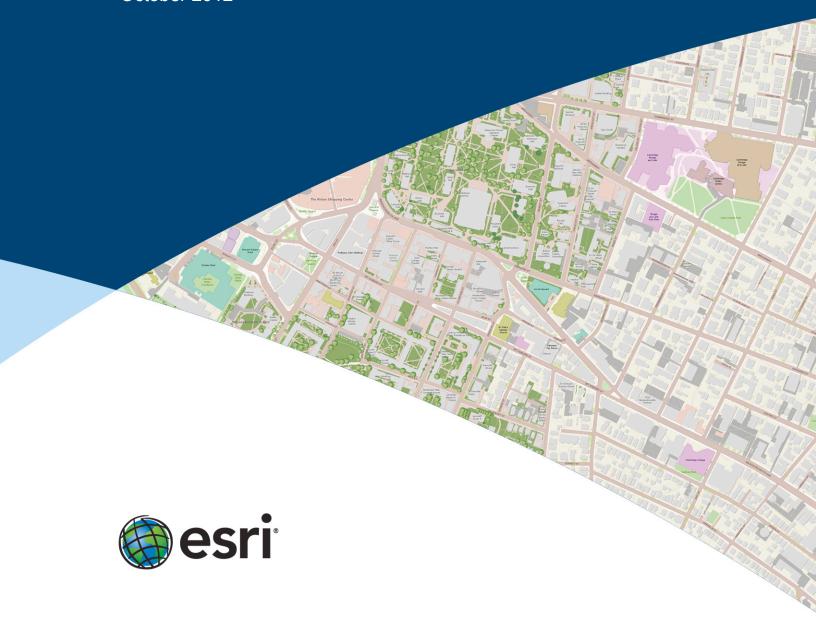
How to Set Up Esri® Geoportal Server 1.2.2 on Windows: Aggregate Geospatial Resources with Open Source Technology

An Esri® White Paper October 2012



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How to Set Up Esri Geoportal Server 1.2.2 on Windows: Aggregate Geospatial Resources with Open Source Technology

An Esri White Paper

Contents	Page
About This Tutorial	1
What You Will Need	1
What You Will Do	1
Download Programs and Files	
Perform Preinstallation Computer Setup	2
Install PostgreSQL 9.1.5	3
Configure PostgreSQL Database	
Install the Java Development Kit and Runtime	
Environment	4
Install Apache Tomcat 7	
Configure Apache Tomcat 7 Service	4
Install Esri Geoportal Server	
Set Up the Geoportal User and Schema in PostgreSQL	4
Geoportal User Setup	4
Populating Geoportal Schema in PostgreSQL	5
Verify Geoportal Tables Were Generated Correctly	5
Deploy the Geoportal Web Application	6
Configure the gpt.xml File	6
Modify the Java Database Connectivity .jar File	6
Log In to the Geoportal	6
Register an ArcGIS for Server Service with the Geoportal	7
Conclusion	8

Contents	Page
Appendixes	
Appendix 1: Software Required in This Tutorial	9
Appendix 2: Modifications to the gpt.xml File	10
Appendix 3: Modifications to the geoportal.xml File	17

October 2012 ii

How to Set Up Esri Geoportal Server 1.2.2 on Windows: Aggregate Geospatial Resources with Open Source Technology

Esri® Geoportal Server provides seamless communication with data services that use a wide range of communication protocols. It supports searching, publishing, and managing standards-based resources. It also provides access to geospatial resources such as metadata records and catalogs, web services, OpenSearch end points, ATOM entries, RSS feeds, KML documents, and REST URLs.

Esri Geoportal Server is an open source product that is free and does not require ArcGIS® for Desktop or ArcGIS for Server licensing. Many organizations use Esri's geoportal technology to manage and publish the metadata for their geospatial resources so users can discover and connect to those resources. Live examples from state, national, and international organizations can be viewed at esri.com/software/arcgis/geoportal/live-user-sites.

