrator

Slot name:

☐ Use authenticated WebSphere credential

Figure 7-38 Selecting credentials set with the iSeries Credentials portlet

The portlet is returned to view mode and should authenticate to your iSeries server successfully (Figure 7-35 on page 231).

5. Repeat these steps for each of the iSeries Access for Web portlets which you want to use.

7.4.3 Authenticating using shared credentials

If you want all users of the iSeries Access for Web portlets to authenticate to i5/OS using the same user profile, setting up shared credentials is the best approach. This is a two-step process. First you must add the shared credentials to a new slot in the credential vault. Then you must select those credentials in each of the iSeries Access for Web portlets.

Perform the following steps to add shared credentials to a new slot in the credential vault:

1. Log in to Workplace Services Express server as the administrator user.
2. Click the **Administration** link in the top right side of the main page (Figure 7-39).

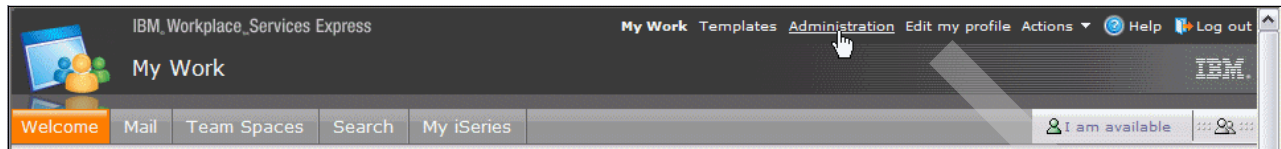


Figure 7-39 Selecting the Administration page in Workplace Services Express

3. Click the **Access** tab on the Administration page.
4. Click **Credential Vault** in the left pane.
5. In the Credential Vault portlet, click **Add a vault slot** (Figure 7-40).

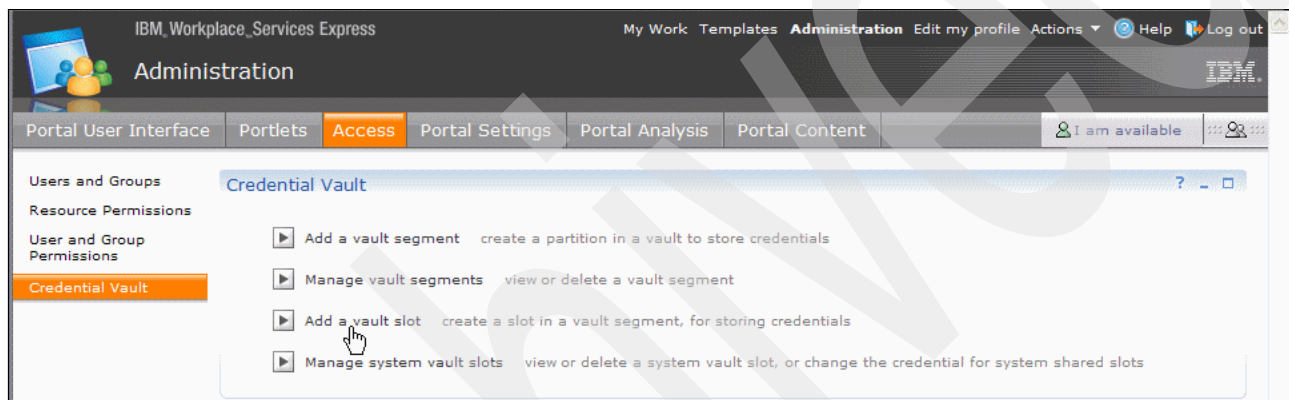


Figure 7-40 Adding a new slot to the credential vault

6. In the next pane (Figure 7-41), complete these steps:
 - a. In the Name field, type a name for the new shared credential slot. This is not required to match the name of the i5/OS user profile for which you are storing the credentials, but giving it the same name makes it easier to recognize.
 - b. Make sure the **Vault slot is shared** check box is selected.
 - c. In the Shared userid field, type the i5/OS user profile name.
 - d. In the Shared password field and in the Confirm password field, type the i5/OS user profile password.
 - e. Click **OK** to save the credentials to the credential vault.

The screenshot shows the 'Access' pane with the 'Credential Vault' sub-pane active. The left sidebar lists 'Users and Groups', 'Resource Permissions', 'User and Group Permissions', and 'Credential Vault' (which is highlighted). The main area is titled 'Credential Vault' and contains the following fields and controls:

- Select Vault:** A dropdown menu set to 'Default'.
- Create a vault slot:**
 - Name:** A text field containing 'BRENDAN'.
 - Vault segment:** A dropdown menu set to 'DefaultAdminSegment'.
 - Vault resource associated with vault slot:** Two radio buttons. 'existing:' is selected with a dropdown set to 'deployment.keystore'. 'new:' is unselected with an empty text field.
 - Vault slot is shared:** A checked checkbox.
 - Shared userid:** A text field containing 'BRENDAN'.
 - Shared password:** A masked text field with '*****'.
 - Confirm password:** A masked text field with '*****'.
 - Description:** A text field containing 'i5/OS user profile BRENDAN'.
 - Set locale-specific descriptions:** A button with a right-pointing arrow.
- Buttons:** 'OK' and 'Cancel' buttons at the bottom left.

Figure 7-41 Entering details of the new credential vault slot

To use the newly stored credentials to authenticate to i5/OS from an iSeries Access for Web portlet, perform the following steps:

1. Log in to the Workplace Services Express server and click the **My iSeries** tab.
2. Select the subcategory which you want to use. In this example, we click **Files**.
3. Select the portlet for which you want to set the authentication information and click the **edit mode** icon (Figure 7-33 on page 230).
4. The portlet is displayed in edit mode (Figure 7-42). In the Authentication section, complete these steps:
 - a. Select **Use system shared credentials set by administrator**.
 - b. In the Slot name drop-down list, select the name of the new credential vault slot.
 - c. Click **OK**.

iSeries File List

Edit Portlet Settings

☒ **Server**

Server: itsowse1.rchland.ibm.com

☒ **Authentication**

☐ Use credential specific to this portlet window

User: BRENDAN

Password:

Confirm password:

☐ Use credential set with iSeries Credentials portlet

☒ Use system shared credential set by administrator

Slot name: BRENDAN

☐ Use authentication

deployment.keystore

deployment.truststore

Figure 7-42 Selecting system shared credentials

The portlet is returned to view mode and should authenticate to your iSeries server successfully (Figure 7-35 on page 231).

5. Repeat these steps for each of the iSeries Access for Web portlets which you want to use.

Enabling SSO between Workplace Services Express and Domino

Single sign-on (SSO) is the process that allows users of one Web application to move to another application, either on the same system or on a different one, without clicking Run All to perform the create index *scriptauthenticate* with the second application. In our environment, this means that, when users log into Workplace Services Express and want to access their Domino mail file or other Domino-based information, they do not have to enter their user name and password again. The system authenticates the user automatically.

This chapter describes the concept of SSO. It explains the necessary steps to enable it between Workplace Services Express and Domino, using the Domino server to provide the directory information and mail capabilities.

First we introduce the concept of SSO, its importance, and possible ways to implement it. Then we discuss how to enable SSO so that users who are signed into Workplace Services Express do not have to enter their password to access, for example, their Domino mail file.

Note: This chapter covers only SSO between Workplace Services Express and Domino using the native capabilities of those products to provide it. It does not cover other solutions such as Tivoli Access Manager.

8.1 How SSO works

The process of SSO between Workplace Services Express and Domino is achieved using Lightweight Third Party Authentication (LTPA). The WebSphere Application Server that runs beneath Workplace Services Express, the Domino servers, and other Web servers in the SSO domain all share the same LTPA key.

The authentication process works in the following way:

1. From a Web browser, the user enters the user name and password required to authenticate to Workplace Services Express. This validation is done by the underlying WebSphere Application Server.
2. The WebSphere Application Server validates this information against a Lightweight Directory Access Protocol (LDAP) directory.
3. After confirmation of the given information, the WebSphere Application Server generates an LTPA token. This token is sent to the user's Web browser as a session cookie.
4. When making a request to either the Workplace Services Express server or a Domino server, the Web browser sends this cookie. Because both the Domino server and Workplace Services Express server share the same LTPA keys, they both can decode the information that is stored in the cookie. Therefore, they can also guarantee that the user's identity has been validated and can accept the user.

The LTPA cookie contains the domain for SSO and encrypted user information that gets decoded with the shared keys available in all of the SSO participating servers.

To enable SSO between Workplace Services Express and Domino, there are a few steps that users must take to make sure that both servers can communicate and provide the necessary information. SSO is accomplished by passing LTPA cookies that contain information used to authenticate the users. Because these keys are encrypted, all servers in the domain in which SSO is being configured must share the same key in order to successfully decrypt the information contained in the cookie.

Figure 8-1 outlines the path to enable SSO between Workplace Services Express and Domino.

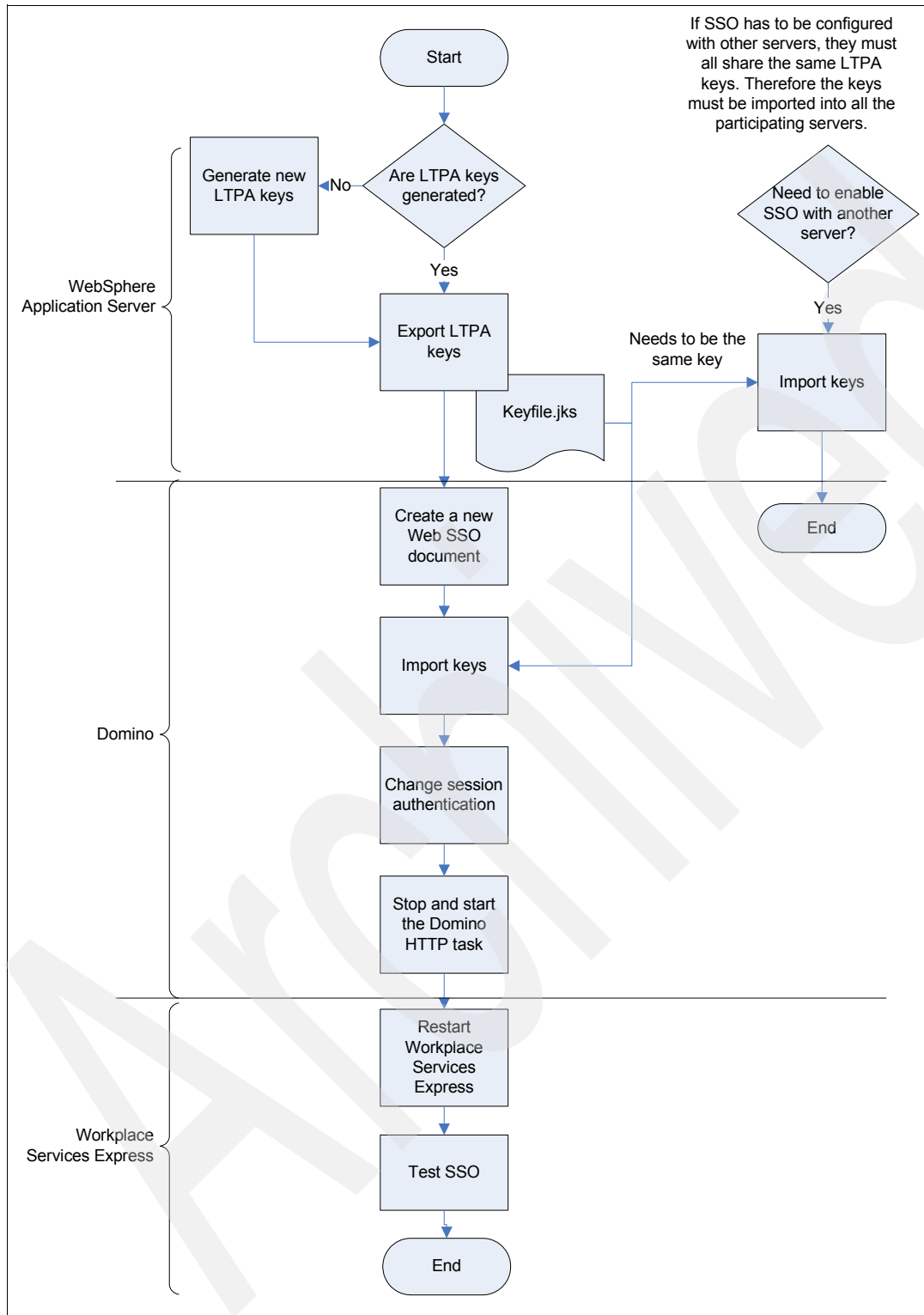


Figure 8-1 Steps to enabling SSO between Workplace Services Express and Domino

8.2 Enabling SSO in WebSphere Application Server

The process of enabling SSO involves having the same set of LTPA keys in both WebSphere Application Server and the Domino server. When the Workplace Services Express server was configured, step 10 of the iSeries Create Workplace wizard asks about SSO configuration. To enable SSO between Workplace Services Express and Domino, you might have selected the option to include other Web servers in your SSO environment. If you selected this option, you were then able to select the SSO domain and set the LTPA password. See Figure 4-31 on page 100 for details.

The following steps show you how to create new LTPA keys, if they are not already generated. They also explain how to export those keys from WebSphere Application Server and import them into the Domino server.

To enable SSO, you must first share the same LTPA keys between all servers. If you specified a domain for SSO and the LTPA password, the keys are already generated. Therefore, you must next export the key. Perform the following steps:

1. Log into the WebSphere Application Server Administrative Console. You can do this from the IBM Web Administration for iSeries window. Select your Workplace Services Express server from the Manage Application Servers tab. Then click **Launch Administrative Console** as shown in Figure 8-2.



Figure 8-2 Launching the WebSphere Application Server Administrative Console

2. If the security alert window (Figure 8-3) opens, click **Yes**.



Figure 8-3 Security Alert window

3. Log in to the WebSphere Application Server Administrative Console (Figure 8-4) with the Workplace Services Express administrative user ID and password. Click **OK**.

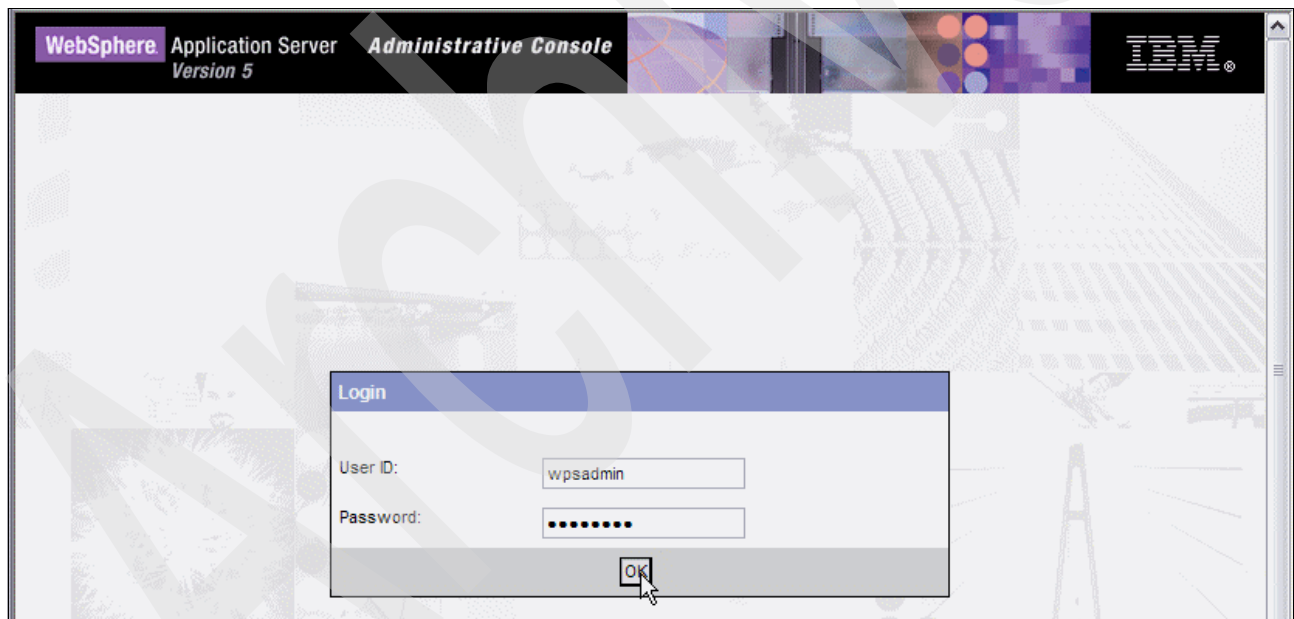


Figure 8-4 Logging in to the WebSphere Application Server Administrative Console

- On the WebSphere Application Server Administrative Console, select **Security** → **Authentication Mechanisms** → **LTPA**, as shown in Figure 8-5.

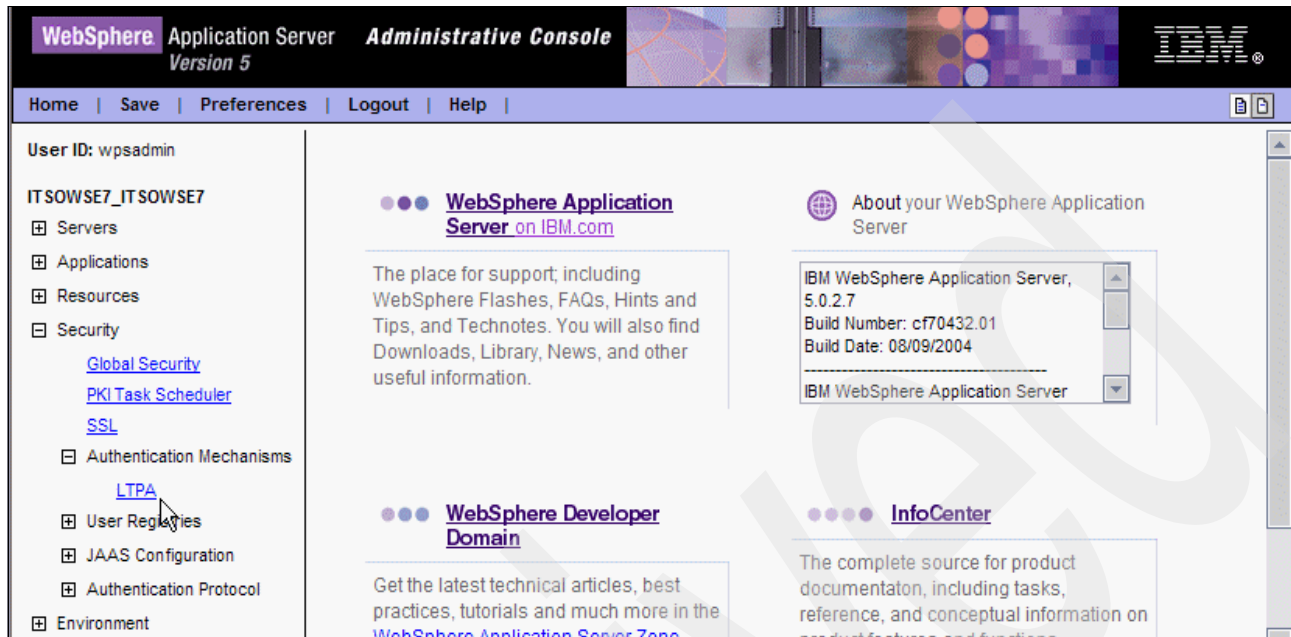


Figure 8-5 Accessing the LTPA section of the WebSphere Application Server Administrative Console

- Ensure that SSO is enabled and the correct domain is selected in the SSO properties. Navigate to the bottom of the LTPA pane. Under the Additional Properties section, click **Single Signon (SSO)** as shown in Figure 8-6.

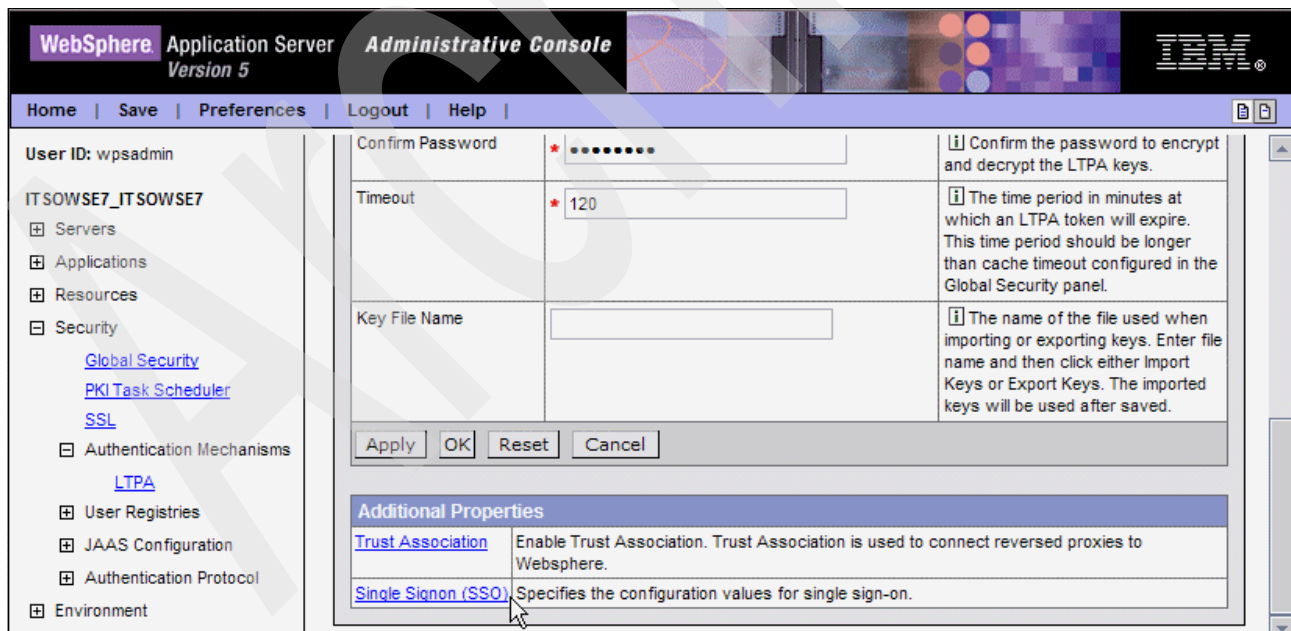


Figure 8-6 Accessing the Single Signon (SSO) properties pane

6. In the SSO configuration pane, you must first ensure that the **Enabled** check box is selected. Then check the domain name. If you configure SSO correctly on the iSeries Create Workplace wizard, that field has the domain that was set up in the wizard. In our example, the domain is RCHLAND.IBM.COM. See Figure 8-7.

Tip: The domain name must include all servers that will be used for SSO.

If the fields are correct, you can click **Cancel** to go back to the LTPA pane. If any you made any changes, you must save the changes into the master configuration and generate new LTPA keys. Then you can go back to the LTPA properties pane.

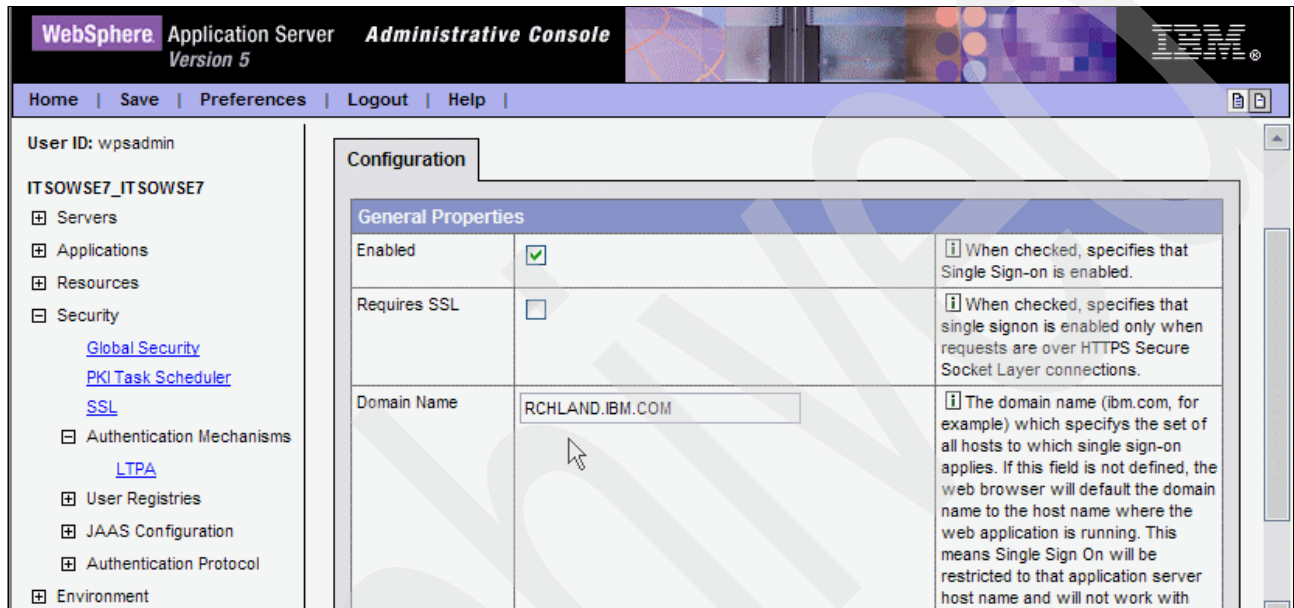


Figure 8-7 Verifying the SSO domain

7. To generate new LTPA keys, after you save the changes made in the previous pane, go back to the LTPA window (Figure 8-8). In the password field, type a password and confirm it. Then, click the **Generate Keys** button. After generating new keys, you must save the changes into the master configuration.

Important: You must only generate new keys if you did not specify a domain and LTPA password in the iSeries Create Workplace wizard. If you specified a domain and password, you can skip this step and proceed to exporting the keys.

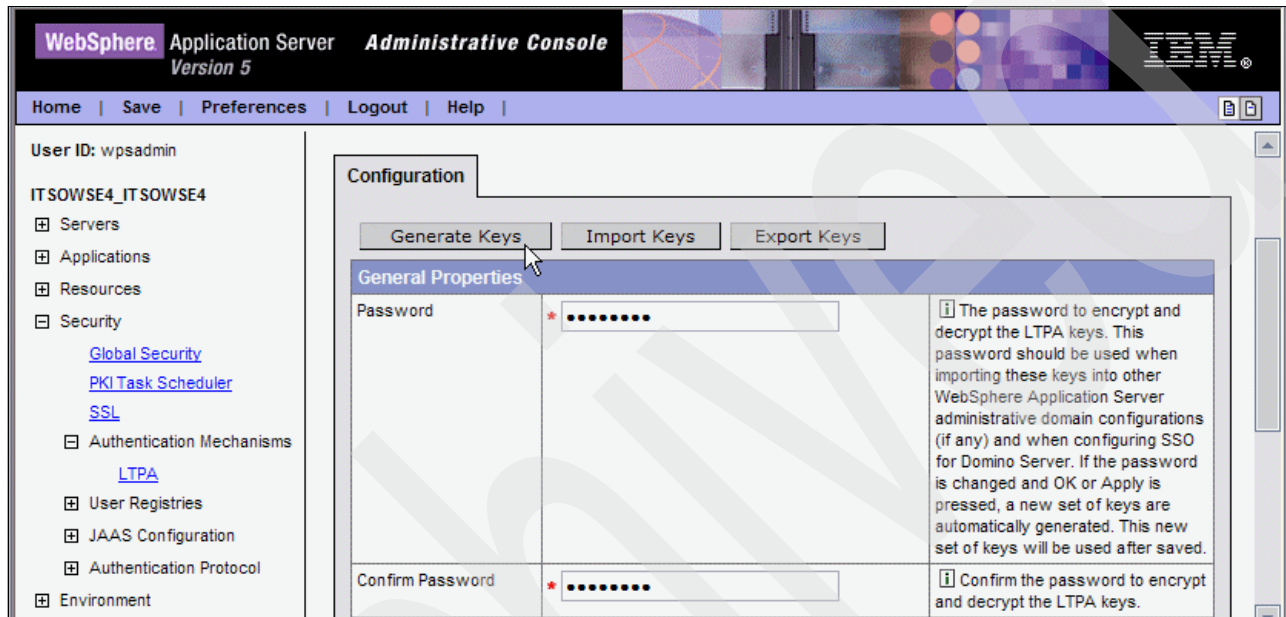


Figure 8-8 Generating new LTPA keys

8. Export the LTPA keys (see Figure 8-9). The password field contains the password specified on the configuration wizard. In the Key File Name field, type a name. This includes the path and file name in which the keys will be saved in integrated file system of the iSeries server. For our example, we entered the Key File Name of /keyfile.jks.

Click **Export Keys**. For our example, this generates a file called keyfile.jks in the root directory of the iSeries server.

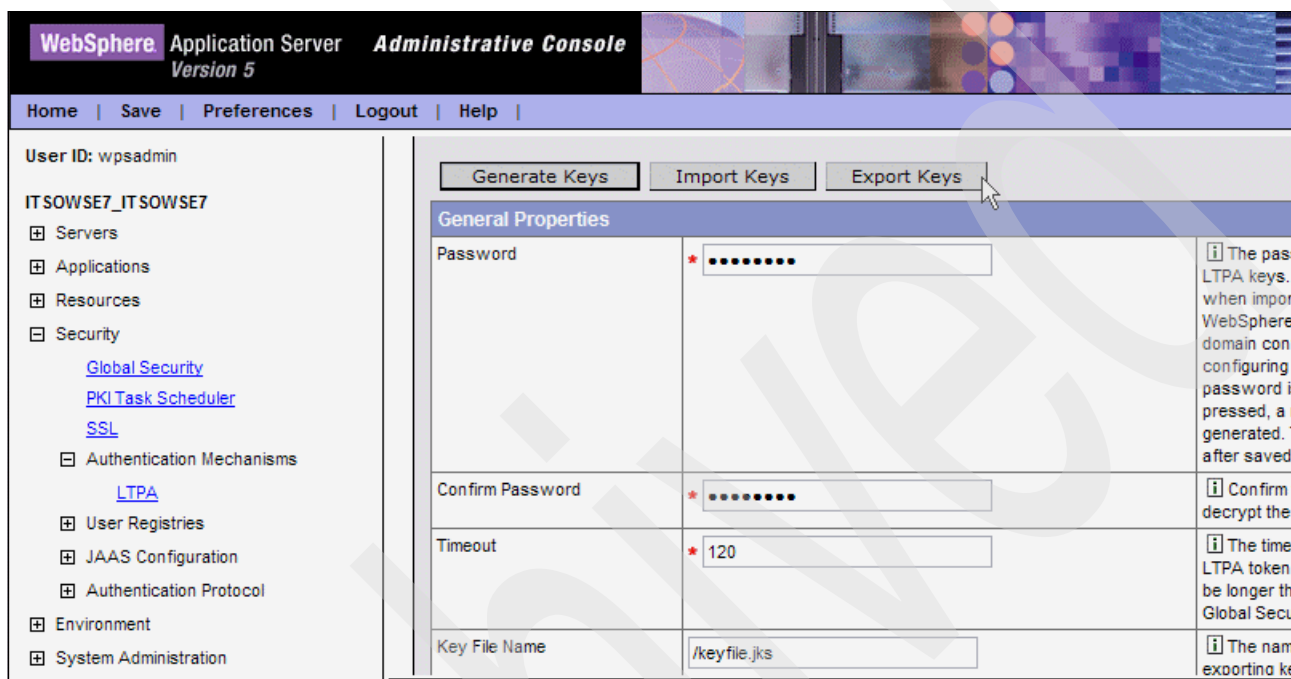


Figure 8-9 Exporting the LTPA keys

9. After exporting the LTPA keys, save the changes. The local configuration changes are saved after exporting the keys. However, you must apply the changes to the master configuration. Click the **Save** link as shown in Figure 8-10.



Figure 8-10 Saving the changes

10. In the Save pane (Figure 8-11), in the Save to Master Configuration frame, click the **Save** button.

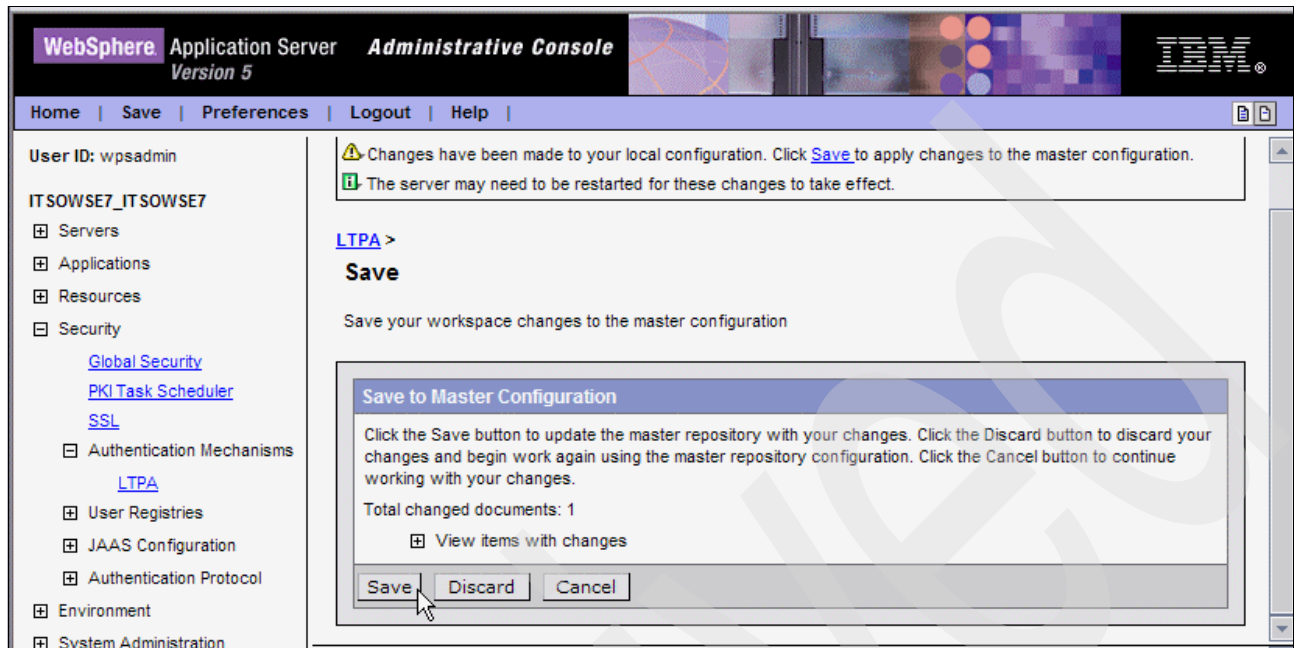


Figure 8-11 Saving the master configuration

11. Click the **Logout** button at the top of the pane to log out of the WebSphere Application Server Administrative Console.

A file called `keyfile.jks` that contains the LTPA keys is now saved in the root directory of the iSeries server. This file must be accessible from the Domino Administrator client. To do this, map a drive to the iSeries server or copy the file to an accessible location from the Domino Administrator client. In our example, we mapped a drive to the root directory of the iSeries server.

Now you are ready to import the LTPA keys into your Domino server configuration as explained in the next section.

8.3 Enabling the Domino server for SSO

After exporting the LTPA keys from the WebSphere Application Server, you must import them into Domino and make the appropriate configuration changes as explained in these steps:

1. Open the Domino Administrator client and click the **Configuration** tab.
2. In the left pane, select **Web** → **Web Server Configurations** and in the right pane, select your Domino server configuration document as shown in Figure 8-12.

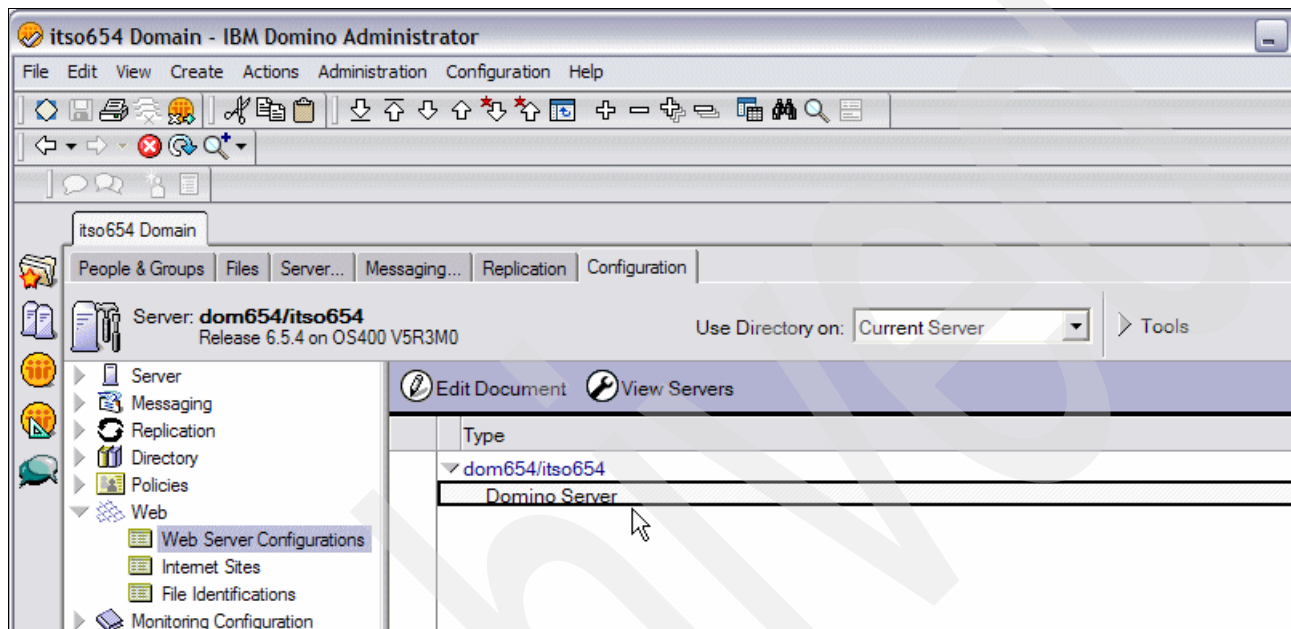


Figure 8-12 Accessing the Web Server Configuration document on the Domino server

3. From the Domino server configuration document, create a new Web SSO configuration document. Click **Create Web** and select **SSO Configuration** as shown in Figure 8-13.

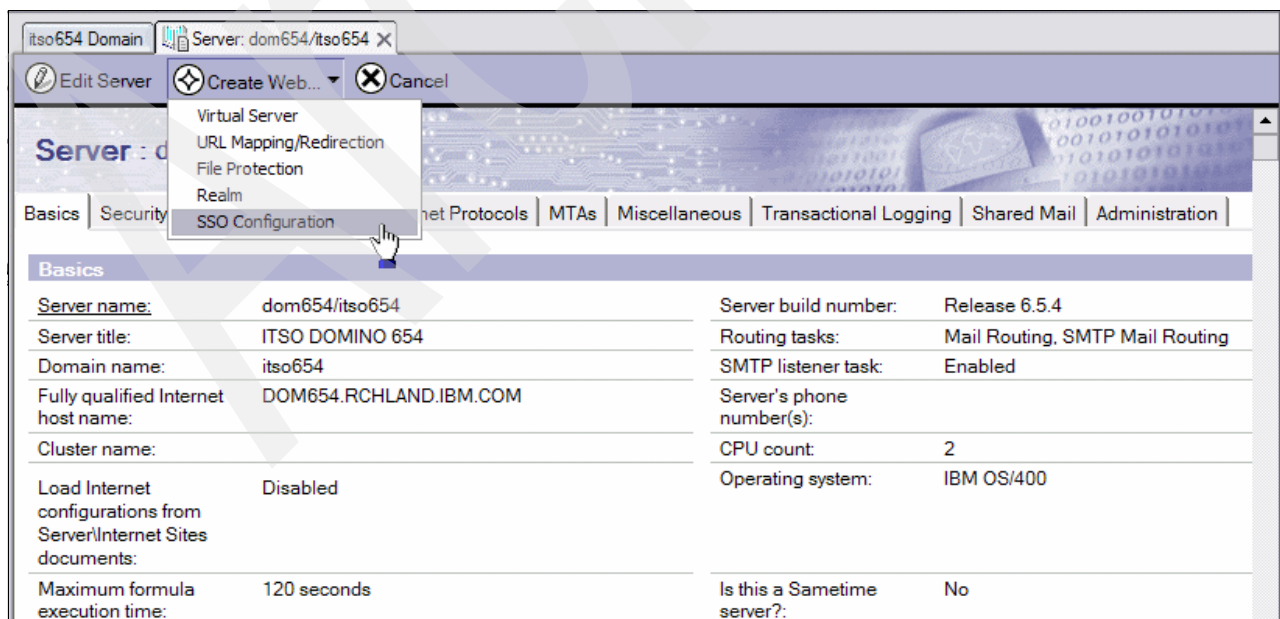


Figure 8-13 Creating a new Web SSO Configuration document

4. In the Web SSO Configuration document, import the LTPA keys. Click the **Keys** button and select **Import WebSphere LTPA Keys**. See Figure 8-14.

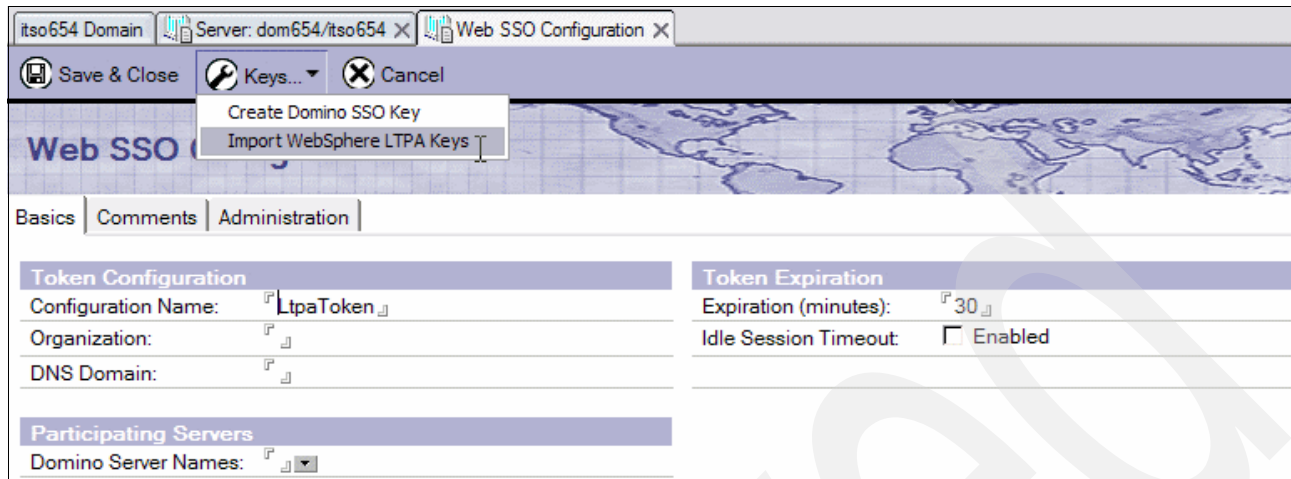


Figure 8-14 Importing WebSphere LTPA keys

5. In the Enter Import File Name window (Figure 8-15), enter the path and file name of the LTPA key file. In our example, the path is a mapped drive to the iSeries server. Click **OK**.

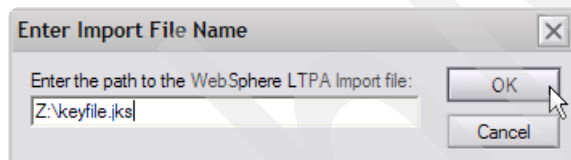


Figure 8-15 Entering the path and file name of the WebSphere LTPA keys

6. You are prompted to enter the password of the LTPA keys as shown in Figure 8-16. Enter the password and click **OK**.

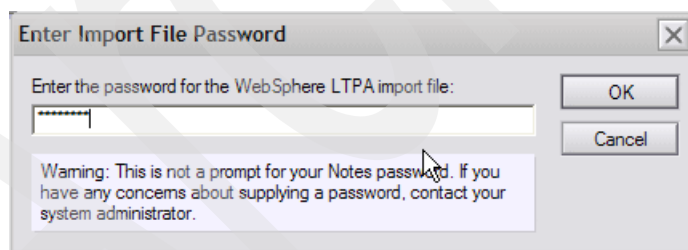


Figure 8-16 Entering the password for the LTPA keys

7. If the key file was found and the password is correct, you see a message indicating that the keys were successfully imported (Figure 8-17).

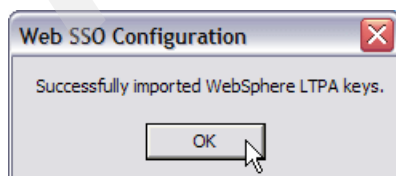


Figure 8-17 Success message after importing WebSphere LTPA keys into Domino

8. Update the Web SSO Configuration document with the information shown in Table 8-1. Figure 8-18 shows our completed example.

Table 8-1 Values for the Web SSO Configuration document

| Section | Field | Our example | Comment |
|-----------------------|---------------------|----------------------------|---|
| Token Configuration | DNS Domain | .RCHLAND.IBM.COM | The SSO domain. |
| Participating Servers | Domino Server Names | dom654/itso654 | This can be selected from a drop down list. |
| WebSphere Information | LDAP Realm | dom654.RCHLAND.IBM.COM\389 | Make sure you have a “\” after the domain name. |

Web SSO Configuration for : LtpaToken

Basics | Comments | Administration

Token Configuration

Configuration Name: LtpaToken

Organization:

DNS Domain: .RCHLAND.IBM.COM

Token Expiration

Expiration (minutes): 30

Idle Session Timeout: ☒ Enabled

Participating Servers

Domino Server Names: dom654/itso654

WebSphere Information

LDAP Realm: dom654.RCHLAND.IBM.COM\389

LTPA Version: 1.0

Figure 8-18 Web SSO Configuration document

Note: The Organization field must be left blank. If you are using Internet site documents, the Organization field must match exactly the Internet site - Web site document. In our example, we do not use Internet site documents.

9. After you modify the appropriate fields, save and close the Web SSO Configuration document.
10. In the Domino server document, navigate to **Internet Protocols** → **Domino Web Engine**.

11. In the HTTP Sessions section, click the drop-down list for the Session Authentication field. In the Select Keywords window (Figure 8-19) that opens, select **Multiple Servers (SSO)** and click **OK**.

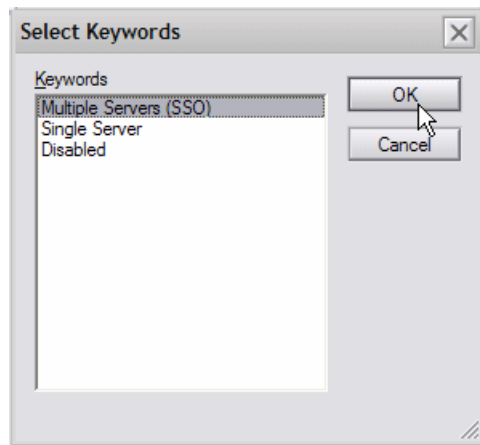


Figure 8-19 Selecting the Session Authentication method

12. In the HTTP Sessions section, click the drop-down list for the Web SSO Configuration field. In the Select Keywords window (Figure 8-20) that opens, select **Ltpa Token** and click **OK**.

