How To Use TCPMON To View SOAP Request and Response

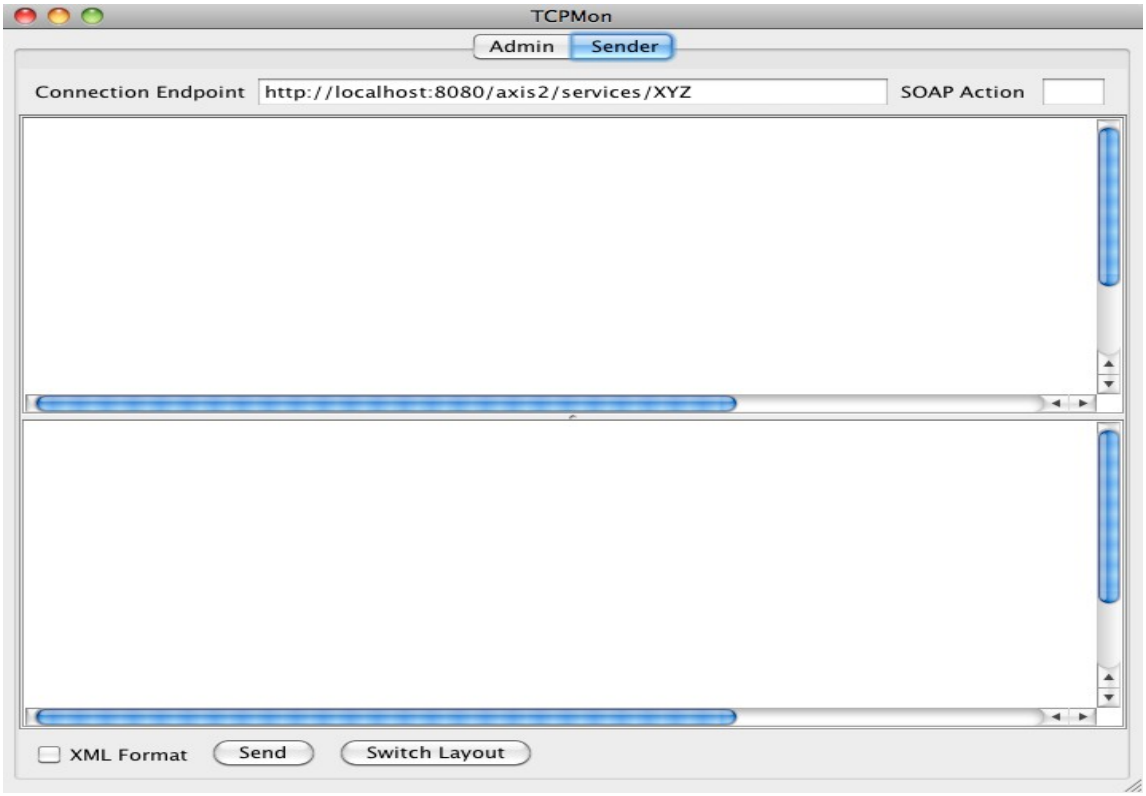
Introduction

When developing client applications for the Blackboard Learn 9.1 web services it's often helpful for trouble-shooting to be able to view the SOAP request and response. I use tcpmon (http://code.google.com/p/tcpmon/) to capture the outgoing and incoming SOAP envelopes when testing my client applications with Blackboard web services.