About This Tutorial

This tutorial steps through implementing a geoportal on an intranet and uses base software that is also open source. This geoportal will be accessible only on your local machine or your organization's intranet. This implementation uses the PostgreSQL database and the Apache Tomcat servlet. To use a different database or servlet, read the Geoportal wiki and installation guides online at esriurl.com/geoportalserver.

This tutorial assumes you can do the following:

- Navigate your computer's file system with Windows Explorer
- Create and name new folders
- Copy and move files between folders
- Extract a ZIP file
- Open a web browser and enter a URL

What You Will Need

- Windows 7/Vista/XP
- Administrator privileges
- An Internet connection to download the required software

What You Will Do

- 1. Download programs and files.
- 2. Perform preinstallation computer preparation.
- 3. Install the PostgreSQL database.
- 4. Install the Java Development Kit and Runtime Environment.
- 5. Install the Apache Tomcat servlet.
- 6. Install Esri Geoportal Server.
- 7. Set up the user and schema for the geoportal in PostgreSQL.

- 8. Deploy the geoportal application.
- 9. Modify the gpt.xml file.
- 10. Modify the Java Database Connectivity (JDBC) .jar file.
- 11. Log in to the geoportal.
- 12. Register an ArcGIS for Server service with the geoportal.

Download Programs and Files

At minimum, Esri Geoportal Server requires the Java Development Kit (JDK) and Runtime Environment, a relational database management system (RDBMS), and a servlet container. Although Esri Geoportal Server supports several different options for the RDBMS and web servlet, this tutorial uses the PostgreSQL RDBMS and the Apache Tomcat servlet. Download the programs and files listed in table 1 by either searching online for the specific versions listed or using the links provided in appendix 1.

Table 1
Software Required in This Tutorial

Component	Function	Version
Esri Geoportal Server	Geoportal software	1.2.2
PostgreSQL	RDBMS	9.1.5
Apache Tomcat	Web servlet	7.0.29
Java Development Kit with Runtime Environment	Java controller	SE 6 Update 35 JDK
JDBC Configuration File	Connects Tomcat to PostgreSQL	postgresql-9.1- 902.jdbc4.jar

Perform Preinstallation Computer Setup

Prior to installing Esri Geoportal Server and its components, you need to create some folders and find out some basic information about your computer. Note: The C:\ drive is used in this tutorial for simplicity; any drive on the host computer can be used to install the software for the geoportal server—just make sure to adjust any path statements appropriately.

Create the following new folders on your computer:

C:\geoportal

C:\lucene

C:\lucene\assertion

Although the geoportal will not be available on the Internet, you need to know the IP address of your computer. The simplest way to find this information is by typing <code>ipconfig</code> in the command prompt.

- 1. Open the Command Prompt window (Start > Programs > Accessories > Command Prompt).
- 2. Type ipconfig.
- 3. Write down the IP address.

Install PostgreSQL 9.1.5

The PostgreSQL RDBMS will store the geoportal user information, resource metadata, and harvesting scheduling information for the geoportal.

- 1. Run the Windows installer for PostgreSQL version 9.1.5. Accept all defaults.
- 2. When asked to create a password for the postgres user, enter postgres.

Note: If your network has a password policy that enforces strong passwords, choose a stronger password.

3. Verify that the PostgreSQL port number is 5432.

Configure PostgreSQL Database

You need to streamline your computer's access to the PostgreSQL database to simplify the geoportal's installation and operation.

- 1. Navigate to C:\Program Files\PostgreSQL\9.1.5\data.
- 2. Open pg_hba.conf in Notepad (right-click and choose Edit). Go to (Ctrl+G) line 80. This line is below the one that starts with # IPv4. Change md5 to trust.
- 3. At the end of the file, add the following two lines, substituting your IP address (which you wrote down earlier) for <IP Address>:

```
# My computer's connection:
host all all <IP Address>/32 trust
```

4. Save and close the file.

These changes open up the PostgreSQL database to connections from your computer only. It does not open the database to external computers. The change to line 80 simplifies connections through localhost, and the new lines allow your computer to connect to the database via a TCP/IP connection.