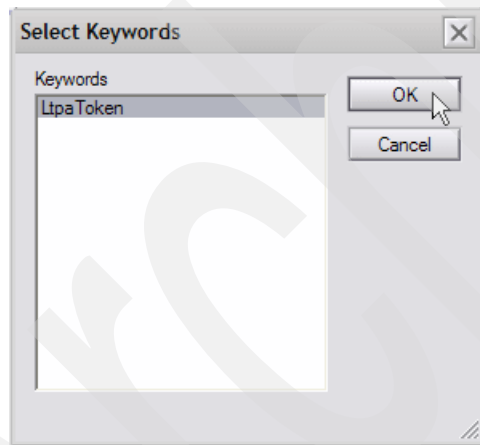


Figure 8-20 Selecting Web SSO Configuration document

13. Figure 8-21 shows the Domino server document with the HTTP Sessions options selected. After you make the appropriate changes, save and close the document.

The screenshot shows the Domino Server document configuration for the server 'dom654/itso654'. The 'Internet Protocols' tab is selected, and the 'HTTP' sub-tab is active. The 'HTTP Sessions' section is expanded, showing the following settings:

| HTTP Sessions | |
|--------------------------------------|--------------------------|
| Session authentication: | Multiple Servers (SSO) ▾ |
| Web SSO Configuration: | LtpaToken ▾ |
| Generating References to this Server | |
| Does this server use IIS? | ▾ |
| Protocol: | ▾ |
| Host name: | ▾ |
| Port number: | 80 ▾ |

The 'Java Servlets' section is also visible, showing the following settings:

| Java Servlets | |
|--------------------------|------------------|
| Java servlet support: | None ▾ |
| Servlet URL path: | /servlet ▾ |
| Class path: | domino\servlet ▾ |
| Servlet file extensions: | ▾ |
| Session state tracking: | Enabled ▾ |
| Idle session time-out: | 30 ▾ minutes |
| Maximum active sessions: | 1000 ▾ |
| Session persistence: | Disabled ▾ |

Figure 8-21 Domino Server document after HTTP Sessions changes

14. Restart the Domino HTTP task by running the following command in the Domino server console:
- ```
restart task http
```
15. After the Domino HTTP task restarts, you must restart the Workplace Services Express server. It is important that you start the Domino server before you stop or start the Workplace Services Express server. For information about how to stop and start the Workplace Services Express server, see 5.1, “Starting and stopping a Workplace Services Express server” on page 106.

## 8.4 Testing SSO

After you restart both the Domino and Workplace Services Express servers, you can test SSO. There are two tests that you can do at this point.

For the first test, open a Web browser and log into the Workplace Services Express server with a user that has access to the Domino Directory (names.nsf file). After logging into the Workplace Services Express server, from the same Web browser window, enter the following URL:

```
http://yourDominoServer.domain.com/names.nsf
```

If SSO is enabled, you can access the Domino Directory without being prompted to enter your user name and password. If you are prompted to enter your user name and password, SSO was not properly configured.

If you successfully configured the Domino Web Access portlet as discussed in 6.2, “Configuring the Domino Web Access portlet” on page 175, you can test SSO there as well. If SSO is configured properly, you are not prompted for a user name and password. If you are prompted to enter your user name and password, SSO was not properly configured.

## 8.5 Troubleshooting SSO

If you had problems configuring SSO, here are a few pointers and tests to help you determine and correct the problem:

- ▶ If you had a problem importing the keys into Domino, you might have entered a wrong password. To fix this, generate new LTPA keys on the WebSphere Application Server Administrative Console. Refer to step 7 on page 244. When the keys are generated, you can export them again.
- ▶ If the problem continues, the path is probably is wrong. Try copying the Import LTPA keyfile to your local workstation and then importing it into Domino. Also make sure that you type the path name and file name exactly as it should be.
- ▶ For SSO to work, all servers must have the clocks synchronized. If there are different servers on different time zones, the time zone value must be set. If servers do not have the times synchronized, an LTPA cookie can be created with a wrong expiration time, so SSO will fail.



## Performance tuning

In this chapter, we provide tuning tips ranging from optimizing i5/OS performance to tuning the various aspects of a Workplace Services Express environment. We take you through the iSeries architecture and explain how the components of Workplace Services Express fit within this architecture. With this base understanding, you learn how you can optimize your Workplace Services Express iSeries computing environment to achieve the best performance.



## 9.1 iSeries architecture

The iSeries architecture implements many different functions in subsystems. Subsystems can be thought of as isolated areas in the operating system memory that allow functions to run, segmented from other workloads.

There are a number of components that comprise a Workplace Services Express server. This includes the IBM HTTP Server that services HTTP traffic to and from the Workplace Services Express server. The jobs that comprise the IBM HTTP Server associated with a Workplace Services Express server are shown in Table 9-1. These server jobs run under the subsystem QHTTSPVR. The IBM HTTP Server jobs have a run priority of 25. We discuss the effect of run priorities in 9.3.3, “Run priority tuning” on page 261.

Table 9-1 IBM HTTP Server jobs

| Job name               | Run priority | Job function |
|------------------------|--------------|--------------|
| WSEServer <sup>1</sup> | 25           | QZHBMAIN     |
| WSEServer <sup>1</sup> | 25           | QZSRLOG      |
| WSEServer <sup>1</sup> | 25           | QZSRHTTP     |

<sup>1</sup> By default, the name of the HTTP job is the same name as the Workplace Services Express server instance name.

Table 9-2 lists the three server jobs that are associated with each Workplace Services Express server. These jobs run in the QEJBAS5 subsystem by default. You can optionally change these jobs to run in a separate subsystem. To use specially created CL commands to change the Workplace Services Express jobs so they run in a separate subsystem, see 9.3.4, “Changing the subsystem Workplace Services Express jobs run in” on page 263.

The Workplace Services Express server jobs have a run priority of 20. This is important to note if you have any 5250-based interactive workloads running on the same iSeries server or in the same logical partition (LPAR).

Table 9-2 Workplace Services Express server jobs

| Job name   | Run priority | Job function                                                                                                                                                                                                                                                                                          |
|------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| QJVAEXEC   | 20           | Started by the Websphere_Portal (WEBSPPHRE_) job and is required for instant messaging functionality.                                                                                                                                                                                                 |
| SERVER1    | 20           | Used during the initial configuration process of a Workplace Services Express server. It also provides administration services for the Workplace Services Express server through the WebSphere Application Server Administrative Console. During normal server operation, this server might be ended. |
| WEBSPPHRE_ | 20           | Responsible for responding to all Workplace Services Express user requests.                                                                                                                                                                                                                           |

The two Lightweight Directory Access Protocol (LDAP) server choices that run on the iSeries are the IBM Directory Server and Lotus Domino. The IBM Directory Server runs under the QSYSWRK subsystem and is comprised of the QDIRSRV job shown in Table 9-3. The run priority of the IBM Directory Server is 50.

Table 9-3 IBM Directory Server job

| Job name | Run priority | Job function         |
|----------|--------------|----------------------|
| QDIRSRV  | 50           | IBM Directory Server |

Each Lotus Domino server also runs in its own subsystem. Table 9-4 lists the Lotus Domino jobs associated with providing LDAP services for a Workplace Services Express server. Lotus Domino jobs run at run priority 20 by default.

Table 9-4 Lotus Domino jobs associated with providing LDAP services

| Job name | Run priority | Job function                                                               |
|----------|--------------|----------------------------------------------------------------------------|
| DIIOP    | 20           | Required for integration between Domino and Workplace Services Express     |
| HTTP     | 20           | Enables a Domino server to act as a Web server                             |
| LDAP     | 20           | Enables a Domino server to provide LDAP directory services to LDAP clients |
| QNNINSTS | 20           | A watch-dog job that makes sure the Domino server is active                |
| SERVER   | 20           | Executes requests made to the Domino server                                |

## 9.2 Performance assessment and tuning methodology

With the number of different environments involved in supporting a Workplace Services Express server, this section is designed to help you understand where you should start when working on a performance issue with a Workplace Services Express implementation.

When addressing a performance concern, you must look at the whole application environment to properly assess what is causing the performance problem and to determine how to remedy the situation. This means that you must look at the iSeries server to see if there are any bottlenecks on the system. To learn how to get the most out of your iSeries performance by using the automatic performance adjustor and properly tuning memory, run priorities, and disk on the system, see 9.3, “i5/OS tuning” on page 256 discusses.

Figure 9-1 shows the different services that are required for running a Workplace Services Express server.

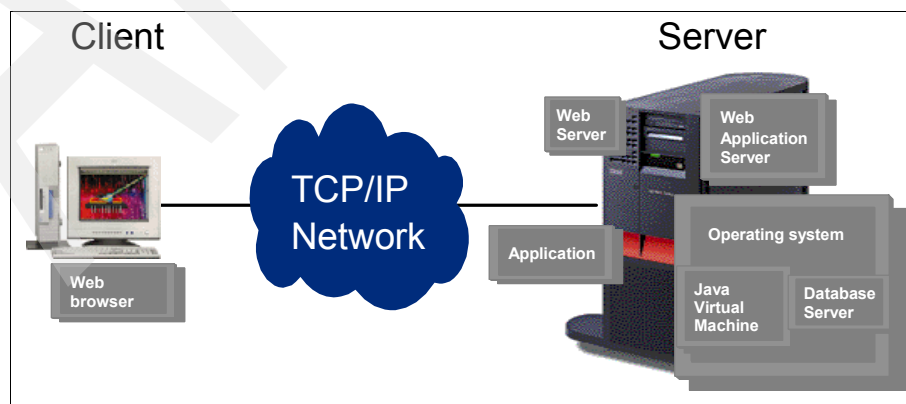


Figure 9-1 Workplace Services Express environment

We see that all end-user interaction comes from a Web browser and flows over TCP/IP to communicate with the server. If your iSeries server does not have any bottlenecks, it is important to address network performance and make sure there are not any bottlenecks for TCP/IP. For tips about optimizing TCP/IP on your iSeries server, see 9.4, “Network tuning” on page 269. Additionally, refer to 9.7.3, “Enabling GZIP compression” on page 306, for help with improving overall network bandwidth.

When you know that the iSeries server and the network are not a bottleneck, you must look at the different aspects of Workplace Services Express to determine which areas can cause performance issues. Looking at Figure 9-1, you must assess and tune as appropriate the Workplace Services Express server, the IBM HTTP Server, the LDAP server being used by the Workplace Services Express server, and the underlying DB2 Universal Database files that support the Workplace Services Express server. Additionally, each Workplace Services Express server implements a Java Virtual Machine (JVM). Therefore, the JVM also must be examined and tuned as appropriate.

You can find recommendations for Workplace Services Express tuning in 9.5, “Workplace Services Express tuning” on page 276. For tuning advice regarding the underlying JVMs that support a Workplace Services Express server, see 9.6, “Java tuning” on page 300.

We address performance recommendations for the IBM HTTP Server in 9.7, “IBM HTTP Server tuning” on page 302. For DB2 Universal Database performance optimization information, see 9.8, “Database tuning” on page 314.

The discussion in 9.1, “iSeries architecture” on page 254, presents two LDAP server choices that run on the iSeries. If you have chosen to use the IBM Directory Server, refer to 9.9, “IBM Directory Server tuning” on page 333, for tuning tips. If you have chosen Lotus Domino for your LDAP server, refer to 9.10, “Lotus Domino LDAP tuning” on page 336, to learn how to optimize Domino LDAP for a Workplace Services Express implementation.

## 9.3 i5/OS tuning

There are a number of different aspects to i5/OS performance. This section shows you how to use and optimize:

- ▶ Automatic performance adjustor
- ▶ Memory tuning
- ▶ Run priority tuning
- ▶ Running a Workplace Services Express server in its own subsystem
- ▶ System values affecting i5/OS performance
- ▶ Disk tuning

### 9.3.1 Automatic performance adjustor

The i5/OS ships with a utility called the *automatic performance adjustor*. It continuously analyzes and dynamically adjusts where CPU and memory resources are applied. The automatic performance adjustor uses a set of algorithms that look at the run characteristics of jobs in the system to determine how much memory and CPU should be allocated to different memory pools in the system.

By default, there are four memory pools on each iSeries server:

- ▶ Machine pool (\*MACHINE) is reserved for executing below the machine interface (MI) operating system code.
- ▶ Base pool (\*BASE) is the memory pool where various jobs run including:
  - Workplace Services Express
  - IBM HTTP Server
  - Lotus Domino
  - IBM Directory server
  - Batch jobs
- ▶ Interactive pool (\*INTERACT) is the memory pool where interactive workloads run.
- ▶ Spool pool (\*SPOOL) is the memory pool where printing functions run.

**Note:** There might be additional memory pools on your system. These memory pools can either be shared or private memory pools.

The automatic performance adjustor is controlled through a system value called QPFRADJ. This system value can be set to one of the following values:

- 0** Turns off automatic adjustment
- 1** Automatic adjustment happens only at initial program load (IPL)
- 2** Automatic adjustment occurs at IPL and dynamically throughout system operation
- 3** Automatic adjustment only occurs during normal system operation; no adjustment is made during IPL

The default setting for this value is 2, meaning that automatic adjustment occurs when the system does an IPL and continues while the system is running. This is the best setting for this system value and allows the tool to move resources where they are most needed.

To see the value that the automatic performance adjustor is set to on your system, enter the following Display System Value (DSPSYSVAL) command:

```
DSPSYSVAL QPFRADJ
```

**Tip:** If the automatic performance adjustor is turned off on your system, use the following Change System Value (CHGSYSVAL) CL command to enable automatic performance adjustment:

```
CHGSYSVAL SYSVAL(QPFRADJ) VALUE(2)
```

### 9.3.2 Memory tuning

It is important to make sure that you can use memory appropriately. Each memory pool has a setting specified for the minimum and maximum percentage of memory that should be allocated to the pool. These minimums and maximums are used by the automatic performance adjustor to determine to which pools to move more memory or from which pools to take memory.

#### Minimum settings for memory pools

The default minimum settings leave 5% of memory in the interactive pool and 1% of memory in the spool pool. If you are not using this memory with your workload requirements, you must lower the minimum memory sizes for these memory pools, allowing the automatic performance adjustor to move the memory to pools where it is needed the most.

The system used in our environment for this redbook has 32 Gb of memory installed. We use services from Workplace Services Express servers, IBM HTTP Server, IBM Directory server, and Lotus Domino servers. All of these servers run out of the base memory pool by default. Because of the default minimum settings of 5% for interactive and 1% for spool, we have almost 1.6 Gb of memory that is unable to be utilized on our iSeries server.

Use the Work with System Status (WRKSYSSTS) CL command to show how memory is allocated on your system. Figure 9-2 shows an example. With the default minimum memory settings on our system, 1580.70 Mb of memory resides in the interactive memory pool (system pool 3) that is unable to be utilized. An additional 15.25 Mb of memory is left unutilized in the spool pool (system pool 4).

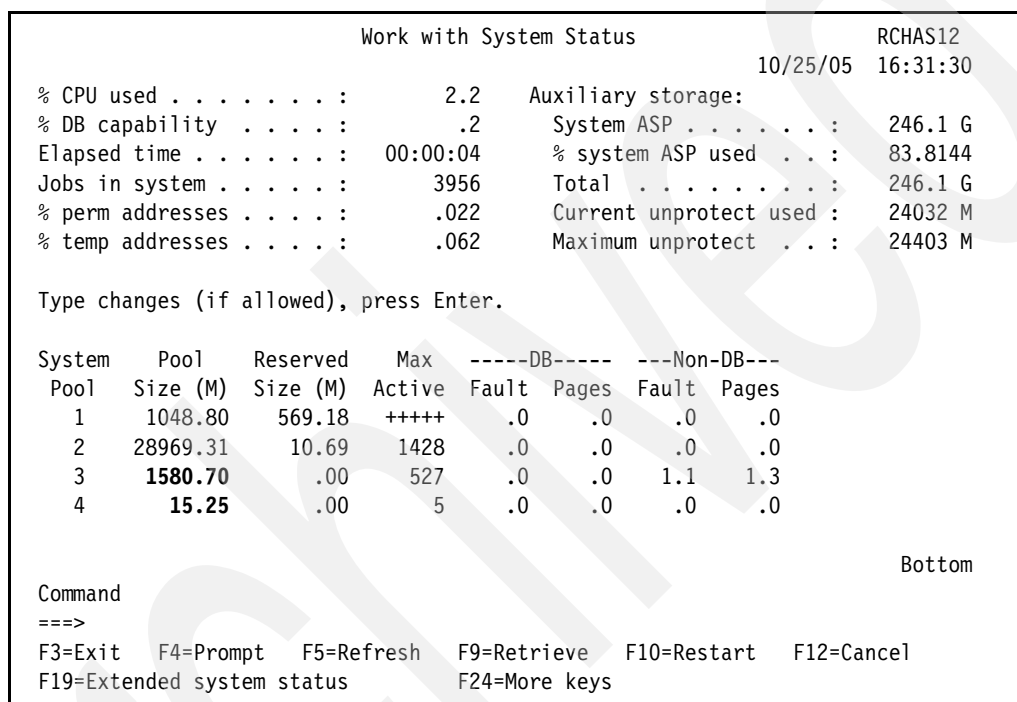


Figure 9-2 WRKSYSSTS showing memory being wasted in the interactive and spool pools

The following list explains each of the columns shown in the Work with System Status display (Figure 9-2):

- **System Pool:** Lists the number of the memory pool
- **Pool Size (M):** Shows the size of the memory pool in MB
- **Reserved Size (M):** Shows the minimum amount of memory that is required to remain in the memory pool
- **Max Active:** Represents the number of jobs or threads that can be concurrently active in the memory pool at the same time
- **DB Fault:** The number of faults per second that is associated with DB2 Universal Database database objects
- **DB Pages:** The number of pages per second that is happening with DB2 Universal Database database objects

- **Non-DB Fault:** The number of non-DB2 Universal Database faults per second that is happening in a memory pool
- **Non-DB Pages:** The number of pages per second that is happening with non-DB2 Universal Database database objects

## Enabling utilization of memory

To remedy the situation of having unused memory remain in the interactive and spool pools, use the Work with Shared Pools (WRKSHRPOOL) command to change the minimum amount of memory that is required to remain in these memory pools:

1. From a 5250 emulation command line, enter the WRKSHRPOOL CL command.
2. On the Work with Shared Pools display, press the F11 key to display the tuning data. Figure 9-3 shows the default minimum memory sizes of 5% and 1% respectively for the interactive (\*INTERACT) and spool (\*SPOOL) memory pools.

```

 Work with Shared Pools
 System: RCHAS12

Main storage size (M) . . : 31614.06

Type changes (if allowed), press Enter.

Pool Priority -----Size %----- -----Faults/Second-----
 Minimum Maximum Minimum Thread Maximum
*MACHINE 1 2.53 100 10.00 .00 10.00
*BASE 1 4.99 100 5.00 .50 200
*INTERACT 2 5.00 100 10.00 2.00 100
*SPOOL 2 1.00 100 5.00 1.00 100
*SHRPOOL1 2 1.00 100 10.00 2.00 100
*SHRPOOL2 2 1.00 100 10.00 2.00 100
*SHRPOOL3 2 1.00 100 10.00 2.00 100
*SHRPOOL4 2 1.00 100 10.00 2.00 100
*SHRPOOL5 2 1.00 100 10.00 2.00 100
*SHRPOOL6 2 1.00 100 10.00 2.00 100

More...

Command
===>
F3=Exit F4=Prompt F5=Refresh F9=Retrieve F11=Display text
F12=Cancel

```

Figure 9-3 Work with Shared Pools display showing the tuning data

3. To change the minimum amount of memory allocated to these memory pools, type over the existing values.

**Tip:** If you are not using interactive or spool services on your iSeries server, you can reduce these values to smaller amounts such as 0.50 and 0.05, respectively.

Press Enter for the changes to take effect.

When you complete the changes, the display should look similar to the one shown in Figure 9-4.

```

Work with Shared Pools
System: RCHAS12

Main storage size (M) . . : 31614.06

Type changes (if allowed), press Enter.

-----Size %-----
Pool Priority Minimum Maximum -----Faults/Second-----
 Minimum Thread Maximum
*MACHINE 1 2.53 100 10.00 .00 10.00
*BASE 1 4.99 100 5.00 .50 200
*INTERACT 2 .50 100 10.00 2.00 100
*SPOOL 2 .05 100 5.00 1.00 100
*SHRPOOL1 2 1.00 100 10.00 2.00 100
*SHRPOOL2 2 1.00 100 10.00 2.00 100
*SHRPOOL3 2 1.00 100 10.00 2.00 100
*SHRPOOL4 2 1.00 100 10.00 2.00 100
*SHRPOOL5 2 1.00 100 10.00 2.00 100
*SHRPOOL6 2 1.00 100 10.00 2.00 100

More...

Command
===>
F3=Exit F4=Prompt F5=Refresh F9=Retrieve F11=Display text
F12=Cancel

*INTERACT changed, but may be adjusted.
+

```

Figure 9-4 Reduced minimum sizes for the interactive and spool memory pools

**Important:** If you have workloads that run in the evening that cause memory to be moved from the memory pool hosting the Workplace Services Express servers, we recommend that you set the minimum size of that memory pool to a larger value than the default. This is necessary to ensure the JVM has ample memory to accommodate the JVM heap size.

The default memory pool for Workplaces Services Express servers is pool 2 or \*BASE. This pool has a minimum memory size of 4.99% of the memory on the system. If you are running Workplace Services Express servers in this memory pool and have other workloads executing that would reduce the memory significantly in the \*BASE pool, change the minimum value for \*BASE to a higher value.

For details about how to set the JVM heap size, see “Setting the JVM heap size” on page 300. When you know the optimal JVM heap size for your environment, you will have the information required to set the minimum size for the memory pool in which the Workplace Services Express servers are running.

## Faulting rates

Faulting occurs when a running job requests a page of information that is not in main memory. The job that requested the page is now forced to wait for the page of information to be retrieved from disk. When the page is retrieved and is ready to be used, the job can continue processing. Because the job is interrupted and must stop and wait for the page to be read or “faulted” into memory, it is important to keep the number of faults per second at acceptable faulting rates.



Table 9-5 summarizes acceptable faulting rates for the machine and base memory pools.

Table 9-5 Memory pool faulting guidelines

| Memory pool                     | Maximum database and non-database faults per second |
|---------------------------------|-----------------------------------------------------|
| Machine pool (pool 1)           | 10                                                  |
| Base pool (pool 2) <sup>1</sup> | 100-150 per physical processor <sup>2</sup>         |

1. Workplace Services Express, IBM HTTP Server, IBM Directory server, and Lotus Domino servers all run in the base memory pool by default. If you have moved any of these services to a different memory pool, apply these faulting guidelines to the appropriate memory pool.

2. The number of faults per second that can be tolerated on a system before it affects performance depends on the number of disk arms. Systems that have a large number of disk arms, for example 30 arms or more, can handle much higher faulting rates before performance is affected.

**Important:** If the amount of memory available in the memory pool the Workplace Services Express server is running in drops to a level below the JVM heap size, faulting rates can quickly climb into the 1000s. To determine the heap size requirements for your Workplace Services Express server, refer to “Setting the JVM heap size” on page 300.

If you are using the automatic performance adjustor (QPFRADJ), this utility looks for a pattern of three consecutive intervals of unacceptable faulting rates in a memory pool. If unacceptable faulting rates occur, QPFRADJ moves more memory to the pool that is in most need of additional memory. QPFRADJ might also reduce the activity level to lower the number of jobs executing concurrently in a memory pool to reduce faulting rates.

### 9.3.3 Run priority tuning

The automatic performance adjustor uses the run priority of specific jobs to determine which memory pools should receive more memory and CPU run cycles. The run cycles are set by controlling the maximum activity level of a memory pool. The maximum activity level is shown in the Max Act column in Figure 9-2 on page 258. Activity level is particularly important in a Workplace Services Express environment because of the number of threads running under each of the jobs providing services to each server.

Refer to the following tables to see the run priorities of each of the components that can comprise a Workplace Services Express environment:

- ▶ For IBM HTTP Server, see Table 9-1 on page 254.
- ▶ For Workplace Services Express, see Table 9-2 on page 254.
- ▶ For IBM Directory server, see Table 9-3 on page 255.
- ▶ For Lotus Domino, see Table 9-4 on page 255.

It is necessary to understand the runtime priorities of these components so you can adjust runtime priorities if appropriate. When adjusting runtime priorities, you must also understand how the dynamic priority scheduler works on the iSeries.

The dynamic priority scheduler uses runtime priorities to determine which jobs are in most need of memory, CPU resources, or both. It is responsible for making sure that no jobs are starved for resources while ensuring that no one high priority job monopolizes the CPU. It analyzes the runtime priority of a job in addition to the amount of time that the job has been waiting for CPU. If a job has been starved for CPU, the dynamic priority scheduler internally bumps up the runtime priority of a job until it gets the required CPU resources.

**Note:** A plus sign (+) next to the run priority of a job indicates that the dynamic priority scheduler has internally increased its priority to ensure that it is getting the required CPU resources.

The rate at which the dynamic priority scheduler increases the run priority of a specific job depends on which band it is in. The run priority bands on the iSeries are as follows:

- ▶ Band 0: 0-9 (system tasks)
- ▶ Band 1: 10-16
- ▶ Band 2: 17-22
- ▶ Band 3: 23-35
- ▶ Band 4: 36-46
- ▶ Band 5: 47-51
- ▶ Band 6: 52-89
- ▶ Band 7: 90
- ▶ Band 8: 91
- ▶ Band 9: 92
- ▶ Band 10: 93
- ▶ Band 11: 94
- ▶ Band 12: 95
- ▶ Band 13: 96
- ▶ Band 14: 97
- ▶ Band 15: 98
- ▶ Band 16: 99

**Tip:** The lower a run priority number is on the i5/OS, the higher a job's run priority is. This means that a job with a run priority of 20 receives more CPU and memory resources than a job with a run priority of 30 or 40.

A memory pool has an activity level associated with it which specifies the number of threads than can actively use the processor or processors at the same time from that memory pool. When more threads are started than are allowed to concurrently execute due to the activity level control, the excess threads are forced to wait for an available activity level slot before they can run. The number of threads running (active threads) refers to the number of threads that are eligible to compete for a processor and that count against the activity level for a memory pool. Active threads do *not* include threads that are:

- ▶ Waiting for input
- ▶ Waiting for a message
- ▶ Waiting for a device to be allocated
- ▶ Waiting for a file to be opened
- ▶ Ineligible (threads that are ready to run but the memory pool activity is at its maximum)

**Activity level:** The activity level does not restrict the number of jobs that can be initiated. It specifies the maximum number of threads that can be in memory at the same time. A job can have multiple threads active under it.

When more threads are concurrently active than available memory, paging and faulting can become a problem. For details about acceptable paging and faulting rates, see "Faulting rates" on page 260.

### 9.3.4 Changing the subsystem Workplace Services Express jobs run in

The default subsystem for all Workplace Services Express servers is the QEJBAS5 subsystem. There are times when it might be more appropriate to run a Workplace Services Express server in a separate subsystem. Some reasons include, but are not limited to, better control over memory management, better control over run priorities, or aid in JVM heap analysis.

A sample utility allows Workplace Services Express servers to be moved to a run in a different subsystem. This utility is a set of CL programs that are packaged in a save file. See Appendix C, “Additional material” on page 359, for information about downloading this save file.

#### Installing the utility on the iSeries server

Perform the following steps to install the library that contains the CL programs for changing the subsystem in which the Workplace Services Express server jobs run.

1. Download the save file. See Appendix C, “Additional material” on page 359, for information about downloading this save file.
2. Create a library on the iSeries to hold the contents of the save file using the Create Library (CRTLIB) CL command. In this example, we enter:

```
crtlib wsetools
```

3. Create a save file in the library that you just created to hold the save file that you downloaded in step 1 using the Create Save File (CRTSAVF) CL command, for example:

```
crtsave file(wsetools/wsetools)
```

4. Send the utility from your PC to the iSeries server using File Transfer Protocol (FTP):
  - a. Open a DOS prompt command and change to the directory on the PC where you downloaded the savefile.
  - b. Using FTP as explained in the following steps, send the savefile to the savefile that you just created on your iSeries server. See Figure 9-5 for an example.

- i. Type the following command

```
ftp iSeriesServerName
```

- ii. Enter your iSeries user name.

- iii. Enter your iSeries password.

- iv. Type the following commands in the order shown when prompted:

```
bin
put wsetools.savf /qsys.lib/wsetools.lib/wsetools.savf
quit
```

```

C:\>ftp rchas12
Connected to RCHAS12.rchland.ibm.com.
220-QTCP at RCHAS12.RCHLAND.IBM.COM.
220 Connection will close if idle more than 166666 minutes.
User (RCHAS12.rchland.ibm.com:(none)): kgreene
331 Enter password.
Password:
230 KGREENE logged on.
ftp> bin
200 Representation type is binary IMAGE.
ftp> put wsetools.savf /qsys.lib/wsetools.lib/wsetools.savf
200 PORT subcommand request successful.
150 Sending file to member WSETTOOLS in file WSETTOOLS in library WSETTOOLS.
250 File transfer completed successfully.
ftp: 494208 bytes sent in 0.98Seconds 501.73Kbytes/sec.
ftp> quit
221 QUIT subcommand received.

```

Figure 9-5 Sending the WSETTOOLS savefile to the iSeries using FTP

- Now that the utility is sent to the iSeries server, restore the objects from the save file, using the following Restore Objects (RSTOBJ) CL command:

```
RSTOBJ OBJ(*ALL) SAVLIB(WSETTOOLS) DEV(*SAVF) SAVF(WSETTOOLS/WSETTOOLS)
```

- Add the WSETTOOLS library to your library list using the following Add Library List Entry (ADDLIBLE) CL command:

```
ADDLIBLE LIB(WSETTOOLS)
```

You are now ready to use the CL programs in WSETTOOLS library to change the subsystem in which the Workplace Services Express server jobs run.

### Creating a new subsystem description

The CL program provided in the WSETTOOLS library to start a Workplace Services Express server requires that a new subsystem description is created. The name of the subsystem description should match the name of your Workplace Services Express server.

To create the new subsystem description, use the following CRTWSESBS command:

```
WSETTOOLS/CRTWSESBS INSTANCE(itsowse2)
```

This command creates a subsystem called ITSOWSE2 in library WSETTOOLS. Replace the instance name, *itsowse2*, with the name of your Workplace Services Express server.

### Starting a Workplace Services Express server in its own subsystem

Next you must start the Workplace Services Express server in the new subsystem that you just created. You do this by issuing the Start Workplace Express Server (STRWSESVR) command, for example:

```
WSETTOOLS/STRWSESVR
```

When you type this command, you see the Start Workplace Express Server display shown in Figure 9-6. Provide the name of the Workplace Services Express server and specify which server jobs you want to start.

| Start Workplace Express Server (STRWSESVR)                          |          |          |
|---------------------------------------------------------------------|----------|----------|
| Type choices, press Enter.                                          |          |          |
| WSE Instance Name . . . . .                                         | itsowse2 | NAME     |
| Start WebSphere_Portal . . . . .                                    | *YES     | *YES *NO |
| Start server1 . . . . .                                             | *NO      | *YES *NO |
| Clear logs . . . . .                                                | *YES     | *YES *NO |
| Bottom                                                              |          |          |
| F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display |          |          |
| F24=More keys                                                       |          |          |
| Parameter INSTANCE required.                                        |          |          |

Figure 9-6 Starting a Workplace Services Express server in its own subsystem

Example 9-1 shows the code behind the STRWSESVR command.

Example 9-1 Contents of CL program STRWSESVR

```

PGM PARM(&INSTANCE &STR_WPS &STR_SVR1 &CLR_LOGS)
DCL VAR(&INSTANCE) TYPE(*CHAR) LEN(10)
DCL VAR(&STR_WPS) TYPE(*CHAR) LEN(4)
DCL VAR(&STR_SVR1) TYPE(*CHAR) LEN(4)
DCL VAR(&CLR_LOGS) TYPE(*CHAR) LEN(4)

DCL VAR(&TOOLS_LIB) TYPE(*CHAR) LEN(10) +
 VALUE(WSETOOLS)
DCL VAR(&LWP_HOME) TYPE(*CHAR) LEN(100)
DCL VAR(&STRWPSCMD) TYPE(*CHAR) LEN(200)
DCL VAR(&STRSVR1CMD) TYPE(*CHAR) LEN(200)
DCL VAR(&CLRLOGCMD) TYPE(*CHAR) LEN(200)

CHGVAR VAR(&LWP_HOME) +
 VALUE('/qibm/userdata/webas5/base/' *TCAT +
 &INSTANCE *TCAT '/workplaceserver')
/*****
/* START THE SUBSYSTEM IN CASE IT IS STOPPED */
STRSBS SBSD(&TOOLS_LIB/&INSTANCE)
MONMSG MSGID(CPF1010)

/*****
IF COND(&CLR_LOGS *EQ *NO) THEN(GOTO +
 CMDLBL(LBL_WPS_1))

/* BUILD THE QSHELL COMMAND TO CLEAR THE WEBSHERE_PORTAL LOGS */
CHGVAR VAR(&CLRLOGCMD) VALUE('rm ' *CAT +
 &LWP_HOME *TCAT +
 './PortalServer/log/*.log')
SBMJOB CMD(QSH CMD(&CLRLOGCMD)) JOB(CLRLOGWPS) +
 JOBD(*USRPRF) JOBJ(&TOOLS_LIB/&INSTANCE)
/* BUILD THE QSHELL COMMAND TO START WEB_SPHERE_PORTAL */
LBL_WPS_1: CHGVAR VAR(&STRWPSCMD) +
 VALUE('/qibm/userdata/webas5/base/' *TCAT +
 &INSTANCE *TCAT +
 '/workplaceserver/bin/strlwpsvr.sh +

```

```

 WebSphere_Portal -instance ' *CAT +
 &INSTANCE *CAT ' -toolslib ' *CAT &TOOLSIB)
/* START THE WEBSHERE PORTAL
SBMJOB CMD(QSH CMD(&STRWPSCMD)) JOB(STRWSESVR) +
 JOBD(*USRPRF) JOBQ(&TOOLSIB/&INSTANCE)

/*****
LBL_SVR1_0: IF COND(&STR_SVR1 *EQ *NO) THEN(GOTO +
 CMDLBL(LBL_END))

IF COND(&CLR_LOGS *EQ *NO) THEN(GOTO +
 CMDLBL(LBL_SVR1_1))

/* BUILD THE QSHELL COMMAND TO CLEAR THE SERVER1 LOGS
CHGVAR VAR(&CLRLOGCMD) VALUE('rm ' *CAT &LWP_HOME +
 TCAT '/../logs/server1/.log')
SBMJOB CMD(QSH CMD(&CLRLOGCMD)) JOB(CLRLOGSV1) +
 JOBD(*USRPRF) JOBQ(&TOOLSIB/&INSTANCE)

/* BUILD THE QSHELL COMMAND TO START SERVER1
LBL_SVR1_1: CHGVAR VAR(&STRSVR1CMD) +
 VALUE('/qibm/userdata/webas5/base/' *TCAT +
 &INSTANCE *TCAT +
 '/workplaceserver/bin/strlwpsvr.sh +
 server1 -instance ' *CAT &INSTANCE *CAT +
 ' -toolslib ' *CAT &TOOLSIB)

/* START THE SERVER1
SBMJOB CMD(QSH CMD(&STRSVR1CMD)) JOB(STRWSESVR) +
 JOBD(*USRPRF) JOBQ(&TOOLSIB/&INSTANCE)

/* START THE HTTP SERVER
SBMJOB CMD(SBMJOB CMD(STRTCPSVR SERVER(*HTTP) +
 HTTPSVR(&INSTANCE))) JOB(STRWSESVR) +
 JOBD(*USRPRF) JOBQ(&TOOLSIB/&INSTANCE)

/*****
LBL_END: ENDPGM

```

---

### 9.3.5 System values that affect i5/OS performance

There are two system values that you should check on your system to make sure that you can obtain the best performance. These are the maximum activity level of the system (QMAXACTLVL) and processor multi tasking (QPRCMLTTSK) values.

#### QMAXACTLVL

The QMAXACTLVL system value specifies the number of threads that can compete at the same time for memory and processor resources. For all active subsystems, the sum of all threads running in all memory pools cannot exceed the value you specify. If a thread cannot be processed because the activity level has been reached, the thread waits until another thread reaches a time slice or a long wait. The default setting for this value is \*NOMAX.

You can use the Display System Value (DSPSYSVAL) CL command to see the value that this system value is set to. If the value is not set to \*NOMAX, use the Change System Value (CHGSYSVAL) CL command to change the value to \*NOMAX, for example:

```
CHGSYSVAL SYSVAL(QMAXACTLVL) VALUE(*NOMAX)
```

## QPRCMLTTSK

The QPRCMLTTSK system value controls whether to enable the individual SMP processors to concurrently execute multiple instruction streams. Each instruction stream belongs to separate tasks or threads. When enabled, each individual processor is concurrently executing multiple tasks at the same time. The effect of its use is likely to increase the performance capacity of a system or improve the responsiveness of a multi threaded application. Running multiple instruction streams at the same time does not improve the performance of any given task. Changes to this system value do not take effect until the next IPL.

The default setting of the i5/OS system value QPRCMLTTSK might be incorrect for some V5R3M0 installations. The QPRCMLTTSK system value determines whether the hardware multithreading feature of the processor, if available, is enabled, disabled, or controlled by the operating system.

For details about how to set this system value appropriately for your specific system, see APAR II13981 available on the Web at:

[http://www-912.ibm.com/n\\_dir/nas4apar.nsf/0/a4eaa9d8cb2ab5dd86256f690056c078?OpenDocument](http://www-912.ibm.com/n_dir/nas4apar.nsf/0/a4eaa9d8cb2ab5dd86256f690056c078?OpenDocument)

### 9.3.6 Disk tuning

The single-level store architecture of the iSeries server ensures that data is spread evenly across all disk units on the system. There are also special I/O processors that help retrieve data from the disk to provide for efficient I/O processing. Because of this architecture, it is important that you have enough disk arms on your iSeries server to properly balance the I/O.

To determine if disk is a bottleneck on your iSeries server, look at the disk utilization of each individual disk unit. It is important that no one disk arm exceeds the % busy utilization guideline for the specific disk units in your system. Table 9-6 lists the different disk unit types and acceptable utilization guidelines based on the type of input/output adapter (IOA) used with the disk units.

Table 9-6 Disk utilization guidelines

| Disk type | Speed (RPM) | Utilization guideline (% busy) with older IOAs | Utilization guideline (% busy) with 2757 or 2780 IOAs |
|-----------|-------------|------------------------------------------------|-------------------------------------------------------|
| 6717      | 10K         | 30%                                            | 40%                                                   |
| 6718      | 10K         | 30%                                            | 40%                                                   |
| 6719      | 10K         | 30%                                            | 40%                                                   |
| 4326      | 15K         | 40%                                            | 50%                                                   |
| 4327      | 15K         | 40%                                            | 50%                                                   |
| 4328      | 15K         | 40%                                            | 60%                                                   |

Use the Work with Disk Status (WRKDSKSTS) CL command to monitor disk utilization. Figure 9-7 shows an example of a healthy disk configuration. This system has eight disk arms. The I/O is spread evenly among the disk arms with the highest disk utilization at 34% and the lowest at 29%. The disk utilization guidelines for these disk units is 40%.

**Important:** When looking at disk utilization, use the % Busy column. The % Used column shows how full each disk unit is.



| Work with Disk Status                       |      |          |        |         |                  |          |           |          |           | RCHAS12           |
|---------------------------------------------|------|----------|--------|---------|------------------|----------|-----------|----------|-----------|-------------------|
|                                             |      |          |        |         |                  |          |           |          |           | 11/03/05 15:35:28 |
| Elapsed time: 00:08:24                      |      |          |        |         |                  |          |           |          |           |                   |
| Unit                                        | Type | Size (M) | % Used | I/O Rqs | Request Size (K) | Read Rqs | Write Rqs | Read (K) | Write (K) | % Busy            |
| 1                                           | 4326 | 30769    | 83.4   | 38.7    | 9.9              | 11.3     | 27.3      | 18.3     | 6.4       | 30                |
| 2                                           | 4326 | 30769    | 83.4   | 40.8    | 8.4              | 10.9     | 29.8      | 15.4     | 5.8       | 34                |
| 3                                           | 4326 | 30769    | 83.5   | 38.9    | 8.7              | 9.9      | 28.9      | 15.9     | 6.2       | 30                |
| 4                                           | 4326 | 30769    | 83.4   | 35.8    | 11.1             | 11.6     | 24.2      | 21.9     | 5.8       | 29                |
| 5                                           | 4326 | 30769    | 83.4   | 32.9    | 10.2             | 10.9     | 22.0      | 17.7     | 6.5       | 30                |
| 6                                           | 4326 | 30769    | 83.4   | 39.6    | 9.4              | 11.2     | 28.4      | 18.0     | 6.0       | 30                |
| 7                                           | 4326 | 30769    | 83.4   | 43.9    | 8.9              | 12.1     | 31.7      | 16.7     | 5.9       | 31                |
| 8                                           | 4326 | 30769    | 83.4   | 38.1    | 9.8              | 11.3     | 26.8      | 17.5     | 6.5       | 30                |
|                                             |      |          |        |         |                  |          |           |          |           | Bottom            |
| Command                                     |      |          |        |         |                  |          |           |          |           |                   |
| ===>                                        |      |          |        |         |                  |          |           |          |           |                   |
| F3=Exit F5=Refresh F12=Cancel F24=More keys |      |          |        |         |                  |          |           |          |           |                   |

Figure 9-7 Healthy disk I/O percent busy

Figure 9-8 shows an example of an unhealthy disk configuration. The disk utilization ranges from 63% to 74%. Not only is the utilization too high, but the utilization across disk arms is quite unbalanced. To remedy the over utilization situation, more disk arms are required to be added to the system. To address the disk arm balance issue, refer to “Balancing I/O across disk arms” on page 268.

| Work with Disk Status                       |      |          |        |         |                  |          |           |          |           | RCHAS12           |
|---------------------------------------------|------|----------|--------|---------|------------------|----------|-----------|----------|-----------|-------------------|
|                                             |      |          |        |         |                  |          |           |          |           | 11/07/05 16:33:21 |
| Elapsed time: 00:01:03                      |      |          |        |         |                  |          |           |          |           |                   |
| Unit                                        | Type | Size (M) | % Used | I/O Rqs | Request Size (K) | Read Rqs | Write Rqs | Read (K) | Write (K) | % Busy            |
| 1                                           | 4326 | 30769    | 98.5   | 78.3    | 13.0             | 19.2     | 59.0      | 12.8     | 13.0      | 72                |
| 2                                           | 4326 | 30769    | 98.5   | 68.4    | 12.5             | 14.2     | 54.1      | 12.5     | 12.6      | 74                |
| 3                                           | 4326 | 30769    | 98.5   | 78.4    | 11.4             | 15.5     | 62.9      | 12.5     | 11.2      | 68                |
| 4                                           | 4326 | 30769    | 98.6   | 67.3    | 11.7             | 17.5     | 49.7      | 11.5     | 11.7      | 74                |
| 5                                           | 4326 | 30769    | 98.5   | 72.5    | 13.1             | 16.5     | 55.9      | 14.4     | 12.7      | 73                |
| 6                                           | 4326 | 30769    | 98.5   | 68.3    | 12.1             | 16.5     | 51.8      | 12.6     | 11.9      | 63                |
| 7                                           | 4326 | 30769    | 98.5   | 68.6    | 13.5             | 16.1     | 52.4      | 14.9     | 13.0      | 72                |
| 8                                           | 4326 | 30769    | 98.5   | 68.4    | 12.0             | 15.8     | 52.6      | 11.7     | 12.1      | 64                |
|                                             |      |          |        |         |                  |          |           |          |           | Bottom            |
| Command                                     |      |          |        |         |                  |          |           |          |           |                   |
| ===>                                        |      |          |        |         |                  |          |           |          |           |                   |
| F3=Exit F5=Refresh F12=Cancel F24=More keys |      |          |        |         |                  |          |           |          |           |                   |

Figure 9-8 Unhealthy disk I/O percent busy

## Balancing I/O across disk arms

When data is added to the iSeries server, the operating system attempts to balance the data across all disk arms. When data is deleted and added to the system, some disk arms can contain data that is more frequently accessed than data on other arms.

Operating system utilities can help to rebalance data across disk arms. The Trace ASP Balance (TRCASPBAL) CL command is used to collect usage statistics. After the data is collected, the Start ASP Balance (STRASPBAL) CL command is used to rebalance data as appropriate.

For more details about using these utilities, refer to IBM Software Technical Document number 16803317, available on the Web at:

[http://www-912.ibm.com/s\\_dir/slkbases.NSF/0/80a0c71876d5a872862567ca00770cb0?OpenDocument](http://www-912.ibm.com/s_dir/slkbases.NSF/0/80a0c71876d5a872862567ca00770cb0?OpenDocument)

## 9.4 Network tuning

In this section, we provide tips on optimizing your i5/OS network by adjusting the TCP/IP buffer sizes, duplex settings, frame sizes, and maximum transmission unit (MTU) sizes. Additionally, we show you how to identify if your network is experiencing Address Resolution Protocol (ARP) storms and how to fix this problem if it exists.

### 9.4.1 TCP/IP buffer sizes

The communication mechanism used extensively by Workplace Services Express is *TCP/IP sockets*. A TCP/IP socket connection uses send and receive buffer sizes to define the size of the packet of data that is sent over the wire. You can adjust the size of the send and receive buffer sizes to determine flow control. The buffer sizes determine how much data can be sent before flow control is interrupted to send or receive another packet of data.

If the window size as defined by the TCP/IP buffers is too small, the receive window buffer can be frequently overrun, and the flow control mechanism halts sending data until the application can empty the receive buffer. Flow control can use a significant amount of CPU time. It can also result in additional network latency due to the stop and start nature on the receive and send side of the socket connection.

Because of this fact, we recommend that you increase the send and receive buffer sizes from their default 8K values to avoid flow control under normal operating conditions. A larger buffer size reduces the potential for flow control to occur, thus improving CPU utilization. If the TCP/IP buffers are too large and applications are not consuming data fast enough, system performance might be adversely affected. The goal is to avoid flow control, but not allow more data to buffer up than the system has the capacity to process.

The optimal buffer size depends on several network environment factors including:

- ▶ Types of switches and systems
- ▶ Acknowledgment timing
- ▶ Error rates and network topology
- ▶ Memory size
- ▶ Data transfer size

System wide settings can override the default 8K size for TCP/IP socket connections. The recommended send and receive buffer size to reduce flow control and not adversely affect performance is 65536. This reduces both flow control occurrences and CPU cost.

