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How To Use Blackboard Learn 9 Web Services For Java Developers

Bruce Phillips



Blackboard

References



- Blackboard Web Services Documentation
 - <http://www.brucephillips.name/blog/index.cfm/2011/6/8/Blackboard-Learn-91-Web-Services-Tutorials-and-Documentation>
- Web Service Example applications
 - <http://www.brucephillips.name/blackboard/registerproxytool.zip>
 - <http://www.brucephillips.name/blackboard/blackboardcoursesforuser.zip>
 - <http://www.brucephillips.name/blackboard/updateaddblackboarduser.zip>
 - <http://projects.oscelot.org/gf/project/webservices/wiki/?pagename=offalClient>
- Apache Axis2
 - <http://axis.apache.org/axis2/java/core/>
- Blackboard Install On Amazon EC2
 - <http://www.edugarage.com/display/BBDN/Installing+Blackboard+in+the+Amazon+EC2+Cloud>



Introduction



- What are Blackboard web services?
- How to access Blackboard web services
- How to generate client classes using Axis2
- Steps to follow in your application that will use Blackboard's web services
- Example applications



My Information



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What Are Blackboard Learn 9.1 Web Services?



- Used by external applications
 - Get data out of Blackboard
 - Add/update data in Blackboard
- SOAP-based
 - Use WS-Security
- Need system administrator access to configure
- Multiple web services
- Limited documentation



How to Access Blackboard Web Services



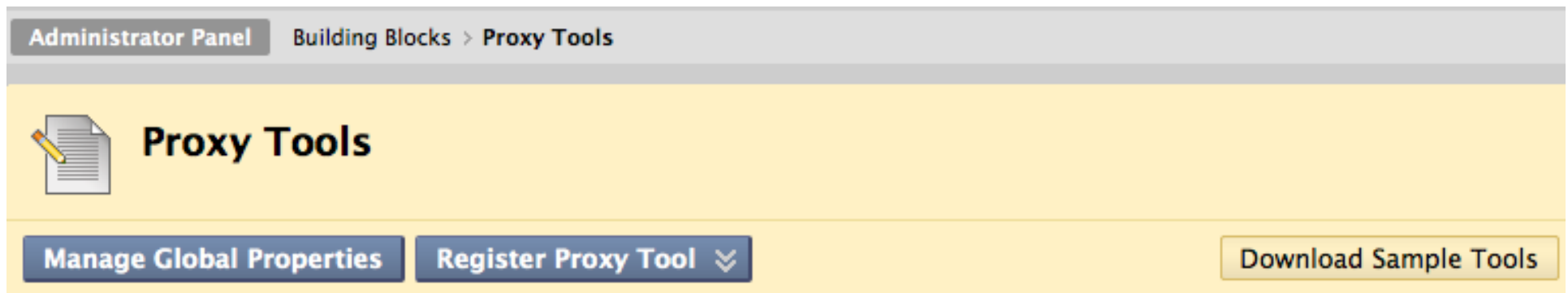
- Login to your Blackboard installation as an administrator
- Go to System Admin tab
 - click on web services under Building Blocks
- Each web service supports multiple operations
 - Click on down arrow and select Operations
- JavaDoc
 - Click on down arrow and select Download Documentation
- Web Service Definition Language (WSDL)
 - Click on the link to the WSDL



Web Services Example Provided By Blackboard



- In Blackboard Administrator Panel – Building Blocks – Proxy Tools
- Click on the Download Sample Tools button
- Zip file with code to create client classes for all the web services and test them
- Doesn't seem to work on Mac/Linux OS



Generate Java Client Classes



- Use web service WSDL and Axis2
 - <http://axis.apache.org/axis2/java/core/docs/userguide-creatingclients.html#createclients>
 - <http://tinyurl.com/3vhz6pt>
- Example
 - See class AxisCodeGenerator – blackboardcoursesforuser project
 - Creates stub client classes your application will use
- Different ways to generate the web service client classes
 - How you do this and the code that results will drive how your application uses Blackboard's web services



Proxy Tool



- Blackboard web service term for a “tool” authorized by a System Admin to access your Blackboard web services
- Alternative to using a user’s credentials
- The tool must first be registered with your Blackboard installation
 - Administrator must authorize the tool and the web services it needs to use
- Context web service has the operations related to registering and logging in for a proxy tool



Example Applications



- Eclipse projects that use Maven
- Can be run from within Eclipse (need m2eclipse plugin)
- Can be run from a terminal window using Maven
- Review the project's pom.xml for dependencies and what transitive dependencies had to be excluded
- Need access to Rampart's module directory
 - Web Service - Security
 - See Setup Rampart Module section of <http://tinyurl.com/3jhg6s8>



Example Proxy Tool Registration



- Get [registerproxytool project](#)
 - After unzipping the download – see ReadMe.txt
- Previously generated client classes for Context web services
- Main work is in class RegisterToolServiceImpl
- Proxy tool is registered once
- A Blackboard administrator must authorize the tool after it is registered