For the database commands that will configure the PostgreSQL database for the geoportal to run correctly, you need to update your computer's environmental variables.

- Right-click My Computer and select Properties. On Windows 7, also click Advanced System Settings.
- 2. On the Advanced tab, click Environment Variables.
- 3. In the System variables section of the new window, select the PATH entry and click Edit.
- 4. Go to the end of the text in the Variable Value box.

5. Do not delete or overwrite any existing text! Add the following to the end of the text:

;C:\Program Files\PostgreSQL\9.1.5\bin

Note: Ensure that there isn't a space between the semicolon (;) that starts this line and C:\.

- 6. Click OK three times to save the changes.
- 7. Restart your computer for the changes to take effect.

Install the Java Development Kit and Runtime Environment

Run the installer and accept all the defaults.

Install Apache Tomcat 7

Apache Tomcat 7 is web servlet software that manages web applications. You will need web servlet software to deploy the geoportal web application. Run the installer and accept all defaults. Verify that the Tomcat port number is 8080. Don't enter an administrator user name or password.

Configure Apache Tomcat 7 Service

- 1. Right-click My Computer and select Manage.
- 2. Expand Services and Applications and select Services.
- 3. Find Apache Tomcat 7 in the Services list and ensure that the Service Status is Started. (If not, right-click it and choose Start.)
- 4. Right-click the Apache Tomcat service and select Properties.
- 5. Change the Startup type to Automatic.
- 6. Click OK to save the change and close the window.
- 7. Verify the installation by opening a web browser and going to http://localhost:8080. A default Tomcat page should appear.

Install Esri Geoportal Server

Extract the contents of geoportal-1.2.2.zip, the geoportal ZIP file, into the C:\geoportal folder.

Set Up the Geoportal User and Schema in PostgreSOL

Geoportal User Setup

- 1. Reopen the Windows command prompt.
- Type cd C:\geoportal\Database Scripts\PostgreSQL to change to
 this directory. (Hint: If the geoportal folder is not on C, type cd /d <drive
 letter>:\ to change from the default C:\prompt.) Type dir to see the contents
 of this directory.

- 3. Type grants_pg to see usage instructions for this script. You will enter parameters according to these usage instructions in the next step.
- 4. Type the following parameters and press Enter. (You will be prompted to create a password for geoportal user. Use the password geoportal, unless your system requires a stronger password.)

```
grants_pg localhost 5432 postgres geoportal
  postgres geoportal
```

5. Enter the password for the new role (geoportal). Enter the password again (geoportal).

Note: If your network has a password policy that enforces strong passwords, choose a stronger password.

Upon the completion of the script, it will generate a text file, grants_pg.txt, and invoke a text editor to display the results of the script.

Populating Geoportal Schema in PostgreSQL

The previous section created the geoportal schema in the PostgreSQL database. This section will populate that schema with the tables the geoportal needs to function.

- At the command prompt, type create_schema_pg to see usage instructions for this script. You will enter parameters according to these usage instructions in the next step.
- 2. Type the following parameters:

```
create_schema_pg localhost 5432 postgres
  geoportal
```

For geoportal user, enter the same password you designated for the geoportal user when you ran the grants_pg script—in most cases, this will be geoportal. Upon the completion of the script, it will generate a text file, geoportal_schema.txt, and invoke a text editor to display the results of the script.

Verify Geoportal Tables Were Generated Correctly

- 1. Open Postgres System Administrator.
- 2. Click Start > All Programs > PostgreSQL 9.1.5 > pgAdmin III.
- 3. Double-click PostgreSQL 9.1 (localhost:5432).
- 4. Enter the password for the postgres user.
- 5. In the table tree, navigate to Databases > postgres > Schemas > geoportal > Tables.
- 6. Verify that Tables contains the following nine tables:
 - gpt_collection
 - gpt collection history
 - gpt_harvesting_history
 - gpt_harvesting_jobs_completed
 - gpt harvesting jobs pending
 - gpt resource
 - gpt_resource_data

- gpt search
- gpt user

Deploy the Geoportal Web Application

Copy geoportal.war from

C:\geoportal\Web Applications\Geoportal
to
C:\Program Files\Apache Software Foundation\Tomcat
7.0\webapps

Apache Tomcat should automatically create a new folder in the webapps folder called geoportal. This is the geoportal website. If the folder is not created, open the Services window (My Computer > Manage) and restart the Apache Tomcat 7 service. Open a web browser and go to http://localhost:8080/geoportal. The default geoportal home page should appear.