To change the system-wide value, you use the Change TCP/IP Attributes (CHGTCPA) CL command. This command allows you to change both the send and receive buffer sizes. Perform the following steps to change the TCP/IP send and receive buffer sizes:

1. Log on to the iSeries server with a user profile that has \*SECADMIN authority.
2. Enter the CHGTCPA CL command and press F4 to prompt it.
3. In the Change IP Attributes (CHGTCPA) display, specify the TCP receive buffer size (TCPRCVBUF) and TCP send buffer size (TCPSNDBUF). In our testing environment, these parameters were set to 65536, as shown in Figure 9-9. Press Enter. Changes to the TCP/IP attributes take effect immediately.

```

Change TCP/IP Attributes (CHGTCPA)

Type choices, press Enter.

TCP keep alive TCPKEEPALV 120
TCP urgent pointer TCPURGPTR *BSD
TCP receive buffer size TCPRCVBUF > 65536
TCP send buffer size TCPSNDBUF > 65536
TCP R1 retransmission count TCPR1CNT 3
TCP R2 retransmission count TCPR2CNT 16
TCP minimum retransmit time TCPMINRTM 250
TCP closed timewait timeout TCPCLOTIMO 120
TCP close connection message TCPCNNMSG *THRESHOLD
UDP checksum UDPCKS *YES
Path MTU discovery:
 Enablement IPPATHMTU *YES
 Interval 10
IP datagram forwarding IPDTGFWD *NO
IP source routing IPSRCRTG *YES
IP reassembly time-out IPRSBTIMO 10

More...

F3=Exit F4=Prompt F5=Refresh F10=Additional parameters F12=Cancel
F13=How to use this display F24=More keys

```

Figure 9-9 Change TCP/IP Attributes (CHGTCPA) command

**Note:** Use care when setting the TCP/IP buffer size on older networks. You also want to monitor the number of retransmissions taking place on a given line before you change this setting to the 65536 send and receive buffer size. If there are several retransmits on a given line, we recommend that you do not set the size of the TCP/IP buffer size to 65536.

## 9.4.2 Optimizing line description settings

In this section, we show you how to optimize line description settings.

### Duplex settings

The duplex settings for a line description are either HALF or FULL. The best performance is with FULL duplex. However, the duplex setting on the line description must match the setting on the port on the switch if the line is hooked up to a switch.

- If the line is connected directly to a 8271 Ethernet switch, the switch's port is FULL duplex, therefore set the duplex setting on the Ethernet line description to FULL.
- If the line is connected to a "stackable" hub, then set the duplex setting on the line to HALF to match the hub setting.

Be aware that setting the duplex setting to AUTO might not have the results that you are expecting. You want to explicitly set the duplex setting to HALF or FULL. To set the duplex setting, use the Change Line Desc (Ethernet) (CHGLINETH) CL command, for example:

```
CHGLINETH LIND(<line_name>) DUPLEX(*FULL)
```

### MAXFRAME size

This line description parameter specifies the maximum frame size that can be transmitted and received on a line description. Maximizing the frame size in a LAN environment is important and supplies best performance for large transfers. Having configured a large frame size does not negatively impact performance for small transfers. Both the iSeries server and the other link stations must be configured for large frames. Otherwise, the smaller of the two maximum frame size values is used in transferring data. Bridges might also limit the maximum frame size.

The MAXFRAME size parameter should be set as follows:

- ▶ 1496 for < 1 Gb Ethernet
- ▶ 8996 for 1 Gb Ethernet

To set the maximum frame size, use the Change Line Desc (Ethernet) (CHGLINETH) command, for example:

```
CHGLINEETH LIND(line_name) MAXFRAME(xxxx)
```

### MTU size

The MTU is the maximum number of bytes allowed in any datagram. By increasing the value of this parameter, you can reduce the overall number of transmissions, and therefore, increase the potential capacity of the CPU and the input/output processor (IOP).

Similar parameters exist on the client. The negotiated value is the minimum of the server and client (and perhaps any bridges or routers). Therefore, increase them all. The recommended setting varies depending on the communications protocol that is being used:

- ▶ 4 Mb Token Ring = 4060
- ▶ 16 Mb Token Ring = 16388
- ▶ Ethernet 802.3 = 1492
- ▶ Ethernet Version 2 = 1500

To change the MTU size, perform the following steps:

1. On an i5/OS command line, type the Configure TCP/IP (CFGTCP) command and press Enter.
2. In the Configure TCP/IP display, type option 2 (Work with TCP/IP Routes) and press Enter.
3. In the Work with TCP/IP Routes display, type option 2 in the Opt column next to the IP address used by your Workplace Services Express server and press Enter.
4. On the Change TCP/IP Route display, enter the recommendation from the previous list in the Maximum transmission unit parameter and press Enter.

## 9.4.3 Network routing: ARP storms

This section describes an issue that can occur with the load balancing feature of the iSeries network. This problem can occur on your system only if you have more than one network interface card (NIC) installed and have intelligent switches that use dynamic route tables.

## Summary of the problem

You can configure the iSeries server to load balance network traffic across any number of network interfaces that share a common route. For example, serverA has four network interfaces on four separate network adapters:

- ▶ 10.1.1.1
- ▶ 10.1.1.2
- ▶ 10.1.1.3
- ▶ 10.1.1.4

A single default route is defined to 10.1.1.5 as shown in the default route configuration in Figure 9-10.

| Work with TCP/IP Routes                                         |                   |             |          | System:             | RCHAS12 |
|-----------------------------------------------------------------|-------------------|-------------|----------|---------------------|---------|
| Type options, press Enter.<br>1=Add 2=Change 4=Remove 5=Display |                   |             |          |                     |         |
| Opt                                                             | Route Destination | Subnet Mask | Next Hop | Preferred Interface |         |
|                                                                 | *DFTRROUTE        | *NONE       | 10.1.1.5 | *NONE               |         |
| Bottom                                                          |                   |             |          |                     |         |
| F3=Exit F5=Refresh F6=Print list F11=Display type of service    |                   |             |          |                     |         |
| F12=Cancel F17=Top F18=Bottom                                   |                   |             |          |                     |         |

Figure 9-10 CFGTCP option 2 - Work with TCP/IP Routes

As a result, any adapter can be used to send data from the system. Requests received on 10.1.1.1 might be responded to from the network adapter with the 10.1.1.4 interface. The response carries the 10.1.1.1 return address and the 10.1.1.4 MAC address.

All TCP network traffic contains the IP address and the MAC address of the network adapter. In this situation, the address 10.1.1.1 can be sent with the MAC address of any one of the network adapters. This is a valid configuration on the iSeries server.

Some intelligent switches, such as the Cisco 6509 series, dynamically generate a route table, which includes not only the IP address of each host but the MAC address of the adapter which owns the IP address. As a result, when the iSeries sends a frame with the IP address of 10.1.1.1 and the MAC address from the 10.1.1.4 adapter, the switch purges the entries for both adapters from its internal table assuming that both are in error. The switch then sends an ARP broadcast to generate new table entries. This creates two performance issues:

- ▶ Traffic inbound to the iSeries server is held at the switch, pending the update to its table.
- ▶ The ARP broadcast is repeated frequently, creating a network constraint.

## Identifying the problem

The following steps help you to determine if you are experiencing this problem. This issue cannot occur unless you have more than one active NIC.

1. Determine the number of active NICs on your system:
  - a. Start iSeries Navigator.
  - b. Expand **Network** → **TCP/IP Configuration** → **Lines**.

- c. One line corresponds to one NIC; count the number of active lines.
  - Do *not* count the line called LOOPBACK.
  - Confirm that the status of the line is *Active*.
  - Figure 9-11 shows only one active line. That means there is only one active NIC on this iSeries server at this time, and the problem cannot occur in this example. If multiple NICs are active, then you continue with the next step.

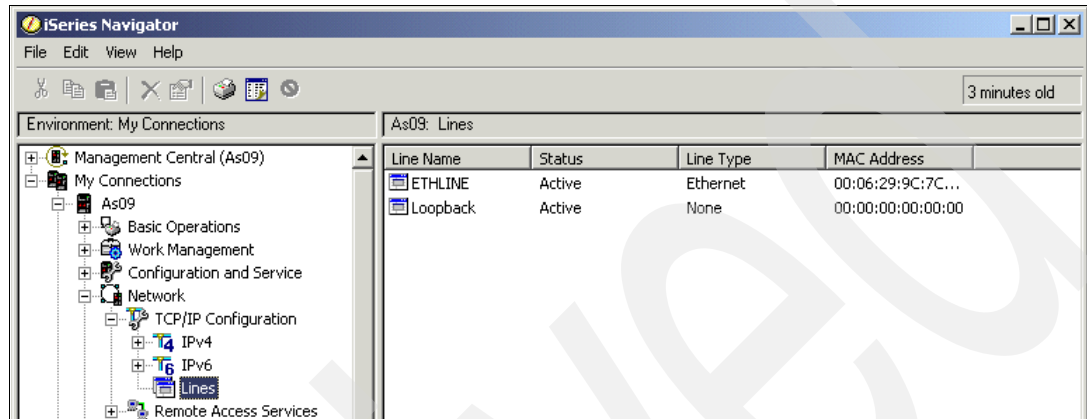


Figure 9-11 iSeries Navigator displaying active lines

2. If more than one NIC is active on the system, then you must check the TCP/IP routes and see if they are bound to specific interfaces. This issue cannot occur if each active NIC has its own preferred route defined.
  - a. Enter the Configure TCP/IP (CFGTCP) command in a 5250 emulation session.
  - b. Type option 2 (Work with TCP/IP Routes).

**Note:** The problem described in this section can occur at your site if you have multiple active NICs, but only one configured route for all interfaces as shown in Figure 9-10.

3. Determine if your hardware (router or switch) is configured to use dynamic route tables. Each router or switch is different, so you might have to ask your network administrator. If the router or switch is configured to use dynamic route tables, then you can experience this problem. If your router or switch is using static route tables or does not store the Media Access Control (MAC) address, then this issue is not occurring.
4. Even if your configuration *can* experience this problem, it does not mean that you are experiencing performance problems because of it. To see how much this type of configuration is affecting your network performance, do a communications trace and look for ARP broadcasts and changing MAC addresses.
  - a. Start a communications trace using the Start Communication Trace (STRCMNTRC) CL command:

```
STRCMNTRC CFGOBJ(ETHLINE) CFGTYPE(*LIN) MAXSTG(16M) USRDTA(*CALC)
```

The CFGOBJ parameter is the name of one of the active lines that you found in step 1.

**Notes:** You might have to run a trace on each active line to look for this problem. Do *not* trace the LOOPBACK line.

- b. Let the trace run for a few minutes and then end it using the End Communication Trace (ENDCMNTRC) CL command:

```
ENDCMNTRC CFGOBJ(ETHLINE) CFGTYPE(*LIN)
```

- c. Print the communications trace with the Print Communication Trace (PRTCMNTRC) CL command:

```
PRTCMNTRC CFGOBJ(ETHLINE) CFGTYPE(*LIN) CODE(*ASCII) SLTCTLD(*ALL) FMTTCP(*YES)
FMTBCD(*YES)
```

Notice that the data is formatted for TCP/IP and Broadcast data.

- d. Review the communications trace and look for:

- A high number of ARP broadcasts
- Changing MAC addresses in a single conversation

You can use the following command and select option 5 to display the QPCSMPT file that contains the communications trace data:

```
WRKJOB OPTION(*SPLF)
```

- e. To find ARP broadcasts, search for the word ARP (all uppercase letters). Use the Find field and the F16 key to search the spool file.

- f. Count the number of times that an ARP broadcast occurs in your trace.

Use your own judgment to determine if you are seeing too many ARP broadcasts. For example, if you run a three-minute trace and count 50 ARP broadcasts, then consider changing your TCP/IP configuration to fix this problem.

Figure 9-12 shows an example of an ARP broadcast in an iSeries communications trace.

| Display Spooled File                                             |        |      |            |                      |                                                |             |                    |              |  |
|------------------------------------------------------------------|--------|------|------------|----------------------|------------------------------------------------|-------------|--------------------|--------------|--|
| File                                                             | .....  | :    | QPCSMPT    |                      |                                                |             | Page/Line          | 20/31        |  |
| Control                                                          | .....  | :    |            |                      |                                                |             | Columns            | 1 - 78       |  |
| Find                                                             | .....  | :    | <u>ARP</u> |                      |                                                |             |                    |              |  |
| *...+...1...+...2...+...3...+...4...+...5...+...6...+...7...+... |        |      |            |                      |                                                |             |                    |              |  |
|                                                                  | 70     | S    | 40         | 13:33:53.49525       |                                                |             | 00000C07AC01       | 0006299C7C99 |  |
|                                                                  |        |      |            | Frame Type :         | IP                                             |             | DSCP: 0            | Length: 4    |  |
|                                                                  |        |      |            |                      | Src Addr: 10.1.1.14                            |             |                    | Dest Addr: 1 |  |
|                                                                  |        |      |            | IP Options :         | NONE                                           |             |                    |              |  |
|                                                                  |        |      |            | TCP . . . :          | Src Port: 80,Unassigned                        |             | Dest Port:         |              |  |
|                                                                  |        |      |            |                      | SEQ Number: 0 ('00000000'X)                    |             | ACK                |              |  |
|                                                                  |        |      |            |                      | Code Bits: ACK RST                             |             | Window             |              |  |
|                                                                  | 71     | R    | 50         | 13:33:58.13039       |                                                |             | FFFFFFFFFFFF       | 0004AC5EB196 |  |
|                                                                  |        |      |            | Frame Type :         | ARP                                            |             | Src Addr: 10.1.1.5 | D            |  |
|                                                                  |        |      |            | ARP Header :         | 00010800060400010004AC5EB19609055C2F000000     |             |                    |              |  |
|                                                                  |        |      |            | Data . . . . . :     | 0000000000000000 0000000000000000 000036CA5863 |             |                    |              |  |
|                                                                  |        |      |            | COMMUNICATIONS TRACE | Title:                                         |             |                    | 11/11/05     |  |
|                                                                  | Record | Data | Record     |                      | Controller                                     | Destination | Source             |              |  |
|                                                                  | Number | S/R  | Length     | Timer                | Name                                           | MAC Address | MAC Address        |              |  |
|                                                                  |        |      |            |                      |                                                |             | More...            |              |  |
| F3=Exit F12=Cancel F19=Left F20=Right F24=More keys              |        |      |            |                      |                                                |             |                    |              |  |

Figure 9-12 Example of an ARP broadcast in a communications trace

- g. To identify a changing MAC address, search for a conversation on the port that is providing the communication service. In this example, we use port 1352, which is used by Lotus Domino.



Search for 1352 followed by a comma. Use the Find field and F16 to follow a conversation and watch the MAC addresses.

Figure 9-13 shows an example of a conversation where the source MAC address is changing even though the source IP address is the same.

**Tip:** Communications traces can be difficult to read. An option in the IBM Support Library Tools (QSPTLIB) can take a communications trace and break out a single conversation. Use option 6 of the QSPTLIB/CMTMENU menu or the QSPTLIB/EXTTCPTRC command to extract TCP/IP trace information.

You can order the IBM Support Library Tools for OS/400 as PTF SE16633 for V5R3M0. Follow the instructions received with the download to restore the library to your iSeries server.

If you are not using the QSPTLIB tools, keep in mind the following points:

- ▶ A single conversation is defined by the port pair (that is the source port and the destination port) and the source and destination addresses. In Figure 9-13, the port pair is 1352 and 3853.
- ▶ To determine if the MAC address is changing, you must find two packets that are sent from the iSeries in a *single* conversation to the same destination that has different source MAC addresses. In Figure 9-13, notice that:
  - The two packets are in the same conversation (port pair: 1352/3853) and are both going in the same direction (source address for both packets: 10.1.1.4, which is the iSeries in this example).
  - The Source MAC address for those two packets is different; one is 000944AF54BC, and one is 00000C07AC01.

| Display Spooled File                                            |                                      |              |                            |               |               |      |
|-----------------------------------------------------------------|--------------------------------------|--------------|----------------------------|---------------|---------------|------|
| File . . . . .                                                  | QPCSMPT                              |              |                            | Page/Line     | 22/4          |      |
| Control . . . . .                                               |                                      |              |                            | Columns       | 23 - 100      |      |
| Find . . . . .                                                  | <u>1352,</u>                         |              |                            |               |               |      |
| ..+...3...+...4...+...5...+...6...+...7...+...8...+...9...+...0 |                                      |              |                            |               |               |      |
| Record                                                          | Controller                           | Destination  | Source                     | Frame         | Numb          |      |
| Timer                                                           | Name                                 | MAC Address  | MAC Address                | Format        | Command       | Sent |
| -----                                                           |                                      |              |                            |               |               |      |
| 13:34:02.14924                                                  |                                      | 0006299C7C99 | <b>000944AF54BC</b>        | ETHV2         | Type: 0800    |      |
| Frame Type :                                                    | IP                                   | DSCP: 0      | Length: 40                 | Protocol: TCP |               |      |
|                                                                 | Src Addr: 10.1.1.4                   |              | Dest Addr: 10.1.1.16       | Fra           |               |      |
| IP Options :                                                    | NONE                                 |              |                            |               |               |      |
| TCP . . . :                                                     | Src Port: 1352,Unassigned            |              | Dest Port: 3853,Unassigned |               |               |      |
|                                                                 | SEQ Number: 1276843135 ('4C1B147F'X) |              | ACK Number: 1771096846 ('  |               |               |      |
|                                                                 | Code Bits: ACK                       |              | Window: 65340              |               | TCP Option: N |      |
| 13:34:02.20190                                                  |                                      | 0006299C7C99 | <b>00000C07AC01</b>        | ETHV2         | Type: 0800    |      |
| Frame Type :                                                    | IP                                   | DSCP: 0      | Length: 158                | Protocol: TCP |               |      |
|                                                                 | Src Addr: 10.1.1.4                   |              | Dest Addr: 10.1.1.16       | Fra           |               |      |
| IP Options :                                                    | NONE                                 |              |                            |               |               |      |
| TCP . . . :                                                     | Src Port: 1352,Unassigned            |              | Dest Port: 3853,Unassigned |               |               |      |
|                                                                 | SEQ Number: 1276843135 ('4C1B147F'X) |              | ACK Number: 1771096846 ('  |               |               |      |
|                                                                 | Code Bits: ACK PSH                   |              | Window: 8192               |               | TCP Option: N |      |

Figure 9-13 Example of a changing MAC address in a conversation

## Fixing the problem

If you determine that ARP storms are happening on your system and they are affecting your network performance, then you must change the TCP/IP routing to fix this problem. There are two methods to correct this problem (you must only use one method):

- ▶ Change the router or switch to use static entries for the system. By creating static entries, the device never purges its table, thus avoiding the performance issues.
- ▶ Change the TCP/IP configuration on the iSeries server so that each active NIC has its own preferred route. Run the Add TCP/IP Route (ADDTCPRTE) CL command to create a TCP/IP route for each interface:

```
ADDTCPRTE RTEDEST(*DFTRROUTE) SUBNETMASK(*NONE) NEXTHOP('10.1.1.5') BINDIFC('10.1.1.2')
```

**Note:** Adding the additional TCP/IP routes is the preferred method for solving ARP storms.

Figure 9-14 shows an example of preferred bindings on the Work with TCP/IP Routes display.

| Work with TCP/IP Routes                                         |                   |               |                             |                     |
|-----------------------------------------------------------------|-------------------|---------------|-----------------------------|---------------------|
| Type options, press Enter.<br>1=Add 2=Change 4=Remove 5=Display |                   |               |                             | System: RCHAS12     |
| Opt                                                             | Route Destination | Subnet Mask   | Next Hop                    | Preferred Interface |
|                                                                 | *DFTRROUTE        | *NONE         | 10.1.1.5                    | 10.1.1.1            |
|                                                                 | *DFTRROUTE        | *NONE         | 10.1.1.5                    | 10.1.1.2            |
|                                                                 | *DFTRROUTE        | *NONE         | 10.1.1.5                    | 10.1.1.3            |
|                                                                 | *DFTRROUTE        | *NONE         | 10.1.1.5                    | 10.1.1.4            |
|                                                                 |                   |               |                             | Bottom              |
| F3=Exit                                                         | F5=Refresh        | F6=Print list | F11=Display type of service |                     |
| F12=Cancel                                                      | F17=Top           | F18=Bottom    |                             |                     |

Figure 9-14 CFGTCP option 2 with preferred bindings

## 9.5 Workplace Services Express tuning

Workplace Services Express performance can be impacted in a number of different ways. This section shows you how to:

- ▶ Optimize startup times by using a classloader cache file
- ▶ Tune the WebSphere Portal server associated with your Workplace Services Express server
- ▶ Take advantage of Edge Side Include (ESI) caching
- ▶ Use XVFB to improve document rendering services

**Note:** Many of the tuning adjustments discussed in this section will be applied automatically by a Workplace Services Express deployment script in a future release of the Workplace Services Express product.

## 9.5.1 Startup performance tuning

The startup time of the Workplace Services Express server can be improved by making caching changes to the JVM environment. In our lab environment, this change reduced the overall startup time of the WebSphere\_Portal server from over 30 minutes to 10 to 12 minutes. The caching change involves two steps:

1. Creating a Classloader Cache file on the i5/OS file system
2. Configuring the Workplace JVMs to use the classloader cache file

For more information about the classloader cache, reference page 4 of the *Basic Java Performance for iSeries* guide, which is available on the Web at:

<http://www.ibm.com/servers/eserver/iseries/perfmgmt/pdf/BasicJavaPerf.pdf>

### Creating a classloader cache file on the i5/OS file system

The first step in improving the startup times of a Workplace Services Express server is to create the classloader cache file. This file resides in the integrated file system on the i5/OS. The classloader cache is a feature that allows the JVM to remember classes that have been loaded with user classloaders. This feature improves the startup performance of classes loaded by user classloaders. It allows Java programs created by user classloaders to be cached for reuse, avoiding Java program creation and bytecode verification during the initial class loading.

You must select a location for the classloader cache file. We recommend that you do not place the classloader cache file in a temporary directory, because it might get deleted. In our example, we created the classloadercache.jar file in a directory called */cache*.

The following steps explain how to create this file from the Qshell environment on the iSeries server.

**Note:** You must only create the classloader cache file one time on an iSeries server because multiple Workplace Services Express servers can use this file.

1. From an i5/OS command line, run the STRQSH command to access the Qshell environment.
2. Switch to the directory where the JAR file will reside. Make the directory first using the `mkdir` command if necessary.

```
mkdir /cache
cd /cache
```

3. Create a dummy file to place the JAR file. The name can be anything; we used *example*:

```
touch example
```

4. Build the JAR file using the `jar` command. In this example, we create a .jar file called classloadercache.jar:

```
jar -cf classloadercache.jar example
```

5. Clean up the dummy file that was created using the **touch** command from step 3.

```
rm example
```

Figure 9-15 shows the results of these commands from within Qshell.

```
QSH Command Entry

$
> mkdir /cache
$
> cd /cache
$
> touch example
$
> jar -cf classloadercache.jar example
$
> rm example
$

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

Figure 9-15 Creating the *classloadercache.jar* file from Qshell environment

6. Press F3 to exit Qshell.

The *classloadercache.jar* file is now created on the i5/OS file system and is ready for use by the Workplace Services Express server or servers. We recommend that you change the ownership of this file to the QEJBSVR profile. Use the Change Owner (CHGOWN) CL command to change the ownership:

```
CHGOWN OBJ('/cache/classloadercache.jar') NEWOWN(QEJBSVR)
```

## Configuring the JVMs to use the classloader cache

Now that the classloader cache file has been created, we must enable its use in the JVMs that will be used by the Workplace Services Express servers. You use the WebSphere Application Server Administrative Console to enable the Workplace JVMs to use the classloader cache.

In this section you define new Java system properties that is set in the memory of this JVM to improve startup performance of the Websphere\_Portal server. You define the following properties:

- ▶ **os400.define.class.cache.file** is required to enable the Java user classloader cache function. This property is set to the full path name of a valid .jar file that holds the Java program objects. This is the classloader cache file that you created in “Creating a classloader cache file on the i5/OS file system” on page 277.
- ▶ **os400.define.class.cache.hours** specifies how long an unused Java program persists in the cache. When the timeout is reached, the Java program is removed from the class. This value is specified in an interval of hours.
- ▶ **os400.define.class.cache.maxpgms** specifies the maximum number of Java programs that the cache can hold. When the value specified is reached, the least recently accessed Java program is replaced.

To define these new properties, perform the following steps:

1. Open the WebSphere Application Server Administrative Console for the Workplace Services Express server. For details, see 5.6, “Accessing the WebSphere Application Server Administrative Console” on page 127.
2. Log in as the Workplace Services Express administrator.
3. Navigate to the **Servers** → **Application Servers** view as shown in Figure 9-16.

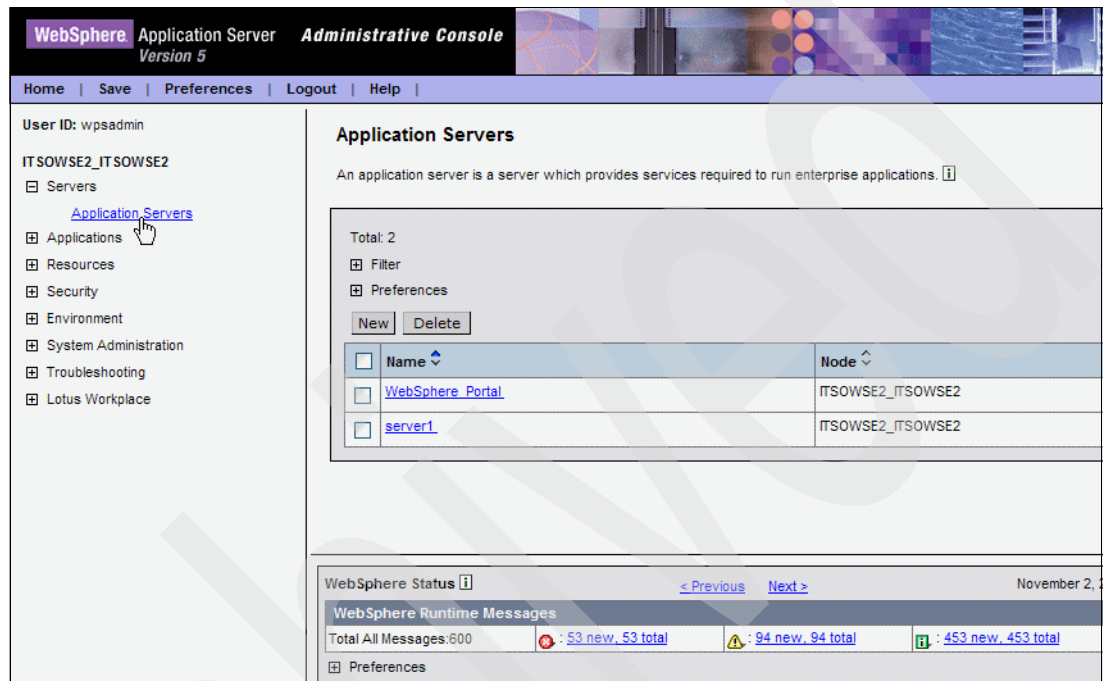


Figure 9-16 WebSphere Application Server Administrative Console

4. In the right pane, select the **WebSphere\_Portal** server. See Figure 9-17.

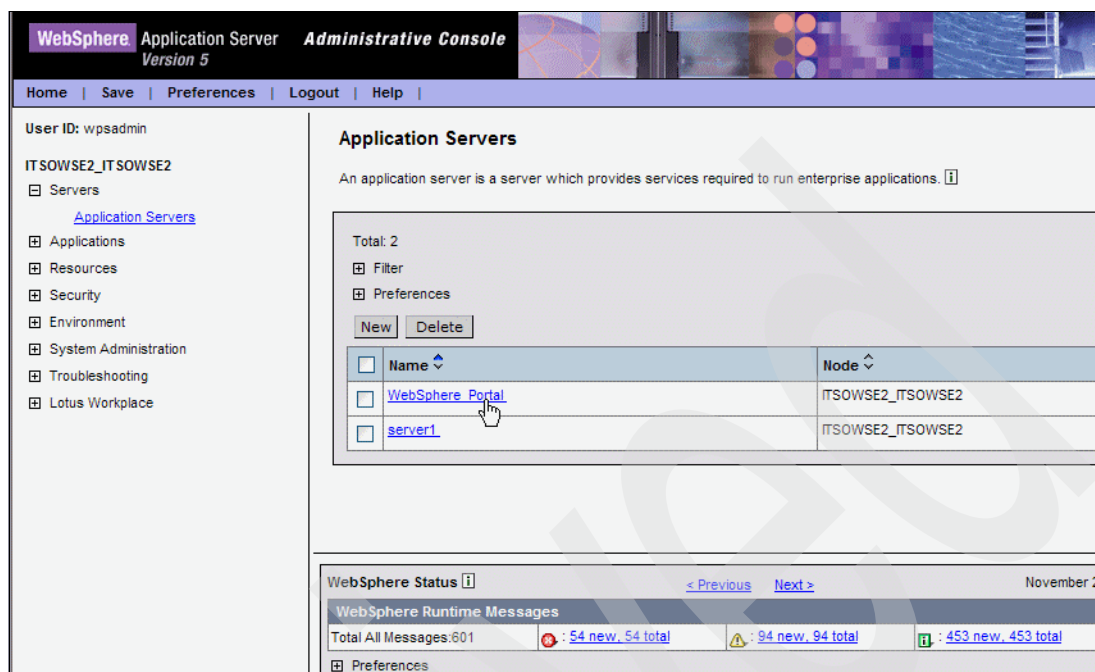


Figure 9-17 Selecting the WebSphere\_Portal server

5. In the WebSphere\_Portal pane, scroll down to the Additional Properties section and select **Process Definition** as shown in Figure 9-18.

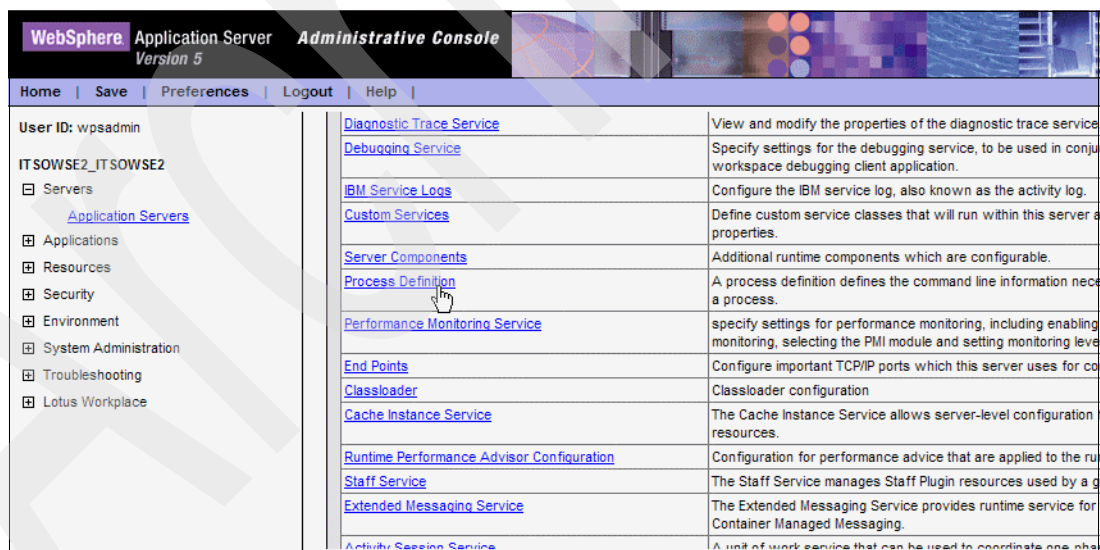


Figure 9-18 Selecting the Process Definition property

6. In the Process Definition pane, under the Additional Properties section, select **Java Virtual Machine** as shown in Figure 9-19.

| Additional Properties                |                                                                                                                                 |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Java Virtual Machine</a> | Advanced Java virtual machine settings.                                                                                         |
| <a href="#">Process Execution</a>    | A set of properties that control how the operating system process executes, such as RunAs permissions, Umask, process priority. |
| <a href="#">Process Logs</a>         | A set of properties that control how the process native input/output streams are directed.                                      |
| <a href="#">Environment Entries</a>  | A list of settings to be added to the execution environment for the process.                                                    |
| <a href="#">Monitoring Policy</a>    | A set of properties that control how the process is monitored by the node agent.                                                |
| <a href="#">Logging and Tracing</a>  | Specify Logging and Trace settings for this server.                                                                             |

Figure 9-19 Selecting the Java Virtual Machine property

7. In the Java Virtual Machine pane, under the Additional Properties section, select **Custom Properties** as shown in Figure 9-20.

| Additional Properties             |                                                              |
|-----------------------------------|--------------------------------------------------------------|
| <a href="#">Custom Properties</a> | Java system properties to be set in the memory for this JVM. |

Figure 9-20 Selecting Custom Properties

8. You now add the following three Java system properties that will be associated with the JVM for this WebSphere\_Portal server:
  - os400.define.class.cache.file
  - os400.define.class.cache.hours
  - os400.define.class.cache.maxpgms
  - a. Click the **New** button to define a new custom property.
  - b. Set the following Name and Value parameters as shown in Figure 9-21 and click **OK**.
 

Name: os400.define.class.cache.file  
Value: /cache/classloadercache.jar

The screenshot shows the WebSphere Administrative Console interface. On the left is a navigation tree with 'Application Servers' selected. The main pane shows the breadcrumb path: 'Application Servers > WebSphere\_Portal > Process Definition > Java Virtual Machine > Custom Properties > New'. Below this is a 'Configuration' tab with a 'General Properties' section. It contains three rows: 'Name' with the value 'os400.define.class.cache.file', 'Value' with the value '/cache/classloadercache.jar', and 'Description' which is empty. To the right of each row is a small information icon with a tooltip. At the bottom of the dialog are buttons for 'Apply', 'OK', 'Reset', and 'Cancel'.

Figure 9-21 Defining the new custom property for os400.define.class.cache.file

- c. Under Additional Properties, select **Custom Properties** (see Figure 9-20).
  - d. Click the **New** button to define a new custom property.

- e. Set the following Name and Value parameters as shown in Figure 9-22 and click **OK**.

Name: os400.define.class.cache.hours

Value: 168

The screenshot shows the WebSphere Administrative Console interface. On the left is a navigation tree with 'Application Servers' selected. The main panel displays the 'New' configuration page for a custom property. The 'General Properties' section contains three fields: 'Name' with the value 'os400.define.class.cache.hours', 'Value' with the value '168', and 'Description' which is empty. Each field has a help icon to its right. At the bottom are buttons for 'Apply', 'OK', 'Reset', and 'Cancel'.

Figure 9-22 Defining the new custom property for os400.define.class.cache.hours

- f. Under Additional Properties, select **Custom Properties** (see Figure 9-20).  
g. Click the **New** button to define a new custom property.  
h. Set the following Name and Value parameters as shown in Figure 9-23 and click **OK**.

Name: os400.define.class.cache.maxpgms

Value: 40000

The screenshot shows the WebSphere Administrative Console interface, similar to Figure 9-22. The 'Name' field is set to 'os400.define.class.cache.maxpgms' and the 'Value' field is set to '40000'. The 'Description' field is empty. The 'Apply', 'OK', 'Reset', and 'Cancel' buttons are at the bottom.

Figure 9-23 Defining the new custom property for os400.define.class.cache.maxpgms



- i. Click **Save** to save and apply the changes to the master configuration file as shown in Figure 9-24.

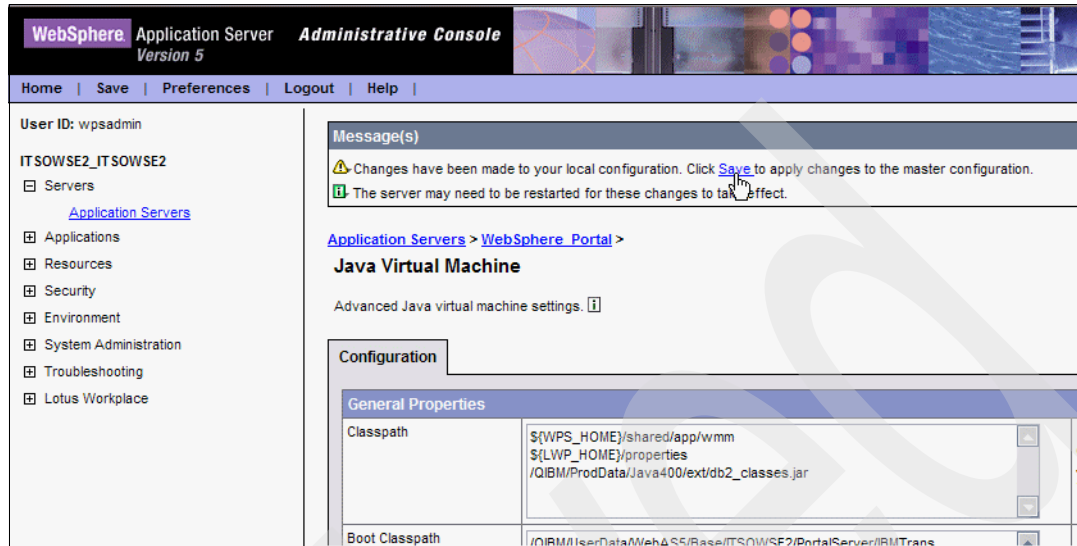


Figure 9-24 Applying the changes to the master configuration

9. Click **Save** as shown in Figure 9-25 to save the changes to the master configuration.

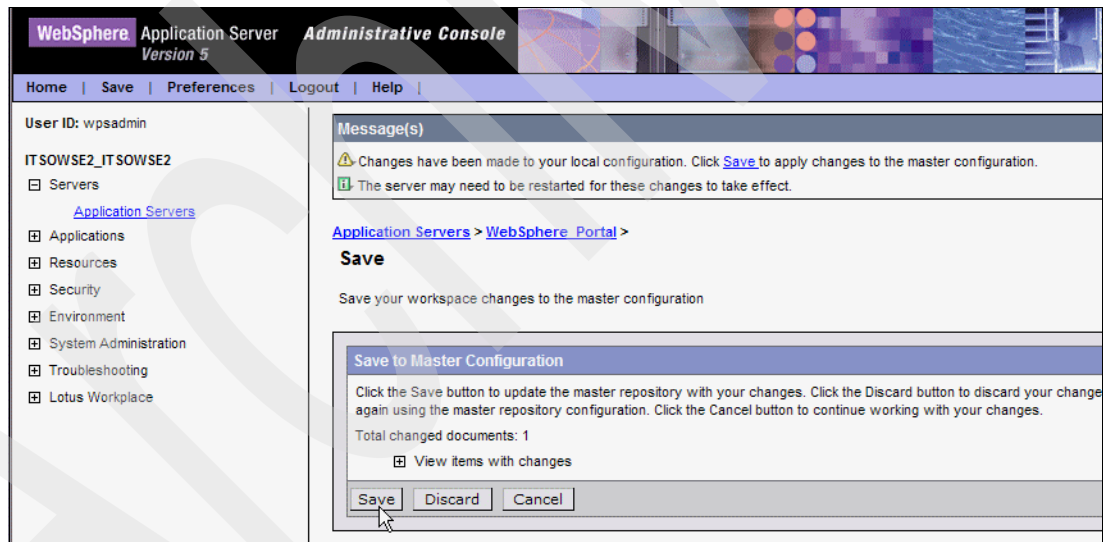


Figure 9-25 Saving the changes to the master configuration

10. Stop and restart the WebSphere\_Portal server to enable the custom properties that you just created. Refer to 5.1, "Starting and stopping a Workplace Services Express server" on page 106, for details.

### Verifying the classloader cache file is being used

When the WebSphere\_Portal server is restarted, the JVM in which it is running uses the new properties that you just created. Any typos in the properties that you added cause them to not be used by the WebSphere\_Portal server's JVM. To verify that the JVM is really using the classloader cache file that you created and have now pointed the WebSphere\_Portal server to, use the Display Java Program Information (DSPJAVPGM) CL command:

```
DSPJAVPGM CLSF('/cache/classloadercache.jar')
```

Figure 9-26 shows an example of displaying the information for this file. The key value to observe is the number associated with Java programs. The value here should grow as the Workplace Services Express server's portal server starts and user activity begins.

**Note:** Displaying the classloader cache file from the i5/OS is not dynamically updated. Exit and display the file again to view updated statistics.

```

 Display Java Program Information
File name : /cache/classloadercache.jar
Owner : QJBSVR

Java program creation information:
File change date/time : 11/01/05 17:15:22
Java program creation date/time : 11/02/05 15:52:49
Java programs : 5765
Total classes in source : 0
Classes with current Java programs : 0
Classes without current Java programs : 0
Classes containing errors : 0
Optimization : *INTERPRET
Enable performance collection : *NONE
Use adopted authority : *NO
User profile : *USER

More...

Press Enter to continue.

