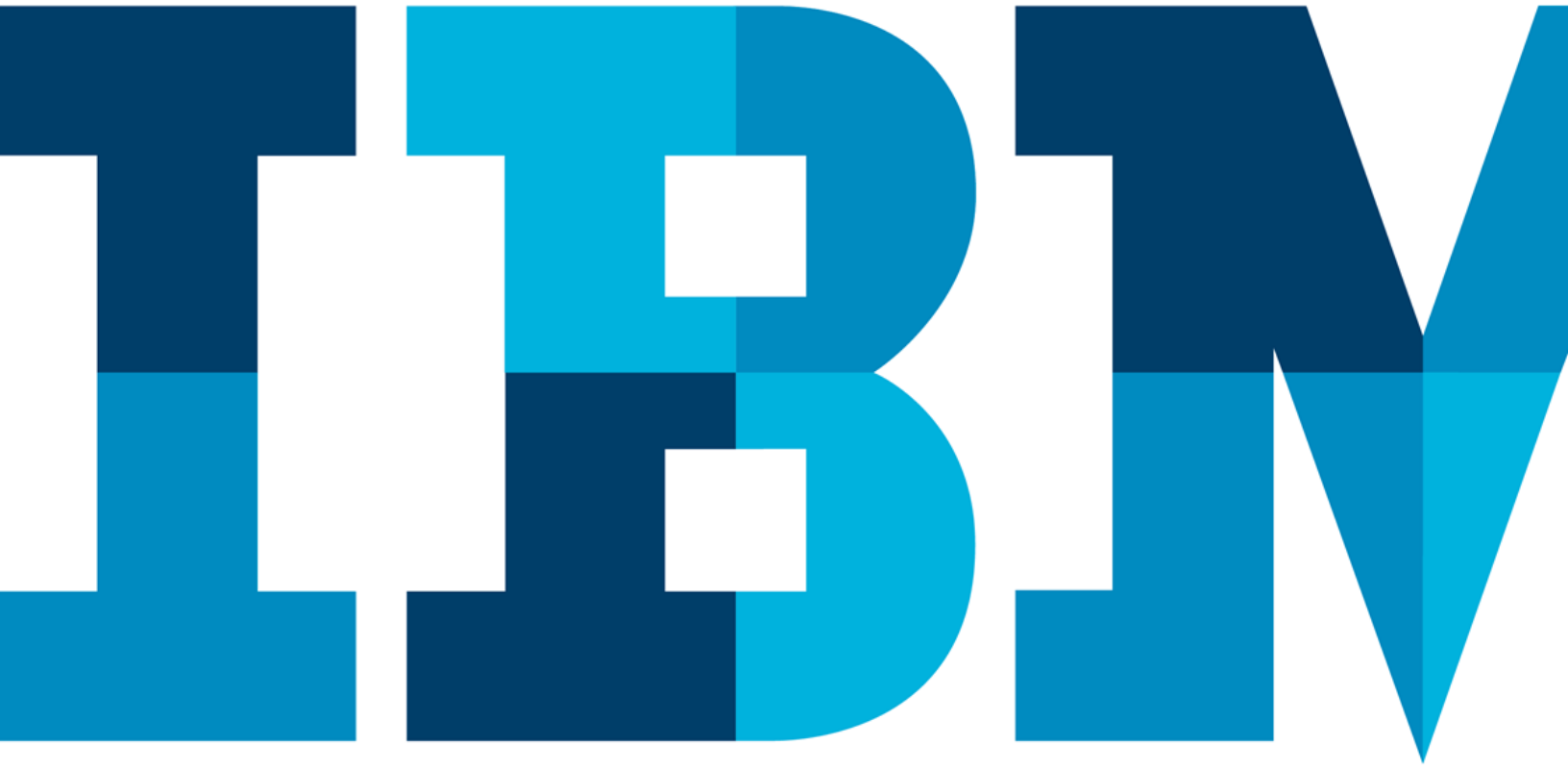
IBM Blockchain Platform Hands-On

Lab 4:

IBM Blockchain Platform Operations
Optional Extras



IBM

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1 Overview of the lab environment and scenario

This lab is an extension to the previous lab -IBM Blockchain Platform Operations.