Configure the gpt.xml File

Look at the highlighted lines in appendix 2 for the required changes to the gpt.xml file.

Note: Be sure to pay attention to indentation when commenting out sections.

- 1. In Windows Explorer, navigate to C:\Program Files\Apache Software Foundation\Tomcat 7.0\webapps\geoportal\WEB-INF\classes\gpt\config.
- 2. Open gpt.xml in Notepad.
- 3. Make the changes shown in appendix 2 to the gpt.xml file.
- 4. Save and close gpt.xml.

Modify the Java Database Connectivity .jar File

- 1. Copy postgresql-9.1-902.jdbc4.jar to C:\Program Files\Apache Software Foundation\Tomcat 7.0\lib.
- 2. Copy geoportal.xml from C:\Geoportal\Other\JNDI Configuration to C:\Program Files\Apache Software Foundation\Tomcat 7.0\conf\Catalina\localhost.
- 3. Right-click the geoportal.xml file; select Properties; and, if necessary, uncheck Read-only.
- 4. Open geoportal.xml with Notepad and make the changes shown in appendix 3. Note that for the password parameter, this is the password for your geoportal database user. If you used a strong password when setting up the geoportal database, use that password.
- 5. Save and close geoportal.xml.
- 6. Restart the Apache Tomcat 7 service.

Log In to the Geoportal

Your geoportal is now up and running. Open a web browser and go to http://localhost:8080/geoportal to access the geoportal's user interface. You can log in to your geoportal with the gptuser user name and gptuser password. You have logged

in successfully when a green banner saying "Welcome gptuser" and the Administration tab appear. Go to http://geoportal.sourceforge.net/documentation.html for information on how to register resources with your geoportal.

Register an ArcGIS for Server Service with the Geoportal

To register an ArcGIS server and its associated services with your geoportal, use the following procedure. The ArcGIS server can be your own or one that is publicly available.

Note: ArcGIS for Server is not required to set up or manage a geoportal server. Esri Geoportal Server supports a wide range of geospatial services, including Open Geospatial Consortium, Inc. (OGC), services (WMS, WCS, WFS, etc.); GeoRSS; ArcGIS services; Open Archive Initiative (OAI) services; and even web-accessible folders.

- 1. Log in to your geoportal. Click Administration. Click Add. Make sure Register resource on the network is selected and click Proceed.
- 2. Select Protocol Type ArcGIS.
- 3. In REST URL, type http://services.arcgisonline.com/ArcGIS/rest/services/.
- 4. In SOAP URL, type http://services.arcgisonline.com/ArcGIS/services/.
- 5. In title, type Services from ArcGIS Online. Click Test to verify the connection. A green banner with "Connection successfully verified" should appear.
- 6. Scroll down, keeping all other defaults, and click Save. A green banner with "Resource data saved successfully" should appear.
- 7. Click Manage at the top of the Administration tab. Services from ArcGISSM Online should be listed. Notice that the fifth icon (Synchronize content) has been dimmed.
- 8. Check the box to the left of the record. Above the records list, in For selected records, choose Set as Approved and click Execute Action. The page should reload, and a green banner should display the message "1 record(s) were updated."
- 9. The fifth icon (Synchronize content) should now be in color; click that icon. A dialog box entitled "The page at localhost 8080 says..." opens. Click OK. A green banner that indicates one resource has been qualified for synchronization should appear. Wait a few moments while the geoportal synchronizes services from the registered ArcGIS server.
- 10. After a few moments, click the last icon (Show documents acquired from this repository). The returned documents are metadata records created for the services hosted on the registered ArcGIS server and now discoverable through your geoportal.

