

Exercise 12

API Management and Governance including Business Activity Monitoring

Prior Knowledge

RESTful services

Previous ESB exercises

Objectives

Understand API management and key issuing. Understand Business Activity Monitoring.

Be able to configure the API Manager and Business Activity Monitor, and use OAuth2

Bearer Tokens

Software Requirements

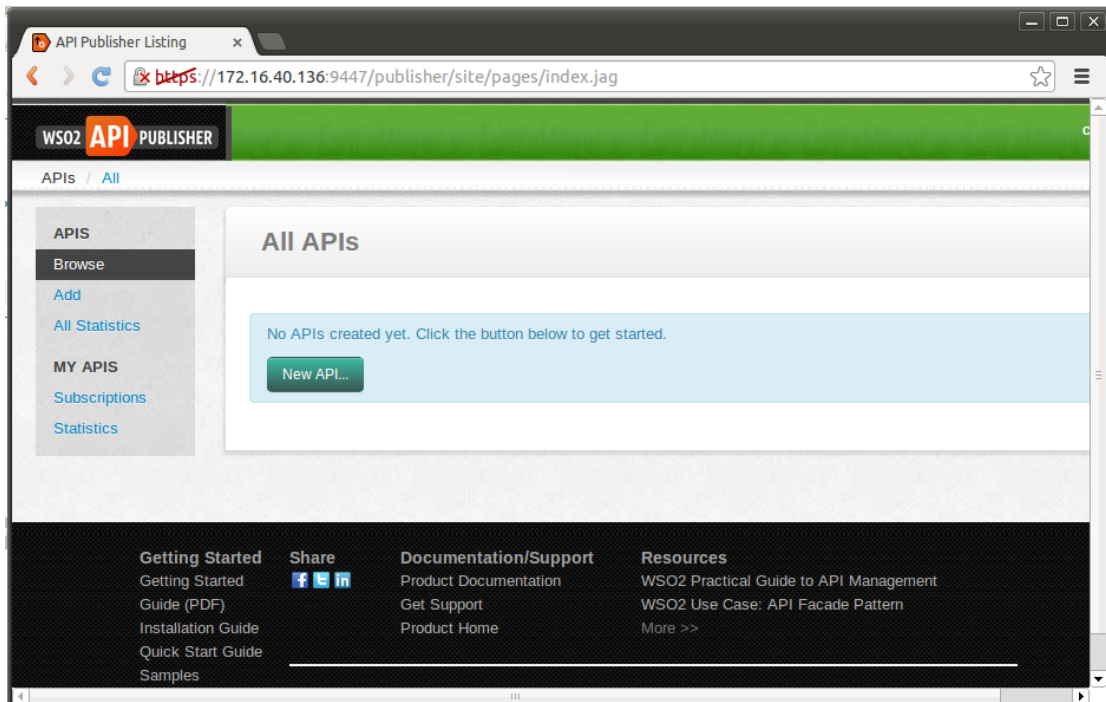
(see separate document for installation of these)

- Java Development Kit 7
- WSO2 App Server and WSO2 ESB working from Exercises 8, 9
- WSO2 API Manager and WSO2 BAM installed and configured to talk to each other
- Google Chrome plus Chrome Advanced REST extension



1. We have already configured the API Manager to publish statistics to the Business Activity Monitor.
2. In addition we have done some of the setup tasks outlined in the API Manager Getting Started Guide. This is good reading:
(Find it on this page: <http://wso2.com/products/api-manager/>)
 - a. We have created roles “creator” and “publisher”
 - b. We have created users *chris* (a creator) and *peter* (a publisher) both with password “password”.
3. Firstly make sure the ESB and AppServer are running.
4. Now in two separate terminal windows start up the BAM, and then AM:

```
cd ~/servers/wso2bam-2.4.0/  
bin/wso2server.sh  
  
cd ~/servers/wso2am-1.5.0/  
bin/wso2server.sh
```
5. You are now ready to create and publish an API, and then subscribe to it.
6. Pull up the “Publisher” webapp by going to URL:
<https://localhost:9447/publisher/>
7. Login as chris/password
8. You should see similar to:



9. Click **New API**

10. Use the following values:

Name: CoffeeOrder
 Context: /order
 Version: 1.0.0
 Tier Availability: Multi-Select All options
 Endpoints/Production Endpoint: <http://localhost:8281/order>
 Sandbox URL: Leave blank
 Transports: Uncheck HTTP leaving HTTPS

Why can you select more than one throttling level?