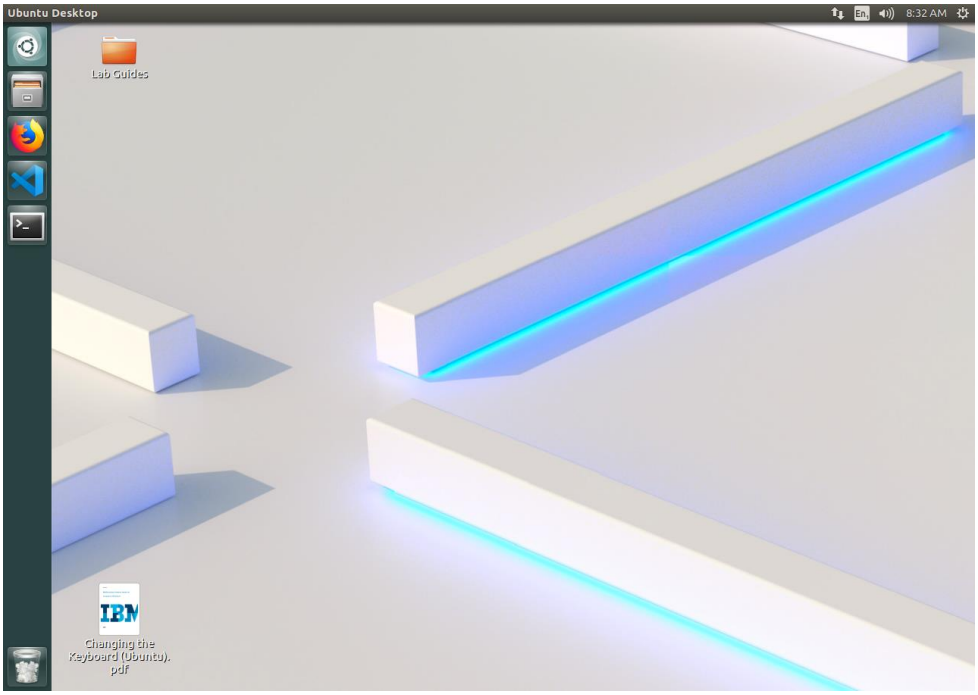
***Note**: The screenshots in this lab guide were taken using version **1.37.1** of **VS Code**, version **1.0.9** of the **IBM Blockchain Platform** plugin and version **0.3.50** of the **IBM Blockchain Platform** console. If you use different versions, you may see differences to those shown in this guide.*

Start here. Instructions are always shown on numbered lines like this one:

__ **1.** If it is not already running, start the virtual machine for the lab. The instructor will tell you how to do this if you are unsure.

__ **2.** Wait for the image to boot and for the associated services to start. This happens automatically but might take several minutes. The image is ready to use when the desktop is visible as per the screenshot below.

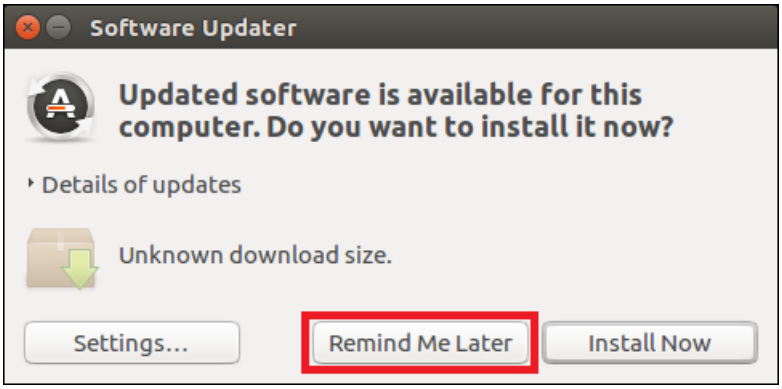
Note: If it asks you to login, the userid and password are both "**blockchain**".