Conclusion

This tutorial walks through the process of setting up Esri Geoportal Server using an open source web servlet and database. For testing purposes, simple authentication was used rather than LDAP authentication. The full functionality of user-based roles in Esri Geoportal Server requires an LDAP-enabled directory server. If an existing directory server is not available, several open source directory servers can be used. To learn more about configuring a directory server and other aspects of installing and using Esri Geoportal Server, see the *Geoportal Server 1.2.2 Installation Guide* part of the documentation that is included with the Esri Geoportal Server download. Also see the Esri Geoportal Server site at esriurl.com/geoportalserver.

Appendix 1: Software Required in This Tutorial

Component	Function	Version	URL
Esri Geoportal Server	Geoportal Software	1.2.2	esriurl.com/geoportalserver
PostgreSQL	RDBMS	9.1.5	postgresql.org
Apache Tomcat	Web servlet	7.0.29	tomcat.apache.org
Java Development Kit with Runtime Environment	Java controller	SE 6 Update 35 JDK	oracle.com/java
JDBC Configuration File	Connects Tomcat to PostgreSQL database	postgresql-9.1- 902-jdbc4.jar	jdbc.postgresql.org/download

Appendix 2: Modifications to the gpt.xml File

Lines	Modifications (changes highlighted)
75–79	<pre><lucene< pre=""></lucene<></pre>
(original)	indexLocation=" <mark>"</mark> "
	writeLockTimeout="60000"
	useNativeFSLockFactory="true"
	analyzerClassName="org.apache.lucene
	.analysis.standard.StandardAnalyzer">
75–79	<pre><lucene< pre=""></lucene<></pre>
(new)	indexLocation=" <mark>C:\lucene</mark> "
	writeLockTimeout="60000"
	useNativeFSLockFactory="true"
	analyzerClassName="org.apache.lucene
	.analysis.standard.StandardAnalyzer">
122–127	<pre><parameter <="" key="assertion.index.enabled" pre=""></parameter></pre>
(original)	value="true"/>
	<pre><parameter key="assertion.index.location" value=" "></parameter></pre>
	<pre><parameter key="assertion.index.allow</pre></td></tr><tr><td></td><td>NonLocalResourceIds" value="false"></parameter></pre>
	<pre><parameter <="" key="assertion.rating.enabled" pre=""></parameter></pre>
	value="true"/>
	<pre><parameter <="" key="assertion.comment.enabled" pre=""></parameter></pre>
	value="true"/>
	<pre><parameter <="" key="assertion.comment.maxLength" pre=""></parameter></pre>
	value="2048"/>
122–127	<pre><parameter <="" key="assertion.index.enabled" pre=""></parameter></pre>
(new)	value="true"/>
	<pre><parameter <="" key="assertion.index.location" pre=""></parameter></pre>
	value=" <mark>C:\lucene\assertion</mark> "/>
	<pre><parameter key="assertion.index.allow</pre></td></tr><tr><td></td><td>NonLocalResourceIds" value="false"></parameter></pre>
	<pre><parameter <="" key="assertion.rating.enabled" pre=""></parameter></pre>
	value="true"/>
	<pre><parameter <="" key="assertion.comment.enabled" pre=""></parameter></pre>
	value="true"/>
	<pre><parameter <="" key="assertion.comment.maxLength" pre=""></parameter></pre>
	value="2048"/>
451–574	User management configuration, simpleAdapter</td
(original)	OR ldapAdapter.
	- simpleAdapter: Configures geoportal with one
	administrative user
	- ldapAdapter: Configures geoportal to connect
	to LDAP user directory store
	>
	<pre><identity enckey="PtkESRI" realm="Geoportal"></identity></pre>
	</td

```
Lines
                       Modifications (changes highlighted)
               <simpleAdapter>
                   <account username="gptaccount"</pre>
                    password="gpt.account"
                    encrypted="false"/>
                   <roles>
                       <role key="gptRegisteredUser"/>
                       <role key="gptPublisher"/>
                       <role key="gptAdministrator"/>
                   </roles>
               </simpleAdapter>
               <ldapAdapter>
                   <ldapConnectionProperties</pre>
                       providerURL="ldap://ldap host
                       name:ldap port"
                       ___initialContextFactoryName="com.sun
                       .jndi.ldap.LdapCtxFactory"
                       securityAuthentication="simple"