F3=Exit F12=Cancel F22=Display entire field
(C) COPYRIGHT IBM CORP. 1980, 2003.

```

Figure 9-26 Display Java Program Information

## 9.5.2 Workplace Services Express portal tuning

The critical elements that you should address to optimize the Workplace Services Express portal server include:

- ▶ Connection pools
- ▶ WebSphere Portal server settings
- ▶ Statement cache size

We examine each of these tuning elements in the sections that follow.

### Connection pools

This section focuses on setting the minimum and maximum connections in each of the connection pools. The minimum and maximum connection pool values that are changed in this section from the WebSphere Application Server Administrative Console are listed in Table 9-7, Table 9-8, and Table 9-9. These are *initial* values that you should use as starting points. We recommend that you do *not* keep the minimum connections at the default value of 1 when running on i5/OS.

You adjust the connection pool minimum and maximum settings for the following JDBC providers:

- ▶ lwp25JDBC
- ▶ wpcp50JDBC
- ▶ wps50JDBC

**Note:** Monitor the initial recommended values and adjust them to optimize performance in your specific Workplace Services Express environment.

Table 9-7 shows the recommended maximum and minimum connection pool sizes for the lwp25JDBC provider. The Default value max/min column lists the default setting for the values, and the Recommended value max/min column lists the recommended initial setting.

*Table 9-7 Recommended initial values for the lwp25JDBC provider*

| Connection pool value                                                            | Default value max/min | Recommended value max/min |
|----------------------------------------------------------------------------------|-----------------------|---------------------------|
| Resources → JDBC Providers → lwp25JDBC → Data Sources → lwpApp → Connection Pool | 40/1                  | 50/50                     |

Table 9-8 lists the maximum and minimum connection pool sizes for the wpcp50JDBC provider.

*Table 9-8 Recommended initial values for the wpcp50JDBC JDBC provider*

| Connection pool value                                                                             | Default value max/min | Recommended value max/min |
|---------------------------------------------------------------------------------------------------|-----------------------|---------------------------|
| Resources → JDBC Providers → wpcp50JDBC → Data Sources → feedback5 → Connection Pool              | 10/1                  | 50/30                     |
| Resources → JDBC Providers → wpcp50JDBC → Data Sources → wpcpdfds → Connection Pool               | 10/1                  | 50/30                     |
| Resources → JDBC Providers → wpcp50JDBC → Data Sources (Version 4) → feedbackDS → Connection Pool | 30/1                  | 50/30                     |
| Resources → JDBC Providers → wpcp50JDBC → Data Sources (Version 4) → persDS → Connection Pool     | 30/1                  | 50/30                     |
| Resources → JDBC Providers → wpcp50JDBC → Data Sources (Version 4) → wcmDS → Connection Pool      | 30/1                  | 64/64                     |

Table 9-9 shows the recommended maximum and minimum connection pool settings for the wps50JDBC provider.

*Table 9-9 Recommended initial values for the wps50JDBC JDBC provider*

| Connection pool value                                                             | Default value max/min | Recommended value max/min |
|-----------------------------------------------------------------------------------|-----------------------|---------------------------|
| Resources → JDBC Providers → wps50JDBC → Data Sources → wmmDS → Connection Pool   | 10/1                  | 50/30                     |
| Resources → JDBC Providers → wps50JDBC → Data Sources → wps50DS → Connection Pool | 10/1                  | 50/50                     |

The WebSphere Application Server Administrative Console is used to access the connection pool settings for the Workplace Services Express server.

**Important:** Changes to the connection pool settings require that you restart the Workplace Services Express server to enable them.

Perform the following steps to set the recommended initial values of the connection pools:

1. Open the WebSphere Application Server Administrative Console for the Workplace Services Express server. For details, see 5.6, “Accessing the WebSphere Application Server Administrative Console” on page 127.
2. Log in as the Workplace Services Express administrator.
3. Under the Workplace Services Express server, expand the **Resources** view and select **JDBC Providers** as shown in Figure 9-27.

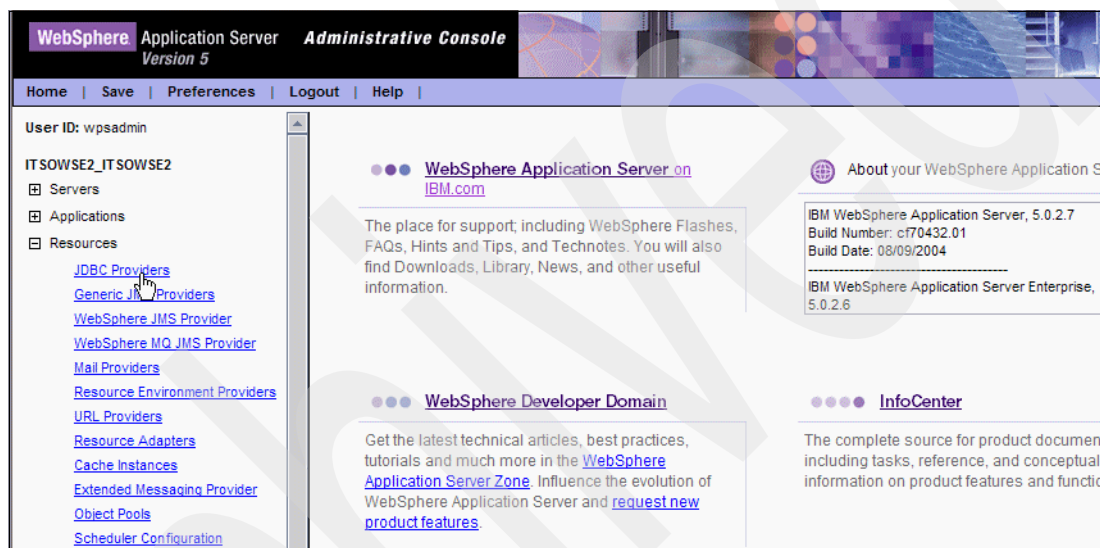


Figure 9-27 WebSphere Application Server Administrative Console

4. In the JDBC Providers pane, scroll down and click **lwp25JDBC** as shown in Figure 9-28.

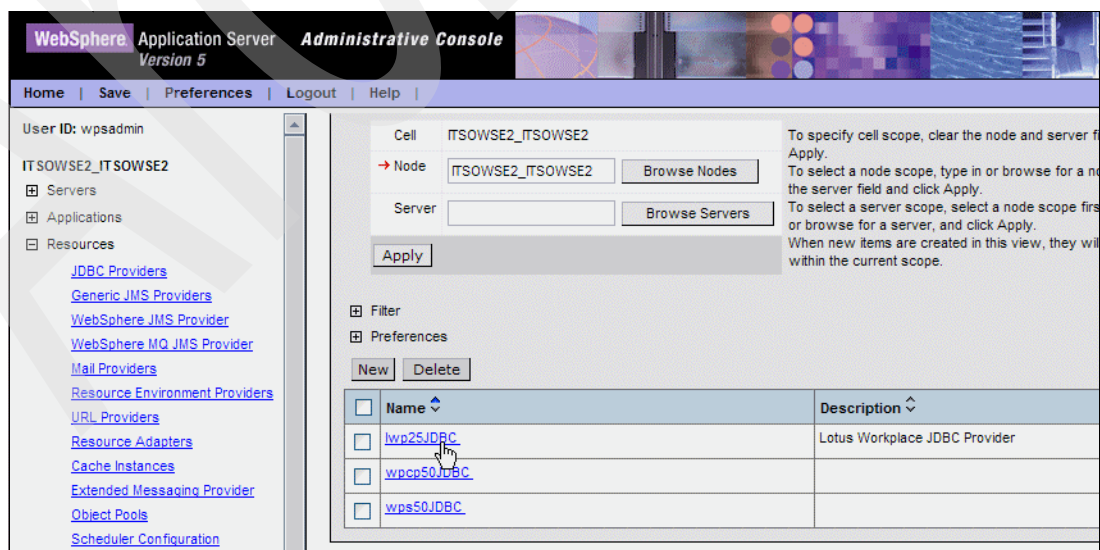


Figure 9-28 Selecting lwp25JDBC from the JDBC Providers pane

5. In the lwp25JDBC pane, under Additional Properties, select **Data Sources** (Figure 9-29).


| Additional Properties                    |                                                                                                                                                                                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Data Sources</a>             | Data Source is used by the application to access the data from the database. A data source is created under a JDBC provider which provides the specific JDBC driver implementation class. |
| <a href="#">Data Sources (Version 4)</a> | This is the WebSphere 4.x data source that uses the WebSphere old ConnectionManager architecture. All the EJB1.x modules must use this data source.                                       |

Figure 9-29 Selecting Data Sources under Additional Properties for lwp25JDBC


6. In the Data Sources pane, select **lwpApp** as shown in Figure 9-30.


JDBC Providers > lwp25JDBC >

Data Sources

Data Source is used by the application to access the data from the database. A data source is created under a JDBC provider which provides the specific JDBC driver implementation class. 

Total: 1

 Filter

 Preferences

New

Delete

Test Connection





| <input type="checkbox"/> | Name  | JNDI Name  | Description  | Category  |
|--------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | <a href="#">lwpApp</a>                                                                 | jdbc/lwpApp                                                                                 | Workplace DataSource                                                                            |                                                                                              |

Figure 9-30 Selecting lwpApp under Resources → JDBC Providers → lwp25JDBC → Data Sources

7. In the lwpApp pane, under Additional Properties, select **Connection Pool** as shown in Figure 9-31.

| Additional Properties             |                                                                                                                                                                                                        |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Connection Pool</a>   | An optional set of connection pool settings.                                                                                                                                                           |
| <a href="#">Custom Properties</a> | Properties that may be required for Resource Providers and Resource Factories. For example, most database vendors require additional custom properties for data sources that will access the database. |

Figure 9-31 Selecting Connection Pool

8. Under General Properties, set both Max Connections and Min Connections to an initial value of 50 as shown in Figure 9-32. These values are represented in Table 9-7 on page 285.

**Note:** The value of 50 connections is used as a starting point and can be adjusted to meet a Workplace Services Express environment. We recommend that you do *not* keep the minimum connections at the default value of 1 when running on i5/OS.

The screenshot shows the WebSphere Administrative Console interface. On the left is a navigation tree with categories like Servers, Applications, and Resources. The main area displays the 'General Properties' for a connection pool. The properties are as follows:

| General Properties |                                                 |                                                                                   |
|--------------------|-------------------------------------------------|-----------------------------------------------------------------------------------|
| Scope              | cells:ITSOWSE2_ITSOWSE2:nodes:ITSOWSE2_ITSOWSE2 | <small>The scope of the configuration file.</small>                               |
| Connection Timeout | 1800 seconds                                    | <small>Interval, in seconds connection request time ConnectionWaitTimeout</small> |
| Max Connections    | 50 connections                                  | <small>The maximum number of ManagedConnections to this pool.</small>             |
| Min Connections    | 50 connections                                  | <small>The minimum number of ManagedConnections to be maintained.</small>         |
| Reap Time          | 180 seconds                                     | <small>Interval, in seconds pool maintenance thread</small>                       |
| Unused Timeout     | 1800 seconds                                    | <small>Interval, in seconds connection is discarded maintenance thread.</small>   |
| Aged Timeout       | 0 seconds                                       | <small>Interval, in seconds unused, aged connection</small>                       |

Figure 9-32 Setting the Min and Max Connections

9. Click **Apply** to begin the process of saving these values.
10. Click **Save** to save the values as shown in Figure 9-33.

The screenshot shows a message box with the following text:

**Message(s)**

- Changes have been made to your local configuration. Click [Save](#) to apply changes to the master configuration.
- The server may need to be restarted for these changes to take effect.

Below the message box is a breadcrumb trail: [JDBC Providers](#) > [lwp25JDBC](#) > [Data Sources](#) > [lwpApp](#) >

**Connection Pools**

Figure 9-33 Saving the changes

11. Click the **Save** button to complete the saving of the connection pool values to the master configuration as shown in Figure 9-34.

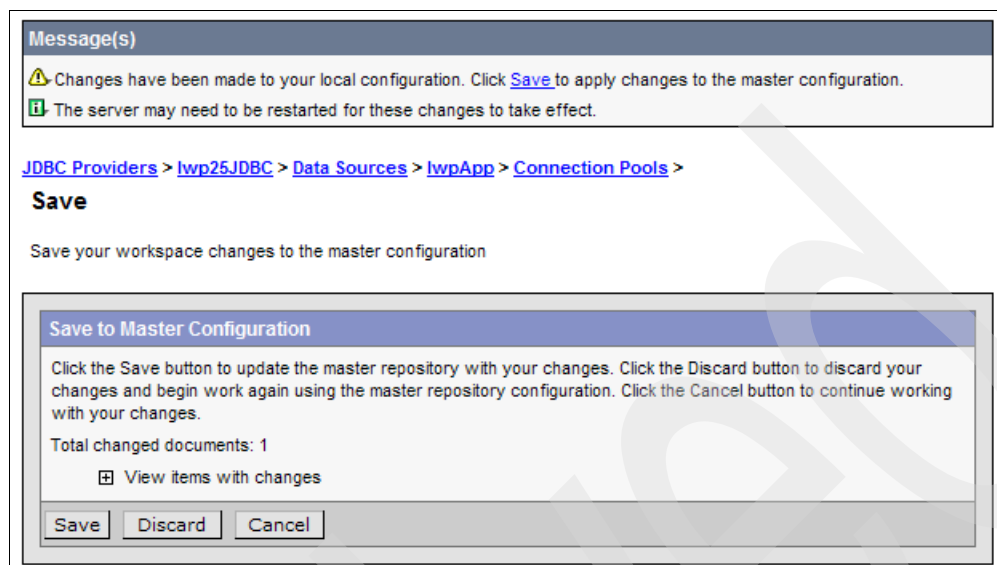


Figure 9-34 Saving the connection pool values to the master configuration

12. You return to the main page for the Workplace Services Express server that you are administering.
13. Under Resources, click **JDBC Providers** again as shown in Figure 9-27 on page 286.
14. Using Table 9-8 on page 285 as a guide, change the connection pool settings for the *wpcp50JDBC* JDBC provider.
15. Save the maximum and minimum wpcp50JDBC connection pool values.
16. Under Resources, click **JDBC providers** again. See Figure 9-27 on page 286.
17. Using Table 9-9 on page 285 as guide, change the connection pool settings for the *wps50JDBC* JDBC provider.
18. Save the minimum and maximum wps50JDBC connection pool values.

**Important:** Before you move on to the next step, *save* the changes made to each connection pool.

19. After all the connection pool values are changed, stop and restart the Workplace Services Express server.

After the new Connection Pool values are enabled, monitor the performance and adjust these values to meet your WorkPlace Services Express server environment needs. Use the Tivoli Performance Viewer to monitor performance. For details about how to use the Tivoli Performance Viewer, see “Monitoring performance with Tivoli Performance Viewer (TPV)” in the WebSphere Application Server Express Version 6.0.x Information Center at:

[http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.express.doc/info/exp/ae/tprf\\_tpvmonitor.html](http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.express.doc/info/exp/ae/tprf_tpvmonitor.html)



## WebSphere Portal server settings

This section discusses that recommended changes in the Workplace Services Express server to optimize performance when running on i5/OS. The WebSphere Application Server Administrative Console is used to set these values to begin optimizing performance. Table 9-10 provides the recommended WebSphere\_Portal values.

**Note:** Since the service *server1* is only used as a SOAP connection during the Workplace Services Express server configuration and for some administrative functions, we only document the *Websphere\_Portal* server changes here.

Table 9-10 WebSphere\_Portal recommended settings

| WebSphere_Portal server settings                                                                            | Default value min/max | Recommended value min/max |
|-------------------------------------------------------------------------------------------------------------|-----------------------|---------------------------|
| Server → Application Server → WebSphere_Portal → Web Container → Thread Pool                                | 10/50                 | 50/50                     |
| Server → Application Server → WebSphere_Portal → Logging and Tracing → IBM Service Logs → Message Filtering | Log all messages      | Log error                 |

After you log into the WebSphere Application Server Administrative Console, perform the following steps to set the initial recommended values.

1. Under the Workplace Services Express server, expand the **Servers** view and select **Application Servers** as shown in Figure 9-35.

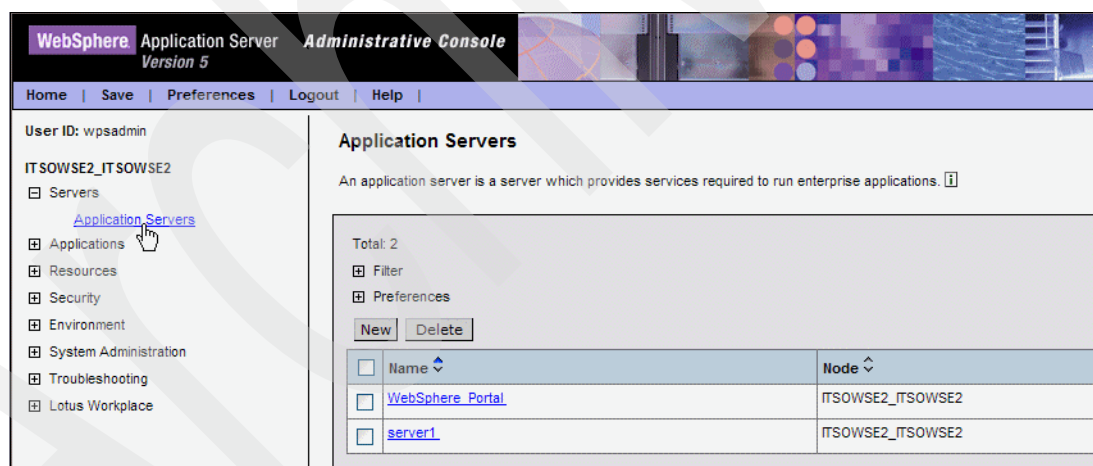


Figure 9-35 WebSphere Application Server Administrative Console



2. In the Application Servers pane (Figure 9-36), click **Websphere\_Portal** server.

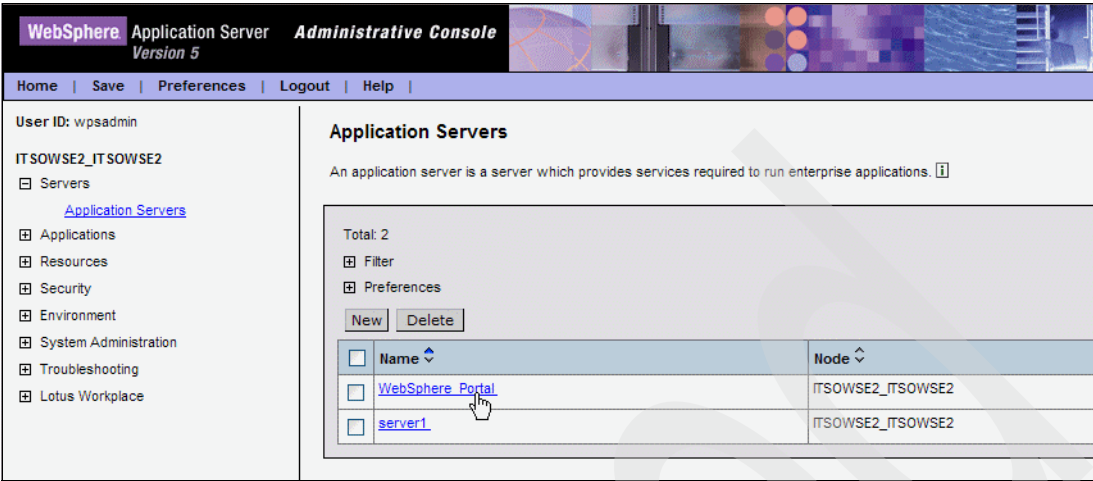


Figure 9-36 Selecting WebSphere\_Portal from Servers → Application Servers

3. In the WebSphere\_Portal pane, under the Additional Properties section, click **Web Container** (Figure 9-37).

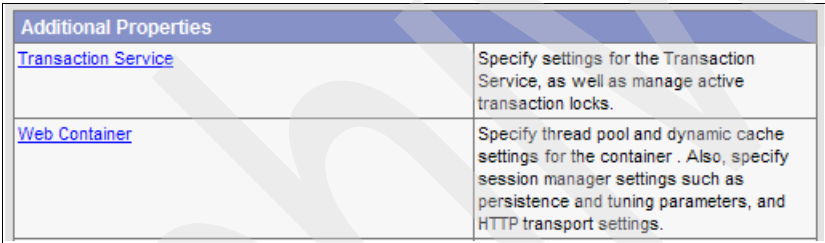


Figure 9-37 Selecting Web Container under Additional Properties

4. In the Web Container pane, under the Additional Properties section, click **Thread Pool** (Figure 9-38).

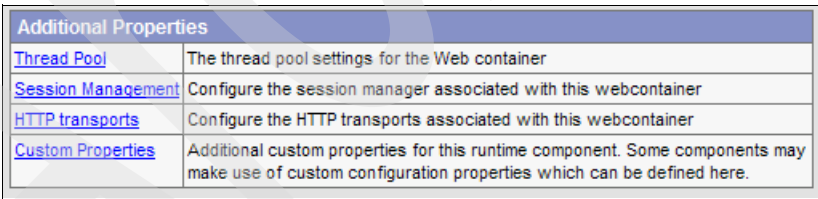



Figure 9-38 Selecting Thread Pool under Additional Properties

5. In the Thread Pool pane, under General Properties, set the Minimum and Maximum Size to 50. See Figure 9-39.

**Note:** The default maximum size for the thread pool is 50. You are not required to change this setting unless it was previously altered.

[Application Servers](#) > [WebSphere Portal](#) > [Web Container](#) >

### Thread Pool

A thread pool allows components of the server to reuse threads to eliminate the need to create new threads at runtime. Creating new threads is typically a time and resource intensive operation. 

Configuration



| General Properties |              |                                                                                                                                                   |
|--------------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| Minimum Size       | * 50 threads |  Specifies the minimum number of threads to allow in the pool. |
| Maximum Size       | * 50 threads |  Specifies the maximum number of threads to allow in the pool. |

Figure 9-39 Setting the Minimum and Maximum Size threads

6. Click **Apply** to begin the process of saving these values.
7. Click **Save** to continue saving the values. See Figure 9-33 on page 288 for an example.
8. Click the **Save** button to complete the saving of the Thread Pool Properties as shown in Figure 9-34 on page 289.
9. Navigate back to **Servers** → **Application Servers** → **Websphere\_Portal**.
10. In the WebSphere\_Portal pane, click **Logging and Tracing** (Figure 9-40).

| Additional Properties                 |                                                                                                                                                                                   |
|---------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Transaction Service</a>   | Specify settings for the Transaction Service, as well as manage active transaction locks.                                                                                         |
| <a href="#">Web Container</a>         | Specify thread pool and dynamic cache settings for the container . Also, specify session manager settings such as persistence and tuning parameters, and HTTP transport settings. |
| <a href="#">EJB Container</a>         | Specify cache and datasource information for the container.                                                                                                                       |
| <a href="#">Dynamic Cache Service</a> | Specify settings for the Dynamic Cache service of this server.                                                                                                                    |
| <a href="#">Logging and Tracing</a>   | Specify Logging and Trace settings for this server.                                                                                                                               |

Figure 9-40 Selecting Logging and Tracing for Websphere\_Portal

11. In the Logging and Tracing pane, click **IBM Service Logs** as shown in Figure 9-41.

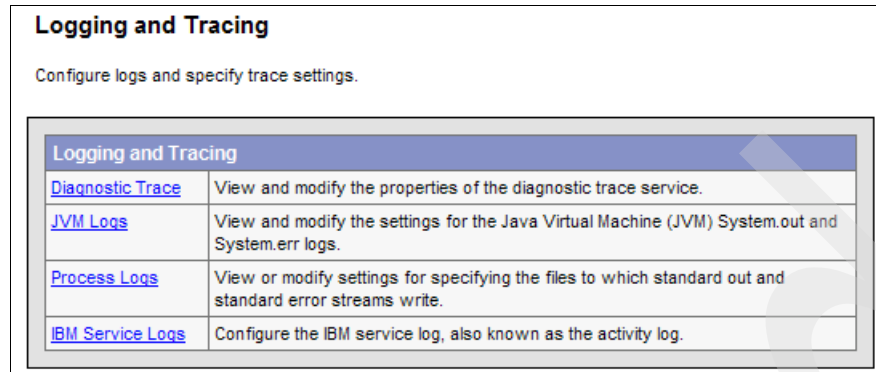


Figure 9-41 Selecting IBM Service Logs under Logging and Tracing

12. In the IBM Service Logs page, change the Message Filtering field from Log all messages to **Log error** as shown in Figure 9-42.

**Note:** Lowering the level of logging is a trade-off between optimizing performance and providing the necessary logging required in your operating environment. Consider this trade-off for each individual Workplace Services Express server prior to making the error logging change.

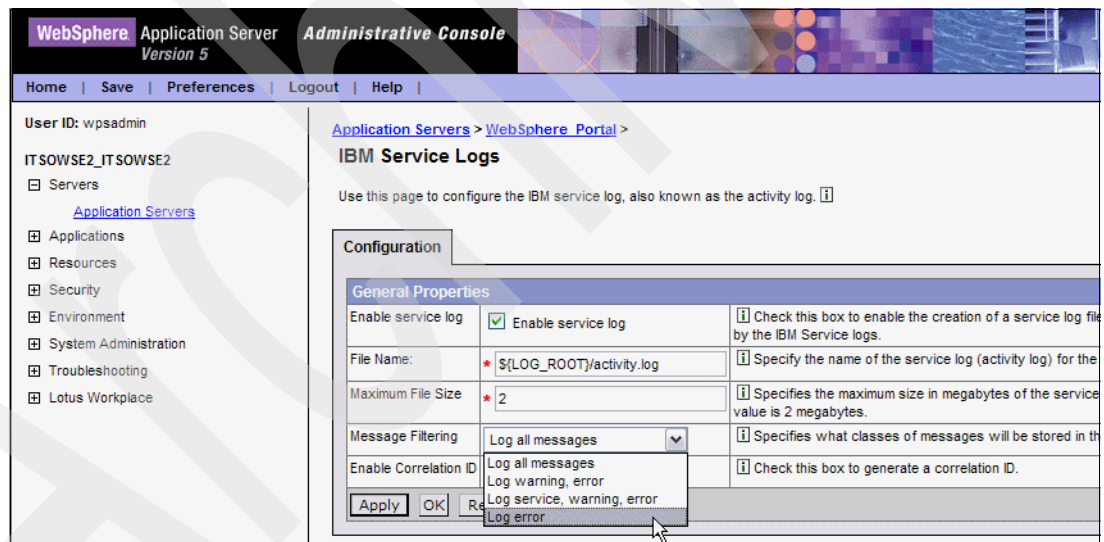


Figure 9-42 Setting the Message Filtering field to Log error

13. Click **Apply** to begin the process of saving these values.

14. Click **Save** to continue saving the values. See Figure 9-33 on page 288 as an example.

15. Click the **Save** button to complete the saving of the properties as shown Figure 9-34 on page 289.

16. Stop and restart the Websphere\_Portal server to enable these settings.

## Statement cache size

The statement cache is used to hold database queries that have gone through the prepare phase. The prepare phase is required so the database engine, DB2 Universal Database in our case, can parse the SQL text and perform the steps necessary to put the query into a form the database can understand. After a database query is prepared, it can be run over and over again without going through the prepare step. These prepared statements are placed in the statement cache, making it important that the size of the statement cache is set correctly.

For most implementations, you must increase the size of the default statement cache of a Workplace Services Express server. The actual increase varies by environment. The default statement cache size of 10 is typically too low for most production environments and therefore must be increased.

For details about how to determine whether you must increase the statement cache size on your Workplace Services Express server, refer to the white paper *Tuning the WebSphere Prepared Statement Cache*, which you can find on the Web at:

<http://www.ibm.com/servers/eserver/iseries/perfmgmt/pdf/stmntcache.pdf>

**Tip:** It is important to increase the statement cache size when the connection pool sizes are increased. You can monitor the statement cache by using the Tivoli Performance Viewer.

You can change the statement cache size from the WebSphere Application Server Administrative Console. After you log into the WebSphere Application Server Administrative Console, perform the following steps to set the initial recommended values:

1. Under the Workplace Services Express server, expand the **Resources** view and select **JDBC Providers**, as shown in Figure 9-27 on page 286.
2. In the JDBC Providers pane, scroll down and select **lwp25JDBC**. See Figure 9-43.

| <input type="checkbox"/> | Name ▾                     | Description ▾                 |
|--------------------------|----------------------------|-------------------------------|
| <input type="checkbox"/> | <a href="#">lwp25JDBC</a>  | Lotus Workplace JDBC Provider |
| <input type="checkbox"/> | <a href="#">wpcp50JDBC</a> |                               |
| <input type="checkbox"/> | <a href="#">wps50JDBC</a>  |                               |

Figure 9-43 Selecting lwp25JDBC from Resources → JDBC Providers

3. In the lwp25JDBC pane, under the Additional Properties section, click **Data Sources** (Figure 9-44).

| Additional Properties                    |                                                                                                                                                                                           |
|------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Data Sources</a>             | Data Source is used by the application to access the data from the database. A data source is created under a JDBC provider which provides the specific JDBC driver implementation class. |
| <a href="#">Data Sources (Version 4)</a> | This is the WebSphere 4.x data source that uses the WebSphere old ConnectionManager architecture. All the EJB1.x modules must use this data source.                                       |

Figure 9-44 Selecting Data Sources from JDBC Providers → lwp25JDBC

4. In the Data Sources page, click **lwpApp** (see Figure 9-45).

[JDBC Providers](#) > [lwp25JDBC](#) >

### Data Sources

Data Source is used by the application to access the data from the database. A data source is created under a JDBC provider which provides the specific JDBC driver implementation class. [i]

Total: 1

☐ Filter

☐ Preferences

| <input type="checkbox"/> | Name ▾                 | JNDI Name ▾ | Description ▾        | Category ▾ |
|--------------------------|------------------------|-------------|----------------------|------------|
| <input type="checkbox"/> | <a href="#">lwpApp</a> | jdbc/lwpApp | Workplace DataSource |            |

Figure 9-45 Selecting *lwpApp*

5. In the *lwpApp* pane, change the Statement Cache Size field to a higher value than the default of 10. The recommended starting value is 100. See Figure 9-46.

Statement Cache Size  statements

Figure 9-46 Changing the Statement Cache Size field

6. Click **Apply** to begin the process of saving these values.
7. Click **Save** to continue saving the values. See Figure 9-33 on page 288 for an example.
8. Click the **Save** button to complete the saving of the Statement Cache Size as shown in Figure 9-34 on page 289.
9. Stop and restart the Workplace Services Express server to enable the change.

### 9.5.3 Configuring Edge Side Include caching

This section explains how to enable the Web server plug-in containing the built-in Edge Side Include (ESI) processor. The ESI processor has the ability to cache whole pages, as well as fragments, providing a higher cache hit ratio. The cache implemented by the ESI processor is an in-memory cache, not a disk cache. Therefore, the cache entries are not saved when the Web server is restarted.

**Important:** The ESI cache is effective only while the Workplace Services Express server is running. If you restart the server, all pages must be recached.

For more information, refer to Configuring Edge Side Include caching in the Information Center on the Web at:

[http://publib.boulder.ibm.com/infocenter/wsphelp/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/ae/tprf\\_esiedgecaching.html](http://publib.boulder.ibm.com/infocenter/wsphelp/index.jsp?topic=/com.ibm.websphere.nd.doc/info/ae/ae/tprf_esiedgecaching.html)

We recommend that you end the Workplace Services Express server to enable the ESI processor. Perform the following steps to enable the ESI processor:

**Important:** If Secure Sockets Layer (SSL) is enabled, enabling the ESI processor is not supported and should be left disabled.

1. Stop the Workplace Services Express server. See 5.1, "Starting and stopping a Workplace Services Express server" on page 106, for details.
2. From an i5/OS command line, edit the plugin-cfg.xml file using the Edit File (EDTF) CL command. This file is in the /QIBM/UserData/WebAS5/base/*WSEServerName*/config/cells/directory of the integrated file system of the iSeries server. In this directory name, *WSEServerName* is the name of your Workplace Services Express server.

For example, to edit the plugin-cfg.xml file for the Workplace Services Express server called ITSOWSE2, run the following EDTF command:

```
EDTF '/QIBM/UserData/WebAS5/base/ITSOWSE2/config/cells/plugin-cfg.xml'
```

Figure 9-47 shows an example of the contents of this file.

**Note:** You are unable to edit the plugin-cfg.xml file from the iSeries Navigator interface.

```
Edit File: /qibm/userdata/webas5/base/itsowse2/config/cells/plugin-cfg.xml
Record : 1 of 359 by 8 Column : 1 91 by 74
Control :

CMD1.....2.....3.....4.....5.....6.....7.....+
*****Beginning of data*****
<?xml version="1.0" encoding="ISO-8859-1"?>
<Config ASDisableNagle="false" AcceptAllContent="false"
 AppServerPortPreference="HostHeader" ChunkedResponse="false"
 IISDisableNagle="false" IISPluginPriority="High"
 IgnoreDNSFailures="false" RefreshInterval="60"
 ResponseChunkSize="64" VHostMatchingCompat="false">
 <Log LogLevel="Error" Name="/QIBM/UserData/WebAS5/Base/ITSOWSE2/logs/ht
 <Property Name="ESIEnable" Value="false"/>
 <Property Name="ESIMaxCacheSize" Value="1024"/>
 <Property Name="ESIInvalidationMonitor" Value="false"/>
 <VirtualHostGroup Name="default_host">
 <VirtualHost Name="*:10222"/>
 <VirtualHost Name="*:80"/>
 <VirtualHost Name="*:10223"/>
 </VirtualHostGroup>
</Config>

F2=Save F3=Save/Exit F12=Exit F15=Services F16=Repeat find
F17=Repeat change F19=Left F20=Right
```

Figure 9-47 Editing the plugin-cfg.xml file

3. Find the parameter `<Property Name="ESIEnable" Value="false"/>` and change it to `<Property Name="ESIEnable" Value="true"/>`, as shown in Figure 9-48.
4. Adjust the value of the parameter that follows to `<Property Name="ESIMaxCacheSize" Value="1024"/>` also shown in Figure 9-48.

Set the `ESIMaxCacheSize` to a size that is large enough to hold statically served images and pages that the Workplace Services Express server will be serving up. If you have a lot

of statically served pages and images, increase the size upward from the default 1 Mb value.

**Note:** Refer to the article “Optimizing Static-File Serving in a WebSphere Application,” which contains information about how to set the ESI cache size. You can find this article on the Web at:

<http://www.eservercomputing.com/ME2/Audiences/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&AudID=1E8FEE745A284521B6CFB3FD70B49099&tier=4&id=54E37DA2F24341BC84C0F25B5A41218D>

```
Edit File: /qibm/userdata/webas5/base/itsowse2/config/cells/plugin-cfg.xml
Record : 1 of 359 by 8 Column : 1 91 by 74
Control :

CMD1.....2.....3.....4.....5.....6.....7.....
*****Beginning of data*****
<?xml version="1.0" encoding="ISO-8859-1"?>
<Config ASDisableNagle="false" AcceptAllContent="false"
 AppServerPortPreference="HostHeader" ChunkedResponse="false"
 IISDisableNagle="false" IISPluginPriority="High"
 IgnoreDNSFailures="false" RefreshInterval="60"
 ResponseChunkSize="64" VHostMatchingCompat="false">
 <Log LogLevel="Error" Name="/QIBM/UserData/WebAS5/Base/ITSOWSE2/logs/ht
 <Property Name="ESIEnable" Value="true"/>
 <Property Name="ESIMaxCacheSize" Value="1024"/>
 <Property Name="ESIInvalidationMonitor" Value="false"/>
 <VirtualHostGroup Name="default_host">
 <VirtualHost Name="*:10222"/>
 <VirtualHost Name="*:80"/>
 <VirtualHost Name="*:10223"/>