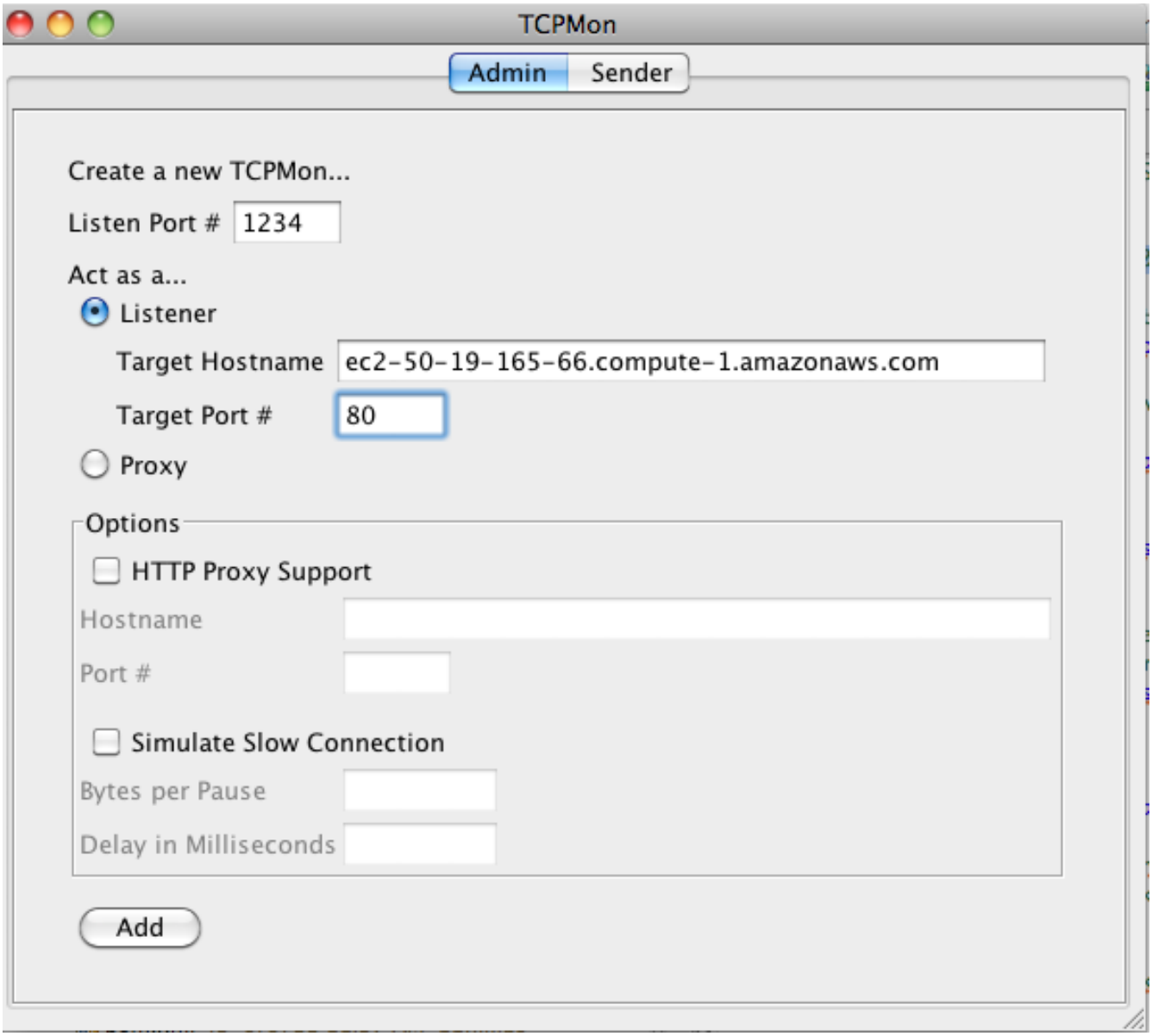
Get tcpmon

Visit http://ws.apache.org/commons/tcpmon/download.cgi to download the 1.0 binary version of tcpmon. Unzip the download. Open a terminal window and navigate to where you unzipped the download. Change directory (cd) to the build folder. Run ./tcpmon.sh (you may need to change permissions on this file).

You should see:



Click on the Admin tab and enter these values for the fields.



We have instructed tcpmon to listen on port 1234 and forward any requests received to ec2-50-19-165-66.compute-1.amazonaws.com (our blackboard installation).

Note we are using Target Port # of 80 since our Blackboard installation is using Apache web server, which by default listens on port 80.

In our web service request we will then set our URL as localhost:1234. This will cause any requests to go through the tcpmon proxy, which will capture the SOAP request and then send on the request to the target hostname value. The response from the web service will also be captured by tcpmon and then forwarded on to our application.

For example in the bbws.properties file for project blackboardcoursesforuser we can set the property bbws.blackboardServerURL=localhost:1234. Then when we run BlackboardCoursesForUserApp tcpmon will capture the SOAP request and response.