                       securityProtocol="">
                       <ldapServiceAccount</pre>
                           securityPrincipal="ldap admin
                           user"
                           securityCredentials="ldap admin
                           _password"
                           encrypted="false"/>
                   </ldapConnectionProperties>
                   <singleSignOn
                       active="false"
                       credentialLocation="userPrincipal"
                       anonymousValue=""
                       logoutOutcome=""/>
                   <selfCareSupport</pre>
                       supportsLogin="true"
                       supportsLogout="true"
                       supportsUserRegistration="true"
                       supportsUserProfileManagement="true"
                       supportsPasswordChange="true"
                       supportsPasswordRecovery="true"/>
                 <!-- optional parameters for user role
                       management:
                    An alternate way to prevent users from
      specific groups is to set "forbidden" attribute to true.
                      - manage: Used to configure role to be
      managed on the user role management page.
                       If the value is true, the users having
      the role are managed on the user role management page.
      Default is true.
                    - forbidden: Used to configure role to
      prevent users with this role from logging in to
      geoportal.
                        If the value is true, the users having
```

```
Lines
                       Modifications (changes highlighted)
      the role will not be allowed to log in.
                    - resKey: A resource key to the label
      displayed for the corresponding role on the user role
      management page.
                   <roles authenticatedUserRequires
                    Role="true">
                       <role
                           key="gptRegisteredUser"
                           resKey="catalog.role.gptRegistered
                        manage="true"
                         forbidden="false"
                           groupDN="group distinguished name
                            _for_registered_user"/>
                       <role
                           key="gptPublisher"
                           inherits="gptRegisteredUser"
                           resKey="catalog.role.gptPublisher"
                        manage="true"
                         forbidden="false"
                           groupDN="group_distinguished_name
                           _for_publisher"/>
                     <role
                           key="gptAdministrator"
                           inherits="gptPublisher"
                           resKey="catalog.role.gpt
                           Administrator"
                        manage="true"
                         forbidden="false"
                           groupDN="group distinguished name
                           _for_administrator"/>
                   </roles>
                   <users
                       displayNameAttribute="uid"
                       passwordEncryptionAlgorithm="SHA"
                       newUserDNPattern="cn={0},
                       Users Node DN"
                       usernameSearchPattern="(&
                       (objectclass=person) (uid={0}))"
                       searchDIT="Users Node DN">
                       <requiredObjectClasses>
                           <objectClass name="top"/>
                           <objectClass name="person"/>
                           <objectClass</pre>
                            name="organizationalPerson"/>
                           <objectClass
                            name="inetOrgPerson"/>
                       </requiredObjectClasses>
                       <userAttributeMap>
                           <attribute key="username"
                            ldapName="uid"/>
                           <attribute key="password"
                            ldapName="userPassword"/>
                           <attribute key="email"
```