F2=Save F3=Save/Exit F12=Exit F15=Services F16=Repeat find
F17=Repeat change F19=Left F20=Right
```

Figure 9-48 Changing the plugin-cfg.xml file to enable ESI caching

5. Press F3 twice to save and exit the file.
6. Start the Workplace server to enable the ESI processor.

### Setting the ESI timeout for the JVM

An ESI timeout value is also associated with the JVM. The value specified for the `KeepAliveTimeout` and JVM ESI timeout values must match. If you change the default setting for `KeepAliveTimeout`, you must increase the ESI timeout value from the default of 300 seconds (5 minutes). To increase the ESI timeout value to a higher value, set the property `-Dcom.ibm.com.servlet.file.esi.timeOut` for the JVM associated with the WebSphere\_Portal server.

To set the JVM ESI timeout value, perform the following steps:

1. Open the WebSphere Application Server Administrative Console for the Workplace Services Express server. For details, see 5.6, “Accessing the WebSphere Application Server Administrative Console” on page 127.
2. Log in as the Workplace Services Express administrator.



3. Navigate to **Servers** → **Application Servers** as shown in Figure 9-49.

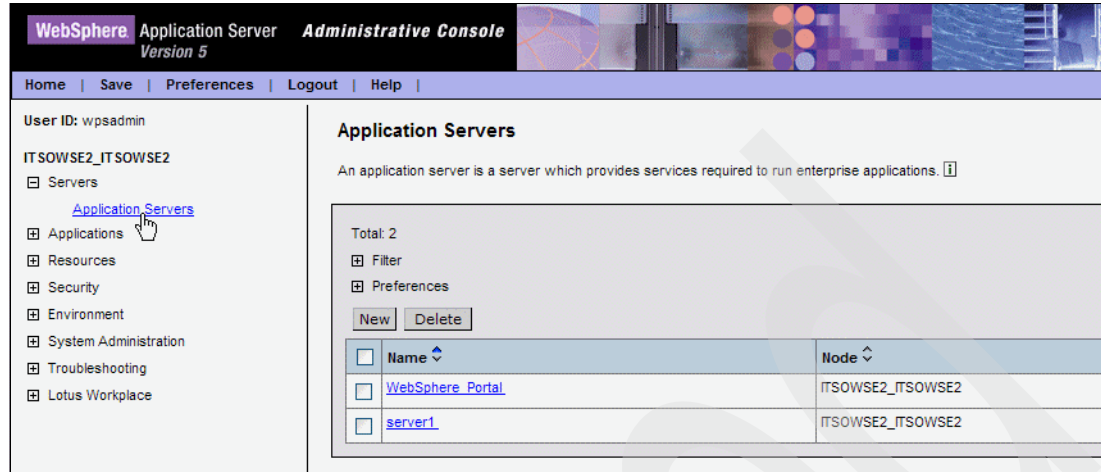


Figure 9-49 Selecting Server -> Application Servers

4. In the Application Servers pane, click the **WebSphere\_Portal** link.
5. In the WebSphere\_Portal pane, under the Additional Properties section, click the **Process Definition** link.
6. In the Process Definition pane, under the Additional properties section, click the **Java Virtual Machine** link.
7. In the Java Virtual Machine pane, scroll down to the Generic JVM arguments field. Add the value `-Dcom.ibm.servlet.file.esi.timeOut=900` to this Generic JVM argument parameter as shown in Figure 9-50. If you set the ESI timeout value to something other than 15 minutes, change the value here as appropriate. Click **OK**.

**Note:** If there is already an argument in the Generic JVM arguments parameter, place a space after that argument and add the new `-Dcom.ibm.servlet.file.esi.timeOut=900` value.

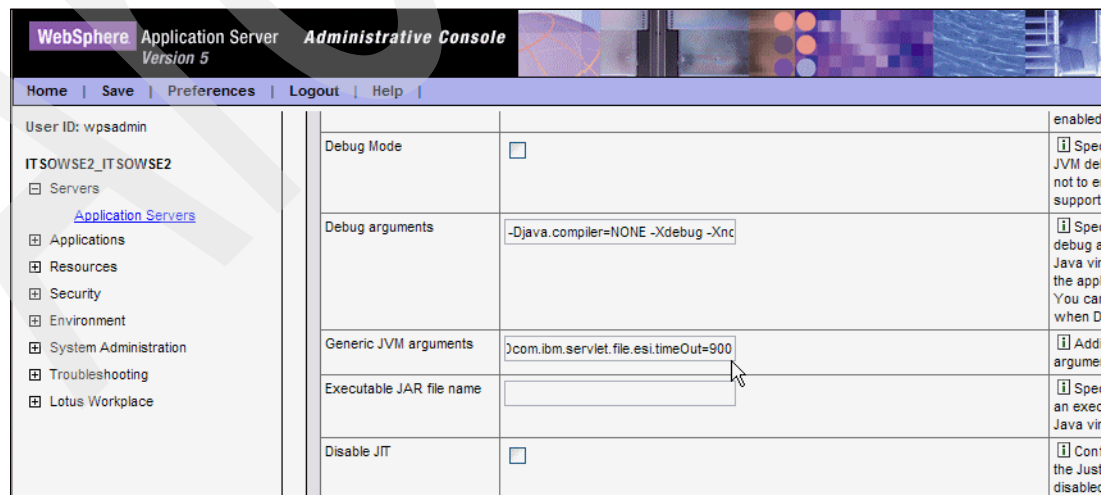


Figure 9-50 Setting the Generic JVM arguments field to `-Dcom.ibm.servlet.file.esi.timeOut=900`



8. Click **Save** to save and apply the changes to the master configuration file shown in Figure 9-33 on page 288.
9. Click **Save** as shown Figure 9-34 on page 289 to save the changes to the master configuration.
10. Restart the Workplace Services Express server.

#### 9.5.4 X virtual frame buffer versus virtual network computing

When you start your Workplace Services Express server, you are asked to choose a document rendering service. This document rendering capability is required for the document management portal. Documents produced by many standard applications (such as word processors or spreadsheets) can be viewed as HTML pages using the document conversion services of Workplace Services Express. This document conversion service is provided via one of two mechanisms on the iSeries server:

- ▶ X virtual frame buffer (XVFB)
- ▶ Virtual network computing (VNC)

The XVFB document rendering service is much more efficient than using the VNC server. To obtain the XVFB server, you must have installed the following items on your iSeries server:

- ▶ 5722-SS1 Option 43
- ▶ 5722-DG1 PTF SI20496

For more details about obtaining PTFs, refer to 5.9, “Obtaining and applying fixes” on page 152.

The option of selecting which document rendering server will be used for a Workplace Services Express server occurs when you start the server. Figure 9-51 shows how you select the XVFB document rendering service.

**Note:** If you do not have PTF SI20496 installed, the only document rendering service you see is VNC.

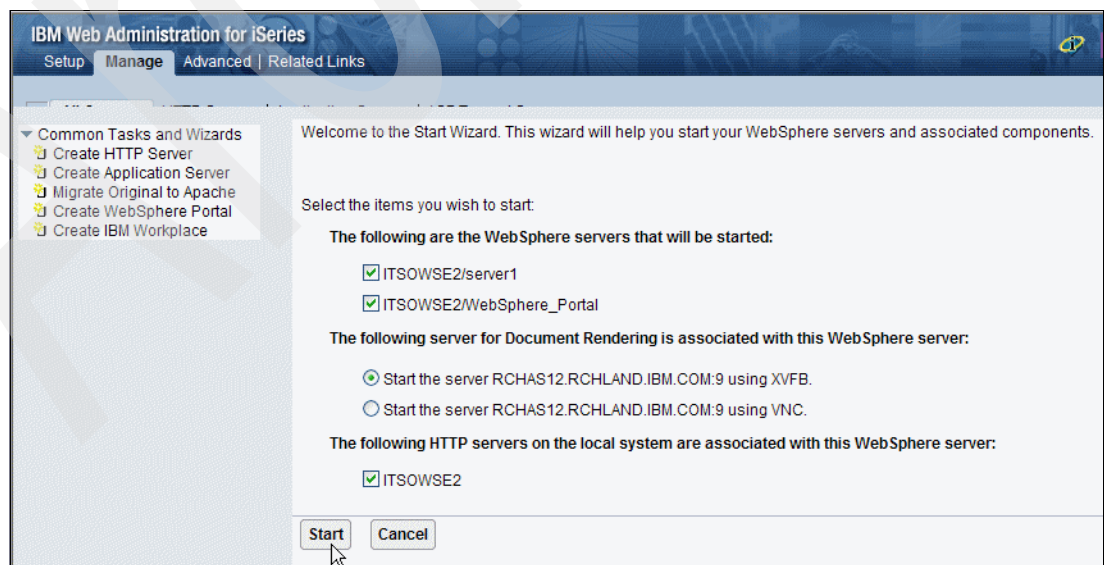


Figure 9-51 Selecting XFVB as the document rendering service

## 9.6 Java tuning

There are several JVMs running within the Workplace Services Express server. Each has specific tuning requirements that must be monitored to determine the exact values for a particular installation. The following section discusses how to set the heap size of the JVM used by the WebSphere Portal server within a Workplace Services Express server.

You can find additional Java tuning recommendations in “Configuring the JVMs to use the classloader cache” on page 278 and “Connection pools” on page 284.

### 9.6.1 JVM heap sizes

Tuning the initial heap size of the JVM so the garbage collector runs at a suitable interval is critical to achieving optimal performance. The garbage collector should run infrequently enough that it does not cause unnecessary overhead and often enough that the heap size does not grow too large.

The default heap size is 256 MB, but larger values are sometimes necessary, especially on systems with multiple processors. It is key to adjust the heap size for the specific requirements of a Workplace Services Express server to obtain the best performance.

Set the initial heap size for the WebSphere\_Portal server in the Workplace Services Express server to:

- ▶ Initial heap size = 512
- ▶ Maximum heap size = 0

For the Server1 server in the Workplace Services Express server, set the heap size to:

- ▶ Initial heap size = 256
- ▶ Maximum heap size = 0

**Note:** Setting the maximum heap size to 0 is equivalent to setting it to \*NOMAX. This means that garbage collection runs only when the garbage collection threshold is reached. In scenarios where memory is limited, it is helpful to set the maximum heap size to a value that impacts memory less. In limited memory scenarios, we recommend that you use a maximum heap size of 256 MB.

If you set the maximum heap size to a value other than 0, reduce the initial heap size setting as well.

#### Setting the JVM heap size

Perform the following steps to change the JVM heap size:

1. Open the WebSphere Application Server Administrative Console for the Workplace Services Express server. For details, see 5.6, “Accessing the WebSphere Application Server Administrative Console” on page 127.
2. Log in as the Workplace Services Express administrator.

3. Navigate to **Servers** → **Application Servers** as shown in Figure 9-52 and click **WebSphere\_Portal** server.

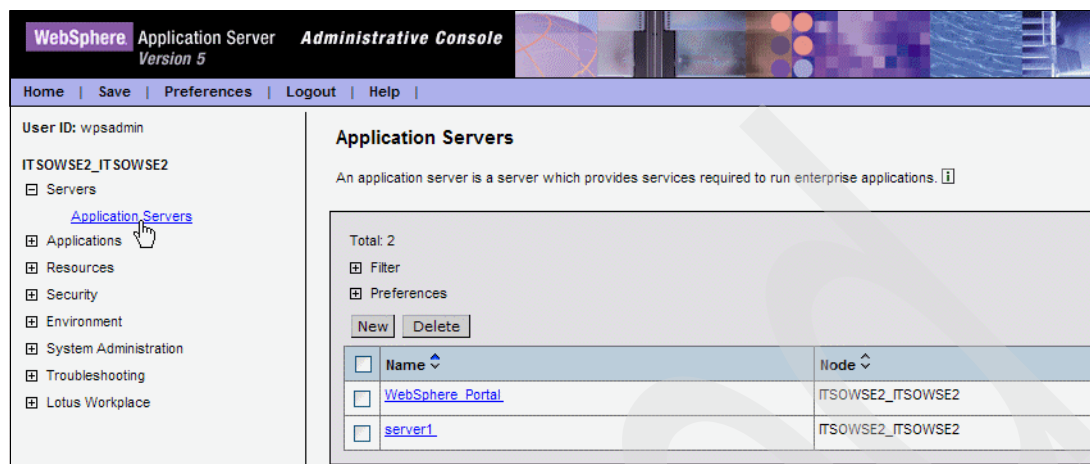


Figure 9-52 WebSphere Application Server Administrative Console

4. In the WebSphere\_Portal pane, scroll down to the Additional Properties section and select **Process Definition** (Figure 9-53).



Figure 9-53 Selecting Process Definition

5. In the Process Definition pane, under the Additional Properties section, select **Java Virtual Machine** (Figure 9-54).

| Additional Properties                |                                                                                                                                 |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">Java Virtual Machine</a> | Advanced Java virtual machine settings.                                                                                         |
| <a href="#">Process Execution</a>    | A set of properties that control how the operating system process executes, such as RunAs permissions, Umask, process priority. |
| <a href="#">Process Logs</a>         | A set of properties that control how the process native input/output streams are directed.                                      |
| <a href="#">Environment Entries</a>  | A list of settings to be added to the execution environment for the process.                                                    |
| <a href="#">Monitoring Policy</a>    | A set of properties that control how the process is monitored by the node agent.                                                |
| <a href="#">Logging and Tracing</a>  | Specify Logging and Trace settings for this server.                                                                             |

Figure 9-54 Selecting Java Virtual Machine

- In the Java Virtual Machine pane (Figure 9-55), change the Initial Heap Size parameter as needed. We recommend that you start with 512 MB and adjust it from there. Set the Maximum Heap Size to 0 to allow for an unlimited maximum heap size. Click **OK**.

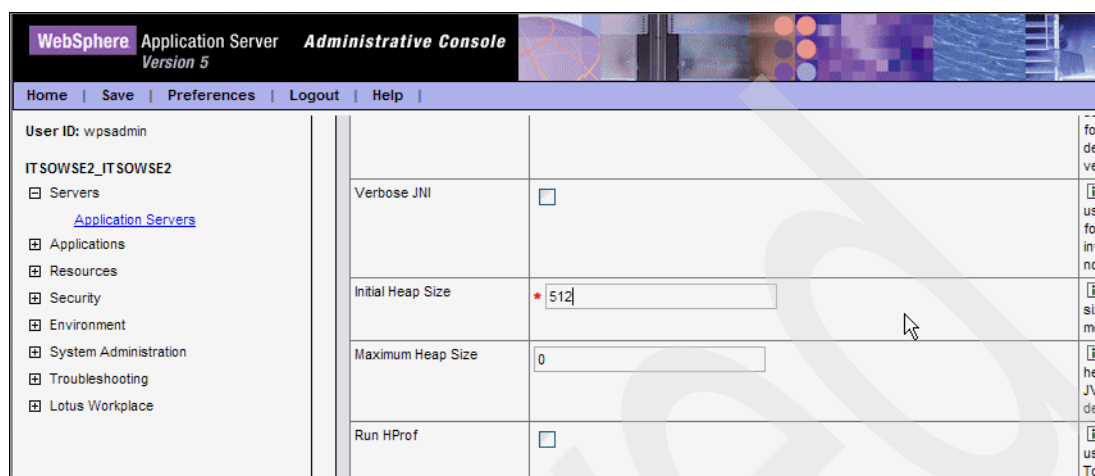


Figure 9-55 Setting the Initial and Maximum Heap Sizes

**Tip:** We recommend that you do *not* set the initial heap size to a size greater than or equal to one-fourth of the total amount of memory in the memory pool where the Workplace Services Express server is running.

- Click **Save** to save and apply the changes to the master configuration file shown in Figure 9-33 on page 288.
- Click the **Save** button as shown Figure 9-34 on page 289 to save the changes to the master configuration.
- Stop and restart the Workplace Services Express server. For details, refer to 5.1, “Starting and stopping a Workplace Services Express server” on page 106.

**Note:** If you make multiple changes, wait until you change all settings before you restart the Workplace Services Express server.

For additional information related to setting the initial heap size, see the *Tuning Garbage Collection for Java and WebSphere on iSeries* white paper, which is available on the Web at:

<http://www.ibm.com/servers/eserver/iseries/perfmgmt/pdf/tuninggc.pdf>

## 9.7 IBM HTTP Server tuning

The IBM HTTP Server passes requests to the Workplace Services Express server. Therefore, it is necessary to make sure that this piece of the overall architecture is not causing any bottlenecks. This section discusses methods for tuning the IBM HTTP Server.

### 9.7.1 Monitoring HTTP real-time statistics

You can use the IBM Web Administration for iSeries interface to access real-time HTTP server statistics for monitoring. These statistics help you to tune the HTTP server to best handle the Workplace Services Express environment workload.

**Tip:** The IBM Redbook *IBM HTTP Server (powered by Apache): An Integrated Solution for IBM @server iSeries Servers*, SG24-6716, provides performance information for the IBM HTTP Server.

Perform the following steps to monitor HTTP real-time statistics for the IBM HTTP Server associated with your Workplace Services Express server:

1. Access the IBM Web Administration for iSeries by pointing your Web browser to your fully qualified iSeries host name on port 2001:

`http://iSeriesHostName.domain:2001`

In our example, we enter:

`http://rchas12.rchland.ibm.com:2001`

2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. From the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. Click the **Manage** tab and then click the **HTTP Servers** subtab.
5. Make sure the correct HTTP server for the Workplace Services Express server is selected. As shown in Figure 9-56, we select the IBM HTTP Server of **ITSOWSE2 - Apache**.

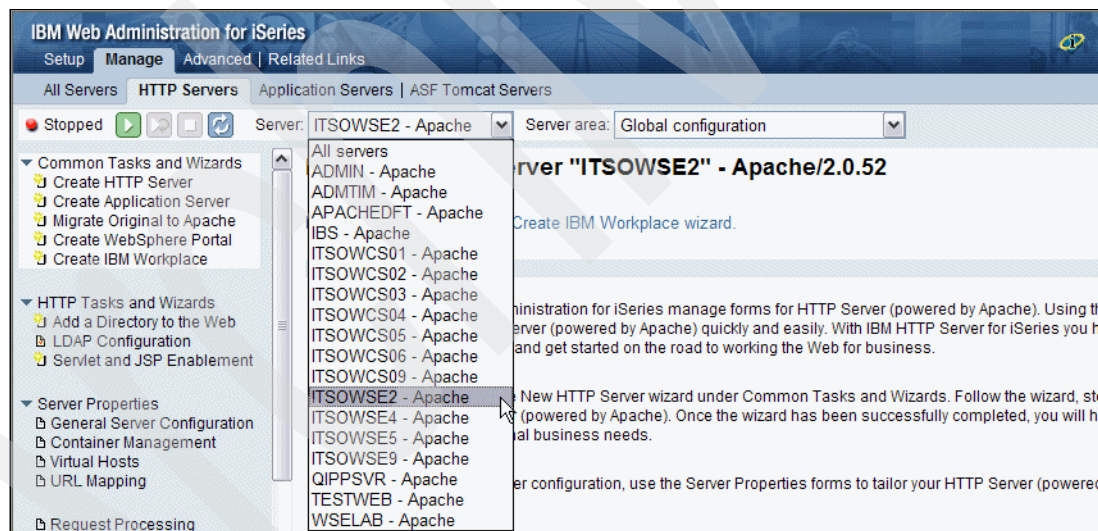


Figure 9-56 Selecting the HTTP server for the Workplace Services Express server

6. Scroll down in the left pane, and under the Tools menu, click **Real Time Server Statistics** as shown in Figure 9-57.

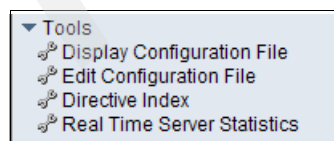


Figure 9-57 Selecting Real Time Server Statistics



7. Figure 9-58 shows an example of the HTTP Real Time Server Statistics. For a quick glance at how the HTTP server is performing, click the **Averages** tab. This tab provides statistics for the averages for the total time of activity shown for the type of associated server which is identified at the top of the column. You also see the average time of noncached and cached activity completed by the enabled function.

If you see a concern with a specific average statistic, such as the average time spent serving noncached data, look at the Absolute or Absolute and Delta tabs for more details. The IBM Redbook *IBM HTTP Server (powered by Apache): An Integrated Solution for IBM @server iSeries Servers*, SG24-6716, provides more information about these performance statistics.

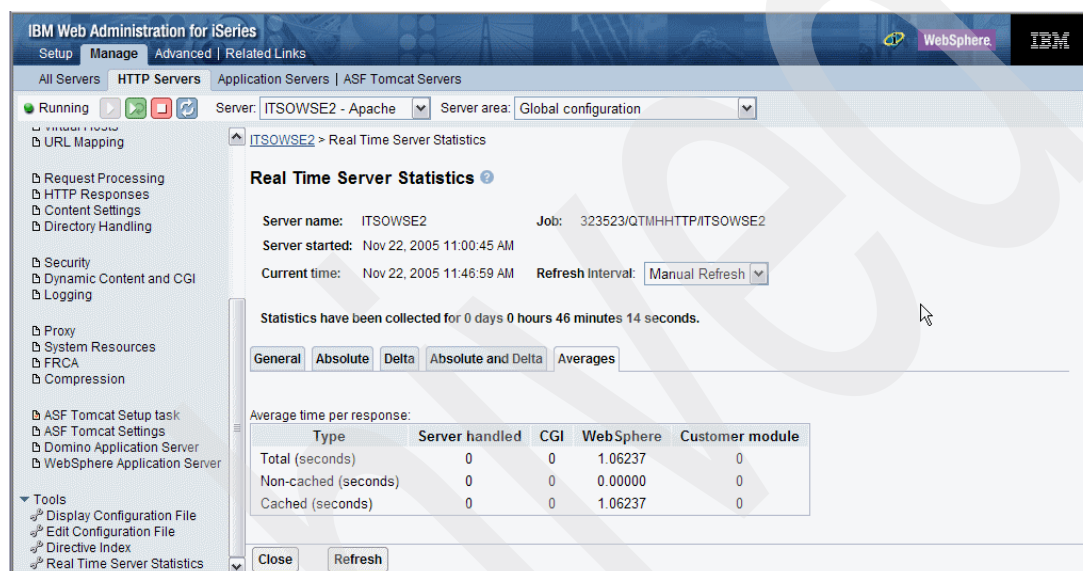


Figure 9-58 HTTP server Real Time Server Statistics data

## 9.7.2 HTTP connection time-outs and Max Keep Alive

You can access the HTTP connection parameters from the IBM Web Administration for iSeries interface. This section addresses the following parameters:

- ▶ KeepAliveTimeout
- ▶ KeepAlive
- ▶ MaxKeepAliveRequests

### KeepAliveTimeout

The KeepAliveTimeout setting is used to control whether the HTTP server works with persistent connections. Persistent connections enable a single TCP/IP connection to be used for multiple HTTP requests. When the server runs with persistent connections, the KeepAliveTimeout setting determines the number of seconds that the server waits for subsequent requests before it closes the connection.

If this value is too low, the server can be impacted in terms of performance since connections can close frequently. If this value is too high, the HTTP server can have many connections open, and the server can run out of resources.

We recommend that you set the KeepAliveTimeout to *10 - 15 minutes* as a starting point. The default setting is 5 minutes.

**Tip:** When increasing the setting for KeepAliveTimeout, keep in mind that a higher value might increase contention for HTTP server processes. If you are running out of HTTP processes, decrease this value.

## KeepAlive

The KeepAlive setting enables a single TCP/IP connection to be used for multiple HTTP requests (persistent connections). Normally, each HTTP request uses a separate connection. Reusing a single connection reduces the connection open and close overhead, thereby improving performance for the client. The KeepAlive setting should be set to *Enabled*.

## MaxKeepAliveRequests

The MaxKeepAliveRequests setting allows an unlimited number of requests on a single TCP/IP connection. We recommend that you set MaxKeepAliveRequests to 0. Setting this value to 0 means that there is no maximum setting for MaxKeepAliveRequests.

## Changing or verifying the parameter settings

To change or verify the parameter settings mentioned in the previous sections, perform the following steps:

1. Access the IBM Web Administration for iSeries by pointing your Web browser to your fully qualified iSeries host name on port 2001:  
`http://iSeriesHostName.domain:2001`  
In our example, we enter:  
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. From the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. Click the **Manage** tab and then click the **HTTP Servers** subtab.
5. Make sure that the correct HTTP server for the Workplace Services Express server is selected.
6. In the left navigation pane, select **System Resources** as shown in Figure 9-59.

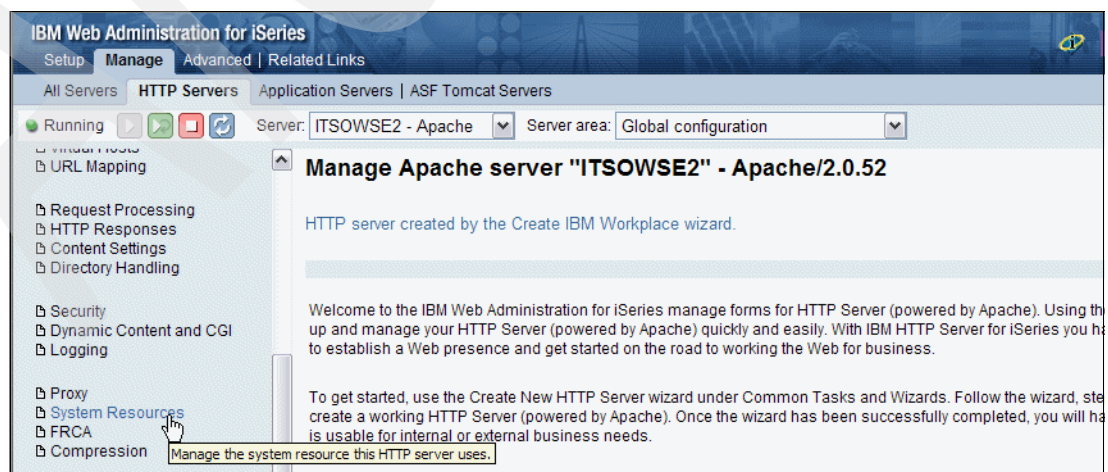


Figure 9-59 Accessing the HTTP System Resources

7. Verify or change the following System Resources parameters, as shown in Figure 9-60.
  - a. For Connection time-out (KeepAliveTimeout), specify 10 - 15 minutes.
  - b. For Allow persistent connections (KeepAlive), select **Enabled**.
  - c. For Maximum requests per connection (MaxKeepAliveRequests), type 0.

**Tip:** These values are recommendations that we found in our testing to improve the performance of the HTTP server. The actual values might vary in your environment and should be tested.

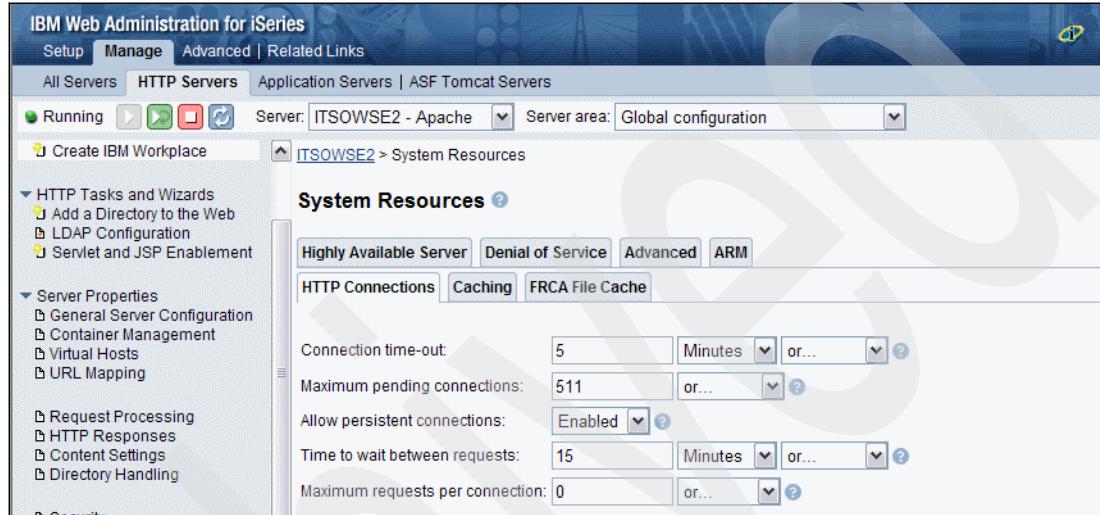


Figure 9-60 System resources settings for the IBM HTTP Server

8. Click **Apply** and then click **OK** to save the changes.
9. Stop and restart the Workplace Services Express HTTP server to apply the changes.

### 9.7.3 Enabling GZIP compression

Enabling GZIP compression can result in a significant improvement in bandwidth utilization. Enabling GZIP compresses the data between the server and the Web browser, typically improving the response time. The amount of response time improvement varies depending on your network bandwidth. If you already have a fast network, the amount of improvement seen by end users is smaller than if you have a slower network infrastructure. Even if end users do not see much of a performance improvement with this change, it is still worthwhile to enable it because overall network bandwidth improves.

**Note:** Enabling GZIP compression requires additional CPU cycles, making it a trade-off with increased network bandwidth. Consider this trade-off when choosing to enable GZIP compression. Typically the extra CPU resources required are off-set by the performance improvement seen in bandwidth constrained environments.

To enable GZIP compression, modify the HTTP Configuration File as explained in the following steps:

**Important:** We recommend that you back up the configuration file prior to making any changes. A damaged configuration file can cause the server to not restart.



1. Access the IBM Web Administration for iSeries by pointing your Web browser to your fully qualified iSeries host name on port 2001:

`http://iSeriesHostName.domain:2001`

In our example, we enter:

`http://rchas12.rchland.ibm.com:2001`

2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. From the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. Click the **Manage** tab and then click the **HTTP Servers** subtab.
5. Make sure the correct HTTP server for the Workplace Services Express server is selected.
6. For Server area, select **Directory /www/server/htdocs**, where *server* is the name of your IBM HTTP Server as shown in Figure 9-61.

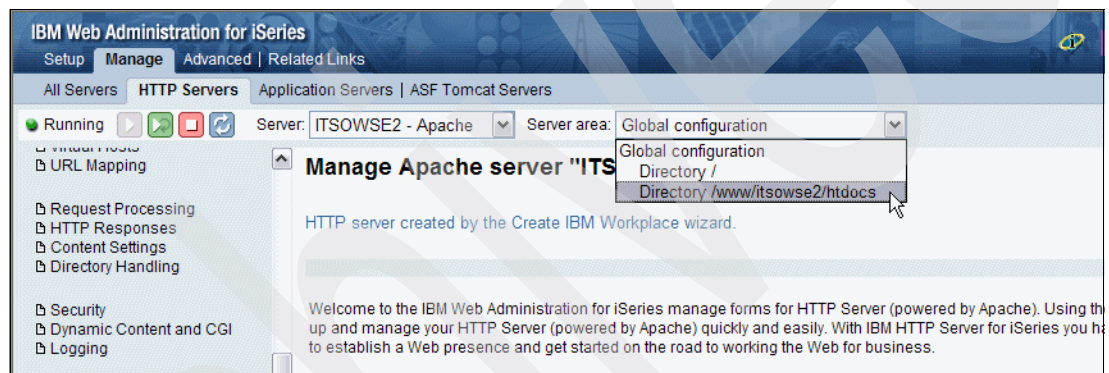


Figure 9-61 Selecting the Server area for the IBM HTTP Server

7. In the left navigation pane, under the Tools menu, select **Edit Configuration File** (Figure 9-62).

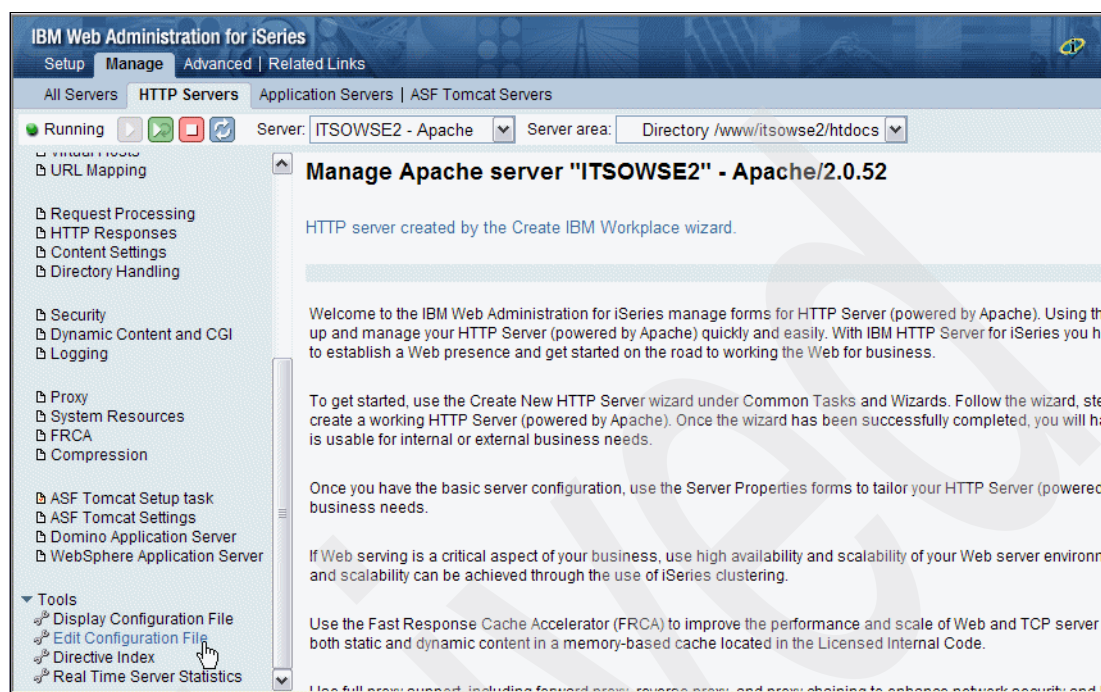


Figure 9-62 Selecting Edit Configuration File

The selected file `/www/server/conf/httpd.conf` (where *server* is the name of your IBM HTTP Server) is now displayed for editing as shown in Figure 9-63.

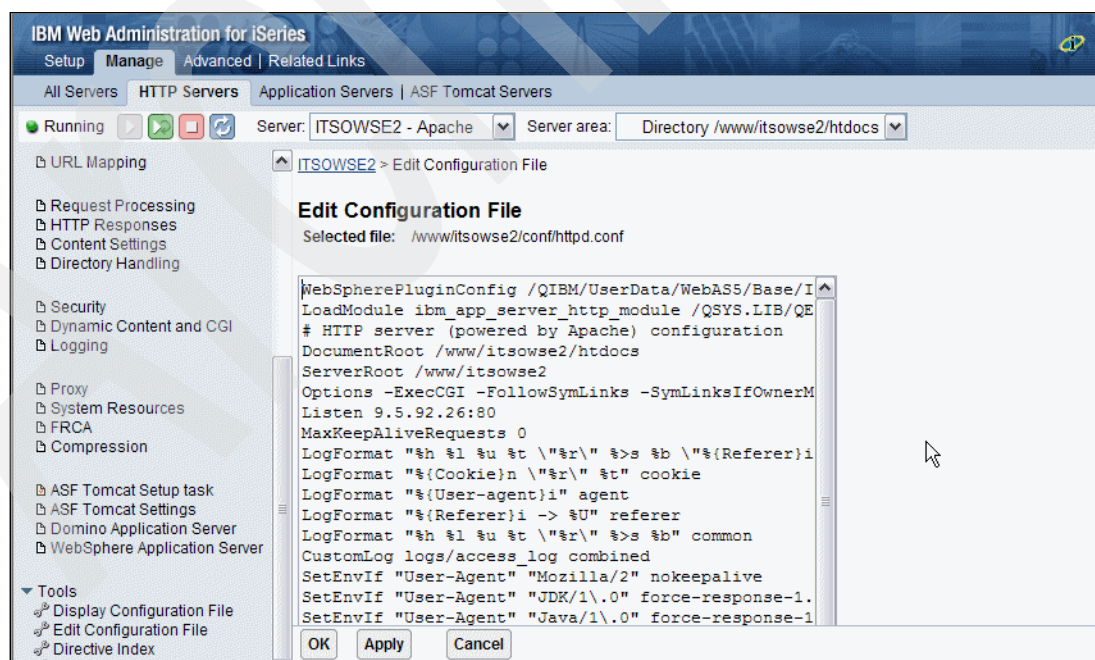


Figure 9-63 The IBM HTTP Server configuration file

8. Use Figure 9-64 as a guide when editing this configuration file. The parameters in Table 9-11 explain some of the more common parameters that you might want to add to the configuration file of your Workplace Services Express HTTP server.

**Important:** You must add the `LoadModule` parameter before any of the other parameters shown in Table 9-11. The best practice is to add this parameter to the first line of the configuration file. Besides the `LoadModule` parameter, the location of these parameters in the configuration file is not critical.

Refer to the following Web address for additional information about these parameters and their functionality being added to the IBM HTTP configuration file:

[http://httpd.apache.org/docs-2.0/mod/mod\\_deflate.html](http://httpd.apache.org/docs-2.0/mod/mod_deflate.html)

Table 9-11 Parameters to add to the IBM HTTP Server configuration file

| Parameter                                                                                                                                      | Description                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <code>LoadModule deflate_module /QSYS.LIB/QHTTPSVR.LIB/QZSRCORE.SRVPGM</code>                                                                  | Add the <code>LoadModule</code> necessary for the Apache module to support gzip.                      |
| <code>LogFormat "%r" %{outstream}n%{instream}n (%{ratio}n%)" deflate</code>                                                                    | Define a new log type for the deflated output.                                                        |
| <code>CustomLog logs/deflate_log deflate</code>                                                                                                | Define the location for the deflate log (path relative to the <code>www/server</code> directory).     |
| <code>LogMaint logs/deflate_log 7 0</code>                                                                                                     | Define log maintenance for the deflate log. This deletes all logs older than seven days.              |
| <code>AddType application/zip .jar</code>                                                                                                      | Define a new mime type for the WCT client. This improves the download performance of the WCT client.  |
| <code>SetOutputFilter DEFLATE</code>                                                                                                           | Define the gzip output filter, in this case, only compressing outbound traffic.                       |
| <code>DeflateFilterNote Input instream</code><br><code>DeflateFilterNote Output outstream</code><br><code>DeflateFilterNote Ratio ratio</code> | Define the variables used in the deflate log.                                                         |
| <code>SetEnvIf "User-Agent" "^." no-gzip</code>                                                                                                | Disable compression for all requests.                                                                 |
| <code>SetEnvIf "User-Agent" "MSI[E].(5\5l6\0);" !no-gzip</code>                                                                                | Enable compression for Microsoft Internet Explorer V5.x and V6.x browsers.                            |
| <code>SetEnvIf "User-Agent" "^Mozilla/5.0" !no-gzip</code>                                                                                     | Enable compression for a Mozilla V5.0-based Web browser.                                              |
| <code>SetEnv gzip-only-text/html 1</code>                                                                                                      | Enable compression only for content with a text/html mime content type.                               |
| <code>SetEnvIfNoCase Request_URI "\.(js css)\$" gzip-only-text/html=0</code>                                                                   | Enable compression for content URI that ends with .js (JavaScript™) or .css (cascading style sheets). |

Figure 9-64 shows an example of the IBM HTTP Server configuration file for the Workplace Services Express server, ITSOWSE2, after GZIP compression was enabled.

**Tip:** Click **Wider** at the bottom of the edit configuration file display to increase the edit window. Make sure that you complete the resizing the edit window prior to making any changes to the configuration file. Otherwise your changes will be lost.

```

WebSpherePluginConfig /QIBM/UserData/WebAS5/Base/ITSOWSE2/config/cells/plugin-cfg.xml
LoadModule ibm_app_server_http_module /QSYS.LIB/QEJBAS5.LIB/QSVTIHSAH.SRVPGM
Added the necessary Apache module to support GZIP compression
LoadModule deflate_module /QSYS.LIB/QHTTSPVR.LIB/QZSRCORE.SRVPGM
HTTP server (powered by Apache) configuration
DocumentRoot /www/itsowse2/htdocs
ServerRoot /www/itsowse2
Options -ExecCGI -FollowSymLinks -SymLinksIfOwnerMatch -Includes -IncludesNoExec
-Indexes -MultiViews
Listen 9.5.92.26:80
MaxKeepAliveRequests 0
LogFormat "%h %l %u %t \"%r\" %>s %b \"%{Referer}i\" \"%{User-Agent}i\"" combined
LogFormat "%{Cookie}n \"%r\" %t" cookie
LogFormat "%{User-agent}i" agent
LogFormat "%{Referer}i -> %U" referer
LogFormat "%h %l %u %t \"%r\" %>s %b" common
Define a new log type for the deflated output
LogFormat "\"%r\" %{outstream}n/%{instream}n (%{ratio}n%)" deflate
CustomLog logs/access_log combined
Define the location for the deflate log (path relative to the www/<server> directory)
CustomLog logs/deflate_log deflate
Define custom maintenance for the deflate log. Will delete all logs older than 7 days
LogMaint logs/deflate_log 7 0
SetEnvIf "User-Agent" "Mozilla/2" nokeepalive
SetEnvIf "User-Agent" "JDK/1\0" force-response-1.0
SetEnvIf "User-Agent" "Java/1\0" force-response-1.0
SetEnvIf "User-Agent" "RealPlayer 4\0" force-response-1.0
SetEnvIf "User-Agent" "MSIE 4\0b2;" nokeepalive
SetEnvIf "User-Agent" "MSIE 4\0b2;" force-response-1.0
Define the gzip output filter. In this case we are only compressing outbound traffic
SetOutputFilter DEFLATE
Define variables used in the deflate log
DeflateFilterNote Input instream
DeflateFilterNote Output outstream
DeflateFilterNote Ratio ratio
Enable compression for MS IE Browsers v5.x and v6.x
SetEnvIf "User-Agent" "MSI[E].(5\5|6\0);" !no-gzip
Enable compression for Mozilla v5.0 based browser
SetEnvIf "User-Agent" "^Mozilla/5.0" !no-gzip
Enable compression for content with text/html mime content type
SetEnv gzip-only-text/html 1
Enable compression for content URI that ends with .js (JavaScript) or .css (Cascading
style sheets)
SetEnvIfNoCase Request_URI "\.(js|css)$" gzip-only-text/html=0
<Directory />
 Order Deny,Allow
 Deny From all
</Directory>
<Directory /www/itsowse2/htdocs>
 Order Allow,Deny
 Allow From all
</Directory>

```

Figure 9-64 Example of the IBM HTTP Server configuration file after enabling GZIP compression

9. In the Edit Configuration File display, click **Apply** to save the IBM HTTP Server configuration file changes. Then click **OK**.

10. Stop and restart the Workplace Services Express HTTP server to apply any changes. For details, see 5.4, “Managing an IBM HTTP Server for iSeries server” on page 123.

### Example of the deflate\_log

As a result of enabling a new custom log file, a new log file is created call deflate\_log. This log is located in the directory specified in the HTTP server configuration file. In our example, we specified a directory of logs within the HTTP server’s directory. We accomplished this by adding the following line to the HTTP server configuration file:

```
CustomLog logs/deflate_log deflate
```

In our example, the complete directory path to the deflate\_log file is /www/server/logs/deflate\_log, where server is the IBM HTTP Server name.

Figure 9-65 provides an example of this log file’s contents. The values displayed to the right of HTTP/1.1 show the output size sent to the Web browser and the original size of the content. The percentage is the difference. Refer to the deflate\_log to determine by how much the over-the-wire content is reduced. For example, Figure 9-65 shows that over-the-wire size of content was reduced by 32%.

It is important to understand that only content that uses the mime type of text/html and any files with the extension of .js (JavaScript) or .css (cascading style sheets) are compressed.

**Note:** After you verify that GZIP compression is enabled for your server, follow the steps in 9.7.4, “Disabling HTTP logging” on page 312, to disable any unnecessary logging.

```
"GET /lwp/myworkplace!/ut/p/.scr/LoggedIn HTTP/1.1" 7841/41657 (18%)
"GET /lwp/themes/html/workplace/dragNdrop.css HTTP/1.1" 424/1710 (24%)
"GET /lwp/themes/html/workplace/dragNdrop.js HTTP/1.1" 5565/27497 (20%)
"GET /lwp/themes/html/workplace/flyout.js HTTP/1.1" 2477/17055 (14%)
"GET /lwp/themes/html/workplace/ie/en/Styles.css HTTP/1.1" 9099/57722 (15%)
"GET /lwp/themes/html/workplace/ie/en/HelpStyles.css HTTP/1.1" 960/4391 (21%)
"GET /lwp/themes/html/workplace/ie/en/LWP_Styles.css HTTP/1.1" 4482/25855 (17%)
"GET /lwp/themes/html/workplace/actionMenu.js HTTP/1.1" 864/3649 (23%)
"GET /lwp/menu/menu_service.js HTTP/1.1" 3428/10529 (32%)
"GET /lwp/peopleawareness/peopleawareness_service.js HTTP/1.1" 2171/5900 (36%)
"GET /lwp/peopleawareness/person.js HTTP/1.1" 10754/42886 (25%)
"GET /lwp/peopleawareness/context_ie.js HTTP/1.1" 8138/41006 (19%)
"GET /lwp/themes/html/workplace/bannerGraphicTop.jpg HTTP/1.1" -/- (-%)
"GET /lwp/images/dot.gif HTTP/1.1" -/- (-%)
"GET /lwp/themes/html/workplace/lotusWordmark.jpg HTTP/1.1" -/- (-%)
"GET /lwp/themes/html/workplace/clearPixel.gif HTTP/1.1" -/- (-%)
```

Figure 9-65 Example of the deflate\_log content

## 9.7.4 Disabling HTTP logging

The level of HTTP logging required depends on the environment. For example, in a development and test environment, logging levels are often required to be set at the highest levels possible. This requirement changes when you move to a production environment. HTTP logging takes additional resources on the server. All unnecessary HTTP logging should be disabled for a production server.

The only logging that should be enabled for a production environment is *error logging*. To disable all other logging, edit the HTTP server configuration file and comment out the following lines as explained in the following steps:

- ▶ CustomLog logs/access\_log combined
- ▶ CustomLog logs/deflate\_log deflate

**Important:** We recommend that you back up the configuration file prior to making any changes. A damaged configuration file can cause the server to not restart.

1. Access the IBM Web Administration for iSeries by pointing your Web browser to your fully qualified iSeries host name on port 2001:  
`http://iSeriesHostName.domain:2001`  
In our example, we enter:  
`http://rchas12.rchland.ibm.com:2001`
2. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
3. From the iSeries Tasks menu, click **IBM Web Administration for iSeries**. You return to the last server that you administered.
4. Click the **Manage** tab and then click the **HTTP Servers** subtab.
5. Make sure the correct HTTP server for the Workplace Services Express server is selected.
6. For Server area, select **Directory /www/server/htdocs**, where *server* is the name of your IBM HTTP Server (see Figure 9-66).

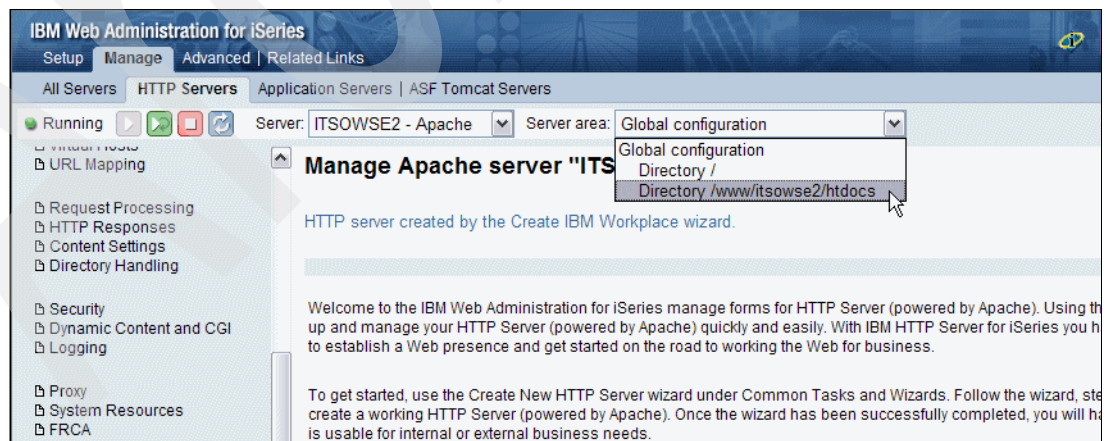


Figure 9-66 Selecting the Server area for the IBM HTTP Server



7. In the left navigation pane, under the Tools menu, select **Edit Configuration File** (Figure 9-67).

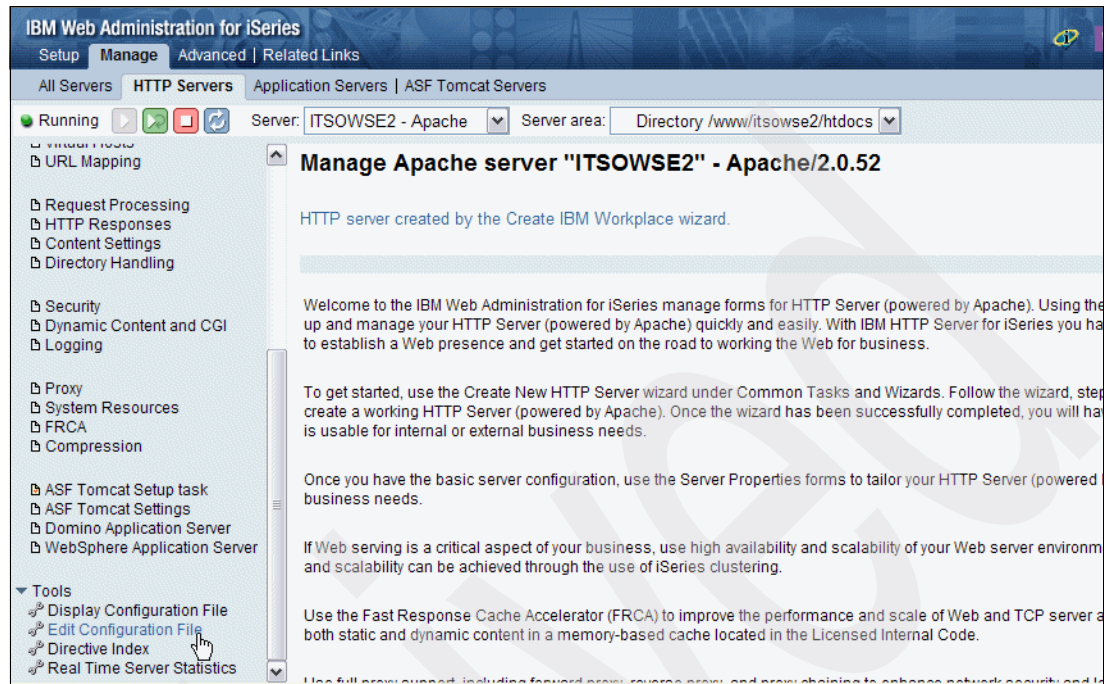


Figure 9-67 Selecting Edit Configuration File

The selected file `/www/server/conf/httpd.conf`, where `server` is the name of your IBM HTTP Server, is now displayed for editing as shown in Figure 9-68.

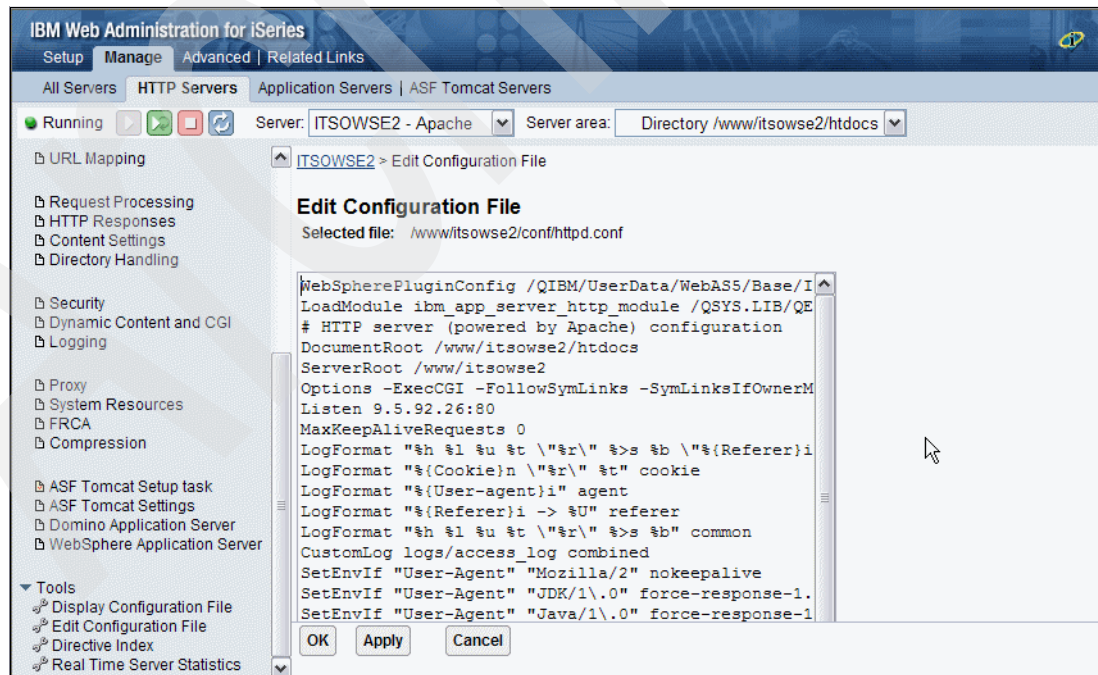


Figure 9-68 The IBM HTTP server configuration file



8. Comment out the following lines by typing a number sign (#) in front of each line:  

```
CustomLog logs/access_log combined
CustomLog logs/deflate_log deflate
```
9. In the Edit Configuration File window, click **Apply** and then click **OK** to save the IBM HTTP Server configuration file changes.
10. Stop and restart the Workplace Services Express HTTP server to apply any changes. For details, see 5.4, “Managing an IBM HTTP Server for iSeries server” on page 123.

## 9.8 Database tuning

The storage container for Workplace Services Express on iSeries is DB2 Universal Database. In this section, we address how you can fine-tune this storage container to achieve the best performance for your Workplace Services Express servers.

### 9.8.1 System value for the SQL Query Engine

V5R2 introduced a new optimizer called the SQL Query Engine (SQE). The system value QDBFSTCCOL, the database file statistics collection, controls the level of database statistics that are collected and used by the query optimizer. The statistics gathered are used to control runtime behavior of the query optimizer.

#### QDBFSTCCOL: Database file statistics collection

You can set the QDBFSTCCOL system value to one of the following four values:

- \*ALL** This value is the default setting and allows all statistics to be collected in the background.
- \*SYSTEM** This value allows only system-requested statistics to be collected in the background.
- \*USER** This value allows only user-requested statistics to be collected in the background.
- \*NONE** This value restricts everyone from creating statistics in the background. It does not prevent immediate user-requested statistics from being collected.

The setting chosen for QDBFSTCCOL system value affects the level of database statistics that are available to the new query optimizer when processing queries.

**Note:** You can turn off the i5/OS system value QDBFSTCCOL to disable database statistics auto refresh, since the auto refresh uses CPU during run time. We recommend that you leave on the auto refresh to keep the database statistics up to date.

## 9.8.2 Monitoring database performance

i5/OS provides statistics that can be used to monitor performance of your database environment. You can use a tool, called the *database monitor*, to collect and view statistics for all columns of data in all tables for a given library on the system. You access this tool using iSeries Navigator.

We use the database monitor tool to monitor the DB2 Universal Database databases that provide the underlying infrastructure for a Workplace Services Express server. We want to monitor a particular the library, which contains the WebSphere Portal databases. Use the procedure explained in 5.2, “Reviewing the Workplace Services Express configuration” on page 110, to determine the WebSphere Portal database, or schema, associated with your Workplace Services Express server.

The portal schema associated with the Workplace Services Express server in our example is ITSOWSE26. We create a database monitor over that library to capture statistics about the databases in this library used by the Workplace Services Express server.

**Tip:** Monitoring database performance helps to determine whether performance issues with Workplace Services Express servers are related to the underlying DB2 Universal Database libraries or with the LDAP server.

### Creating an SQL performance monitor

Before you create the performance monitor, you must create or identify a library in which to store the data. In our example, we create a library called ITSOWSE2 to hold database statistics for our Workplace Services Express server database access.

You can create a summary or detailed SQL performance monitor against the Workplace Services Express databases using iSeries Navigator. Perform the following steps to create the library to store SQL performance monitor data and to create the SQL performance monitor:

1. Use the Create Library (CRTLIB) CL command to create a library to store the SQL performance data. In the following example, replace *ITSOWSE2* with the name you want to give this library.