Proxy Tool Demo Part 1



- Login to Blackboard as administrator
- Get proxy tool registration password
- Make web services available
- Set SSL required to Not Required
- Change Discoverable to Yes

In production set SSL required yes and also set IP filters (on edit proxy tool page)

Manage Web Services						
<div>Upload Web Services Download Sample Tools Download All Documentation</div>						
<div>Availability SSL Discoverability Refresh</div>						
<input type="checkbox"/>	Web Service Name	WSDL Location	Available	SSL Required	Discoverable	Logging
<input type="checkbox"/>	Announcement.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Announcement.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	Calendar.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Calendar.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	Content.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Content.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	Context.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Context.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	Course.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Course.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	CourseMembership.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/CourseMembership.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	Gradebook.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Gradebook.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	NotificationDistributorOperations.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/NotificationDistributorOperations.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	User.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/User.WS?wsdl	Yes	No	Yes	Common
<input type="checkbox"/>	Util.WS	http://ec2-50-19-165-66.compute-1.amazonaws.com/webapps/ws/services/Util.WS?wsdl	Yes	No	Yes	Common

Proxy Tool Demo Part 2




- Review registerproxytool project ReadMe.txt
- Set values in bbws.properties
- Run RegisterProxyToolApp
- In console should see:
 - The proxy tool named proxyregister was registered with Blackboard web services successfully







Proxy Tool Demo Part 3



- In Blackboard authorize the proxy tool that was just registered

 **Proxy Tools**

[Manage Global Properties](#) [Register Proxy Tool](#) [Download Sample Tools](#)

 Delete							Refresh
<input type="checkbox"/> Vendor	 Program	Availability	Tool Authentication Configured	Tool Entitlements Requested	Proxy Placements Requested		
<input type="checkbox"/> brucephillips	proxyregister 	No	Yes	Yes	No		
 Delete							Refresh



Once a proxy tool is make available it can be used by other web service client applications

In production also set IP filters (on edit proxy tool page – click on the down arrow next to Program name)



Proxy Tool Demo Part 4



- Use the proxy tool in another client that will login to Blackboard's web services
- Run LoginApp in registerproxytool project
- In console should see:
 - Login using proxy tool named proxyregister was successful.





Code Review

Blackboard Web Services Client

- In registerproxytool project review class LoginServiceImpl
- Web service client classes previously generated using Axis 2
- Several steps to use the proxy tool and to login in order to interact with Blackboard web services





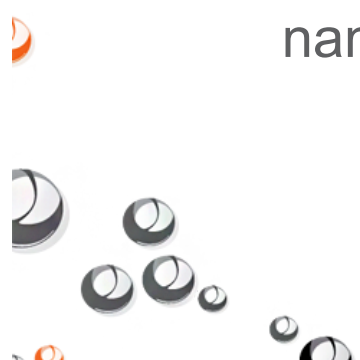
More In Depth Example

Get Blackboard Courses For A Specific User

- Get [blackboardcoursesforuser](#) project, unzip, and review ReadMe.txt
- Uses both context and course web services
 - Clients for those previously generated

- Review code in class

BlackboardCoursesForUserServiceImpl

- First uses the context web service methods to login and get course memberships
 - Then uses the course web service methods to get the course names for those courses
- 

Get Courses For User

Demo Part 1



- Enter values in `bbws.properties`
- Need a proxy tool authorized to use both context and course web services
 - Run `RegisterProxyToolApp`
 - Login to Blackboard and authorize the proxy tool



Get Courses For User

Demo Part 2



- Run BlackboardCoursesForUserApp
 - Course titles for the user should appear in the console



Get/Create/Update/Delete Blackboard User



- Get [updateaddblackboarduser](#) project, unzip, and review ReadMe.txt
- Example of how to get a user's data out of Blackboard, add a new user to Blackboard, update a user's information in Blackboard, and delete a user
 - Note the update user web service doesn't work due to Blackboard web service bug
- Uses context and user web services
 - Clients previously generated
- Review code in class BlackboardUserServiceImpl
 - First uses the context web service methods to login
 - Then uses the user web service methods to get, add, update and delete a user



Get/Create/Update/Delete Blackboard User – Demo Part 1



- Enter values in `bbws.properties`
- Need a proxy tool authorized to use both context and course web services
 - Run `RegisterProxyToolApp`
 - Login to Blackboard and authorize the proxy tool



Get/Create/Update/Delete Blackboard User – Demo Part 2



- Run JUnit test - BlackboardUserServiceTest
 - First provide values for the final String constants
 - In Eclipse - Run As - Maven test
 - In command window - mvn test



View SOAP Envelopes



- Can use various tools to review outgoing and incoming SOAP envelopes
 - can see raw XML being sent to Blackboard web service and returned from Blackboard web service
- See <http://tinyurl.com/6kmyp52> for how to use tcpmon



Summary



- Study the web services
- Use WSDL to create client classes
- Study web service JavaDoc and client classes API
- Ensure you have setup access to Rampart correctly
- Create proxy tool and authorize it
- Design your application to use the client classes and methods
 - Be sure to setup the out-going web security
- Consult references for more information





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The title of this session is:

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