1.1 Lab Scenario

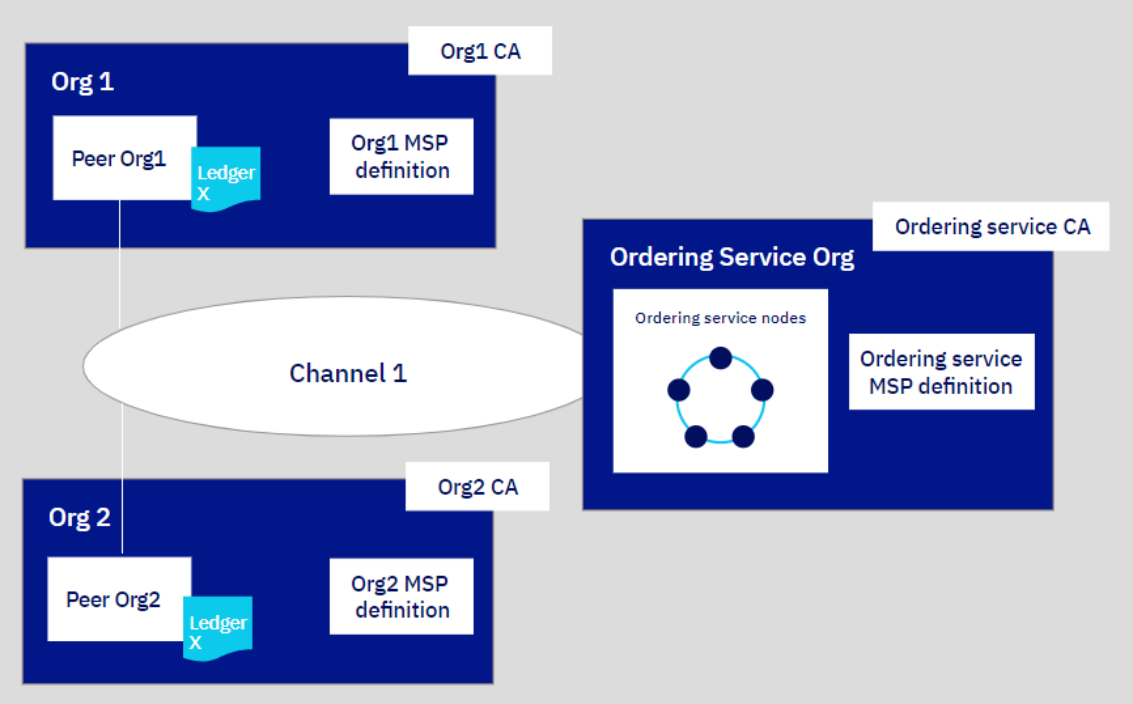
In this lab, we will be carrying on from where we finished in the previous lab. We will be exploring some extra content around logging etc.

***Note** that if you get an "Software Updater" pop-up at any point during the lab, please click "**Remind Me Later**":*



2 IBM Blockchain Platform Operations

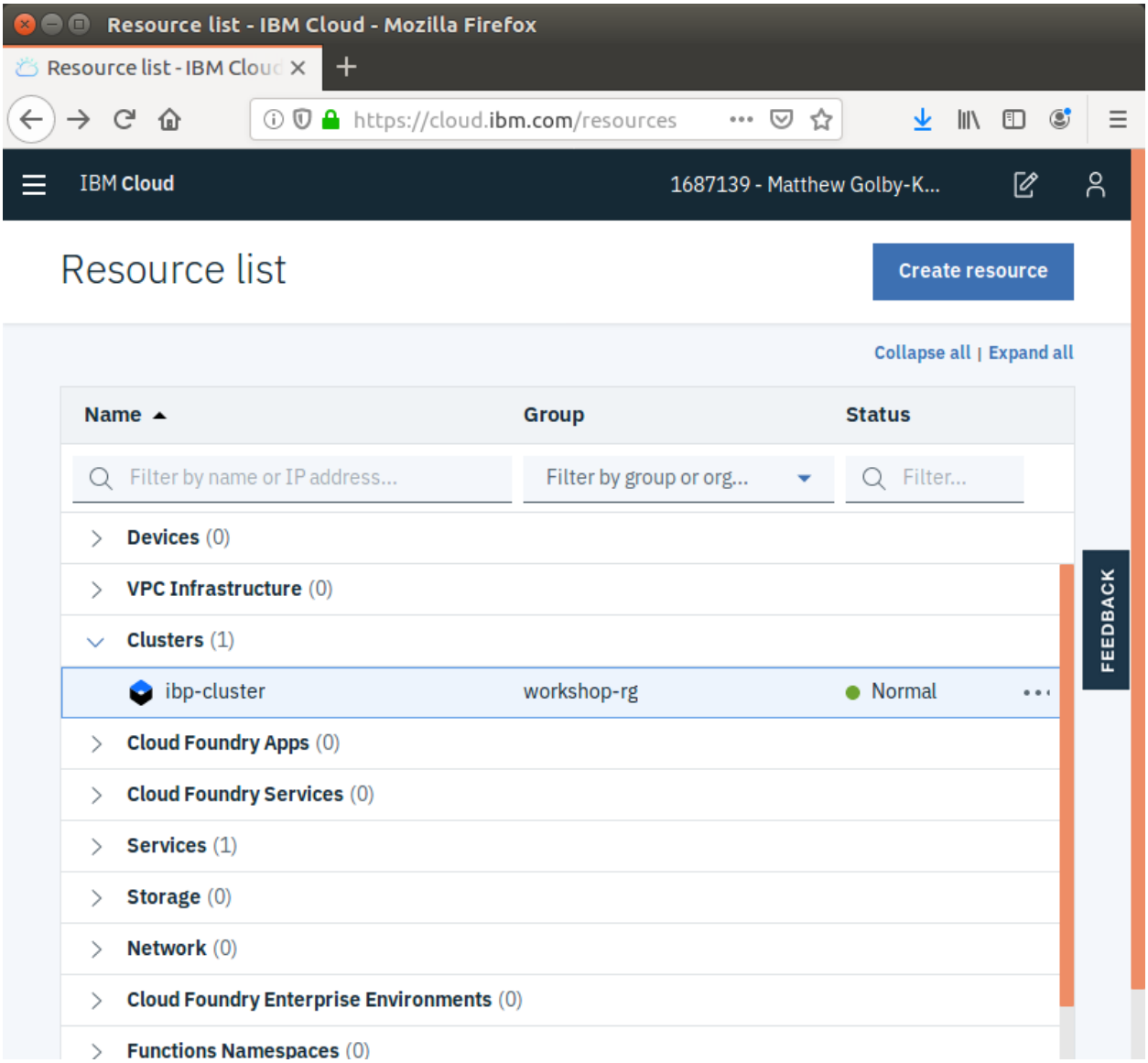
As mentioned above, in this lab we will be carrying on from where we finished in the previous lab. This assumes that you managed to complete the previous lab. As a reminder, here is a diagram of the network we built in the previous lab:



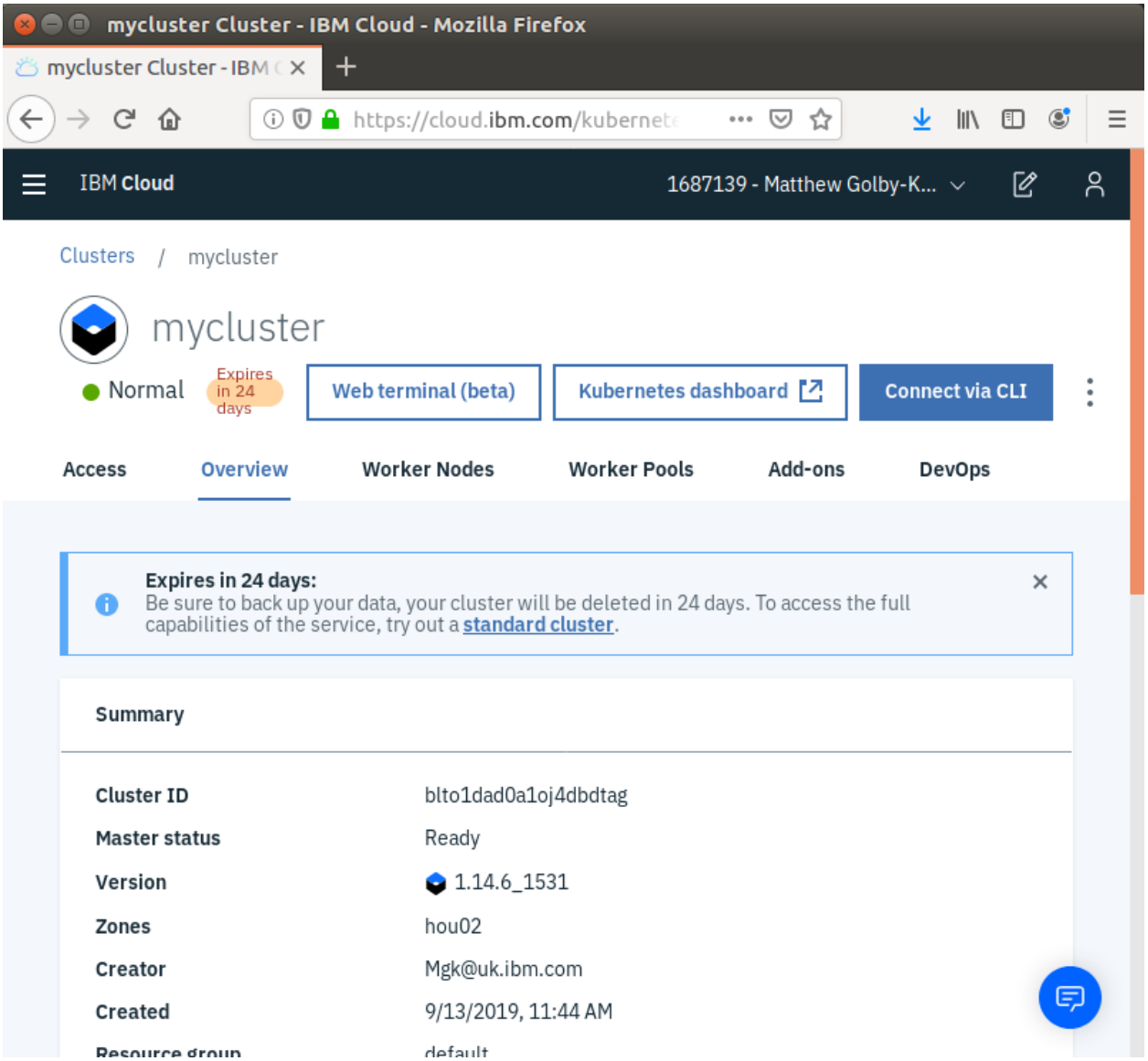
In the previous lab we split into pairs, each doing a separate part. In this lab, we can go back to doing the steps individually if you wish or you can carry on sharing a screen in you prefer.