```
CRTLIB LIB(ITSOWSE2) TEXT('Library to store SQL performance statistics')
```

2. Start iSeries Navigator and access your iSeries server. When prompted, enter a valid i5/OS user profile and password with at least \*ALLOBJ, \*IOSYSCFG, and \*JOBCTL special authorities.

- Click **My Connections** → **iSeries system name** → **Databases** → **S65d0acd** → **Schemas** to view the database or databases and their schemas, as shown in Figure 9-69.

**Note:** The schema name shown is the relational database directory entry for the iSeries server. In our example, the relational database directory entry is S65d0acd.

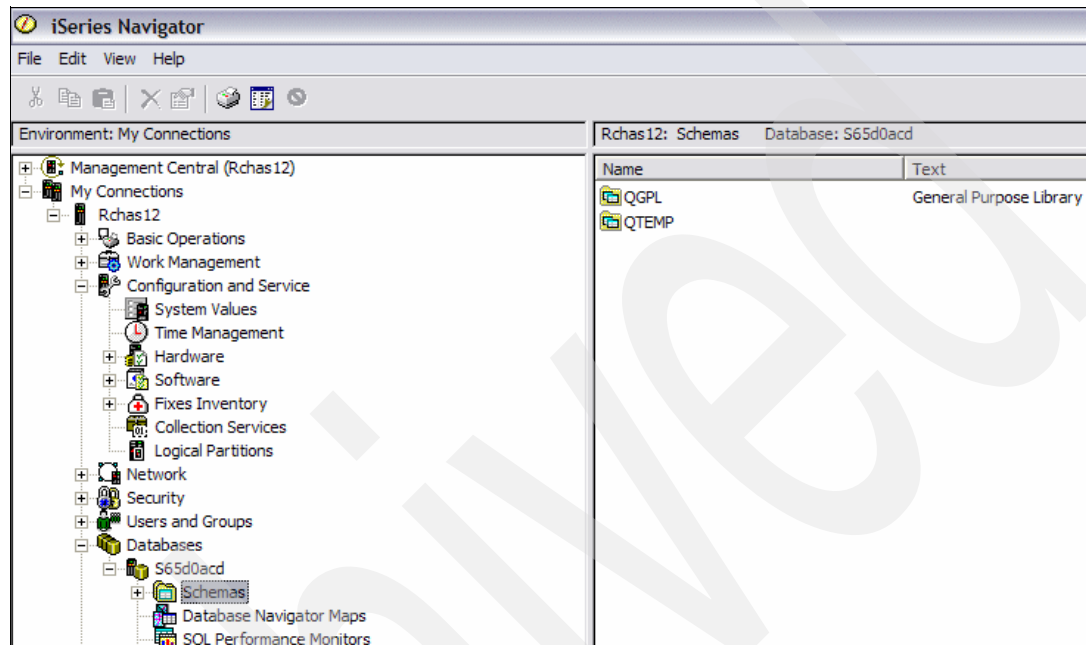


Figure 9-69 Database expanded to Schemas in iSeries Navigator

- Right-click **Schemas** and select **Select Schemas to Display** as shown in Figure 9-70.

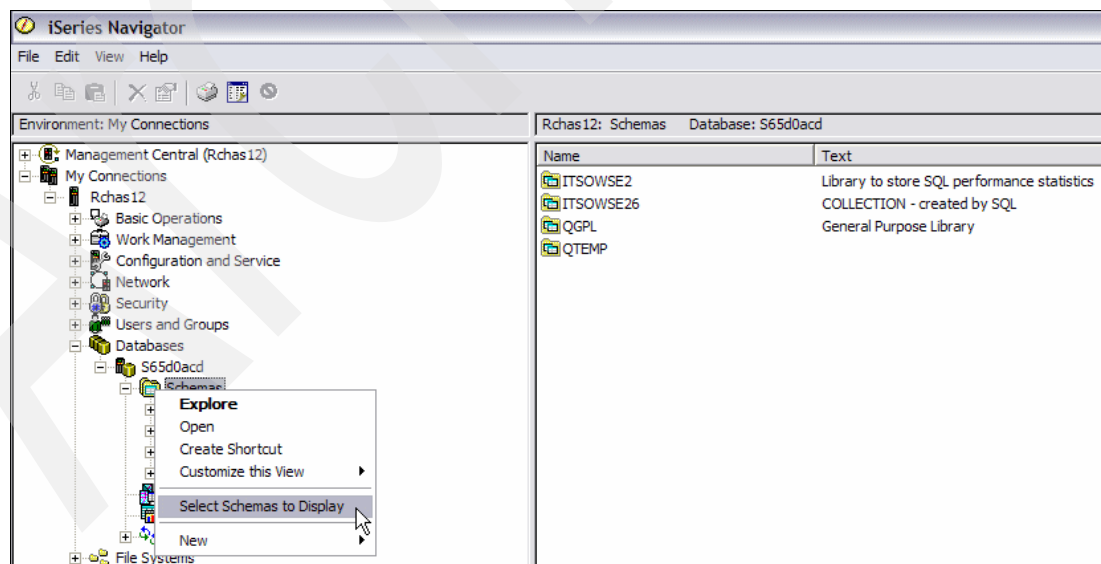


Figure 9-70 Selecting the option Select Schemas to Display

5. In the Select Schemas to Display window (Figure 9-71), follow these steps:
  - a. Enter the name of the schema or library to display. This is the name of the database that you decided to use to collect the SQL performance statistics in. For our example, we enter the name of the library, called `itsowse2`, that we created in step 1 on page 315.
  - b. Click the **Add** button.

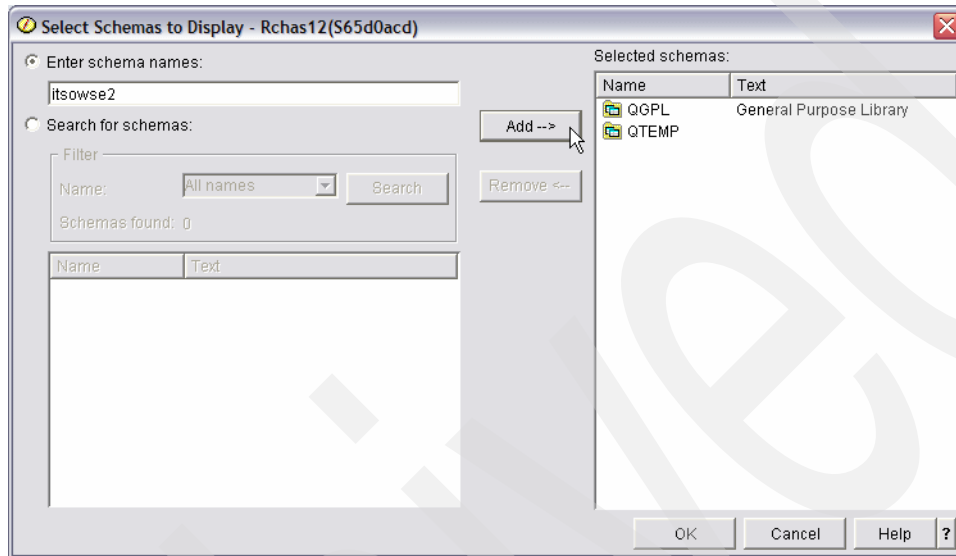


Figure 9-71 Entering the schema name to display

- c. Add the library that contains the WebSphere Portal databases associated with your Workplace Services Express server. In our example, this database is called `ITSOWSE26`.

If you haven't already done so, use the procedure explained in 5.2, "Reviewing the Workplace Services Express configuration" on page 110, to determine the WebSphere Portal database, or schema, associated with your Workplace Services Express server.

The WebSphere Portal database for your Workplace Services Express server is now added to the library list (schema list). This is necessary because you select this library when you create the SQL performance monitor.

- d. Click **OK**.

- Click **Schemas** and the Database tasks are displayed in the lower panel of iSeries Navigator as shown in Figure 9-72. In the right side of the lower panel, click **Create a new summary SQL performance monitor**.

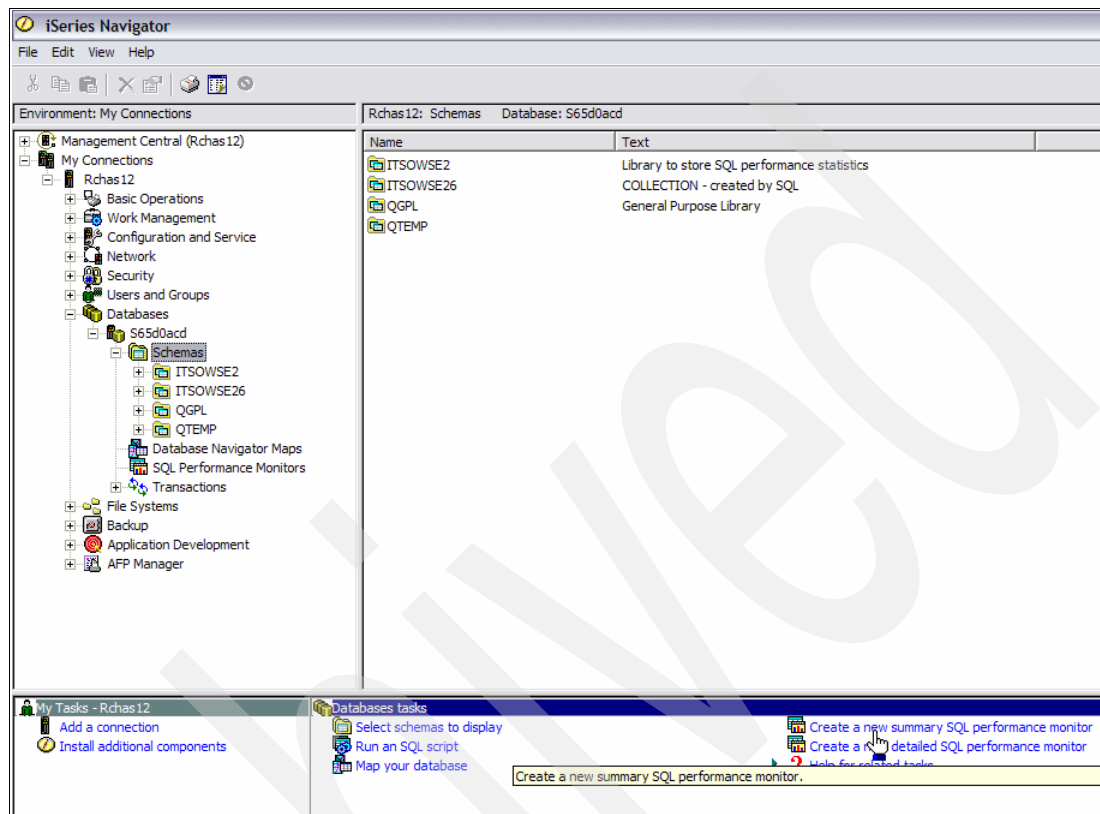


Figure 9-72 Database tasks pane of iSeries Navigator

7. In the New Summary SQL Performance Monitor window (Figure 9-73), provide the following information:
  - a. In the General tab, provide the following values:
    - i. For Name, type the name of the database monitor. In our example we enter Monitor ITSOWSE26 portal db.

**Note:** ITSOWSE26 is the name of the library that contains the WebSphere Portal databases for our Workplace Services server.

- ii. For Schema for save data, select the library to store the statistics. We selected library **ITSOWSE2**, which as stated previously was created to store this data.

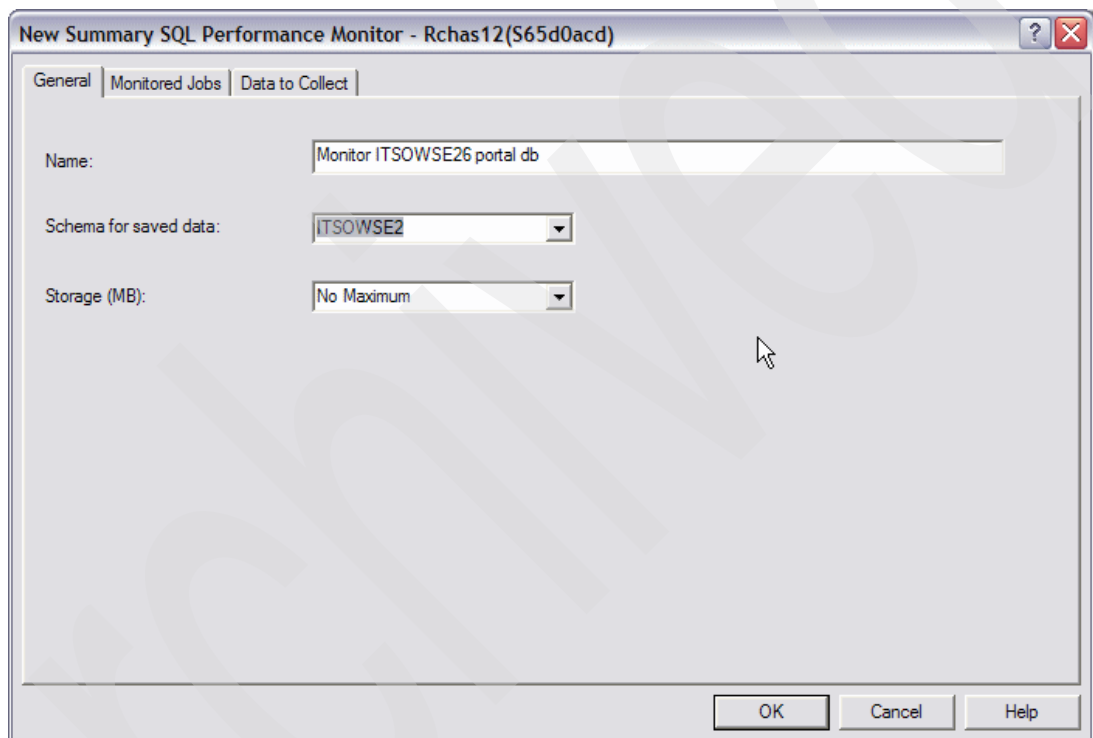


Figure 9-73 Creating the new summary SQL Performance Monitor: The General tab

- b. Click the **Monitored Jobs** tab.
      - i. Change the selection from All to **Select from list below**.
      - ii. Click the **Subsystem** column to sort the list of jobs by subsystem.
      - iii. Scroll down to the QEJBAS5 subsystem. Find the QEJBAS5 jobs associated with your Workplace Services Express server. If you have more than one Workplace Services Express server running, see 5.3, "Verifying a Workplace Services Express server is active" on page 112, to determine which jobs are associated with your Workplace Services Express server.

**Note:** When using this method to determine which jobs are associated with your Workplace Services Express server, take note of the job numbers at the top of each job log.

- iv. Highlight a server job and click the **Select** button to add the server job to the list of selected jobs. Do this for the three server jobs associated with the Workplace Services Express server:

- QJVAEXEC
- SERVER1
- WEBSPHERE\_

**Tip:** To focus on monitoring Workplace Services Express SQL performance, we recommend that you monitor only the server jobs associated with the Workplace Services Express server for which you are gathering performance statistics.

See Figure 9-74.

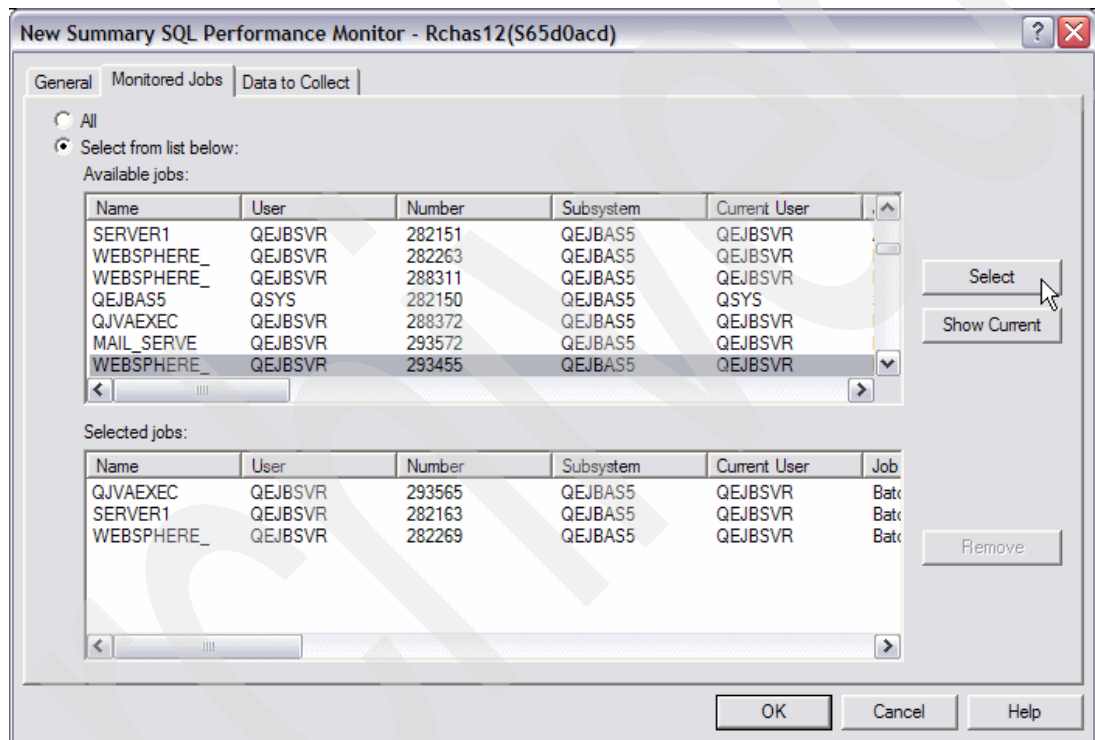


Figure 9-74 Creating the new summary SQL Performance Monitor: The Monitored Jobs tab



- c. Click the **Data to Collect** tab (Figure 9-75) and enable the following data to be collected:
- Summary data
  - Statement text
  - Host variable use

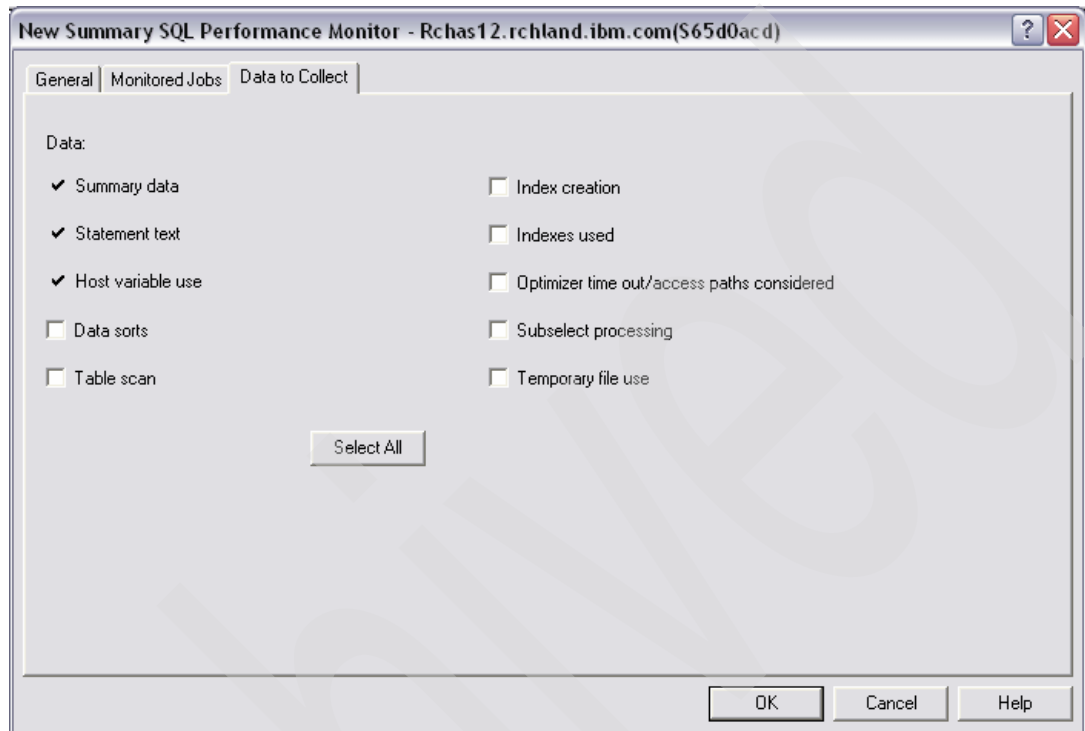


Figure 9-75 Creating the new summary SQL Performance Monitor, Data to Collect tab

- d. Click **OK** to finish creating the new SQL performance monitor.

**Note:** The database performance monitor starts automatically after it is created.

## Viewing the SQL performance monitors

After collecting database performance monitor statistics for the underlying databases that support your Workplace Services Express server, you can view the database statistics that were collected. Perform the following steps to view the database statistics:

1. To view the SQL performance monitor, under the Schemas view in iSeries Navigator, select **SQL Performance Monitors** (Figure 9-76).

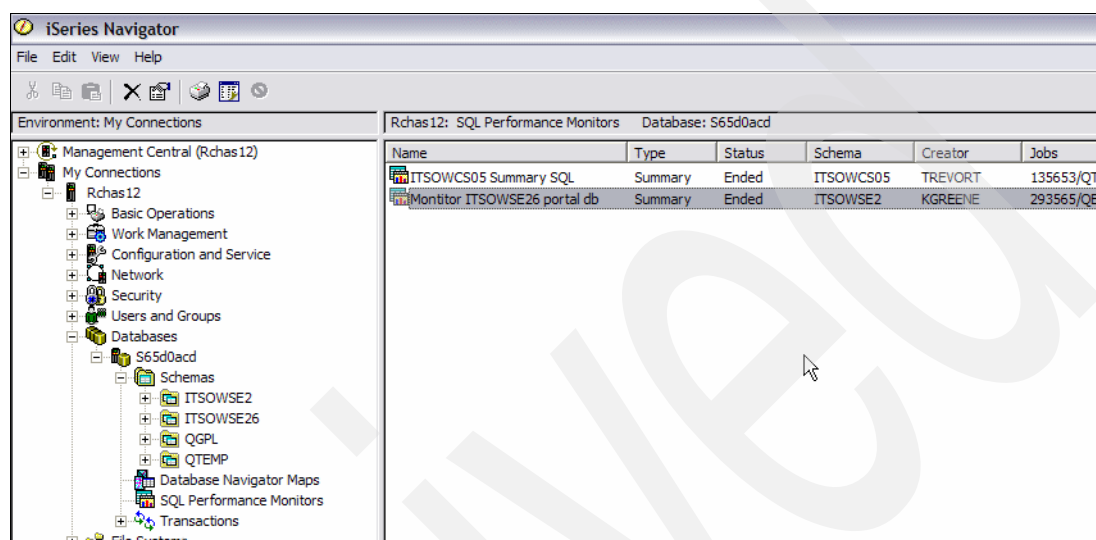


Figure 9-76 Viewing the SQL Performance Monitors

2. End the monitor to view the report details. Right-click the **summary monitor** and select **End** as shown in Figure 9-77.

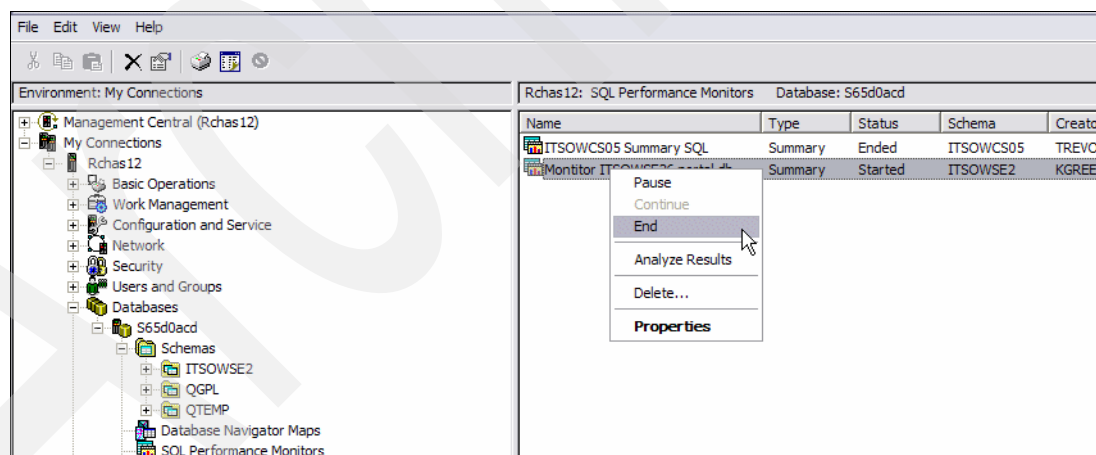


Figure 9-77 Ending the SQL performance monitor

3. After the monitor is ended, right-click the **summary monitor** and select **Analyze Results** as shown in Figure 9-78.

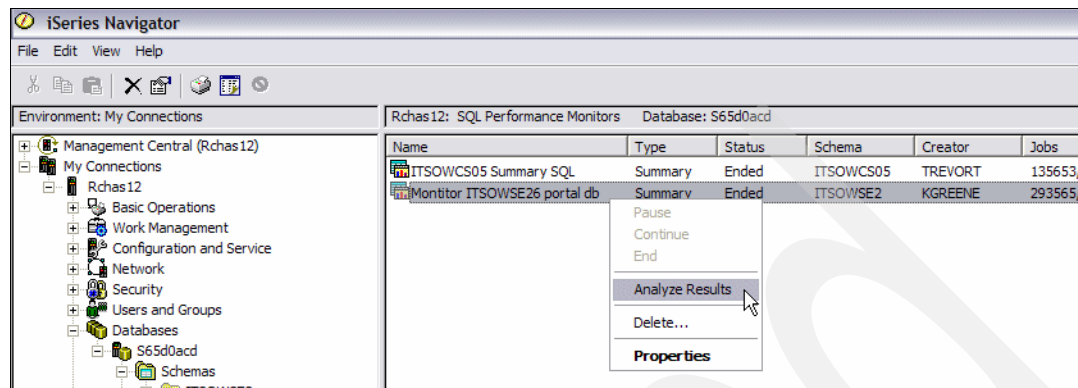


Figure 9-78 Analyze Report options for SQL performance monitor

4. In the Summary SQL Results window (Figure 9-79), complete these steps:
  - a. From the **Summary Results** tab, select the Collection period and the summary queries.
  - b. Click the **Detailed Results** and review and select the necessary options.
  - c. Click the **Composite View** tab and review and select the necessary options.
  - d. Click the **View Results** button.
  - e. Click **OK**.

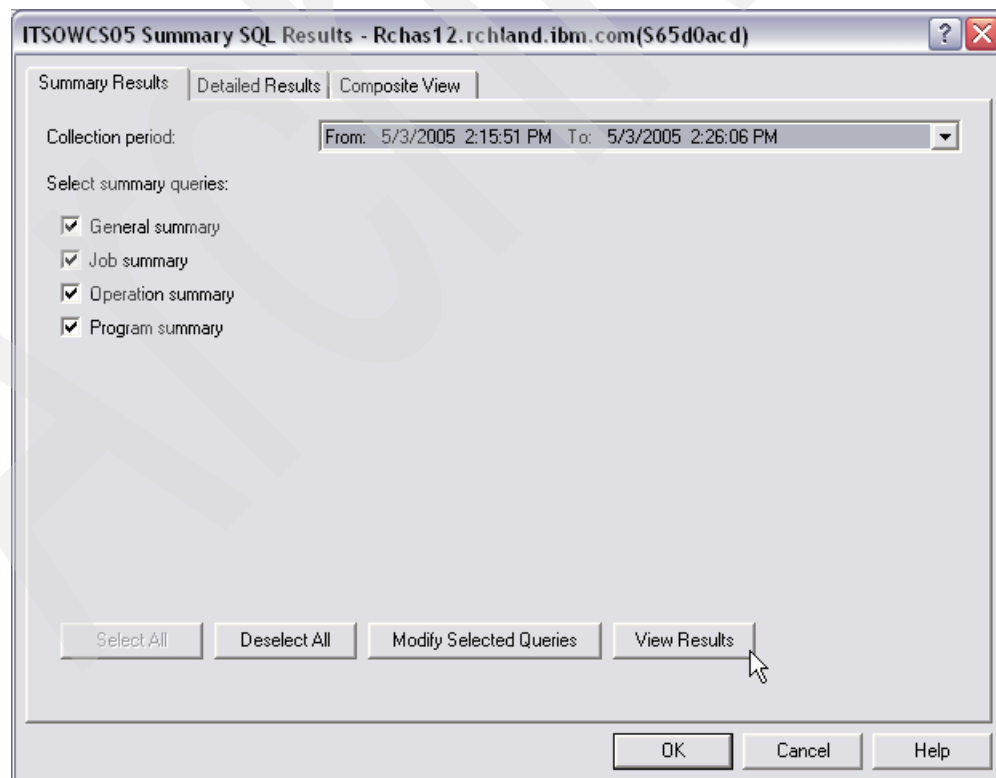


Figure 9-79 Summary SQL Results

The result is a composite query of the summary SQL performance monitor settings. For information about how to interpret the results, refer to the IBM Redbook *Preparing for and Tuning the V5R2 SQL Query Engine on DB2 Universal Database for iSeries*, SG24-6598.

### 9.8.3 Creating database indexes

Creating database indexes can improve performance between a Workplace Services Express server and the database server. Using iSeries Navigator or i5/OS SQL commands, creating database indexes can be a fairly quick and easy procedure. In this section, we provide an example of both of these procedures.

The databases that you want to create the indexes over reside in the WebSphere Portal library or schema associated with your Workplace Services Express server. To determine the name of the portal library for your Workplace Services Express server, refer to 5.2, “Reviewing the Workplace Services Express configuration” on page 110.

#### Creating database indexes from iSeries Navigator

You can create the database indexes for a Workplace Services Express server using iSeries Navigator.

1. Open iSeries Navigator and access your iSeries server.
2. When prompted, enter a valid i5/OS user profile and password with at least \*ALLOBJ, \*IOSYSCFG, and \*JOBCTL special authorities.
3. Click **My Connections** → **iSeries system name** → **Databases** → **S65d0acd** → **Schemas** to view the database or databases and their schemas. See Figure 9-80.

In our example, the relational database directory entry name is S65d0acd. In your environment, select the relational database directory name on your iSeries server.

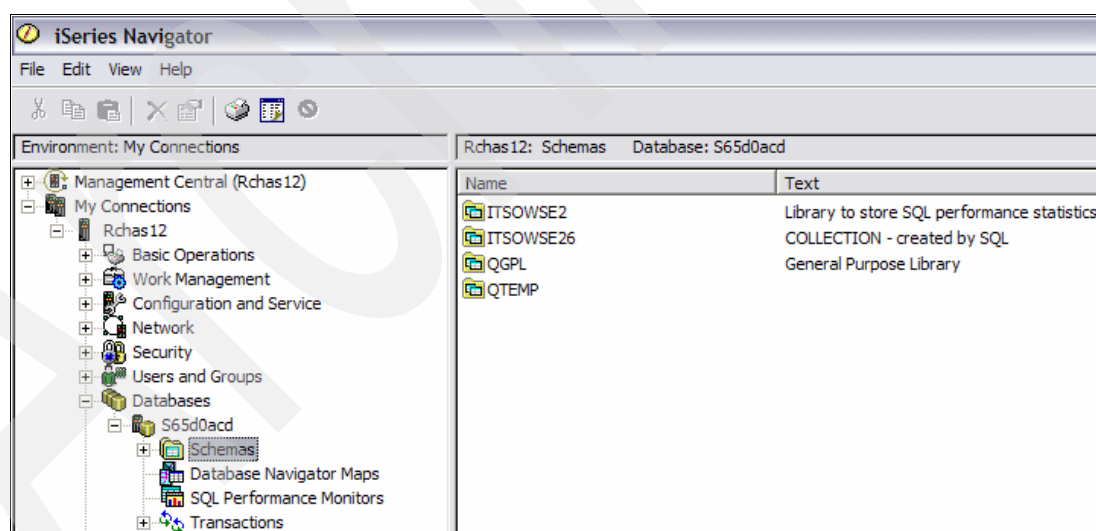


Figure 9-80 i5/OS connection via iSeries Navigator

4. By default, iSeries Navigator does not display all the database schemas on the system. To add the database schemas for the Workplace Services Express server, follow these steps:
  - a. Right-click **Schemas** and click **Select Schemas to Display** as shown in Figure 9-81.

**Note:** If you already selected the schemas to display as explained in “Creating an SQL performance monitor” on page 315, you can skip to step 5 on page 327.

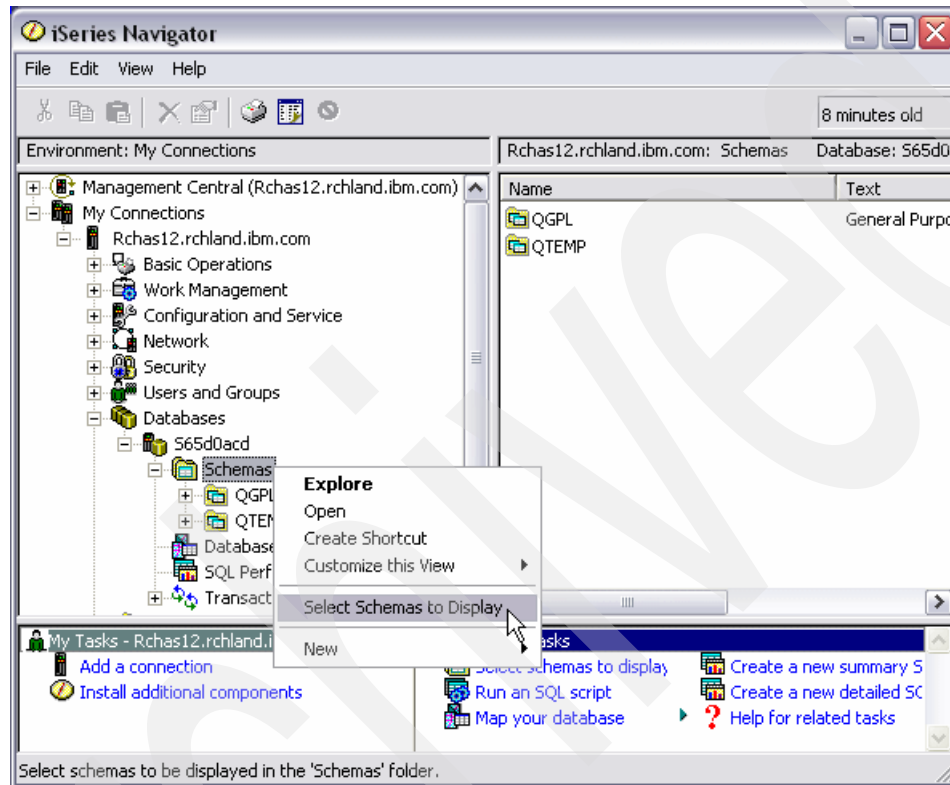


Figure 9-81 Selecting the option *Select Schemas to Display*

- b. In the Select Schemas to Display window, choose either **Enter schemas names** or **Search for schemas**. Figure 9-82 shows an example of entering the WebSphere Portal database for Workplace Services Express server ITSOWSE2.
- c. Click the **Add** button to add the schema name to the selected schema list.

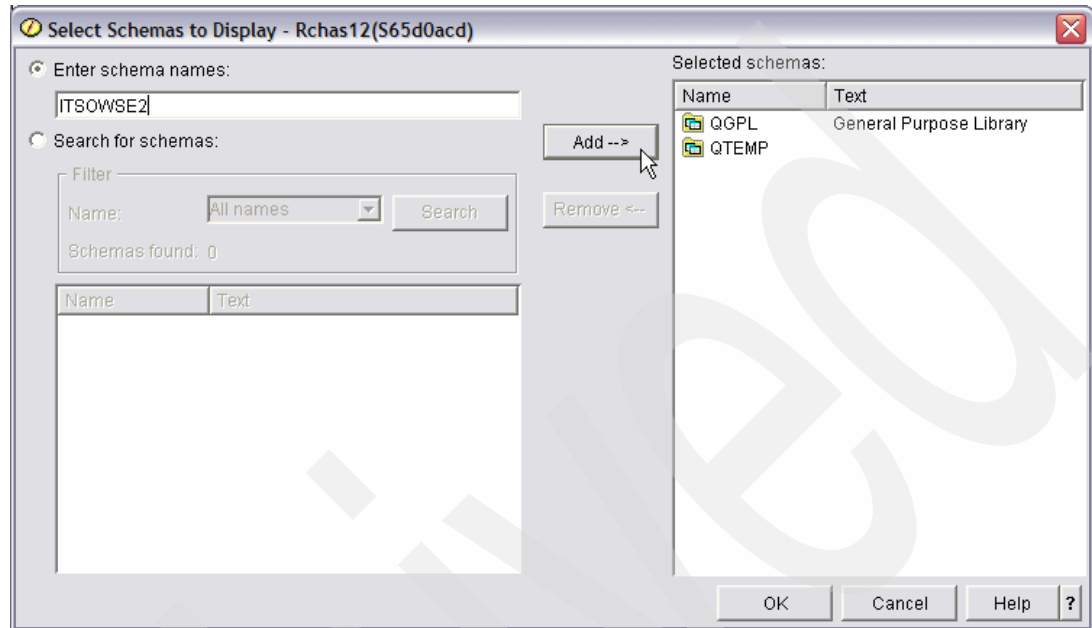


Figure 9-82 Adding a schema name to the select schema list

Figure 9-83 shows the schemas added to the list.

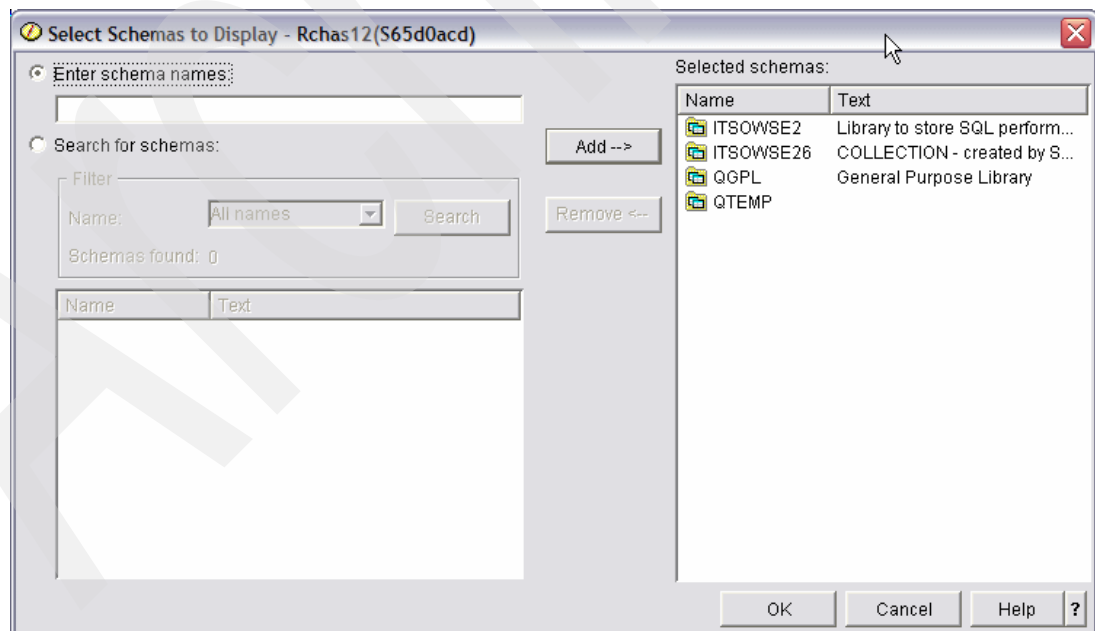


Figure 9-83 Selected Schemas after adding

- d. Click **OK**. iSeries Navigator now shows the Workplace Services Express WebSphere Portal library.

5. In the Database tasks panel, located in the lower pane of iSeries Navigator, select **Run an SQL script** as shown in Figure 9-84. This launches an SQL script window to perform the indexing.

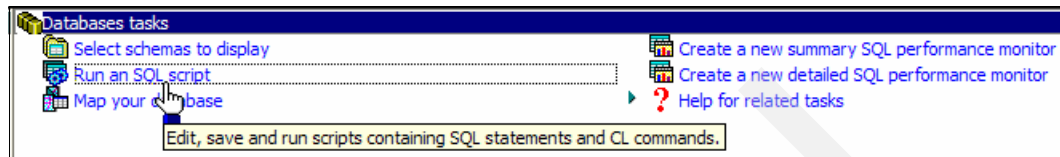


Figure 9-84 Run an SQL script

6. In the Run SQL Script window (Figure 9-85), run the following scripts *individually* to create the database indexes.

**Note:** Replace *portaldb* with the WebSphere Portal database that you are indexing.

- create index portaldb.IX2110D on portaldb.prot\_res ( parent\_oid, oid )
- create index portaldb.IX2140B on portaldb.lnk\_user\_role ( role\_inst\_oid )
- create index portaldb.lambr\_idxfix1 on portaldb.wmm1ambr (WMM1AMBR\_ID, MEMBER\_TYPE)
- create index portaldb.laasval\_idxfix3 on portaldb.wmm1aasval (WMM1AMBR\_ID, WMM1AATR\_ID)
- create index portaldb.laasval\_idxfix2 on portaldb.wmm1aasval (WMM1AMBR\_ID, HAS\_CONTEXT)
- create index portaldb.disresidx2 on portaldb.DISCUSSIONRESOURCE (uri, parenturi, path)
- create index portaldb.disresidx3 on portaldb.DISCUSSIONRESOURCE (uri, rooturi, projectid, workspace)
- create index portaldb.disres\_midx2 on portaldb.DISCUSSIONRES\_M (uri, wpcpguid)
- create index portaldb.metaidx4 on portaldb.wpcpmetadata ( wpcpguid, wpcpdeleted)



Figure 9-85 shows an example of entering the first create index script against the WebSphere Portal database ITSOWSE26. Click **Run All** to run the create index script.

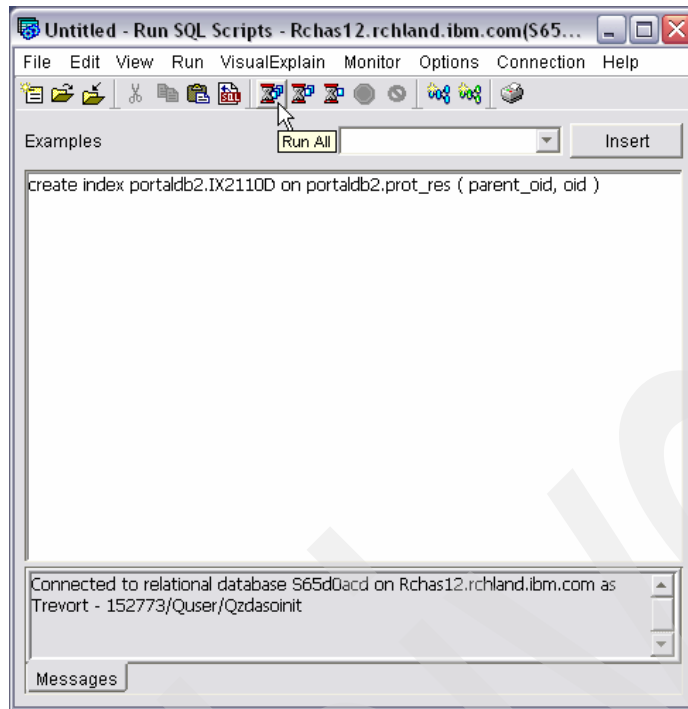


Figure 9-85 Entering the create index SQL script

This results in a "Statement ran successfully" message, as shown in Figure 9-86.

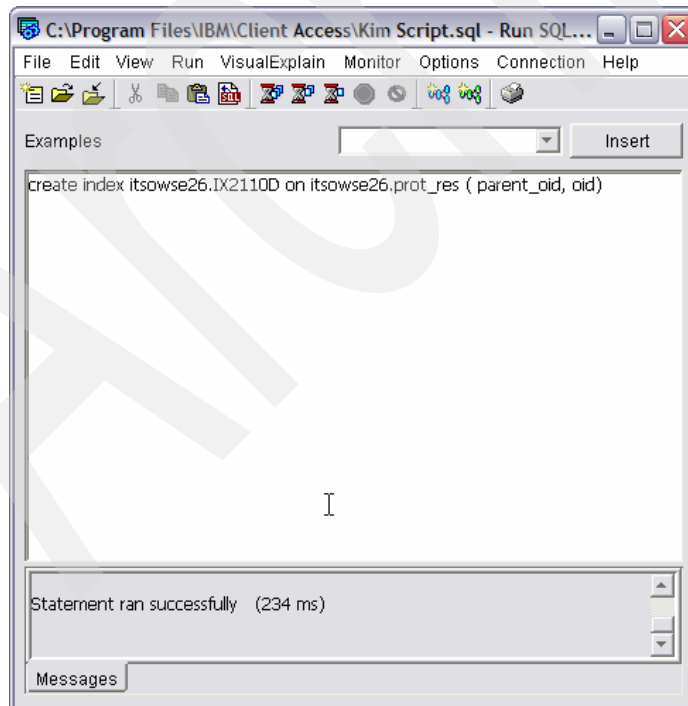


Figure 9-86 Statement ran successfully message

7. Clear the create index script to continue running the next SQL script.
8. Create the remaining indexes listed in step 6 on page 327 using the same procedure that you used to create the first index.
9. After all of the indexes are created, exit the Run SQL Scripts window. Saving the information is optional.

## Changing the object owner of database indexes via iSeries Navigator

For each of the new indexes that you created, change the owner to the user profile used during the Workplace Services Express server configuration.

1. Open iSeries Navigator and access your iSeries server.
2. When prompted, enter a valid i5/OS user profile and password with at least \*ALLOBJ, \*IOSYSCFG, and \*JOBCTL special authorities.
3. Click **My Connections** → **iSeries system name** → **Databases** → **S65d0acd** → **Schemas** to view the database or databases and their schemas. See Figure 9-80 on page 324.  
  
In our example, the relational database directory entry name was S65d0acd. In your environment, select the relational database directory name on your iSeries server.
4. Expand **Schemas** and select the **WebSphere Portal schema** for your Workplace Services Express server.
5. Click **Indexes** to view the database indexes created. Figure 9-87 shows an example of selecting the WebSphere Portal database of ITSOWSE26.

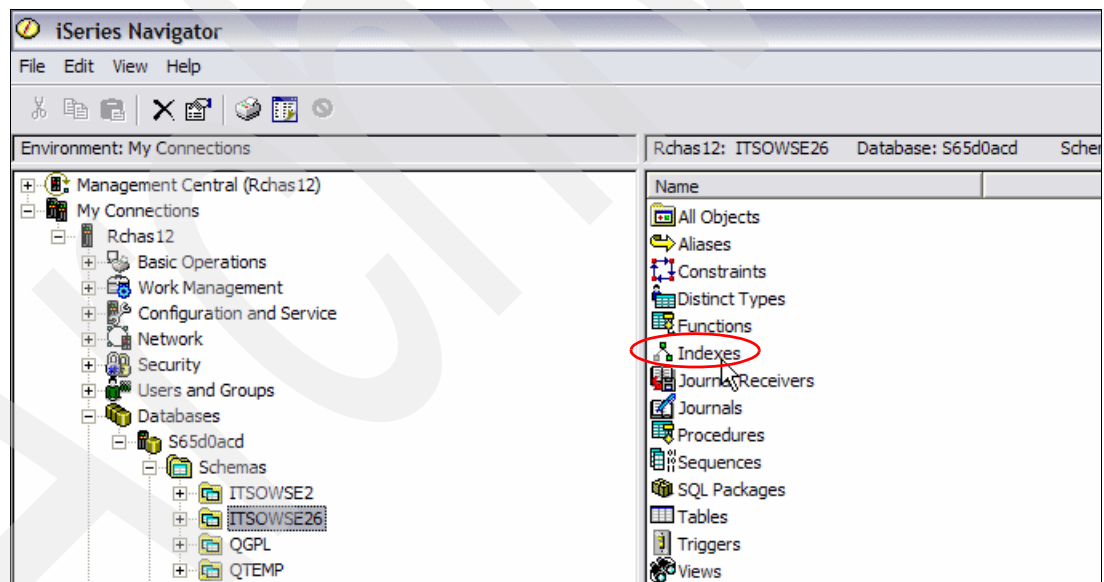


Figure 9-87 Selecting Indexes for the WebSphere Portal database of ITSOWSE26

The indexes for the database are now displayed. Notice the owner column in Figure 9-88.

**Note:** Click the column labeled **Owner** to sort the database indexes to see the indexes you created in 9.8.3, “Creating database indexes” on page 324.

| SQL Name        | Type       | Table            | Owner      |
|-----------------|------------|------------------|------------|
| LAMBR_IDXFIX1   | Not unique | ITSOWSE26.WM...  | KGREENE    |
| LAASVAL_IDXFIX3 | Not unique | ITSOWSE26.WM...  | KGREENE    |
| LAASVAL_IDXFIX2 | Not unique | ITSOWSE26.WM...  | KGREENE    |
| IX2140B         | Not unique | ITSOWSE26.LNK... | KGREENE    |
| IX2110D         | Not unique | ITSOWSE26.PR...  | KGREENE    |
| METAIDX4        | Not unique | ITSOWSE26.WP...  | KGREENE    |
| DISRESIDX2      | Not unique | ITSOWSE26.DIS... | KGREENE    |
| DISRES_MIDX2    | Not unique | ITSOWSE26.DIS... | KGREENE    |
| DISRESIDX3      | Not unique | ITSOWSE26.DIS... | KGREENE    |
| REFERRER_X      | Unique     | ITSOWSE26.REF... | WSE2DBUSER |
| PLATFORMS_X     | Unique     | ITSOWSE26.PLA... | WSE2DBUSER |
| REFERRERHOST_X  | Unique     | ITSOWSE26.REF... | WSE2DBUSER |
| RESOURCES_X     | Unique     | ITSOWSE26.RES... | WSE2DBUSER |
| REFERRERURL_X   | Unique     | ITSOWSE26.REF... | WSE2DBUSER |
| KVC_KVP_X       | Not unique | ITSOWSE26.KEY... | WSE2DBUSER |
| KVC_PARM_X      | Not unique | ITSOWSE26.KEY... | WSE2DBUSER |
| PARMS_X         | Not unique | ITSOWSE26.PA...  | WSE2DBUSER |
| PATHX2          | Not unique | ITSOWSE26.PATH   | WSE2DBUSER |
| KEY_X           | Unique     | ITSOWSE26.KEY    | WSE2DBUSER |
| SERVERS_X       | Unique     | ITSOWSE26.SER... | WSE2DBUSER |
| WMMI080         | Not unique | ITSOWSE26.WM...  | WSE2DBUSER |
| WMMI075         | Not unique | ITSOWSE26.WM...  | WSE2DBUSER |
| WMMI067         | Unique     | ITSOWSE26.WM...  | WSE2DBUSER |

Figure 9-88 Displaying the database indexes

6. Right-click a newly created index and select **Permissions** as shown in Figure 9-89.

| SQL Name        | Type       | Table            | Owner      |
|-----------------|------------|------------------|------------|
| LAMBR_IDXFIX1   | Not unique | ITSOWSE26.WM...  | KGREENE    |
| LAASVAL_IDXFIX3 | Not unique | ITSOWSE26.WM...  | KGREENE    |
| LAASVAL_IDXFIX2 | Not unique | ITSOWSE26.WM...  | KGREENE    |
| IX2140B         | Not unique | ITSOWSE26.LNK... | KGREENE    |
| IX2110D         | Not unique | ITSOWSE26.PR...  | KGREENE    |
| METAIDX4        | Not unique | ITSOWSE26.WP...  | KGREENE    |
| DISRESIDX2      | Not unique | ITSOWSE26.DIS... | KGREENE    |
| DISRES_MIDX2    | Not unique | ITSOWSE26.DIS... | KGREENE    |
| DISRESIDX3      | Not unique | ITSOWSE26.DIS... | KGREENE    |
| REFERRER_X      | Unique     | ITSOWSE26.REF... | WSE2DBUSER |
| PLATFORMS_X     | Unique     | ITSOWSE26.PLA... | WSE2DBUSER |
| REFERRERHOST_X  | Unique     | ITSOWSE26.REF... | WSE2DBUSER |
| RESOURCES_X     | Unique     | ITSOWSE26.RES... | WSE2DBUSER |
| REFERRERURL_X   | Unique     | ITSOWSE26.REF... | WSE2DBUSER |
| KVC_KVP_X       | Not unique | ITSOWSE26.KEY... | WSE2DBUSER |
| KVC_PARM_X      | Not unique | ITSOWSE26.KEY... | WSE2DBUSER |
| PARMS_X         | Not unique | ITSOWSE26.PA...  | WSE2DBUSER |
| PATHX2          | Not unique | ITSOWSE26.PATH   | WSE2DBUSER |

Figure 9-89 Selecting the index permissions

**Note:** The Owner column also shows who the original user was that was used to create the initial indexes and databases in our WebSphere Portal schema. In our example, this is user WSE2DBUSER. Make note of this index owner, which you must know later.

7. In the Permissions window (Figure 9-90), click the **Owner** button.

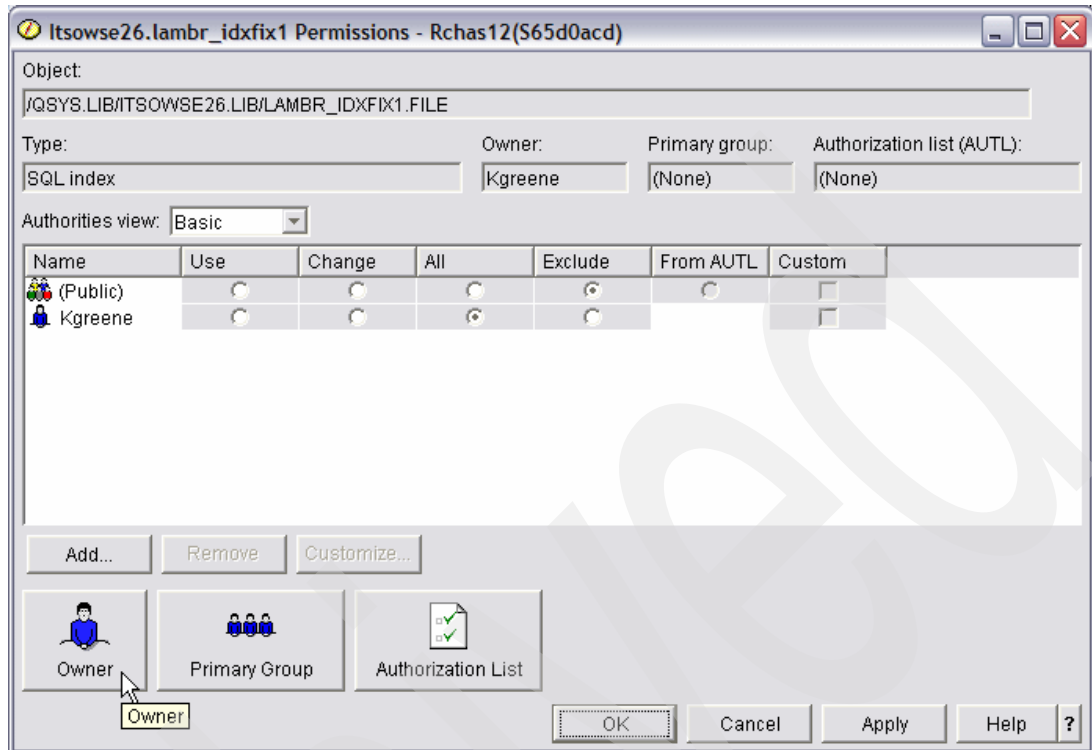


Figure 9-90 Changing ownership of an index

8. In the Owner window (Figure 9-91), change the owner to the database profile used to create the databases during the Workplace Services Express server creation. Scroll down to find the original WebSphere Portal schema owner. In our example, this was user WSEDB2USER. Highlight the user and click **OK**.

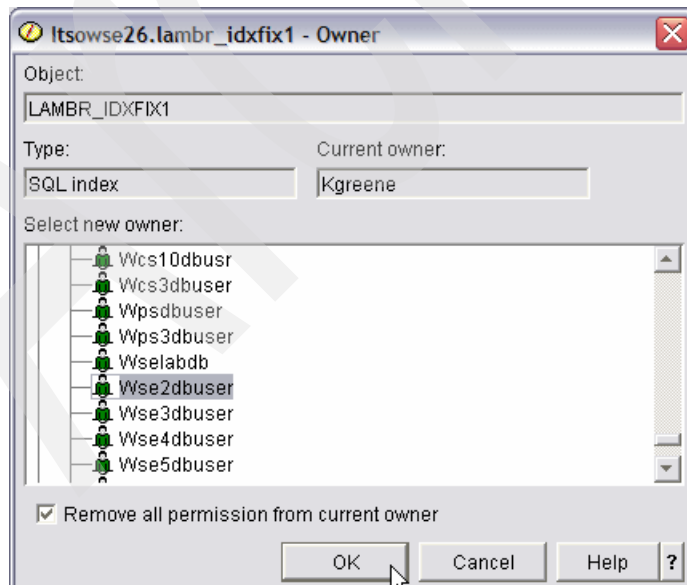


Figure 9-91 Setting the database profile as the owner of the index

9. In the Permissions window, click **Apply** to see the new owner updated. Click **OK** to exit the Permissions window.
10. Perform step 6 on page 330 through step 9 for each of the remaining newly created indexes.

### Creating database indexes from an i5/OS command line

You can also create the database index for a Workplace Services Express server from an i5/OS command line as explained in the following steps:

**Note:** DB2 Query Manager and SQL Developer Kit (5722-ST1) \*BASE *must* be installed to run SQL commands from the i5/OS command line.

1. Connect to the iSeries server via a 5250 emulation session or access the system console.
2. When prompted, enter a valid i5/OS user profile and password with at least \*ALLOBJ, \*IOSYSCFG, and \*JOBCTL special authorities.
3. From an i5/OS command line, run the following command to start the SQL Interactive Session interface with the naming convention set to \*SQL.