Lines	Modifications (changes highlighted)
	ldapName="mail"/>
	<attribute <="" key="firstName" th=""></attribute>
	ldapName="givenName"/>
	<attribute <="" key="lastName" th=""></attribute>
	ldapName="sn"/>
	<attribute <="" key="displayName" th=""></attribute>
	ldapName="displayName"/>
	<attribute <="" key="organization" th=""></attribute>
	ldapName="o"/> <attribute <="" key="affiliation" th=""></attribute>
	ldapName="businessCategory"/>
	<pre><attribute <="" key="street" pre=""></attribute></pre>
	ldapName="street"/>
	<pre><attribute <="" key="city" pre=""></attribute></pre>
	ldapName="1"/>
	<attribute <="" key="stateOrProv" th=""></attribute>
	ldapName="st"/>
	<attribute <="" key="postalCode" th=""></attribute>
	ldapName="postalCode"/>
	<attribute <="" key="country" th=""></attribute>
	ldapName=""/>
	<attribute <="" key="phone" th=""></attribute>
	ldapName="telephoneNumber"/>
	<pre></pre>
	<groups< th=""></groups<>
	displayNameAttribute="cn"
	dynamicMemberOfGroupsAttribute=""
	dynamicMembersAttribute=""
	memberAttribute="uniquemember"
	<pre>memberSearchPattern="(&</pre>
	<pre>(objectclass=groupOfUniqueNames)</pre>
	<pre>(uniquemember={0}))"</pre>
	searchDIT="Groups_Node_DN">
	</th
	<pre><metadatamanagementgroup< pre=""></metadatamanagementgroup<></pre>
	name="Region 1"
	groupDN="group_distinguished_name"/>
	<pre><metadatamanagementgroup< pre=""></metadatamanagementgroup<></pre>
	name="Region 2"
	groupDN="group_distinguished
	_name"/>
	>
	//idontitus
451 554	
451–574 (now)	User management configuration, simpleAdapter</th
(new)	OR ldapAdapter.
	 simpleAdapter: Configures geoportal with one administrative user
	- ldapAdapter: Configures geoportal to connect
	to LDAP user directory store
	>
<u> </u>	

```
Lines
                       Modifications (changes highlighted)
           <identity encKey="PtkESRI" realm="Geoportal">
               <simpleAdapter>
                   <account username="gptuser"</pre>
                    password="gptuser" encrypted="false"/>
                   <roles>
                       <role key="gptRegisteredUser"/>
                       <role key="gptPublisher"/>
                       <role key="gptAdministrator"/>
                   </roles>
               </simpleAdapter>
               <ldapAdapter>
                   <ldapConnectionProperties</pre>
                       providerURL="ldap://ldap_host
                        name: ldap port"
                       initialContextFactoryName="com.sun
                       .jndi.ldap.LdapCtxFactory"
                       securityAuthentication="simple"
                       securityProtocol="">
                       <ldapServiceAccount</pre>
                           securityPrincipal="ldap admin
                            user"
                           securityCredentials="ldap_admin
                            _password"
                            encrypted="false"/>
                   </ldapConnectionProperties>
                   <singleSignOn
                       active="false"
                       credentialLocation="userPrincipal"
                       anonymousValue=""
                       logoutOutcome=""/>
                   <selfCareSupport</pre>
                       supportsLogin="true"
                       supportsLogout="true"
                       supportsUserRegistration="true"
                       supportsUserProfileManagement="true"
                       supportsPasswordChange="true"
                       supportsPasswordRecovery="true"/>
                       optional parameters for user role
       management:
                    An alternate way to prevent users from
       specific groups is to set "forbidden" attribute to true.
                      - manage: Used to configure role to be
       managed on the user role management page.
                       If the value is true, the users having
       the role are managed on the user role management page.
       Default is true.
                     - forbidden: Used to configure role to
       prevent users with this role from logging in to
       geoportal.
```

```
Lines
                       Modifications (changes highlighted)
                        If the value is true, the users having
      the role will not be allowed to log in.
                    - resKey: A resource key to the label
      displayed for the corresponding role on the user role
      management page.
                   <roles authenticatedUserRequires
                    Role="true">
                       <role
                           key="qptRegisteredUser"
                           resKey="catalog.role.gptRegistered
                           User"
                        manage="true"
                        forbidden="false"
                           groupDN="group distinguished name
                            _for_registered user"/>
                           key="gptPublisher"
                           inherits="gptRegisteredUser"
                           resKey="catalog.role.gptPublisher"
                        manage="true"
                        forbidden="false"
                           groupDN="group_distinguished_name
                           _for_publisher"/>
                     <role
                           key="gptAdministrator"
                           inherits="gptPublisher"
                           resKey="catalog.role.gpt
                           Administrator"
                        manage="true"
                        forbidden="false"
                           groupDN="group distinguished name
                           _for_administrator"/>
                   </roles>
                   <users
                       displayNameAttribute="uid"
                       passwordEncryptionAlgorithm="SHA"
                       newUserDNPattern="cn={0},
                       Users Node DN"
                       usernameSearchPattern="(&
                      (objectclass=person) (uid={0}))"
                       searchDIT="Users Node DN">
                       <requiredObjectClasses>
                           <objectClass name="top"/>
                           <objectClass name="person"/>
                           <objectClass name="organizational</pre>
                            Person"/>
                           <objectClass name="inetOrg</pre>
                            Person"/>
                       </requiredObjectClasses>
                       <userAttributeMap>
                           <attribute key="username"
                            ldapName="uid"/>
                           <attribute key="password"
                            ldapName="userPassword"/>
```