If you want a nice coffee icon for this API, expand more options. You will find an icon in the Downloads directory.

Fill in the business information if you wish

Update the Resource definitions as follows:

- Uncheck the DELETE
- Change all the Auth types to be Application (= two legged OAuth)
- Make sure OPTIONS has None authtype

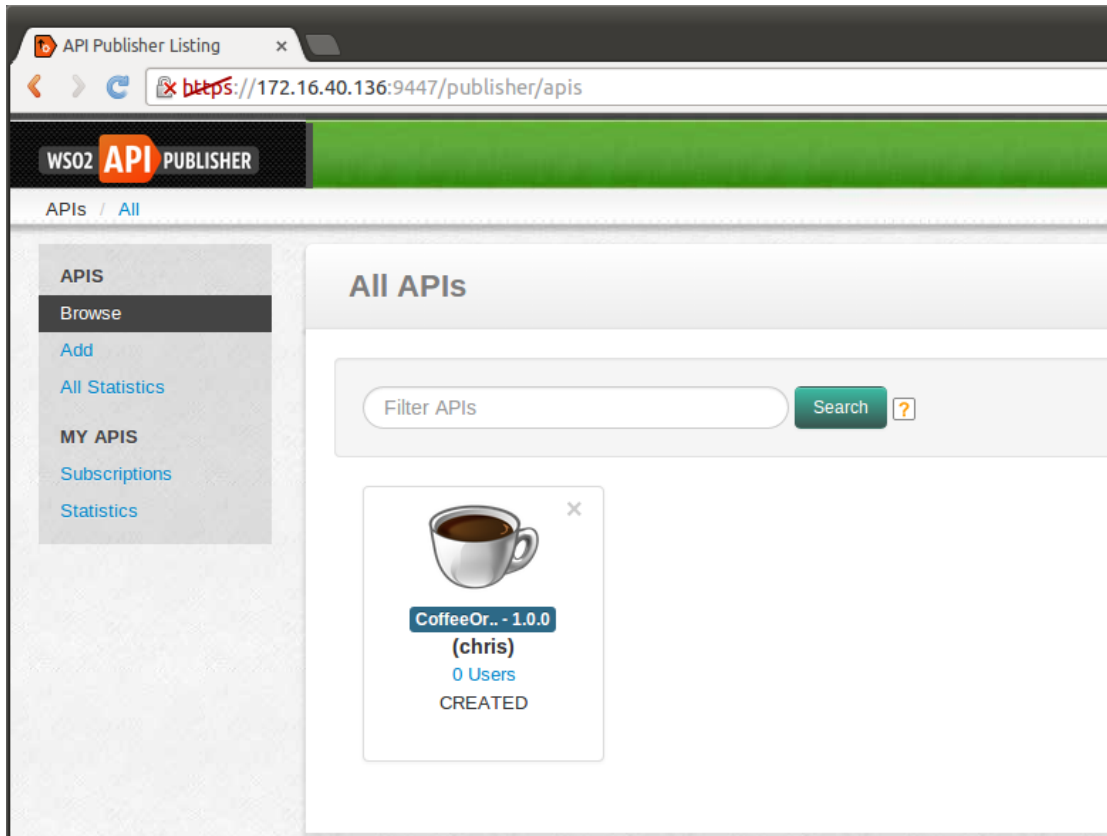
[+ Add New Resource](#)