The SOAP request for the getCourse method of the course web service looks like:

```
POST /webapps/ws/services/Course.WS HTTP/1.0
Content-Type: application/soap+xml; charset=UTF-8; action="loadCourse"
User-Agent: Axis2
Host: ec2-50-19-165-66.compute-1.amazonaws.com:1234
Cookie: $Version=0; JSESSIONID=E3D68E938FBE17BA79764363A7A6529C.root; $Path=/webapps/ws
Content-Length: 1291

<?xml version='1.0' encoding='UTF-8'?>
  <soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
    <soapenv:Header>
      <wsse:Security xmlns:wsse="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-secext-
1.0.xsd" soapenv:mustUnderstand="true">
        <wsu:Timestamp xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-wssecurity-
utility-1.0.xsd" wsu:Id="Timestamp-2067115646">
          <wsu:Created>2011-06-09T21:37:48.736Z</wsu:Created>
          <wsu:Expires>2011-06-09T21:42:48.736Z</wsu:Expires>
        </wsu:Timestamp>
        <wsse:UsernameToken xmlns:wsu="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-
wssecurity-utility-1.0.xsd" wsu:Id="UsernameToken-759351160">
          <wsse:Username>session</wsse:Username>
          <wsse:Password Type="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-username-token-
profile-1.0#PasswordText">c812f4272d22413d9930e231e45e5d32</wsse:Password>
        </wsse:UsernameToken>
      </wsse:Security>
    </soapenv:Header>
    <soapenv:Body>
      <ns3:getCourse xmlns:ns3="http://course.ws.blackboard">
        <ns3:filter>
          <ns1:filterType xmlns:ns1="http://course.ws.blackboard/xsd">3</ns1:filterType>
          <ns1:ids xmlns:ns1="http://course.ws.blackboard/xsd">_41_1</ns1:ids>
          <ns1:ids xmlns:ns1="http://course.ws.blackboard/xsd">_42_1</ns1:ids>
        </ns3:filter>
      </ns3:getCourse>
    </soapenv:Body>
  </soapenv:Envelope>
```

Examining the above SOAP request, we see that two ids are being sent: _41_1 and _42_1.

Also note the values for created and expires in the Timestamp node in the Security portion of the Header. The expires is set for 5 minutes after the created date/time. This means that if your Blackboard server time is more than 5 minutes off of the time of the computer generating the SOAP request, the SOAP request will fail.

The SOAP response back is

```
HTTP/1.1 200 OK
Date: Thu, 09 Jun 2011 21:37:49 GMT
Server: Apache/1.3.41 (Unix) mod_gzip/1.3.26.1a mod_ssl/2.8.31 OpenSSL/0.9.8n mod_jk/1.2.28
X-Blackboard-appserver: ip-10-68-30-176
X-Blackboard-product: Blackboard Learn &#8482; 9.1.50119.0
Pragma: no-cache
```

Cache-Control: no-cache
Cache-Control: max-age=0
Cache-Control: no-store
Cache-Control: must-revalidate
Last-Modified: Tue, 07 Jun 2011 16:01:25 GMT
Expires: Wed, 09 Jun 2010 21:37:49 GMT
Connection: close
Content-Type: application/soap+xml;
action="http://course.ws.blackboard/Course/getCourseResponse";charset=UTF-8

<?xml version='1.0' encoding='UTF-8'?>
<soapenv:Envelope xmlns:soapenv="http://www.w3.org/2003/05/soap-envelope">
<soapenv:Body>
<ns:getCourseResponse xmlns:ns="http://course.ws.blackboard"
xmlns:ax217="http://ws.platform.blackboard/xsd" xmlns:ax218="http://course.ws.blackboard/xsd">
<ns:return type="blackboard.ws.course.CourseVO">
<ax218:allowGuests>true</ax218:allowGuests>
<ax218:allowObservers>false</ax218:allowObservers>
<ax218:available>true</ax218:available>
<ax218:batchUid>ENGL101</ax218:batchUid>
<ax218:buttonStyleBbId>_87_1</ax218:buttonStyleBbId>
<ax218:buttonStyleShape>Default</ax218:buttonStyleShape>
<ax218:buttonStyleType>Default</ax218:buttonStyleType>
<ax218:cartridgeId xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:nil="true" />
<ax218:classificationId>_113_1</ax218:classificationId>
<ax218:courseDuration>Continuous</ax218:courseDuration>
<ax218:courseId>ENGL101</ax218:courseId>
<ax218:coursePace>InstructorLed</ax218:coursePace>
<ax218:courseServiceLevel>Course</ax218:courseServiceLevel>
<ax218:dataSourceId>_2_1</ax218:dataSourceId>
<ax218:decAbsoluteLimit>0</ax218:decAbsoluteLimit>
<ax218:description>Introduction to English</ax218:description>
<ax218:endDate>0</ax218:endDate>
<ax218:enrollmentAccessCode></ax218:enrollmentAccessCode>
<ax218:enrollmentEndDate>0</ax218:enrollmentEndDate>
<ax218:enrollmentStartDate>0</ax218:enrollmentStartDate>
<ax218:enrollmentType>InstructorLed</ax218:enrollmentType>
<ax218:expansionData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:nil="true" />
<ax218:fee>0.0</ax218:fee>
<ax218:hasDescriptionPage>false</ax218:hasDescriptionPage>
<ax218:id>_41_1</ax218:id>
<ax218:institutionName></ax218:institutionName>
<ax218:locale xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:nil="true" />
<ax218:localeEnforced>false</ax218:localeEnforced>
<ax218:lockedOut>false</ax218:lockedOut>
<ax218:name>ENGLISH 101</ax218:name>
<ax218:navCollapsable>true</ax218:navCollapsable>