Lines	Modifications (changes highlighted)
Lines	Modifications (changes highlighted)
	<attribute <="" key="email" th=""></attribute>
	ldapName="mail"/>
	<attribute key="firstName" ldapname="givenName"></attribute>
	<pre>cattribute key="lastName"</pre>
	ldapName="sn"/>
	<pre><attribute <="" key="displayName" pre=""></attribute></pre>
	ldapName="displayName"/>
	<pre><attribute <="" key="organization" pre=""></attribute></pre>
	ldapName="o"/>
	<attribute <="" key="affiliation" th=""></attribute>
	ldapName="businessCategory"/>
	<attribute <="" key="street" th=""></attribute>
	ldapName="street"/>
	<attribute <="" key="city" th=""></attribute>
	ldapName="l"/>
	<attribute <="" key="stateOrProv" th=""></attribute>
	ldapName="st"/>
	<attribute <="" key="postalCode" th=""></attribute>
	ldapName="postalCode"/>
	<attribute <="" key="country" th=""></attribute>
	ldapName=""/>
	<attribute <="" key="phone" th=""></attribute>
	ldapName="telephoneNumber"/>
	<pre> </pre>
	<groups< th=""></groups<>
	displayNameAttribute="cn"
	dynamicMemberOfGroupsAttribute=""
	dynamicMembersAttribute=""
	memberAttribute="uniquemember"
	<pre>memberSearchPattern="(&</pre>
	(objectclass=groupOfUniqueNames)
	(uniquemember={0}))"
	searchDIT="Groups_Node_DN">
	<metadatamanagementgroup< th=""></metadatamanagementgroup<>
	name="Region 1"
	groupDN="group_distinguished
	name"/>
	- <metadatamanagementgroup< th=""></metadatamanagementgroup<>
	name="Region 2"
	groupDN="group_distinguished
	_name"/>
	>

Appendix 3: Modifications to the geoportal.xml File

Lines	Modifications (changes highlighted)
Original	Context configuration file for the Geoportal Web App <context crosscontext="true" debug="0" docbase="<Geoportal 10 web app name>" path="/<Geoportal 10 web app name>" reloadable="true"></context>
New	Context configuration file for the Geoportal Web App <context crosscontext="true" debug="0" docbase="geoportal" path="/geoportal" reloadable="true"></context>



Esri inspires and enables people to positively impact their future through a deeper, geographic understanding of the changing world around them.

Governments, industry leaders, academics, and nongovernmental organizations trust us to connect them with the analytic knowledge they need to make the critical decisions that shape the planet. For more than 40 years, Esri has cultivated collaborative relationships with partners who share our commitment to solving earth's most pressing challenges with geographic expertise and rational resolve. Today, we believe that geography is at the heart of a more resilient and sustainable future. Creating responsible products and solutions drives our passion for improving quality of life everywhere.



Contact Esri

380 New York Street Redlands, California 92373-8100 USA

1 800 447 9778

т 909 793 2853

F 909 793 5953

info@esri.com

esri.com

Offices worldwide esri.com/locations