URL Prefix	URL Pattern	HTTP Verb	Auth Type	Throttling Tier	Action
/order/1.0.0	/*	<input checked="" type="checkbox"/> GET	Application ▼	Unlimited ▼	Move Down
		<input checked="" type="checkbox"/> POST	Application ▼	Unlimited ▼	
		<input checked="" type="checkbox"/> PUT	Application ▼	Unlimited ▼	Move Up
		<input type="checkbox"/> DELETE	Application ▼	Unlimited ▼	
		<input checked="" type="checkbox"/> OPTIONS	None ▼	Unlimited ▼	Delete

11. Click Create.



12. You should see similar to:



13. Click on the CoffeeOrder Icon.

14. You can now add some documentation in the Documentation tab. A good idea would be to link to the existing docs that are available for the Starbucks APIs.

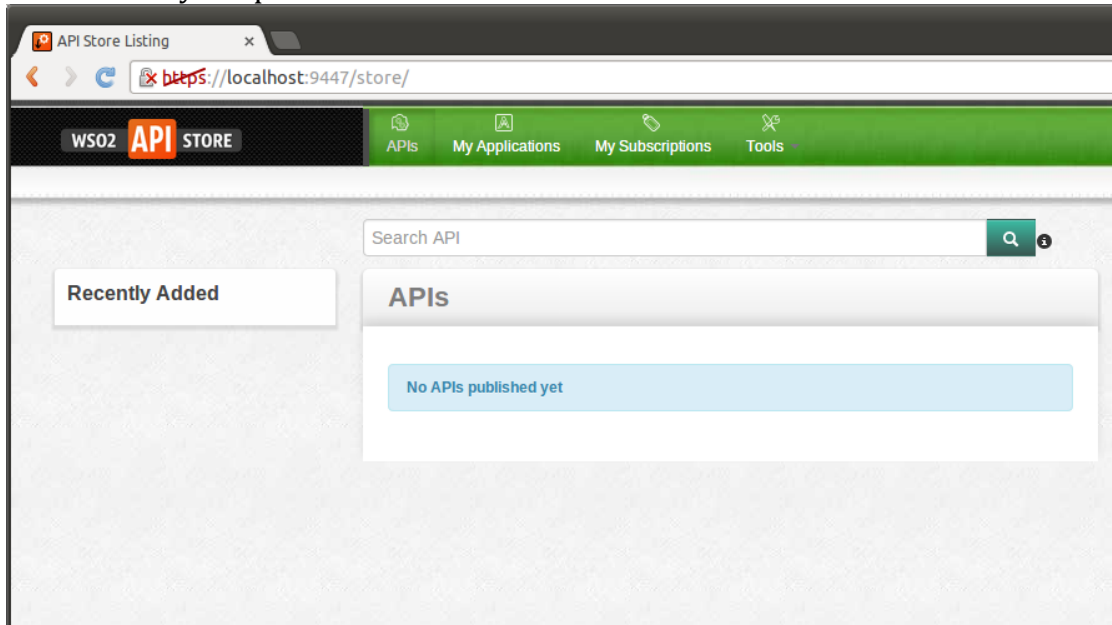
15. Once you are happy with the API and the documentation, you can log out.

16. Now lets pretend to be a subscriber (i.e. a third-party developer).
The subscribers can sign up themselves.

17. Go to the Store: <https://localhost:9447/store/>



18. You should NOT see any APIs in the store, because the API has not yet been authorized by the publisher to be used.



19. Now go back to the publisher system (<https://localhost:9447/publisher/>) and now log in as peter/password.
20. Click on the Coffee Icon.
21. You will see a different tab here: Lifecycle.
22. Set the lifecycle to Published. Make sure that the box “Propagate Changes to API Gateway” is **ticked** (default).
23. Click Update



blank.