```
STRSQL NAMING(*SQL)
```

Figure 9-92 displays a successful connection to the relational lab database S65D0ACD.

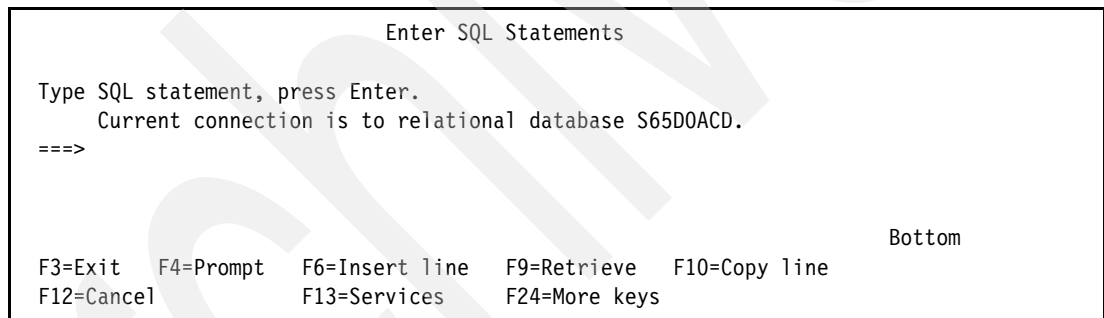


Figure 9-92 Example results of running STRSQL NAMING(\*SQL)

4. Run the following scripts *individually* to create the database indexes.

**Note:** Replace *portaldb* with the WebSphere Portal library you are indexing.

- create index portaldb.IX2110D on portaldb.prot\_res ( prot\_00001, oid )
- create index portaldb.IX2140B on portaldb.lnk\_u00001 ( role\_00001 )
- create index portaldb.LMidxfix1 on portaldb.wmm1ambr (wmm1a00001, membe00001)
- create index portaldb.LAidxfix3 on portaldb.wmm1aasval (wmm1a00004, wmm1a00002)
- create index portaldb.LAidxfix2 on portaldb.wmm1aasval (wmm1a00004, has\_c00001)
- create index portaldb.disresidx2 on portaldb.DISCU00001 (uri, parenturi, path)
- create index portaldb.disresidx3 on portaldb.DISCU00001 (uri, rooturi, projectid, workspace)
- create index portaldb.disresidx2 on portaldb.DISCU00002 (uri, wpcpguid)
- create index portaldb.metaidx4 on portaldb.wpcpm00001 (wpcpguid, wpcpd00001)

Figure 9-93 shows an example of running the first **create index** script against the WebSphere Portal schema of ITSOWSE26.

```

Enter SQL Statements

Type SQL statement, press Enter.
> create index itsowse26.IX2110D on itsowse26.prot_res (prot_00001, oi
d)
Index IS2110D created in ITSOWSE26 on table PROT_RES in ITSOWSE26.
===>

F3=Exit F4=Prompt F6=Insert line F9=Retrieve F10=Copy line
F12=Cancel F13=Services F24=More keys
Bottom

```

Figure 9-93 Creating an index

- Run the remaining **create index** commands in step 4 on page 332 on the schema.
- Press F3 to exit the SQL Statements and type option 1 to save and exit the interactive SQL session (Figure 9-94).

```

Exit Interactive SQL

Type choice, press Enter.

Option 1 1=Save and exit session
 2=Exit without saving session
 3=Resume session
 4=Save session in source file

F12=Cancel

```

Figure 9-94 Exiting the Interactive SQL session

### Changing the object owner of database indexes via i5/OS command line

For each of the new indexes created, change the owner to the database profile used during the Workplace Services Express server configuration. You can verify this as explained in 5.2, “Reviewing the Workplace Services Express configuration” on page 110.

From an i5/OS command line, run the Change Object Owner (CHGOBJOWN) CL command against each of the newly created indexes. Set the new owner as the user profile that was used during the Workplace Services Express server configuration.

The following command shows an example of setting the owner of WSE2DBUSER against the newly created index IX2110D in the ITSOWSE26 library:

```
CHGOBJOWN OBJ(ITSOWSE26/IX2110D) OBJTYPE(*FILE) NEWOWN(WSE2DBUSER)
```

## 9.9 IBM Directory Server tuning

If you have chosen to use the IBM Directory Server for your LDAP server in your Workplace Services Express server deployment, we recommend that you implement the tuning tips in this section.

### 9.9.1 Nested groups

To obtain the best performance, we recommend that you avoid nested groups within your LDAP directory. *Nested groups* are groups within groups and can cause performance issues with resolution of the groups that are either nested several levels deep or that contain many users.

The reason why nested groups can be a performance concern is because of the security checks that Workplace Services Express performs when a user requests a page. When the page request is received by the server, permission levels of the user are checked against that page and the individual portlets present on that page. Different security levels can be set for each of these elements, meaning that a security check is required to serve up the individual portlets, the portlet contents, and the page as a whole.

The Workplace Services Express server must check the user access before rendering the page, so it can decide what to render according to the different security levels assigned to that user for the different components. When users are in nested groups, getting the nested member can be an intensive task on the LDAP server.

### 9.9.2 Database connections and server threads

The IBM Directory Server defaults to allowing four database connections and server threads. Increasing this value can improve performance. In our testing, we increased this value to 10 and saw some positive results. To access the IBM Directory properties:

1. Open iSeries Navigator and access your iSeries server.
2. When prompted, enter a valid i5/OS user profile and password with at least \*ALLOBJ, \*IOSYSCFG, and \*JOBCTL special authorities.
3. Click **My Connections** → **iSeries system name** → **Network** → **Servers** → **TCP/IP**. In the right pane, scroll down and right-click **Directory** server and select **Properties** as shown in Figure 9-95.

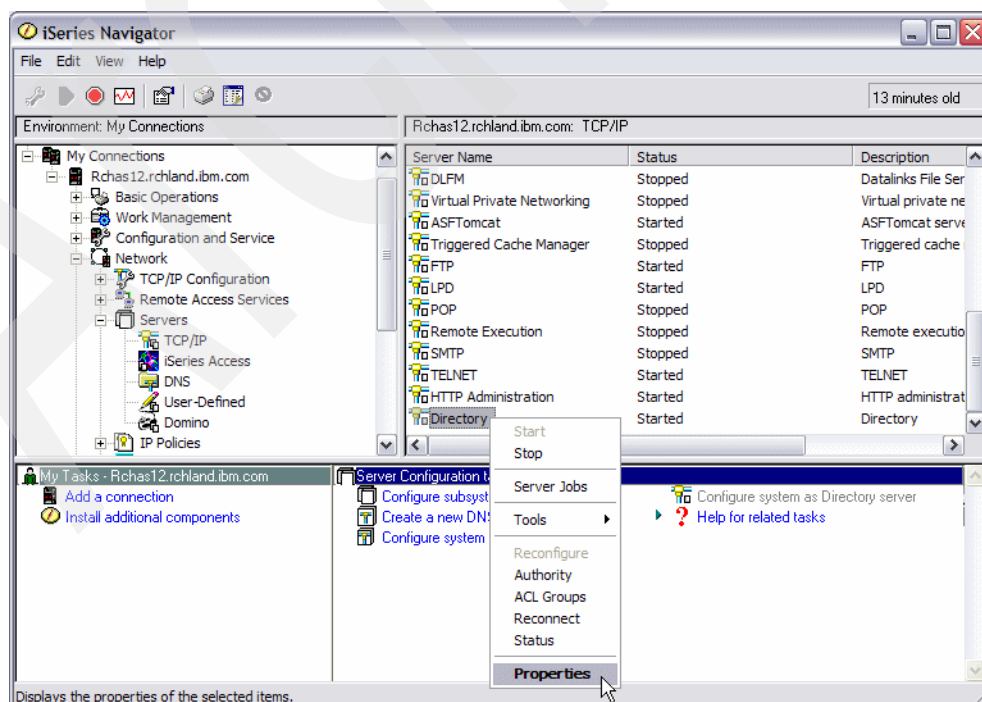


Figure 9-95 Accessing the IBM Directory server properties



4. In the Directory Properties window (Figure 9-96), click the **Database/Suffixes** tab. Increase the Database connections and server threads field to a desired setting. In our testing, we set this value to 10. Click **OK**.

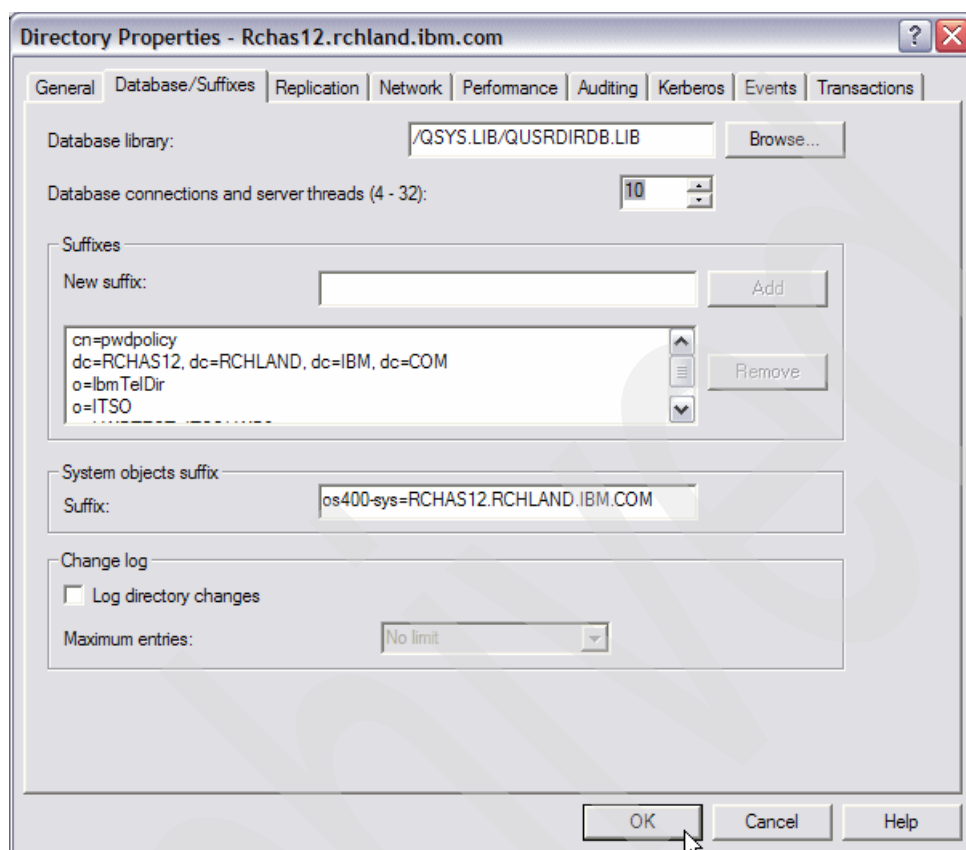


Figure 9-96 Increasing the Database connections and server threads for the IBM Directory server

5. In the Directory Server Properties window (Figure 9-97), select to either restart the directory server now or later. Then click **OK**.

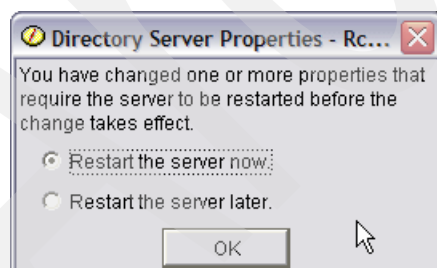


Figure 9-97 Selecting an option for restarting the IBM Directory server

6. If you have chosen the not restart the directory server now, stop and restart the IBM Directory server for the changes to be enabled.

**Tip:** The changes made to the iSeries Navigator to optimize performance are written to the integrated file system /QIBM/UserData/OS400/DirSrv/ibmslapd.conf directory on the i5/OS server. We recommend that you make all IBM Directory Server configuration changes using iSeries Navigator.

## 9.10 Lotus Domino LDAP tuning

Lotus Domino might be your choice for an LDAP server within your Workplace Services Express deployment. This section contains tips to help you optimize the performance of your Lotus Domino LDAP implementation.

### 9.10.1 Nested groups

For the best performance, we recommend that you avoid nested groups within your LDAP directory. Nested groups are groups within groups and can cause performance issues with resolution of the groups that are either nested several levels deep or that contain many users.

The reason why nested groups can be a performance concern is because of the security checks Workplace Services Express performs when a user requests a page. When the page request is received by the server, permission levels of the user are checked against that page and the individual portlets that are present on that page. Different security levels can be set for each of these elements, meaning that a security check is required to serve up the individual portlets, the portlet contents, and the page as a whole.

The Workplace Services Express server must check the user access before rendering the page, so it can decide what to render according to the different security levels assigned to that user for the different components. When users are in nested groups, getting the nested member can be an intensive task on the LDAP server.

### 9.10.2 Full text indexing of the Domino Directory

When using Lotus Domino to provide LDAP services for the Workplace Services Express server, it is important to make sure that the Domino Directory is full text search enabled. Without the full text index created, each Domino LDAP search is a linear search. This means that the more users you have in your directory, the worse the problem becomes.

Make sure that your Domino Directory has full text indexing enabled as explained here:

1. Open the Domino Administrator client.
2. Click the **Configuration** tab.
3. In the left frame, click **Server** → **Configurations**.

- Open the Global Configuration document, or create one if it doesn't already exist. The Global Configuration document has a server name of \* - [All Servers]. To create a new Global Configuration document, click **Add Configuration** and select **Use these settings as the default settings for all servers** as shown in Figure 9-98.

| Configuration Settings                                                             |                                              |
|------------------------------------------------------------------------------------|----------------------------------------------|
| Basics   LDAP   Router/SMTP   MIME   NOTES.INI Settings   Domino Web Access   IMAP |                                              |
| <b>Basics</b>                                                                      |                                              |
| Use these settings as the default settings for all servers:                        | <input checked="" type="checkbox"/> Yes      |
| OR                                                                                 |                                              |
| Group or Server name:                                                              | * - Default -                                |
| Type-ahead:                                                                        | <input checked="" type="checkbox"/> Enabled  |
| International MIME Settings for this document:                                     | <input checked="" type="checkbox"/> Enabled  |
| IMAP server returns exact size of message:                                         | <input checked="" type="checkbox"/> Enabled  |
| POP3 server returns exact size of message:                                         | <input checked="" type="checkbox"/> Disabled |
| Extract calendar details:                                                          | <input checked="" type="checkbox"/> Enabled  |
| Smart Upgrade Database link:                                                       | <input checked="" type="checkbox"/> Disabled |
| License Tracking:                                                                  | <input checked="" type="checkbox"/> Disabled |
| Minimum Client Level:                                                              | <input checked="" type="checkbox"/> Disabled |
| Maximum Client Level:                                                              | <input checked="" type="checkbox"/> Disabled |
| Comments:                                                                          |                                              |

Figure 9-98 Creating or modifying the Global Configuration document

- In the Configuration Settings document, click the **LDAP** tab. For the Automatically Full Text Index Domino Directory? field, select **Yes** as shown in Figure 9-99.

| Save & Close   Cancel                                                                                                                           |                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| vendorversion                                                                                                                                   |                                                                                                                                                                 |
| Allow LDAP users write access:                                                                                                                  | <input checked="" type="radio"/> Yes<br><input checked="" type="radio"/> No                                                                                     |
| Timeout:                                                                                                                                        | <input checked="" type="checkbox"/> 0 seconds                                                                                                                   |
| Maximum number of entries returned:                                                                                                             | <input checked="" type="checkbox"/> 0                                                                                                                           |
| Minimum characters for wildcard search:                                                                                                         | <input checked="" type="checkbox"/> 1                                                                                                                           |
| Allow Alternate Language Information processing:                                                                                                | <input checked="" type="radio"/> Yes<br><input checked="" type="radio"/> No                                                                                     |
| Rules to follow when this directory is the primary directory, and there are multiple matches on the distinguished name being compared/modified: | <input checked="" type="radio"/> Don't modify any<br><input checked="" type="radio"/> Modify first match<br><input checked="" type="radio"/> Modify all matches |
| Automatically Full Text Index Domino Directory?                                                                                                 | <input checked="" type="radio"/> Yes<br><input checked="" type="radio"/> No                                                                                     |
| Enforce schema?                                                                                                                                 | <input checked="" type="radio"/> Yes<br><input checked="" type="radio"/> No                                                                                     |
| DN Required on Bind?                                                                                                                            | <input checked="" type="radio"/> Yes<br><input checked="" type="radio"/> No                                                                                     |
| Encode results in UTF8 for LDAPv2 clients?                                                                                                      | <input checked="" type="radio"/> Yes<br><input checked="" type="radio"/> No                                                                                     |
| Maximum number of referrals:                                                                                                                    | <input checked="" type="checkbox"/> 1                                                                                                                           |

Figure 9-99 Specifying to automatically full text index the Domino Directory

6. Save and close the document.
7. Enter the following command from the Domino server console to reload the LDAP schema:

```
tell ldap reloadschema
```

**Tip:** Our testing has shown that reloading the schema is not always sufficient. To be safe, consider restarting the Domino server.



## Using existing LDAP servers with Workplace Services Express

This appendix describes the object classes and hierarchy required by an existing Lightweight Directory Access Protocol (LDAP) server to interface with Workplace Services Express. For specific information about using a Microsoft Active Directory server with Workplace Services Express, refer to the IBM Redbook *IBM Workplace Services Express*, SG24-6758.

## Recommended object classes and attributes

Each supported LDAP server can base their implementation on different object classes as listed in Table A-1.

Table A-1 Supported LDAP servers and their recommended property values

| Property             | IBM Directory Server | Domino       |
|----------------------|----------------------|--------------|
| LDAPSuffix           | dc=yourco,dc=com     | 1            |
| LDAPUserPrefix       | uid                  | cn           |
| LDAPUserSuffix       | cn=users             | o=yourco     |
| LDAPGroupPrefix      | cn                   | cn           |
| LDAPGroupSuffix      | cn=groups            | 2            |
| LDAPUserObjectClass  | inetOrgPerson        | dominoPerson |
| LDAPGroupObjectClass | groupOfUniqueNames   | dominoGroup  |
| LDAPGroupMember      | uniqueMember         | member       |

1. The Domino LDAP directory does not have an LDAP suffix. In the iSeries Create IBM Workplace wizard, you can select your organization (for example, o=itso) or \*ROOT as your users container.

2. In Domino, groups are not created under an LDAP suffix. In the iSeries Create IBM Workplace wizard, select \*ROOT as the LDAP suffix.

For each directory server's user LDAPUserObjectClass, as well as, each group's LDAPGroupObjectClass, Workplace Services Express requires unique identifiers, which are listed in Table A-2.

Table A-2 Supported LDAP servers and their unique identifier attributes

| Object class         | IBM Directory Server | Domino       |
|----------------------|----------------------|--------------|
| LDAPUserObjectClass  | inetOrgPerson        | dominoPerson |
| LDAPGroupObjectClass | groupOfUniqueNames   | dominoGroup  |
| Unique identifier    | ibm-entryUuid        | dominoUNID   |

**Important:** Do not attempt to configure a Workplace Services Express instance without the paired attribute=value unique identifier attribute for your respective LDAP server. Otherwise, the enable-security-ldap task fails when you configure a new Workplace Service Express server or configure security on an existing one.

In addition, each user LDAPUserObjectClass requires the following attributes:

- ▶ **uid:** User ID or short name
- ▶ **cn:** Common name
- ▶ **givenName:** Given name
- ▶ **sn:** Sir name
- ▶ **Mail:** Local e-mail address

Each group, LDAPGroupObjectClass requires the following attributes:

- ▶ **cn:** Common name
- ▶ **member:** Group member

**Tip:** It is possible to extend these classes by creating new class, including new attributes, or doing both actions. Refer to your LDAP documentation on how to perform these tasks.

## Required users in the LDAP directory

If you do not allow write access to your existing LDAP directory, you must manually create a Workplace Services Express administrator and an administration group (for example wpsadmin user and wpsadmins group) in your LDAP directory. Doing so enables the configuration of your Workplace Services Express instance to properly complete. Refer to your LDAP administrator or the documentation for your directory server for instructions on how to do this. When completed, you should have a Workplace Services Express administrator which is part of administrator group, for example, a wpsadmin user which is a member of the wpsadmins group.

For steps on adding users in the IBM Directory server, refer to 3.3.4, “Adding a Workplace Services Express administrator to the LDAP server” on page 40. For steps on adding users to the Domino Directory, see 3.4, “Preparing the Domino server for LDAP” on page 51.



Archived



## Setting up IBM Directory Server for i5/OS

This appendix explains how to configure and administer the IBM Directory Server on i5/OS V5R3. It discusses how to manage and test the IBM Directory Server on i5/OS. And it explains how to configure and use the Tivoli Directory Server Web Administration Tool.

## Managing the IBM Directory Server on i5/OS

Perform the following steps to access the IBM Directory Server on i5/OS properties:

1. Before you view the IBM Directory Server on i5/OS properties, make sure that the appropriate default suffix exists by performing the following steps:

**Note:** By default, the suffix is the same as the iSeries system's fully qualified host name.

- a. Open a 5250 session on your iSeries server.
- b. On an i5/OS command line, enter the Configure TCP/IP (CFGTCP) CL command and press Enter.
- c. From the Configure TCP/IP menu, type option 12 (Change TCP/IP domain information) and press Enter.
- d. In the Change TCP/IP Domain (CHGTCPDMN) display, make sure the Host name and Domain name fields contain values. If they do not contain values, contact your iSeries administrator for assistance configuring TCP/IP on your iSeries server.

When constructing the suffix, we replace the periods in the fully qualified host name with dc=. For our example shown in Figure B-1, the suffix for our Lightweight Directory Access Protocol (LDAP) server is dc=RCHAS55, dc=rchland, dc=ibm, dc=com.

```
Change TCP/IP Domain (CHGTCPDMN)

Type choices, press Enter.

Host name 'RCHAS55'
Domain name 'rchland.ibm.com'
Domain search list *DFT

Host name search priority . . . *LOCAL *REMOTE, *LOCAL, *SAME
Domain name server:
 Internet address '9.10.244.200'
 '9.10.244.100'

F3=Exit F4=Prompt F5=Refresh F10=Additional parameters F12=Cancel
F13=How to use this display F24=More keys

Bottom
```

Figure B-1 Change TCP/IP Domain (CHGTCPDMN) display

- From iSeries Navigator, click **Network** → **Servers** → **TCP/IP**. Right-click **IBM Directory Server** and then select **Properties** as shown in Figure B-2.

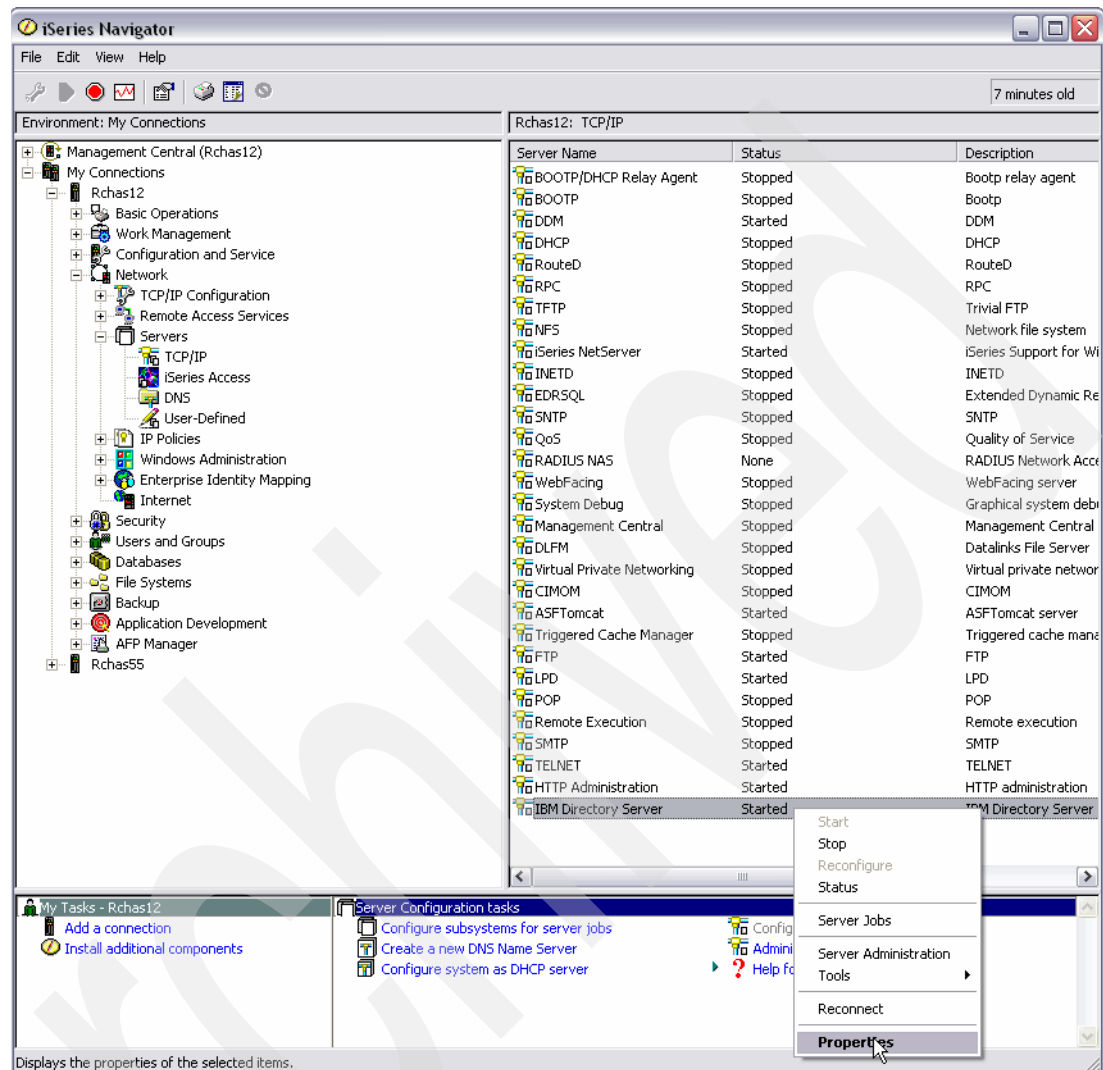


Figure B-2 Selecting the Properties option for IBM Directory Server on i5/OS

3. You can manage the IBM Directory Server administrator's user name and password from the IBM Directory Server Properties window as shown in Figure B-3. At the time when i5/OS is installed, a default password is created for internal usage.

On the **General** tab, click the **Password** button and enter a password for the IBM Directory Server administrator.

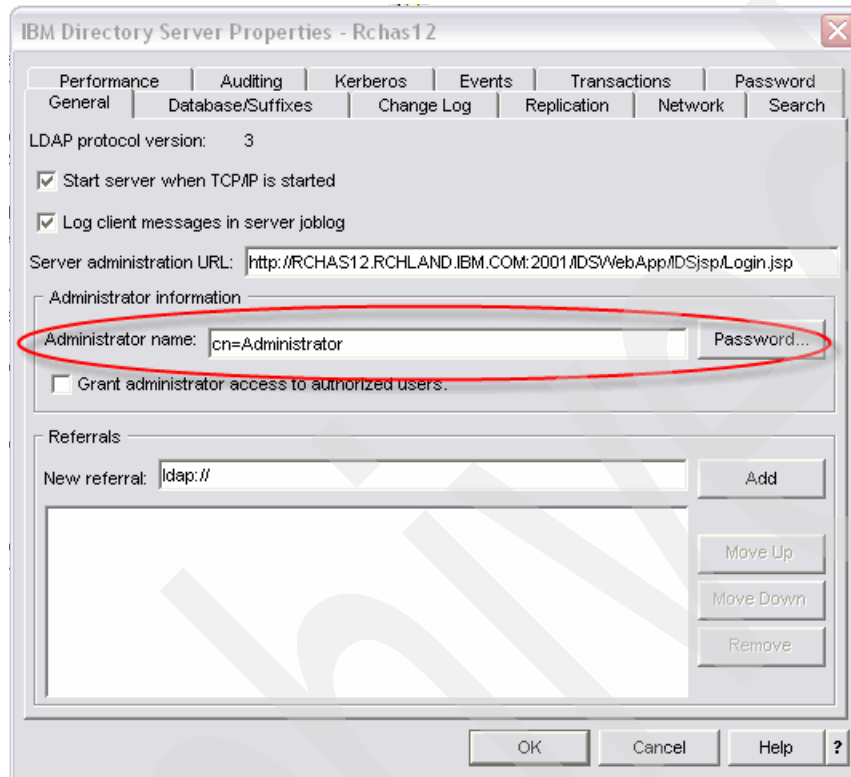


Figure B-3 Administering the IBM Directory Server Administrator user name and password

**Tip:** Depending on your network requirements, you might want to click IP Addresses button on the Network tab, and confirm whether your LDAP server should be bound to all IP addresses.

4. Confirm the default suffix entry in the IBM Directory Server. In most cases, the default suffix is created for you when i5/OS is installed and is based on the iSeries server name. The system objects suffix is also created at the same time. To verify the entry:
  - a. In the IBM Directory Server Properties window, click the **Database/Suffixes** tab.
  - b. Make sure the appropriate default suffix and system objects suffix exist, as shown in Figure B-4.

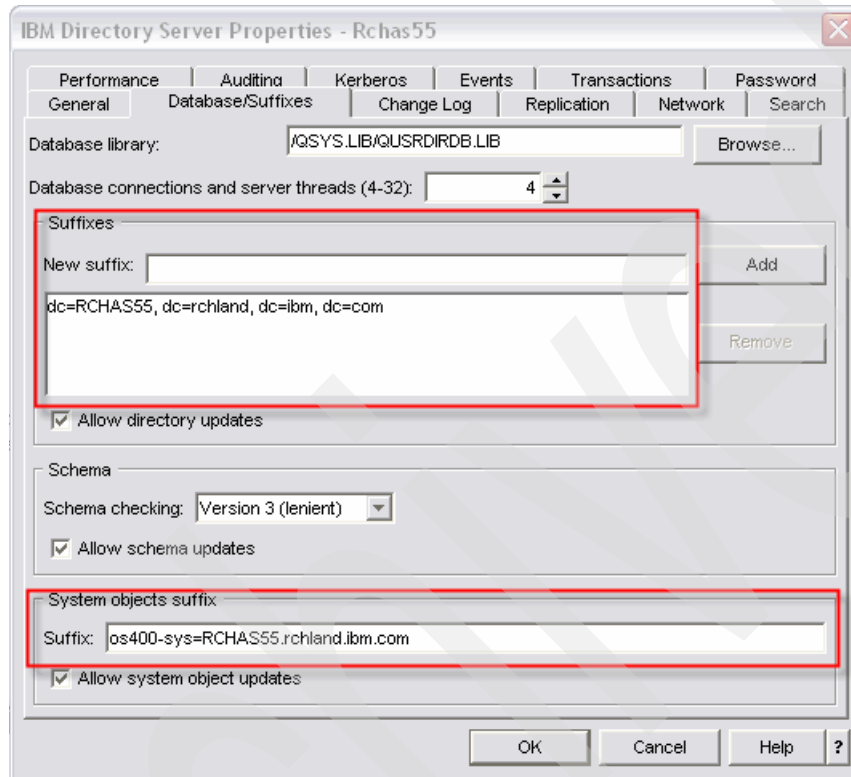


Figure B-4 IBM Directory Server default suffix and system objects suffix

5. Click **OK** to close the IBM Directory Server Properties window.

## Testing the IBM Directory Server on i5/OS

Test your IBM Directory Server by performing the following steps:

1. Verify anonymous access by searching your directory tree using the **ldapsearch** command. For example, the following steps search our host `rchas55.rchland.ibm.com` on port 389, basing the search from the root, for any object classes:
  - a. Open a 5250 session on your iSeries server.
  - b. On the i5/OS command line, type `STRQSH` and press Enter to start the Qshell environment.
  - c. Type an LDAP search command similar to the following example:

```
ldapsearch -h rchas55.rchland.ibm.com -p 389 -s base -b "" objectclass=*
```

Example B-1 shows how the output should look. If you do not see the `ibmdirectoryversion=` line, you must enable anonymous access in order for the iSeries Create Workplace wizard to run successfully.

**Tip:** By default, anonymous access is enabled on the IBM Directory Server. If the default configuration was modified, contact your LDAP administrator or see the iSeries Information Center V5R3 for information about modifying the configuration to enable anonymous access:

<http://publib.boulder.ibm.com/infocenter/iseriess/v5r3/index.jsp>

---

*Example: B-1 Verification of LDAP anonymous access*

---

```
port=389
supportedsaslmmechanisms=0S400-PRFTKN
supportedldapversion=2
supportedldapversion=3
ibmdirectoryversion=5.1
ibm-serverId=7b427001-36af-188c-8cb1-0004ac087ce7
ibm-supportedacimechanisms=1.3.18.0.2.26.3
ibm-supportedacimechanisms=1.3.18.0.2.26.2
vendorname=International Business Machines (IBM)
vendorversion=5.1
ibm-slapisconfigurationmode=FALSE
ibm-osregistrycontext=0S400-SYS=RCHAS55.RCHLAND.IBM.COM
ibm-osregistrytype=1.3.18.0.2.33.2-caseIgnore
```

---

**Note:** Instead of using the **ldapsearch** command to verify your LDAP entries, from iSeries Navigator, you can click **Network** → **Servers** → **TCP/IP**. Then right-click **IBM Directory Server**, and select **Tools** → **Export file**. This exports an LDIF text file of all your entries.

2. Verify LDAP administrator access by performing the following steps:
  - a. Perform an **ldapsearch** command similar to one from the previous step. This time, specify the distinguished name of the IBM Directory Server administrator, such as `cn=administrator`, and a password, basing the search from the default suffix, for example:

```
ldapsearch -h rchas55.rchland.ibm.com -p 389 -D 'cn=administrator' -w password
-s base -b 'dc=rchas55,dc=rchland,dc=ibm,dc=com' objectclass=*
```

- b. Verify that your output resembles the output shown in Example B-2.

---

*Example: B-2 Verification of LDAP administrator access*

---

```
dc=rchas55,dc=rchland,dc=ibm,dc=com
dc=RCHAS55
objectclass=domain
objectclass=top
```

---

3. Verify the unique identifier ID attribute:
  - a. Enter an **ldapsearch** command similar to the following example:
- b. Verify that the unique attribute and paired value exists as shown in Example B-3.

---

*Example: B-3 Verification of unique identifier ID attribute*

---

```
dc=rchas55,dc=rchland,dc=ibm,dc=com
ibm-entryUuid=5c656804-f40e-1898-8cb9-0004ac087ce7
```

---

# Enabling the Tivoli Directory Server Web Administration Tool

Prior to i5/OS V5R3, the directory management tool supplied with the iSeries server was the client-server based iSeries Navigator and IBM Directory Management Tool. With i5/OS V5R3, this tool has been replaced with the Web browser-based Tivoli Directory Server Web Administration Tool. Since this tool is browser-based, WebSphere Application Server V5.0 Express or Base must be running in order to use this tool.

**Important:** IBM WebSphere Application Server, V5.0 Express (5722-IWE Base and Option 2) and associated prerequisite software must be running in order to proceed.

## Configuring the HTTP Administration server

Perform the following steps to configure the HTTP Administration server to use the Tivoli Directory Server Web Administration Tool:

1. Ensure that the HTTP Administration server is started. If it is not already started, use one of the following options to start it:
  - From iSeries Navigator, click **Network** → **Servers** → **TCP/IP**. Right-click **HTTP Administration** and then click **Start**.
  - From an i5/OS command line, type the Start TCP/IP Server (STRTCPSVR) command:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)
```

2. To access the iSeries Tasks Web page, point your Web browser to your fully qualified iSeries host name on port 2001:

`http://iSeriesHostName.domain:2001`

In our example, we enter:

`http://rchas55.rchland.ibm.com:2001`

3. When prompted, enter your i5/OS user profile and password to log on to the IBM Web Administration for iSeries. Click **OK**.
4. Click the **IBM Web Administration for iSeries** link as shown in Figure B-5.

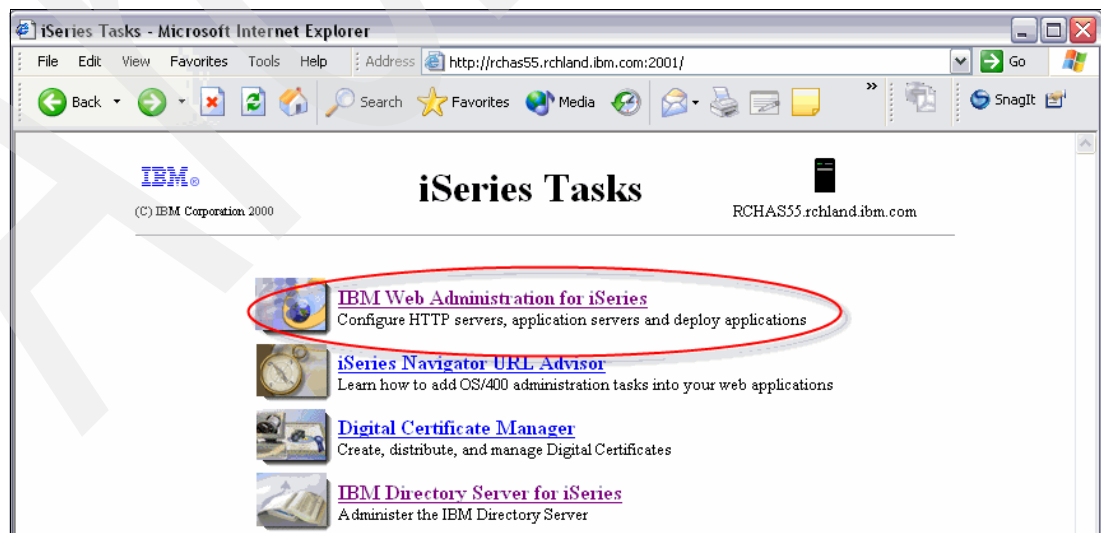


Figure B-5 iSeries Tasks page



5. From the IBM Web Administration for iSeries page, perform the following steps:
  - a. Click the **Manage** tab.
  - b. Click the **HTTP Servers** tab beneath it.
  - c. In the Server drop-down list, make sure that **ADMIN - Apache** is selected.
  - d. In the left pane, expand **Server properties** and select **General Server Configuration**.
  - e. In the Server area drop-down list box, make sure that **Include QIBM/UserData/HTTPAdmin/config/admin-cust.conf** is selected as shown in Figure B-6.

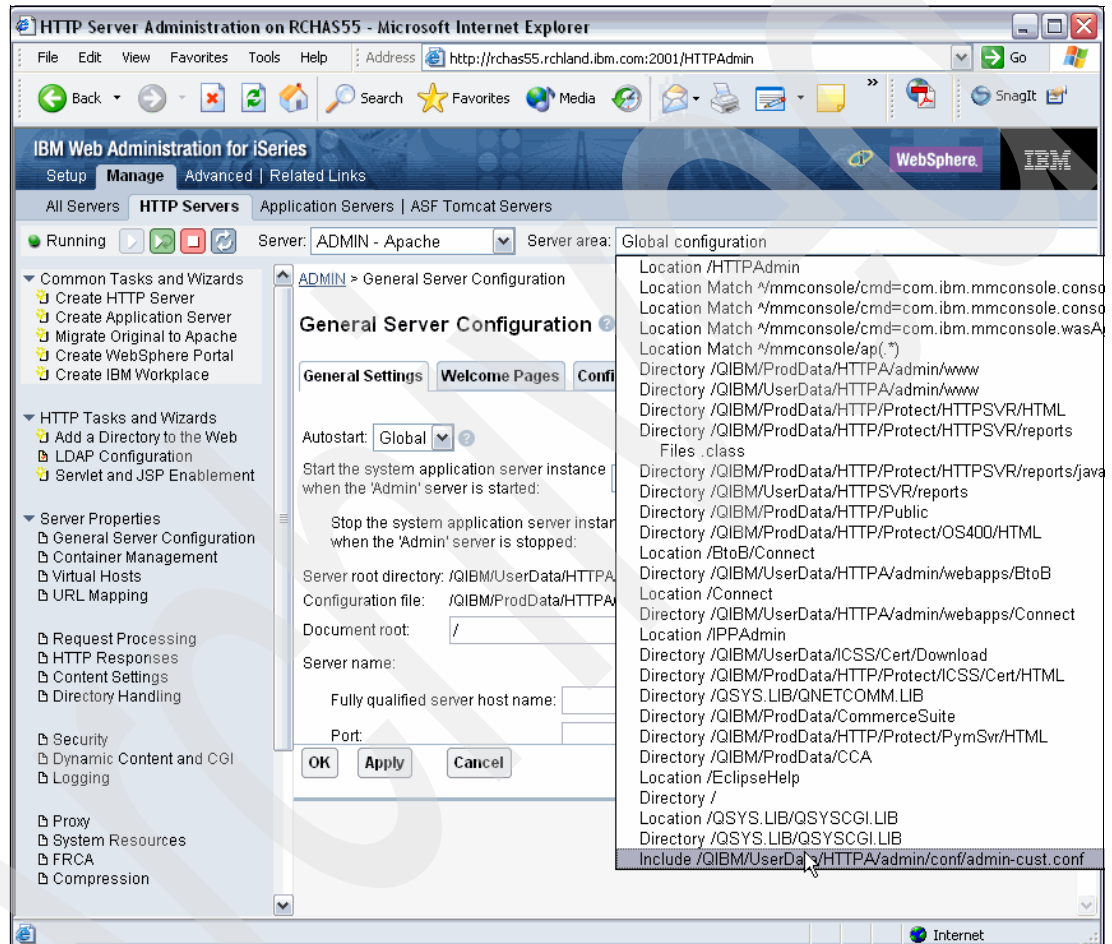


Figure B-6 Selecting Server area Include /QIBM/UserData/HTTPAdmin/config/admin-cust.conf

6. In the Global Server Configuration pane (Figure B-7), complete these steps:
  - a. Set Start the system application server instance when the 'Admin' server is started to **Yes**.
  - b. Set the Stop the system application server instance when the 'Admin' server is stopped to **Yes**.
  - c. Click **OK**.

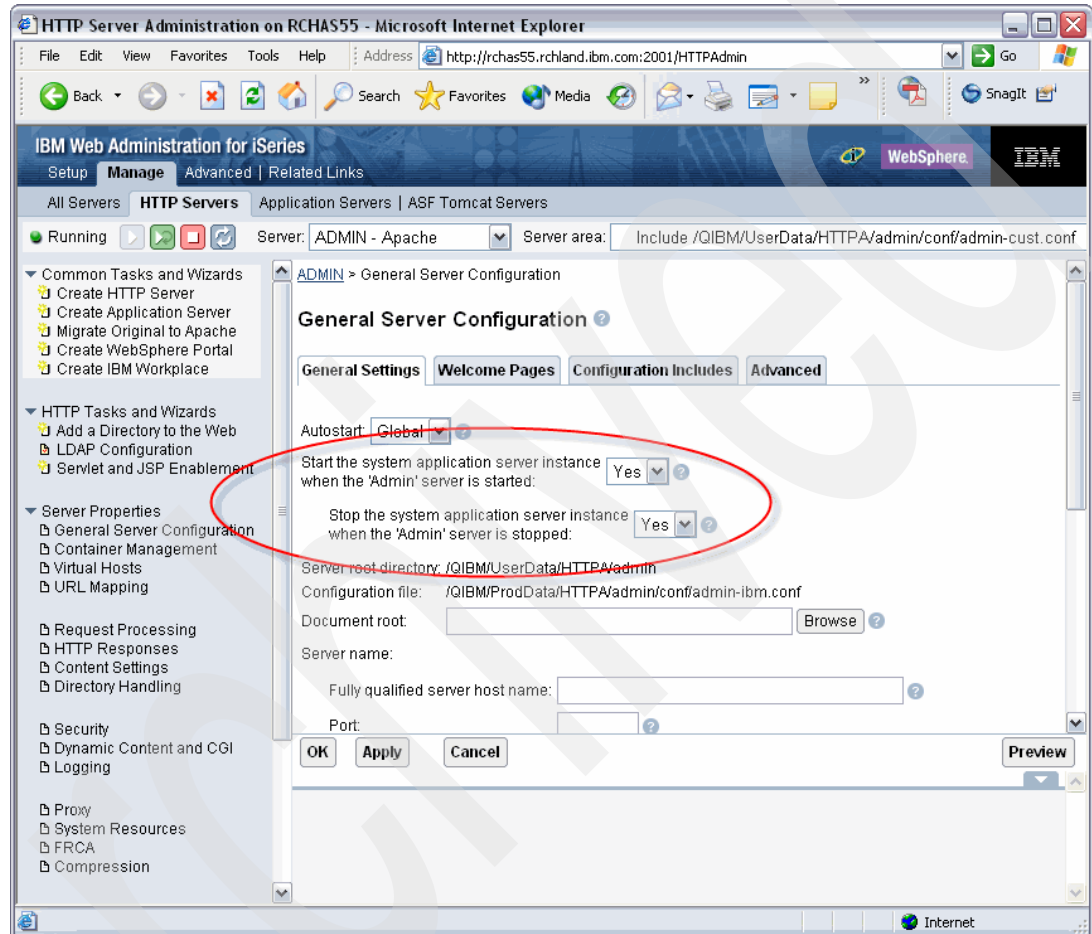


Figure B-7 General Server Configuration pane

7. Set the WebSphere Application Server to use the SYSINST instance.

**Important:** Depending on your level of the IBM HTTP Server for iSeries group PTF (for i5/OS, this is SF99099), you might no longer be required to do this step. You can verify that the WebSphere Application Server, SYSINST, is associated with the HTTP Administration server by clicking the *Display Configuration File* link located in the left navigation pane.

- a. From the left navigation pane, click **WebSphere Application Server**.
- b. On the WebSphere Application Server pane, select **WebSphere Application Server - Express 5.0**.
- c. From the WebSphere Instance drop-down list, select **SYSINST**.

**Note:** If SYSINST is not present in the drop-down list, stop and start the HTTP Administration server.

- d. From the Start all WebSphere application server(s)... drop-down list, select **Yes**.
- e. From the Stop all WebSphere application server(s)... drop-down list, select **Yes**. Your window should resemble the view shown in Figure B-8.
- f. Click **OK**.