2.1 Looking at the logs in the IBM Blockchain Platform.

__ **3.** Open the Firefox web browser inside the VM and go to https://cloud.ibm.com/resources. Make sure you are logged in, then expand "**Clusters**" to see the "**ibp-cluster**" that the network you have created is hosted in.

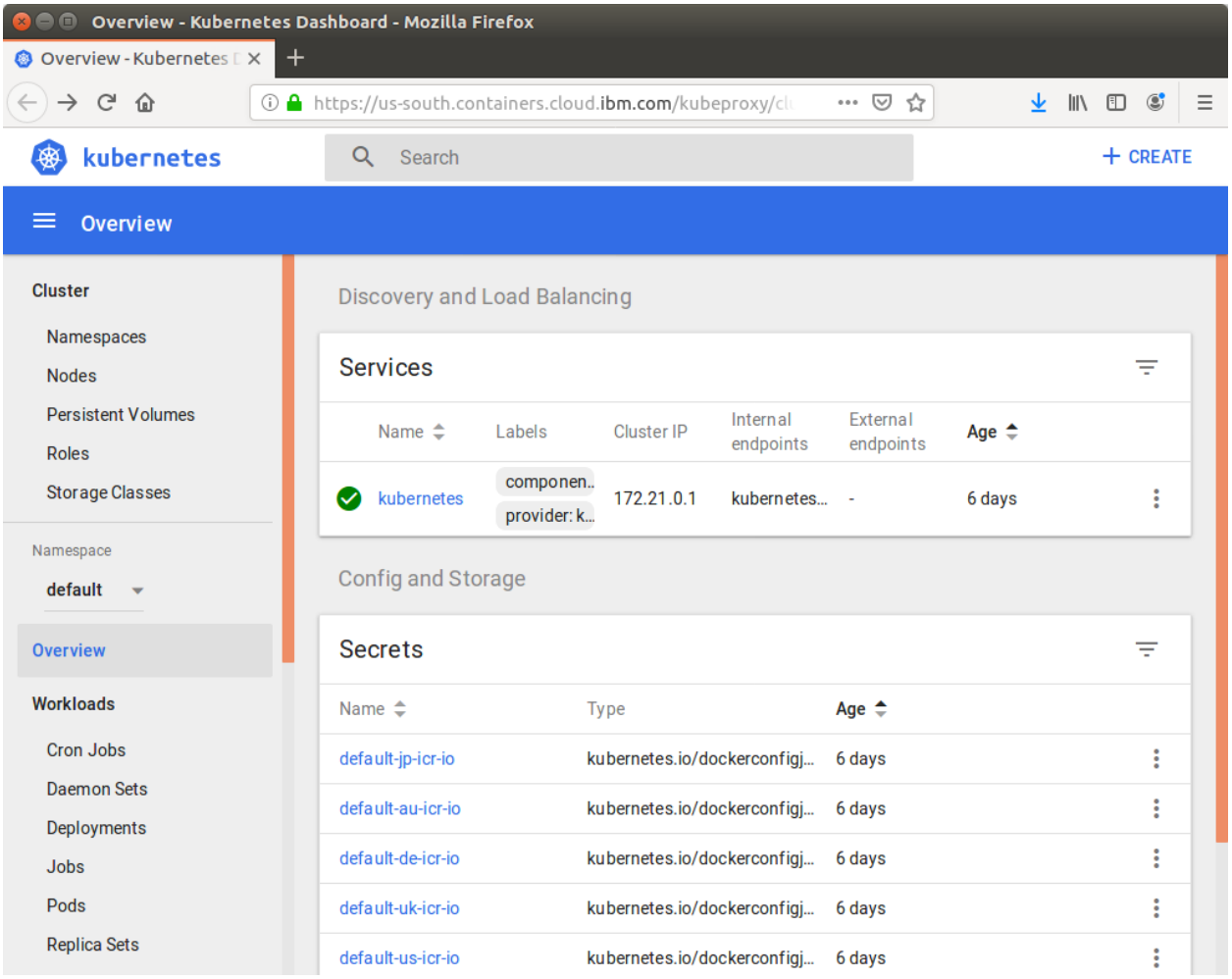