35. Now go back to APIs and select the CoffeeOrder-1.0.0 API.
Select the PhoneCoffee application and the Silver throttling level.
Click Subscribe.
36. Go to My Subscriptions. Now you can see the subscription. Please note that the sandbox is not much use as we didn't create and provide a sandbox API. This would be a good extension exercise.
37. Click Generate
38. You should see something similar to:

Subscriptions

Keys are generated per Application which allows to use a single key for multiple APIs and subscribe multiple times to a single API, with different SLA

Applications With Subscriptions

PhoneCoffee

Keys - Production

Access Token
8Ugj90gPiu215tK2yt1MhsMfPbMa
Re-generate Token Validity: 3600 Seconds

Consumer Key
jGhAA6k5nDITMI_qqCLIGugtEUa

Consumer Secret
kxTCRwdWITSbWoHSBcqj0ZD3TQa

Allowed Domains
ALL
Leave empty or filling with "ALL" will allow all domains.
Update Domains

39. Copy the Access Token into the clipboard.
40. Now try an Advanced REST Client request again, but this time create a Header with the name **Authorization** and the value **Bearer YourTokenHere** like this:

Raw **Form** **Headers**

Add new header

Authorization Bearer 8Ugj90gPiu215tK2yt1MhsMfPbMa



41. You should ideally construct a proper POST first, but a GET to the URL will test the API gateway (yes it's a hack but an easy one). Try the request. It should work.

Status **202 Accepted** Loading time: 240 ms

Request headers
User-Agent: Mozilla/5.0 (X11; Linux i686) AppleWebKit/5
Authorization: Bearer 8Ugj90gPiu215tK2yt1MhsMfPbMa
Accept: */*
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-GB,en-US;q=0.8,en;q=0.6
Cookie: requestedURI=../carbon/admin/index.jsp; region
MSG13855668101650.044212817879040855=true; MSC
breadcrumb=configure_menu%2Cuserstores_menu%23t

Response headers
Access-Control-Allow-Headers: authorization,Access-Ci
Access-Control-Allow-Methods: GET,POST,PUT,DELETE
Content-Type: application/octet-stream
Date: Wed, 27 Nov 2013 17:17:10 GMT
Server: WSO2-PassThrough-HTTP
Transfer-Encoding: chunked
Connection: keep-alive

42. Now try again 5 more times within a minute. You should be blocked, because we subscribed with the Silver level and so the throttling will kick in:

Status **503 Service Unavailable** Loading time: 8 ms

Request headers
User-Agent: Mozilla/5.0 (X11; Linux i686) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/3:
Authorization: Bearer 8Ugj90gPiu215tK2yt1MhsMfPbMa
Accept: */*
Accept-Encoding: gzip,deflate,sdch
Accept-Language: en-GB,en-US;q=0.8,en;q=0.6
Cookie: requestedURI=../carbon/admin/index.jsp; region1_configure_menu=none; region3_re
MSG13855668101650.044212817879040855=true; MSG13855668483480.29572639447537:
breadcrumb=configure_menu%2Cuserstores_menu%23user+user-mgt.jsp*; MSG1385566914!

Response headers
Accept-Language: en-GB,en-US;q=0.8,en;q=0.6
Cookie: requestedURI=../carbon/admin/index.jsp; region1_configure_menu=none; region3_re
MSG13855668101650.044212817879040855=true; MSG13855668483480.29572639447537:
breadcrumb=configure_menu%2Cuserstores_menu%23user+user-mgt.jsp*; MSG1385566914!
Access-Control-Allow-Headers: authorization,Access-Control-Allow-Origin,Content-Type
Access-Control-Allow-Origin: *
Accept-Encoding: gzip,deflate,sdch
Access-Control-Allow-Methods: GET,POST,PUT,DELETE,OPTIONS
Content-Type: application/xml; charset=UTF-8
Accept: */*
Date: Wed, 27 Nov 2013 17:18:06 GMT
Server: WSO2-PassThrough-HTTP
Transfer-Encoding: chunked
Connection: Close