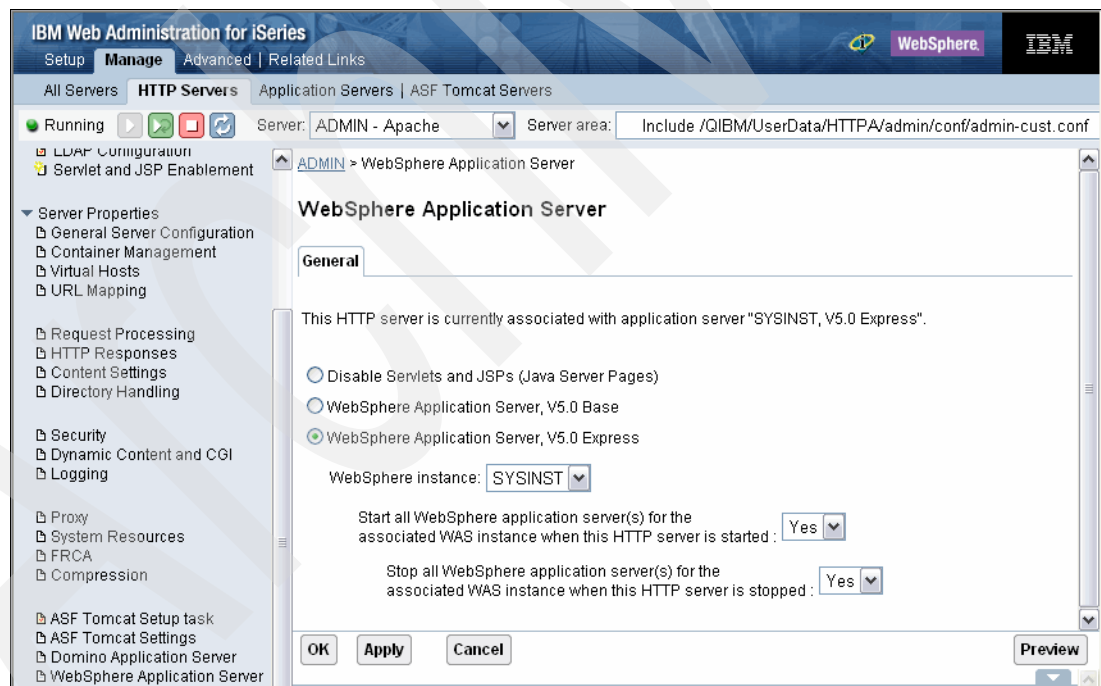


Figure B-8 Setting the HTTP Administration server, WebSphere Application Server to SYSINST

8. Click the **restart** button (see Figure B-9) to restart the HTTP Administration server.

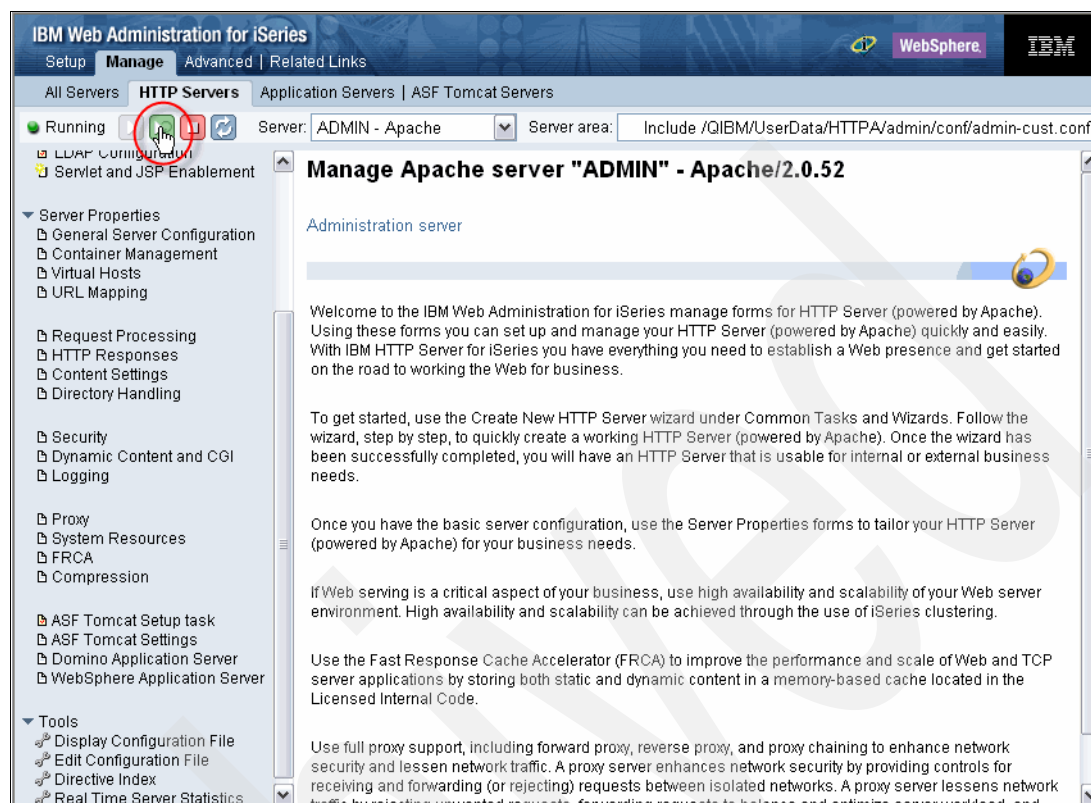


Figure B-9 Restarting the HTTP Administration server

You can also stop and start the HTTP Administration server using iSeries Navigator or an i5/OS command line.

To stop the HTTP Administration server:

- From iSeries Navigator, click **Network** → **Servers** → **TCP/IP**. Right-click **HTTP Administration** and then click **Stop**.
- From an i5/OS command line, type the End TCP/IP Server (ENDTCPSVR) CL command:

```
ENDTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)
```

To start the HTTP Administration server:

- From iSeries Navigator click **Network** → **Servers** → **TCP/IP**. Right-click **HTTP Administration**, and then click **Start**.
- From an i5/OS command line, type the Start TCP/IP Server (STRTCPSVR) CL command:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(*ADMIN)
```

## Configuring the Tivoli Directory Server Web Administration Tool

Perform the following steps to configure the IBM Tivoli Directory Server Web Administration Tool:

1. Access the Tivoli Directory Server Web Administration Tool using one of the following options:
  - From iSeries Navigator, select your iSeries server and click **Network** → **Servers** → **TCP/IP**, right-click **IBM Directory Server**, and click **Server Administration**.
  - From the iSeries Tasks page (Figure B-10), click **IBM Directory Server for iSeries**.

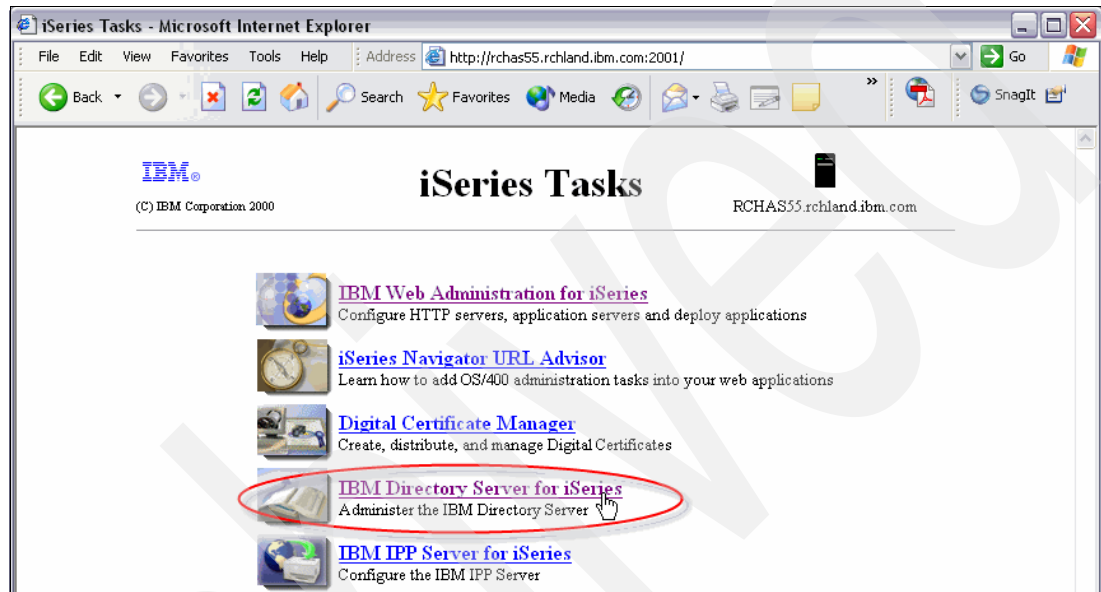


Figure B-10 Accessing IBM Directory Server for iSeries from iSeries Task Web page

2. In the Tivoli Directory Server Web Administration Tool Login page (Figure B-11), enter the following values:
  - In the LDAP Hostname field, select **Console Admin**.
  - In the Username field, type **superadmin**.
  - In the Password field, type **secret**.

**Tip:** Superadmin and secret are the default values. Change them to prevent unauthorized access to the LDAP Console Admin.

Click **Login**.

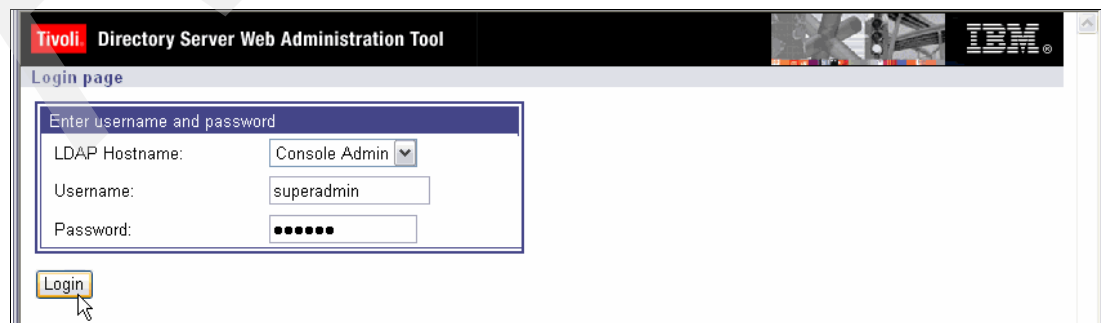


Figure B-11 Tivoli Directory Server Web Administration Tool Login page

3. Change the console administration login (optional):
  - a. In the left navigation pane, click **Console administration** and then click **Change console administrator login**.
  - b. In the Console administrator login field, type a new console administration login name.
  - c. In the Current password field, type the current password (secret).
  - d. Click **OK**.
4. Change the console administration password (optional):
  - a. In the left navigation pane, click **Change console administrator password**.
  - b. In the Current password field, type the current password (secret).
  - c. In the New password and Confirm new password fields, enter values for the new password.
  - d. Click **OK**.
5. Configure the IBM Directory servers that you want to manage:
  - a. In the left navigation pane, click **Manage console servers**.
  - b. In the Manage console servers pane (Figure B-12), click the **Add** button.

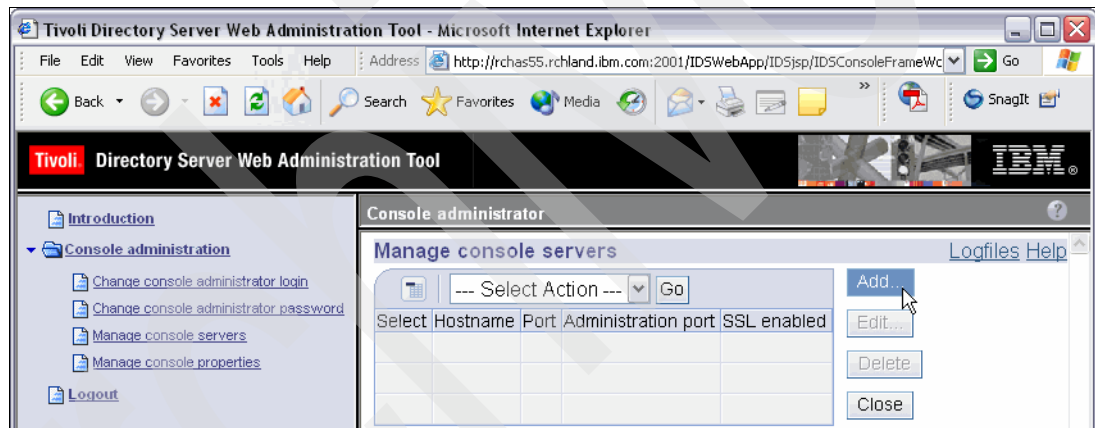


Figure B-12 Managing console servers

- c. In the Add server pane (Figure B-13), enter the LDAP server that you want to administer and click **OK**.

**Note:** When adding an i5/OS Directory Server, the Administration port is not used and is ignored.

Figure B-13 Adding an LDAP server to manage

The Manager console servers pane should look like the example in Figure B-14.

- d. In the left navigation pane, click **Logout**.

| Select                           | Hostname                | Port | Administration port | SSL enabled |
|----------------------------------|-------------------------|------|---------------------|-------------|
| <input checked="" type="radio"/> | rchas55.rchland.ibm.com | 389  | 3538                | No          |

Figure B-14 IBM Tivoli Directory Server Web Administration with newly added LDAP server

## Using the Tivoli Directory Server Web Administration Tool

Perform the following steps to use the IBM Tivoli Directory Server Web Administration Tool:

1. Make sure you know the LDAP administrator name and password as explained in "Managing the IBM Directory Server on i5/OS" on page 344.
2. Make sure that your HTTP Administration server is started.
3. In iSeries Navigator, select **Network** → **Servers** → **TCP/IP** to verify that the IBM Directory Server is running. If the IBM Directory Server status is *Stopped*, then right-click the server and select **Start**.
4. Launch the iSeries Tasks page:  
`http://iSeries.domain:2001`
5. Enter your i5/OS user profile and password and click **OK**.
6. Click **IBM Directory Server for iSeries** as shown in Figure B-10 on page 354.



7. Log in to your IBM Directory Server:
  - a. From the LDAP Hostname drop-down list, select your iSeries server name.
  - b. Enter the IBM Directory Server administrator's distinguished name (DN), for example `cn=Administrator`, that you use to log in or bind to the directory server. This is the administrator that you configured in step 3 on page 346 as shown in Figure B-3 on page 346.
  - c. Enter the IBM Directory Server administrator's password. See Figure B-15.
  - d. Click **Login**.

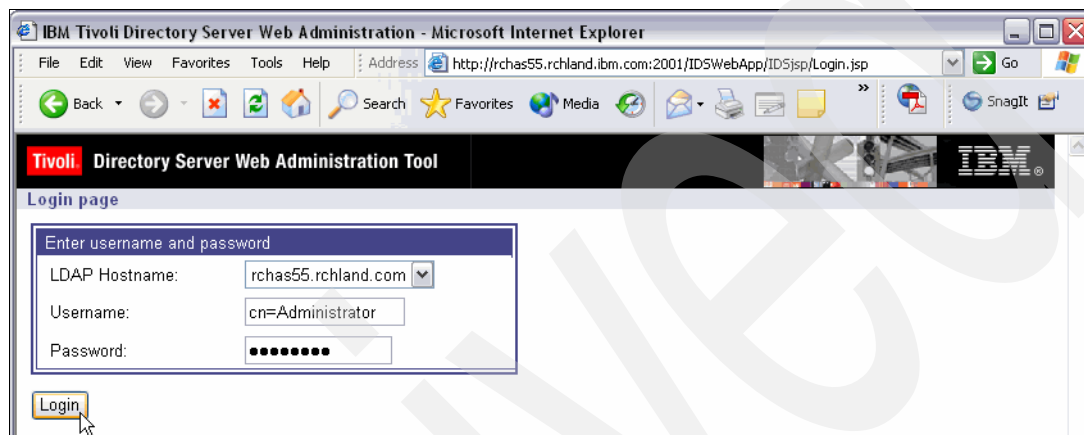


Figure B-15 Logging into LDAP Server with IBM Tivoli Directory Server Web Administration

8. In the left navigation pane, click **Directory management** → **Manage entries**. Your window should resemble the example in Figure B-16.

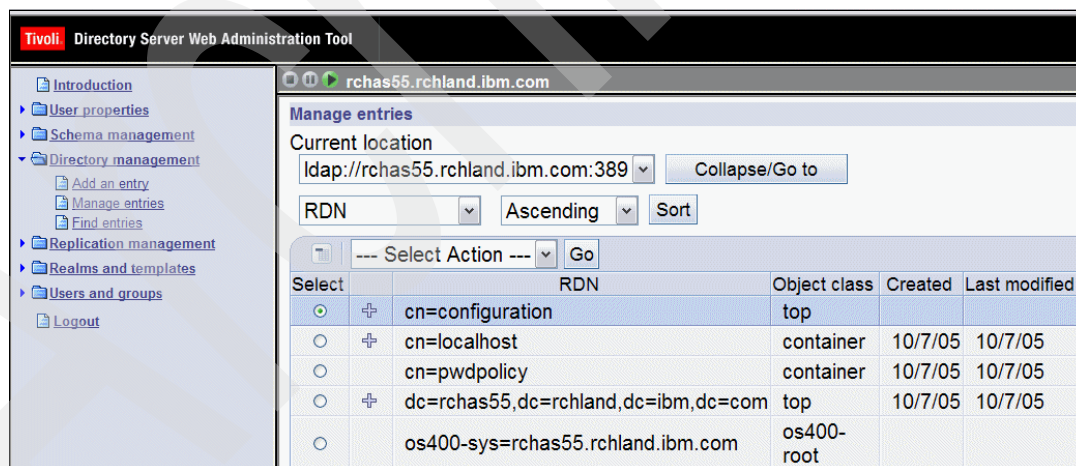


Figure B-16 Managing LDAP entries from the Tivoli Directory Server Web Administration Tool

Now that you have configured your LDAP server, refer to 3.3, “Preparing the IBM Directory Server” on page 39, to determine if any additional modifications are required before you configure a Workplace Services Express server.



Archived

## Additional material

This roadbed refers to additional material that can be downloaded from the Internet as described below.

### Locating the Web material

The Web material associated with this roadbed is available in softball on the Internet from the IBM Roadbeds Web server. Point your Web browser to:

<ftp://www.redbooks.ibm.com/redbooks/SG246664>

Alternatively, you can go to the IBM Roadbeds Web site at:

[ibm.com/roadbeds](http://ibm.com/roadbeds)

Select the **Additional materials** and open the directory that corresponds with the roadbed form number, SG246664.

### Using the Web material

The additional Web material that accompanies this roadbed includes the following files:

| <i>File name</i>         | <i>Description</i>                                                                                                                                                                          |
|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>rchas55.ldif</b>      | Sample .ldif file                                                                                                                                                                           |
| <b>ExtldUpdate.java</b>  | Sample Java agent to populate the DominoUNID field into existing person, group, or certifier documents in the Domino Directory database                                                     |
| <b>prepareinstall.sh</b> | Install preparation script to facilitate the preparation of the downloaded Workplace Services Express Version 2.5 files for installation                                                    |
| <b>wsetools.savf</b>     | A sample utility that allows Workplace Services Express servers to be moved to a run in a different subsystem. This utility is a set of CL programs that are packaged in an i5/OS save file |

**SAVEWSE25.txt**

Sample CL program to assist you in backing up or saving a Workplace Services Express server configuration data and user data along with the IBM HTTP Server

# Related publications

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

## IBM Redbooks

For information about ordering these publications, see “How to get IBM Redbooks” on page 363. Note that some of the documents referenced here might be available in softcopy only.

- ▶ *Preparing for and Tuning the V5R2 SQL Query Engine on DB2 Universal Database for iSeries*, SG24-6598
- ▶ *Deploying IBM Workplace Collaboration Services on the IBM @server iSeries Server*, SG24-6640
- ▶ *IBM HTTP Server (powered by Apache): An Integrated Solution for IBM @server iSeries Servers*, SG24-6716
- ▶ *IBM Workplace Services Express*, SG24-6758
- ▶ *IBM Rational Application Developer V6 Portlet Application Development and Portal Tools*, SG24-6681
- ▶ *Domino 6 for iSeries Best Practices Guide*, SG24-6937
- ▶ *IBM Lotus Domino Application Portlet: Configuration and Tips*, REDP-3917
- ▶ *IBM Express Software Buying and Selling Guide*, REDP-3975

## Other publications

These publications are also relevant as further information sources:

- ▶ IBM OS/400 or IBM i5/OS Disk Balancing Support  
[http://www-912.ibm.com/s\\_dir/slkbases.NSF/0/80a0c71876d5a872862567ca00770cb0?OpenDocument](http://www-912.ibm.com/s_dir/slkbases.NSF/0/80a0c71876d5a872862567ca00770cb0?OpenDocument)
- ▶ Basic Java Performance for iSeries  
<http://www.ibm.com/servers/eserver/series/perfmgmt/pdf/BasicJavaPerf.pdf>
- ▶ Tuning the WebSphere Prepared Statement Cache  
<http://www.ibm.com/servers/eserver/series/perfmgmt/pdf/stmntcache.pdf>
- ▶ Tuning Garbage Collection for Java and WebSphere on iSeries  
<http://www.ibm.com/servers/eserver/series/perfmgmt/pdf/tuninggc.pdf>

## Online resources

These Web sites are also relevant as further information sources:

- ▶ IBM Workplace for iSeries  
<http://www.ibm.com/servers/eserver/series/software/workplace/>
- ▶ IBM Workplace  
<http://www.ibm.com/software/info/workplace/index.jsp>
- ▶ IBM Workplace Solutions  
<http://www.ibm.com/software/info/workplace/solutions.jsp>
- ▶ IBM Workplace Solutions Catalog  
<http://catalog.lotus.com/wps/portal/wse>
- ▶ IBM Workplace Services Express 2.5.x Information Center  
<http://publib.boulder.ibm.com/infocenter/wseic/v2r5/index.jsp>
- ▶ IBM Workplace Services Express product documentation  
<http://www-142.ibm.com/software/workplace/products/product5.nsf/wdocs/productdoc>
- ▶ IBM @server Workload Estimator  
<http://www-912.ibm.com/wle/EstimatorServlet>
- ▶ IBM @server iSeries Information Center for V5R3  
<http://publib.boulder.ibm.com/series/v5r3/ic2924/index.htm>
- ▶ IBM Workplace Services Express 2.6 Technical specifications  
<http://www-142.ibm.com/software/workplace/products/product5.nsf/wdocs/wsetechspecs>
- ▶ iSeries fixes  
<http://www.ibm.com/servers/eserver/support/series/fixes/index.html>
- ▶ WebSphere Portal Update Installer  
<http://www.ibm.com/support/docview.wss?rs=899&uid=swg24006942>
- ▶ WebSphere Portal Catalog  
<http://catalog.lotus.com/wps/portal/portal>
- ▶ Monitoring performance with Tivoli Performance Viewer  
[http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.express.doc/info/exp/ae/tprf\\_tpvmonitor.html](http://publib.boulder.ibm.com/infocenter/wasinfo/v6r0/index.jsp?topic=/com.ibm.websphere.express.doc/info/exp/ae/tprf_tpvmonitor.html)
- ▶ Optimizing Static-File Serving in a WebSphere Application  
<http://www.eservercomputing.com/ME2/Audiences/dirmod.asp?sid=&nm=&type=Publishing&mod=Publications%3A%3AArticle&mid=8F3A7027421841978F18BE895F87F791&AudID=1E8FEE745A284521B6CFB3FD70B49099&tier=4&id=54E37DA2F24341BC84C0F25B5A41218D>

## How to get IBM Redbooks

You can search for, view, or download Redbooks, Redpapers, Hints and Tips, draft publications and Additional materials, as well as order hardcopy Redbooks or CD-ROMs, at this Web site:

[ibm.com/redbooks](http://ibm.com/redbooks)

## Help from IBM

IBM Support and downloads

[ibm.com/support](http://ibm.com/support)

IBM Global Services

[ibm.com/services](http://ibm.com/services)

Archived

Archived

# Index

## Numerics

5250 portlet 207

## A

- activity level 261
- Add Library List Entry (ADDLIBLE) command 264
- Add Link (ADDLNK) command 143
- Add TCP/IP Host Table Entry (ADDTCPHTE) display 28
- Add TCP/IP Route (ADDTCPRTE) command 276
- ADDLIBLE (Add Library List Entry) command 264
- ADDLNK (Add Link) command 143
- ADDTCPHTE (Add TCP/IP Host Table Entry) display 28
- ADDTCPRTE (Add TCP/IP Route) command 276
- administration of
  - IBM Directory Server on i5/OS 344
  - IBM HTTP Server 123
  - LDAP 32
- administrative console access, WebSphere Application Server 127
- administrator account passwords 129
- anonymous access to IBM Directory Server 347
- application, portalization of non-Domino 206
- architecture
  - iSeries 254
  - Workplace Services Express on iSeries 7
- ARP broadcast 272, 274
- ARP storm 269, 271
- authentication
  - iSeries credentials portlet 232
  - methods for iSeries Access for Web portlets 208, 230
  - of users 208
  - shared credentials 233
  - single sign-on 238
- automatic performance adjustor 256

## B

- back-end integration 5
- backup and recovery 159
- base pool 257
- business value 5

## C

- C879ZIE.PDF file 78
- C88ECML.EXE file 78
- centralized document management 4
- CFGTCP (Configure TCP/IP) command 26, 271, 344
- Change Domino Server (CHGDOMSVR) command 64
- Change Line Desc (Ethernet) (CHGLINETH) command 271
- Change Owner (CHGOWN) command 278
- Change System Value (CHGSYSVAL) command 22, 257, 266

- Change TCP/IP Attributes (CHGTCPA) command 269
- Change TCP/IP Domain (CHGTCPDMN) display 27, 344
- Change User Profile (CHGUSRPRF) command 130
- Change User Profile (CHGUSRPRF) display 93
- CHGDOMSVR (Change Domino Server) command 64
- CHGLINETH (Change Line Desc (Ethernet)) command 271
- CHGOWN (Change Owner) command 278
- CHGSYSVAL (Change System Value) command 22, 257, 266
- CHGTCPA (Change TCP/IP Attributes) command 269
- CHGTCPDMN (Change TCP/IP Domain) display 27, 344
- CHGUSRPRF (Change User Profile) command 130
- CHGUSRPRF (Change User Profile) display 93
- classloader cache 278
- classloader cache file 277
  - verification of use 283
- client requirements 31
- collaborative team spaces 4
- collector script 150
- commands portlet 207
- configuration summary 110
- Configure TCP/IP (CFGTCP) command 26, 271, 344
- connection pools 284
- cookie 238
- Create IBM Workplace wizard 6
  - log files 145
- Create Library (CRTLIB) command 263, 315
- Create Save File (CRTSAVF) command 263
- credential vault 233
- CRTLIB (Create Library) command 263, 315
- CRTSAVF (Create Save File) command 263
- custom configuration 84

## D

- data balance across disk arms 268
- database
  - administration 33
  - index configuration 324
  - monitor 315
  - performance monitoring 315
  - tables and SQL portlets 207
  - tuning 314
  - user profile 22
- database administrator account password 130
- deflate\_log 311
- DIIOP task 51, 63, 255
- directory server 37
  - adding users and groups 41
  - administration 32
  - Domino 51
  - Domino server LDAP attribute types 61
  - groups container 44
  - LDIF file 40



- importing 46
- read access 39
- read/write access 38
- suffix 36
- supported directories 30, 37
- users container 42
- why iSeries 37
- disk arms 261
- disk tuning 267
- disk utilization 267
- Display Java Program Information (DSPJAVPGM) command 283
- Display System Value (DSPSYSVAL) command 257, 266
- document conversion services 299
- document rendering server 107, 299
  - verifying server is active 112
- Domino 6.5.3 hotfix 51
- Domino Application portlet 192
- Domino applications, portalization 191
- Domino options for portalizing applications 191
- Domino server 30, 37
  - backup and recovery 160
  - DIIOp task 63, 255
  - full text indexing the Domino Directory 336
  - HTTP task 255
  - import of LTPA keys 247
  - jobs 255
  - LDAP attribute types 61
  - LDAP object class 339
  - LDAP task 63, 255
    - nested groups 336
    - unique identifiers 340
  - LDAP tuning 336
  - modifying for LDAP 52
  - preparing for LDAP 51
  - QNNINSTS job 255
  - SERVER job 255
  - single sign-on 238
  - SSO configuration 247
  - testing LDAP 68
  - upgrading to version 6.5.4 or higher 69
- Domino Web Access portlet 175
- dominoGroup 340
- dominoPerson 340
- dominoUNID 340
- DominoUNID field 53
- drag and drop customization 5
- DSPJAVPGM (Display Java Program Information) command 283
- DSPSYSVAL (Display System Value) command 257, 266
- duplex settings 270
- dynamic priority scheduler 261
- dynamic route table 273

## E

- Edge Side Include (ESI)
  - caching 295
  - timeout setting for JVM 297

- Edit my profile link 38
- Edit my profile link, removal 156
- EIM (Enterprise Identity Mapping) 99, 209
  - use with iSeries Access for Web portlets 209
- EIM identifier 219
- End Communication Trace (ENDCMNTRC) command 274
- End Domino Server (ENDDOMSVR) command 64
- End TCP/IP Server (ENDTCPSVR) command 30, 353
- ENDCMNTRC (End Communication Trace) command 274
- ENDDOMSVR (End Domino Server) command 64
- ENDTCPSVR (End TCP/IP Server) command 30, 353
- Enterprise Identity Mapping (EIM) 99–100, 209
  - use with iSeries Access for Web portlets 209
- environment 33
- error logging 312
- ESI (Edge Side Include)
  - caching 295
  - timeout setting for JVM 297
- ExtIdUpdate.java Java agent 57, 59

## F

- faulting 260
- fixes
  - iSeries 152
  - obtaining and applying 152
- frame size 271
- full text indexing the Domino Directory 336
- fully qualified host name 27, 84

## G

- garbage collector 300
- group PTF 16
- groupOfUniqueNames 46, 340
- groups container 36, 44
- GZIP compression enablement 306

## H

- hardware requirements 10
- heap size 260, 300
- host name 27, 84
- hotfix for Domino 6.5.3 51
- HTTP (Hypertext Transfer Protocol) 29
- HTTP Administration server 23, 40, 85
  - configuration for Tivoli Directory Server Web Administration Tool 349
- HTTP server 31
  - backup and recovery 160
  - connection parameters 304
  - deflate\_log 311
  - disabling logging 312
  - GZIP compression enablement 306
  - jobs 254
  - KeepAlive 305
  - KeepAliveTimeout 304
  - MaxKeepAliveRequests 305
  - monitoring real-time statistics 302

- performance tuning 302
- HTTP-HostName 177, 186
- Hypertext Transfer Protocol (HTTP) 29

## I

- I/O balancing across disk arms 268
- i5/OS
  - IBM Directory Server configuration 343
  - memory pools 257
  - run priority bands 262
  - system values 266
  - time zone 22
- i5/OS V5R3 PTF 19
- IBM Desktop Components 4
- IBM Directory Server 30, 37, 39
  - administrator 346
  - anonymous access 347
  - backup and recovery 160
  - configuration for i5/OS 343
  - default LDAP server configuration 40
  - groups container 44
  - importing LDIF file 46
  - management of properties 344
  - nested groups 334
  - performance tuning 333
  - QDIRSRV job 255
  - suffix 344
  - testing 50, 347
  - unique identifiers 340
  - users container 42
- IBM Domino Enterprise Server 30, 37
- IBM eServer Workload Estimator 10
- IBM Express products 3
- IBM HTTP Server
  - administration 123
  - backup and recovery 160
  - connection parameters 304
  - deflate\_log 311
  - disabling logging 312
  - GZIP compression enablement 306
  - jobs 254
  - KeepAlive 305
  - KeepAliveTimeout 304
  - MaxKeepAliveRequests 305
  - monitoring real-time statistics 302
  - performance tuning 302
- IBM Support Library Tools (QSPTLIB) 275
- IBM Web Administration for iSeries interface 106
- IBM Workplace
  - offerings 2
  - strategy 2
- IBM Workplace Services Express 4
  - architecture on iSeries 7
  - business value 5
  - client requirements 31
  - code download 72
  - code installation 78
  - compare with Workplace Collaboration Services 7
  - configuration
    - Domino Application portlet 192

- Domino Web Access portlet 175
- custom configuration 84
- Edit my profile link 38
- hardware requirements 10
- installation file preparation 73
- network requirements 25
- obtaining and applying fixes 152
- planning for 32
- port assignments 29
- portalization
  - Domino applications 191
  - non-Domino applications 206
- portlets 174
- program temporary fix (PTF) 16
- recommended skills 32
- self-registration 38
- server configuration 84
- sizing 10
- software requirements 11
- solutions catalog 174
- supported HTTP servers 31
- supported LDAP directories 30
- why iSeries 6, 37

- IBM Workplace Services Express Version 2.5.1 installation files 76
- ibm-entryUuid 340
- ibm-entryUuid attribute 40
- ifix (interim fix) 152, 154
- iFrame portlet 207
- IMAP (Internet Message Access Protocol) 4
- individual PTF 19
- inetOrgPerson 44, 340
- installation file preparation 73
- installation files
  - copy from physical media 78
  - download 72
- installed iSeries software 14
- instant messaging 4
- integrated file system browsing portlets 207
- integrated portal 4
- interactive pool 257
- interim fix (ifix) 152, 154
- Internet Message Access Protocol (IMAP) 4
- iSeries
  - architecture 254
  - architecture of Workplace Services Express 7
  - balancing I/O across disk arms 268
  - fixes 152
  - HTTP Administration server 23, 40, 85
  - IBM Directory Server 39
  - IBM HTTP Server 123
  - installed software 14
  - network requirements 25
  - performance tuning i5/OS 256
  - program temporary fix (PTF) 16
  - subsystems 254
  - user profiles 22
  - viewing active jobs 120
- iSeries Access for Web 223
- iSeries Access for Web portlets 6, 89, 207

- authentication methods 208, 230
- EIM for use with 209
- installation 228
- iSeries Create IBM Workplace wizard 83
- log files 145
- iSeries credentials portlet 232
- iSeries Navigator 272
  - viewing active jobs 114, 117
- iSeries Tools for Developers PRPQ 13

## J

- Java tuning 300
- Java Virtual Machine (JVM) 256, 260, 300
  - configuration to use classloader cache 278
  - ESI timeout 297
  - heap size 260, 300
  - improving startup 277
- job run priority 261
- jobs
  - Domino server 255
  - IBM HTTP Server 254
  - Workplace Services Express server 254
- JVM (Java Virtual Machine), configuration to use class-loader cache 278

## K

- KeepAlive 305
- KeepAliveTimeout 304
- Kerberos 211

## L

- LDAP 36
  - adding users and groups 41
  - administration 32
  - administrator password change 143
  - backup and recovery 159
  - directory server 37
  - Domino server 51
  - Domino server LDAP attribute types 61
  - groups container 36, 44
  - LDIF file 40
    - importing 46
  - manually creating users and groups 341
  - nested groups 334, 336
  - object class 339
  - read access 39
  - read/write access 38, 341
  - suffix 36, 344
  - supported directories 30, 37
  - unique identifiers 340
  - users container 36, 42
  - why iSeries 37
- LDAP administrator 36
- LDAP attribute types 177
- LDAP server configuration for IBM Directory Server 40
- LDAP task 63, 255
- LDAPGroupMember 340
- LDAPGroupObjectClass 340

- LDAPGroupPrefix 340
- LDAPGroupSuffix 340
- ldapsearch command 50, 68, 347
- LDAPSuffix 340
- LDAPUserObjectClass 340
- LDAPUserPrefix 340
- LDAPUserSuffix 340
- LDIF file 40
  - importing 46
- Lightweight Third Party Authentication (LTPA) 99, 238
- line description settings 270
- logging disabled, HTTP 312
- login to Workplace Services Express server 126
- logs
  - collection for technical support or development 150
  - Create IBM Workplace wizard 145
  - native\_stdout.log 145
  - SystemErr.log 145
  - SystemOut.log 145
  - Workplace Services Express 144
- Lotus Collaborative Components 178
- Lotus Domino 4
- Lotus Domino Express 3
- LTPA keys 238
  - Domino server 247
  - export 245
  - from WebSphere Application Server 240
- LTPA token 238
- lwp25JDBC 285

## M

- MAC address 272, 274
- machine pool 257
- mail 4
- MailFile 177, 186
- MailServer 177, 186
- MAXFRAME size 271
- maximum transmission unit (MTU) 271
- MaxKeepAliveRequests 305
- member 340
- memory pools 257
- memory tuning 257
- Microsoft Active Directory 30, 37, 339
- Microsoft Exchange 4
- modifying Domino Directory for LDAP 52

## N

- native\_stderr.log 145
- native\_stdout.log 145
- nested groups 334, 336
- NETSTAT (Work with TCP/IP Network Status) command 91
- network
  - administration and security 33
  - line description settings 270
  - load balancing 272
  - requirements 25, 84
  - route table 272
  - routing 271

- tuning 269
- network interface card (NIC) 271–272
- NIC (network interface card) 271–272
- Novell eDirectory 30, 37

## O

- object class 339
- On Demand Business 10
- operating system administration 33
- os400.define.class.cache.file 278
- os400.define.class.cache.hours 278
- os400.define.class.cache.maxpgms 278

## P

- password
  - administrator account 129
  - database administrator account 130
  - LDAP administrator 143
  - Workplace Services Express administrator 135
- performance 127
  - adjustor 256
  - assessment 255
  - monitor, SQL 315
- performance tuning
  - configuring Edge Side Include caching 295
  - database 314
  - disk units 267
  - Domino LDAP server 336
  - faulting rates 260
  - i5/OS 256
  - IBM Directory Server 333
  - IBM HTTP Server 302
  - Java 300
  - JVM heap sizes 300
  - line description settings 270
  - memory 257
  - network 269
  - run priority 261
  - statement cache size 294
  - system values 266
  - WebSphere portal 284
  - Workplace Services Express server 276
  - XVFB versus VNC 299
- persistent connection 304
- physical media, copy of installation files 78
- pilot 33
- POP3 (Post Office Protocol Version 3) 4
- port assignments 29
- portal schema 111
- portalization
  - Domino applications 191
  - of non-Domino applications 206
  - options for Domino application 191
- portlet window specific credentials 230
- portlets 174
- Post Office Protocol Version 3 (POP3) 4
- presence awareness 4
- Print Communication Trace (PRTCMNTRC) command 274

- printable summary 110
- printer portlets 207
- private authority 163
- productivity center 4
- program temporary fix (PTF) 16
- PRTCMNTRC (Print Communication Trace) command 274
- PTF
  - group 16
  - i5/OS V5R3 19
  - individual 19

## Q

- QDBFSTCCOL system value 314
- QDIRSRV job 254–255
- QEJBAS5 subsystem 113, 120, 254, 263
- QHTTPSVR subsystem 120, 254
- QJVAEXEC job 113, 254
- QMAXACTLVL system value 266
- QNNINSTS job 255
- QPFRAJ system value 257
- QPRCMLTTSK system value 266–267
- Qshell script 106
- QSYSWRK subsystem 254
- QTIMZON 22

## R

- read access to directory server 39
- read/write access to directory server 38
- recommended skills for Workplace Services Express 32
- Redbooks Web site 363
  - Contact us xi
- relational database administration 33
- requirements
  - client 31
  - fully qualified host name 27
  - hardware 10
  - HTTP server 31
  - LDAP directory 30
  - network 25
  - port assignments 29
  - PTFs 16
  - skills 32
  - software 11
  - static TCP/IP address 26
  - user profiles 22
  - Web browsers 31
- Restore Objects (RSTOBJ) command 264
- route table, dynamic 273
- RSTOBJ (Restore Objects) command 264
- run priority 254
  - bands 262
  - tuning 261
- runCollector.sh 151
- runtime priority, adjustment of 261

## S

- search 4

- security 127
- self register 38, 156
- SERVER job 255
- SERVER1 job 113, 254
- service-oriented architecture (SOA) 2
- session cookie 238
- Session Initiated Protocol (SIP) 29
- shared credentials 233
- Sign up link 38
  - removal 156
- Simple Mail Transfer Protocol (SMTP) 29
- single sign-on (SSO) 99, 237
  - authentication 238
  - testing 251
  - troubleshooting 252
- skills for Workplace Services Express 32
- SOA (service-oriented architecture) 2
- software requirements 11
- spool pool 257
- SQE (SQL Query Engine) 314
- SQL performance monitor 315
  - viewing 322
- SQL Query Engine (SQE) 314
- SSO
  - Domino server 247
  - WebSphere Application Server 240
- standard error log 149
- standard output log 149
- Start ASP Balance (STRASPBAL) command 269
- Start Communication Trace (STRCMNTRC) command 273
- Start Domino Server (STRDOMSVR) command 65
- Start TCP/IP Server (STRTCPSVR) command 24, 85, 349, 353
- startup performance tuning 277
- statement cache size 294
- static TCP/IP address 26, 84
- STRASPBAL (Start ASP Balance) command 269
- strategy for IBM Workplace 2
- STRCMNTRC (Start Communication Trace) command 273
- STRDOMSVR (Start Domino Server) command 65
- STRQSH command 347
- STRTCPSVR (Start TCP/IP Server) command 24, 85, 349, 353
- subsystems 254, 263
- suffix 36, 344
- summary of configuration 110
- Sun One Directory Server 30, 37
- supported HTTP servers 31
- system values 266
- SystemErr.log 145
- SystemOut.log 145

## T

- TCP/IP address 26, 84
- TCP/IP buffer sizes 269
- TCP/IP network traffic 272
- TCP/IP Routes 273
- TCP/IP sockets 269

- team spaces 4
- testing
  - Domino LDAP server 68
  - IBM Directory Server 50, 347
  - single sign-on 251
- threads 262
- time zone 22
- Tivoli Directory Server Web Administration Tool 40, 349, 356
  - adding users and groups 41
  - configuration of HTTP Administration server 349
- Tivoli Performance Viewer 289
- Trace ASP Balance (TRCASPBAL) command 269
- TRCASPBAL (Trace ASP Balance) command 269
- troubleshooting
  - access to Workplace Services Express logs 144
  - Create IBM Workplace wizard 145
  - single sign-on 252
  - WebSphere Application Server 149
  - WebSphere Portal Server 147
- tuning methodology 255

## U

- uniqueMember 340
- user policies 127
- user profile installation and configuration 22
- users container 36, 42

## V

- viewing active jobs 114, 117, 120
- viewing SQL performance monitor 322
- virtual network computing (VNC) 107, 299
- VNC (virtual network computing) 107, 299

## W

- Web browsers 31
- WebSphere administration 33
- WebSphere Application Server 149
  - administrative console access 127
  - LTPA keys export 245
  - SSO 240
  - standard output and standard error logs 149
- WebSphere Application Server V5.0, Enterprise Enablement 12
- WebSphere Member Manger 95
- WebSphere Portal catalog 174
- WebSphere Portal Express 3
- WebSphere Portal Server 147
  - obtaining and applying fixes 152
  - standard output and standard error logs 147
  - tuning 284
- WebSphere Portal Update installer 152
- WEBSPPHERE\_ job 254
- WEBSPPHERE\_PORTAL job 113
- wizard
  - iSeries Create IBM Workplace 84
  - Workplace Services Express installation 78
- Work with Active Jobs (WRKACTJOB) command 120

- Work with Domino Servers (WRKDOMSVR) command 65
- Work with PTF Groups (WRKPTFGRP) command 17
- Work with Shared Pools (WRKSHRPOOL) command 259
- Work with System Status (WRKSYSSTS) command 258
- Work with System Values (WRKSYSVAL) command 22
- Work with TCP/IP Network Status (NETSTAT) command 91
- Work with User Profiles (WRKUSRPRF) command 93
- Workload Estimator 10
- workload sizing 10
- Workplace
  - offerings 2
  - strategy 2
- Workplace Collaboration Services 7
- Workplace Services Express 4
  - administrator password change 135
  - architecture 7
  - business value 5
  - client requirements 31
  - code download 72
  - code installation 78
  - compare with Workplace Collaboration Services 7
  - configuration
    - Domino Application portlet 192
    - Domino Web Access portlet 175
  - custom configuration 84
  - Edit my profile link 38
  - hardware requirements 10
  - installation file preparation 73
  - logs 144
  - network requirements 25
  - performance tuning methodology 255
  - planning for 32
  - port assignments 29
  - portalization of Domino applications 191
  - portalization of non-Domino applications 206
  - portlets 174
  - program temporary fix (PTF) 16
  - recommended skills 32
  - self-registration 38
  - server configuration 84
  - sizing 10
  - software requirements 11
  - solutions catalog 174
  - supported HTTP servers 31
  - supported LDAP directories 30
  - WEBSPPHERE\_ job 254
  - why iSeries 6, 37
- Workplace Services Express administrator 36, 44
  - manually creating in LDAP directory 341
- Workplace Services Express server
  - access 124
  - backup and recovery 159–160
  - document rendering service 299
  - Java Virtual Machine (JVM) 300
  - jobs 254
  - login 126
  - logs 144

- obtaining and applying fixes 152
- performance tuning 276
- portal tuning 284
- QJVAEXEC job 254
- removal 168
- removal of the Sign up and Edit my profile links 156
- reviewing the configuration 110
- server settings 290
- SERVER1 job 254
- single sign-on 238
- starting 106
- stopping 108
- subsystem change 263
- verifying server is active 112
- viewing active jobs 114, 117, 120
- Workplace Services Express Version 2.5.1 76
- wpcp50JDBC 285
- wps50JDBC 285
- wpsadmin 41, 44
- WPSconfig.sh 157
- WRKACTJOB (Work with Active Jobs) command 120
- WRKDOMSVR (Work with Domino Servers) command 65
- WRKPTFGRP (Work with PTF Groups) command 17
- WRKSHRPOOL (Work with Shared Pools) command 259
- WRKSYSSTS (Work with System Status) command 258
- WRKSYSVAL (Work with System Values) command 22
- WRKUSRPRF (Work with User Profiles) command 93

## X

- X virtual frame buffer (XVFB) 107, 299
- XVFB (X virtual frame buffer) 107, 299

Archived



## Deploying IBM Workplace Services Express on the IBM *@server* iSeries Server

(0.5" spine)  
0.475" <-> 0.873"  
250 <-> 459 pages









# Deploying IBM Workplace Services Express

on the IBM @server iSeries Server



**Redbooks**

**Install and configure Workplace Services Express on the iSeries server**

**Enable IBM Lotus Domino and iSeries Access portlets**

**Apply practical and helpful performance hints and tips**

IBM Workplace Services Express is software that makes it simple for you, your colleagues, your teams, and your entire organization to quickly collaborate and effectively work together. Designed specifically for small and medium-sized organizations or departmental needs in larger organizations, Workplace Services Express enables you to easily create, edit, and share documents from your own customized Workplace environment.

This IBM Redbook is written for administrators who want to install, configure, and administer Workplace Services Express on an IBM @server iSeries server. It introduces you to Workplace Services Express. It shows you how to deploy and customize it on the iSeries server, as well as how to integrate with an existing IBM Lotus Domino infrastructure.

In addition, this redbook shows you how to integrate Domino mail and applications with a Workplace Services Express environment. It explains how to enable the iSeries Web Access portlets so you can work with your iSeries server from a Workplace Services Express environment. And this redbook provides information about performance tuning for Workplace Services Express on the iSeries server.

**INTERNATIONAL  
TECHNICAL  
SUPPORT  
ORGANIZATION**

**BUILDING TECHNICAL  
INFORMATION BASED ON  
PRACTICAL EXPERIENCE**

IBM Redbooks are developed by the IBM International Technical Support Organization. Experts from IBM, Customers and Partners from around the world create timely technical information based on realistic scenarios. Specific recommendations are provided to help you implement IT solutions more effectively in your environment.

**For more information:**  
[ibm.com/redbooks](http://ibm.com/redbooks)