__ **4.** You will see your cluster, which will have an expiry date if it is a free cluster.

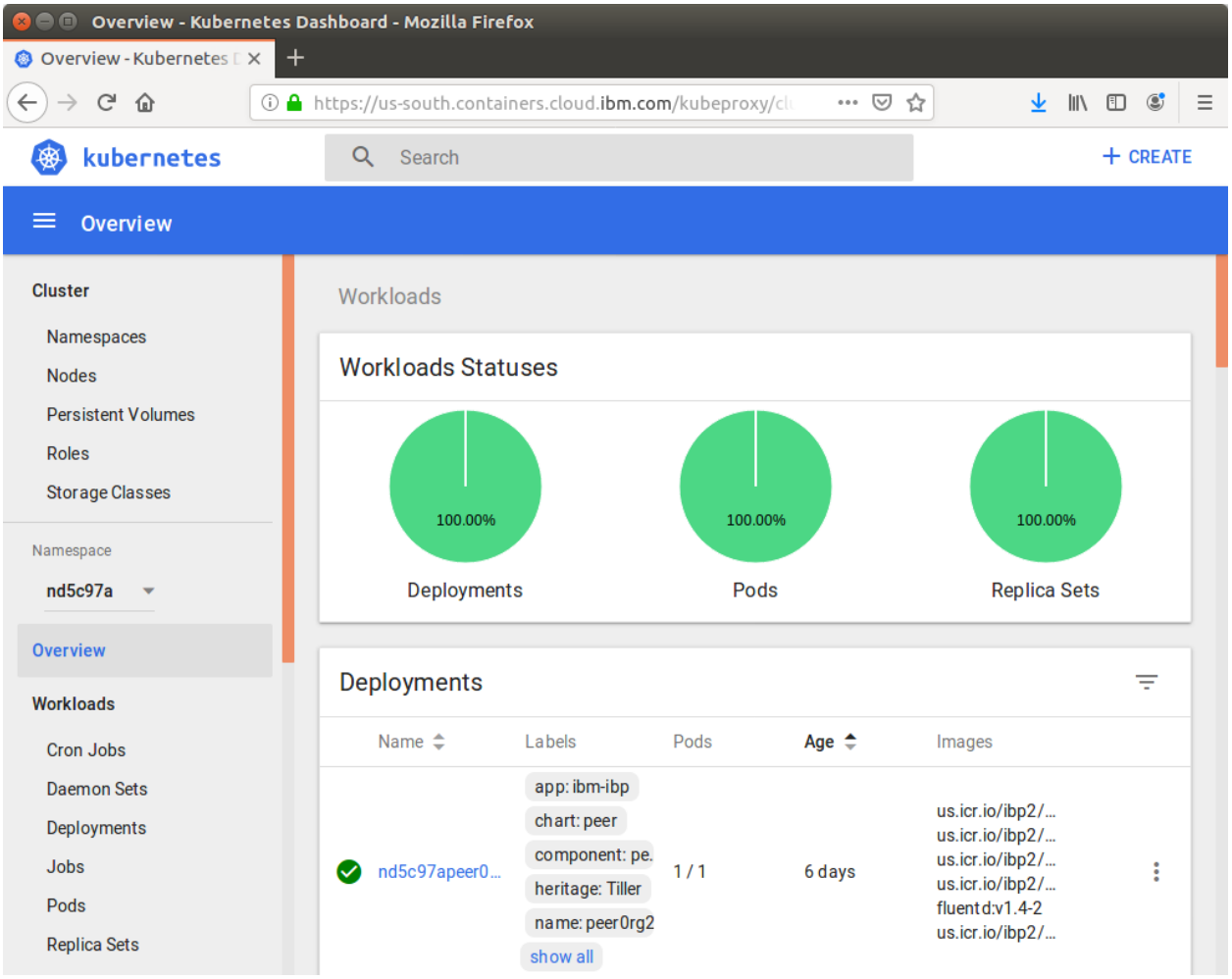


If you scroll down you should see that there is one Worker Node that should **be 100% Normal** which means it is running correctly.