Raw XML Response

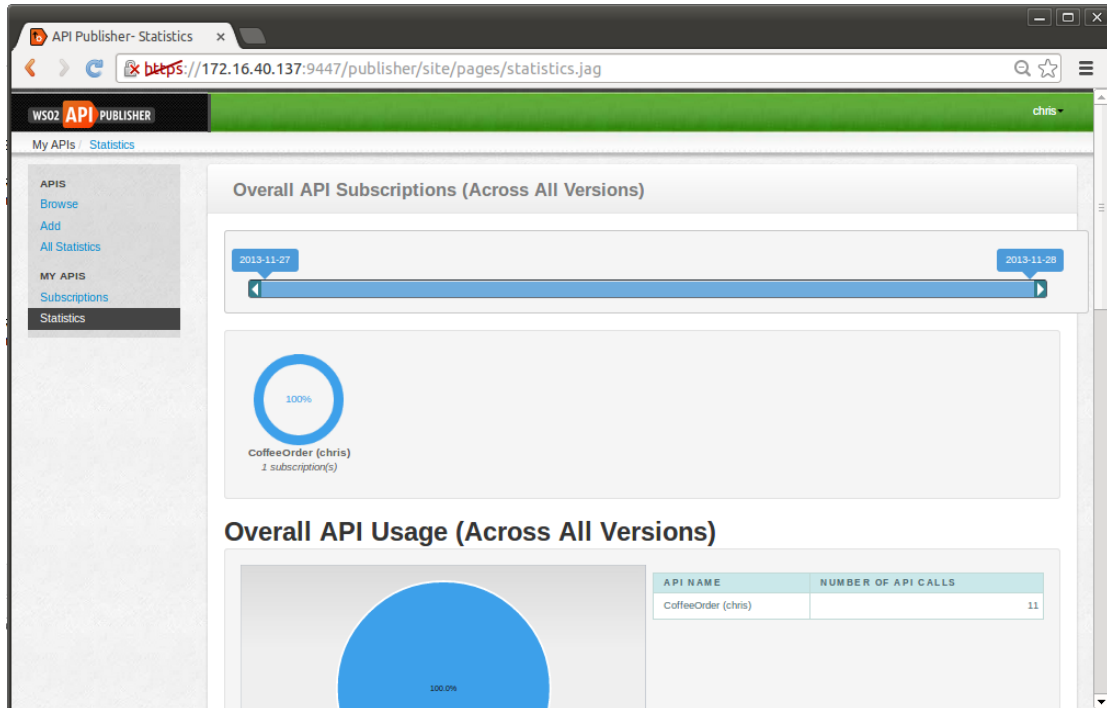
Copy to clipboard Save as file

```
<amt: fault>
  <amt: code>900800</amt: code>
  <amt: message>Message Throttled Out</amt: message>
  <amt: description>You have exceeded your quota</amt: description>
</amt: fault>
```

43. Wait a minute and then send some more requests through.
44. An important part of API Management is the monitoring of the runtime. We have configured the system to support monitoring via the Business Activity Monitor.



45. Log into the publisher portal as chris/password (or as admin/admin)
46. Look at the statistics: Select Statistics on the left hand side:



47. You can change the time period with the slider at the top. The statistics are a bit boring because we have only had a single subscriber call a single method on a single API! As an extension you could create a new version and some other subscribers in order to see more useful data.
48. You can also go to the subscriptions tab where you can block access, either to the production only (allowing a faulty app to be re-tested) or to both versions. Try that. Note that there might be a time-lapse on blocking / unblocking.
49. Congratulations!
50. Extensions:
 - You could define all the different Barista/Starbucks APIs.
 - You could add third-party APIs.
 - You could version the existing API.
 - You could create a second “sandbox” API and see how that works.
51. If you are feeling adventurous you could try to install and configure the BAM Toolbox for the ESB or AS from <http://wso2.com/products/business-activity-monitor/toolboxes/> and then monitor those in BAM (note that the BAM port offset is 5).