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            <ax218:navColorBg>#FFFFFF</ax218:navColorBg>
            <ax218:navColorFg>#003366</ax218:navColorFg>
            <ax218:navigationStyle>Text</ax218:navigationStyle>
            <ax218:numberOfDaysOfUse>0</ax218:numberOfDaysOfUse>
            <ax218:organization>false</ax218:organization>
            <ax218:showInCatalog>true</ax218:showInCatalog>
            <ax218:softLimit>0</ax218:softLimit>
            <ax218:startDate>0</ax218:startDate>
            <ax218:uploadLimit>0</ax218:uploadLimit>
          </ns:return>
          <ns:return type="blackboard.ws.course.CourseVO">
            <ax218:allowGuests>true</ax218:allowGuests>
            <ax218:allowObservers>false</ax218:allowObservers>
            <ax218:available>true</ax218:available>
            <ax218:batchUid>MATH101</ax218:batchUid>
            <ax218:buttonStyleBbId>_87_1</ax218:buttonStyleBbId>
            <ax218:buttonStyleShape>Default</ax218:buttonStyleShape>
            <ax218:buttonStyleType>Default</ax218:buttonStyleType>
            <ax218:cartridgeId xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:nil="true" />
            <ax218:classificationId>_113_1</ax218:classificationId>
            <ax218:courseDuration>Continuous</ax218:courseDuration>
            <ax218:courseId>MATH101</ax218:courseId>
            <ax218:coursePace>InstructorLed</ax218:coursePace>
            <ax218:courseServiceLevel>Course</ax218:courseServiceLevel>
            <ax218:dataSourceId>_2_1</ax218:dataSourceId>
            <ax218:decAbsoluteLimit>0</ax218:decAbsoluteLimit>
            <ax218:description>Introduction to Math</ax218:description>
            <ax218:endDate>0</ax218:endDate>
            <ax218:enrollmentAccessCode></ax218:enrollmentAccessCode>
            <ax218:enrollmentEndDate>0</ax218:enrollmentEndDate>
            <ax218:enrollmentStartDate>0</ax218:enrollmentStartDate>
            <ax218:enrollmentType>InstructorLed</ax218:enrollmentType>
            <ax218:expansionData xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:nil="true" />
            <ax218:fee>0.0</ax218:fee>
            <ax218:hasDescriptionPage>false</ax218:hasDescriptionPage>
            <ax218:id>_42_1</ax218:id>
            <ax218:institutionName></ax218:institutionName>
            <ax218:locale xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xsi:nil="true" />
            <ax218:localeEnforced>false</ax218:localeEnforced>
            <ax218:lockedOut>false</ax218:lockedOut>
            <ax218:name>MATH 101</ax218:name>
            <ax218:navCollapsable>true</ax218:navCollapsable>
            <ax218:navColorBg>#FFFFFF</ax218:navColorBg>
            <ax218:navColorFg>#003366</ax218:navColorFg>
            <ax218:navigationStyle>Text</ax218:navigationStyle>
            <ax218:numberOfDaysOfUse>0</ax218:numberOfDaysOfUse>
            <ax218:organization>false</ax218:organization>
```

```
            <ax218:showInCatalog>true</ax218:showInCatalog>
            <ax218:softLimit>0</ax218:softLimit>
            <ax218:startDate>0</ax218:startDate>
            <ax218:uploadLimit>0</ax218:uploadLimit>
          </ns:return>
        </ns:getCourseResponse>
      </soapenv:Body>
    </soapenv:Envelope>
```

The huge advantage of using Axis2 (see part 3 - http://www.brucephillips.name/blog/index.cfm/2011/6/8/Blackboard-Learn-91-Web-Services-Tutorials-and-Documentation) to generate our client Java classes is that we don't have to manually create the SOAP request XML and we don't have to manually parse the SOAP response XML. Behind the scenes the Java client classes we generated using Axis2 do all this work for us.

However, by using tcpmon we can examine the SOAP request and response when necessary.