__ **5.** At the top of the page, click on the **Kubernetes dashboard** button to launch the dashboard. This may take a while to show.

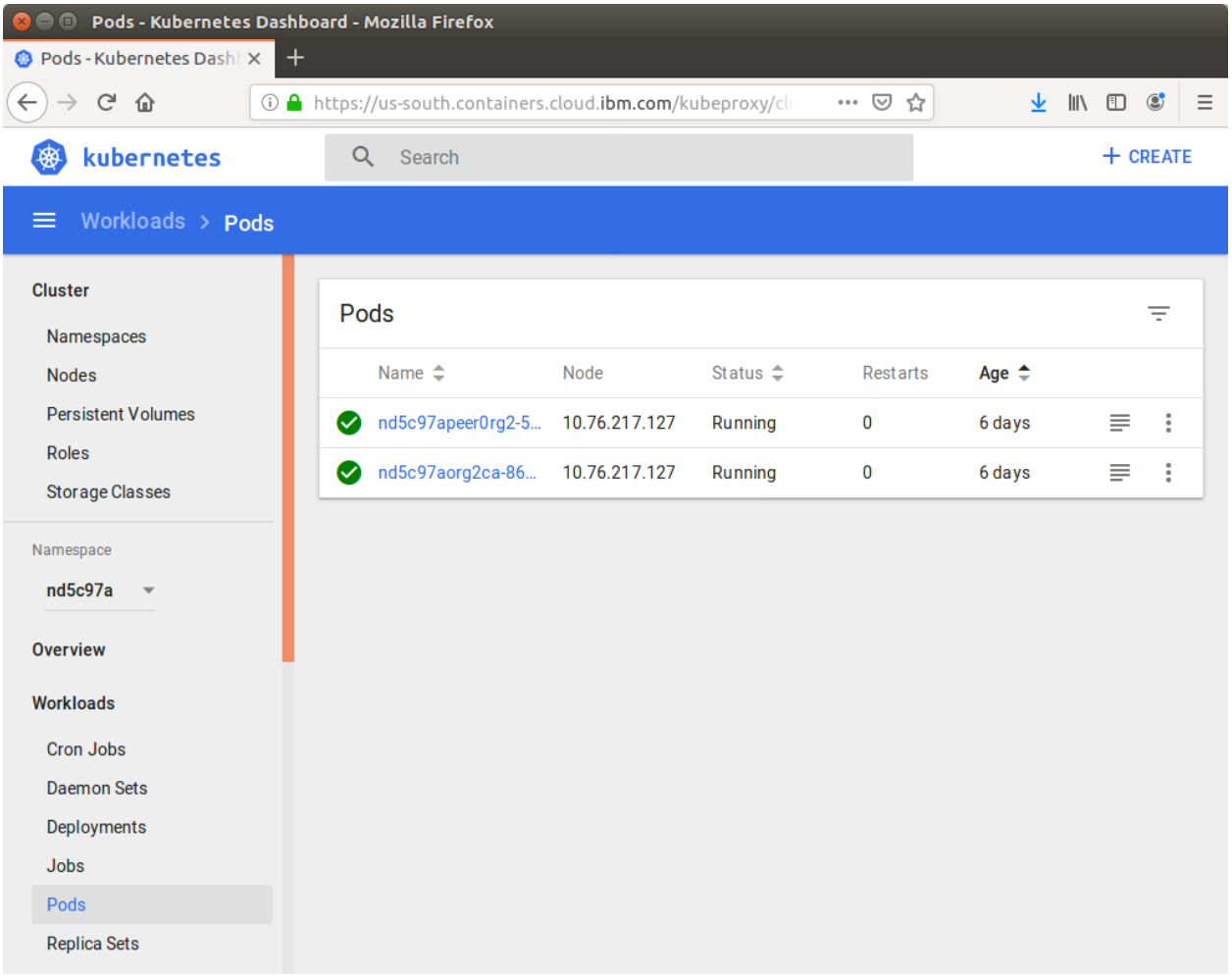


__ **6.** On the left-hand side of the page, click on the "**Namespace**" drop down, and scroll to the end of the list to find a namespace beginning with the letter "**n**" and select it. This is the namespace that IBM Blockchain Platform creates when you deploy it:

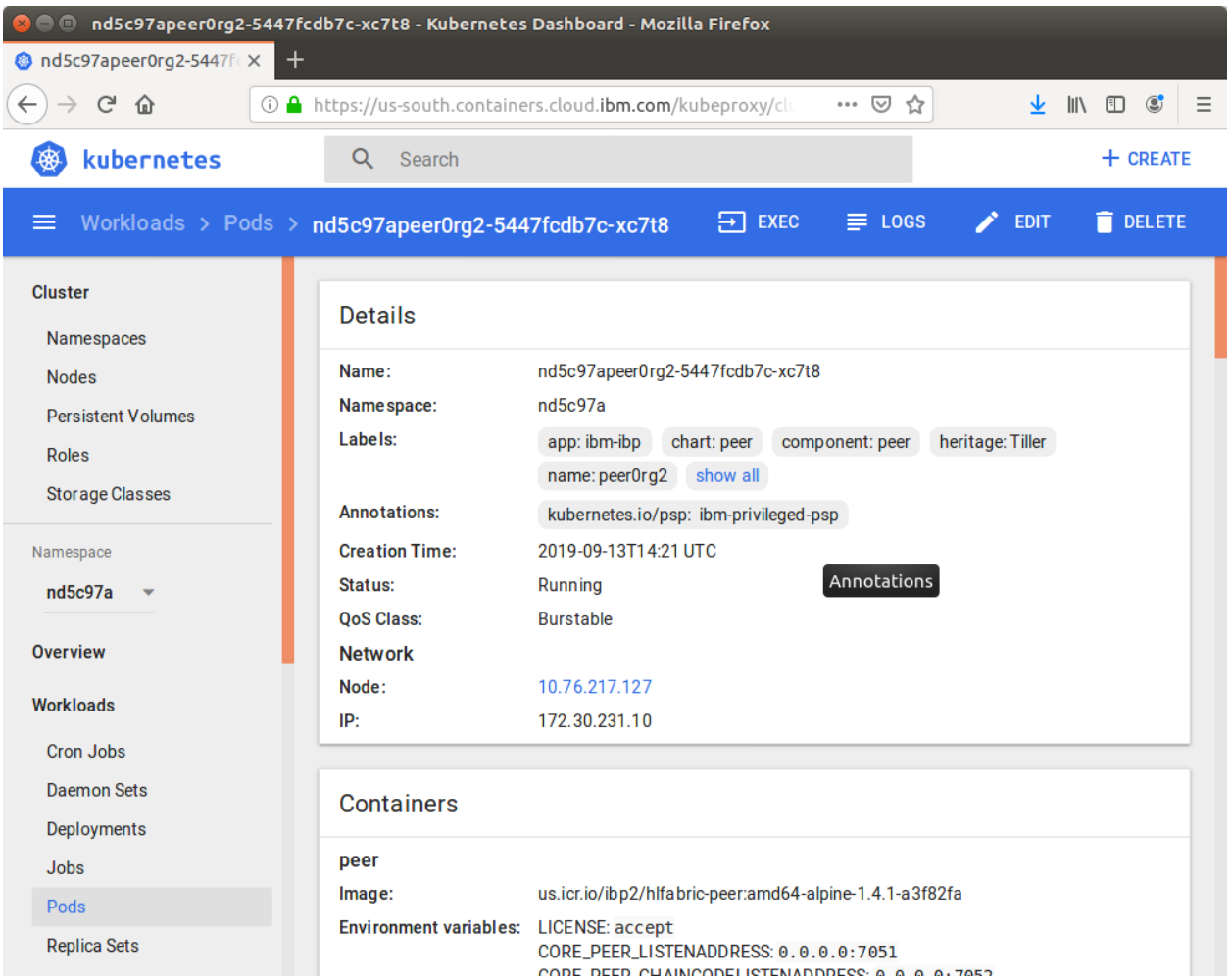


Scroll down the page and you will now be able to see the status of the **Deployments**, **Pods**, **Replica Sets** and **Services** created at part of your IBM Blockchain Platform deployment.

__ **7.** From the left-hand side of the page, click on the "**Pods**" link under "**Workloads**" and you will see a list of the running **Pods**. If you look closely at the names for each pod, you will see that they start with the namespace (**nd5c97a** in this case – yours will be different). After the namespace you will see the name you used earlier such as **peerOrg2** or **org2ca**. Note that this screenshot only shows two pods as it was taken from **Org2** who ran the **Join** tutorial. If you ran the **Build** tutorial, you will see more pods.

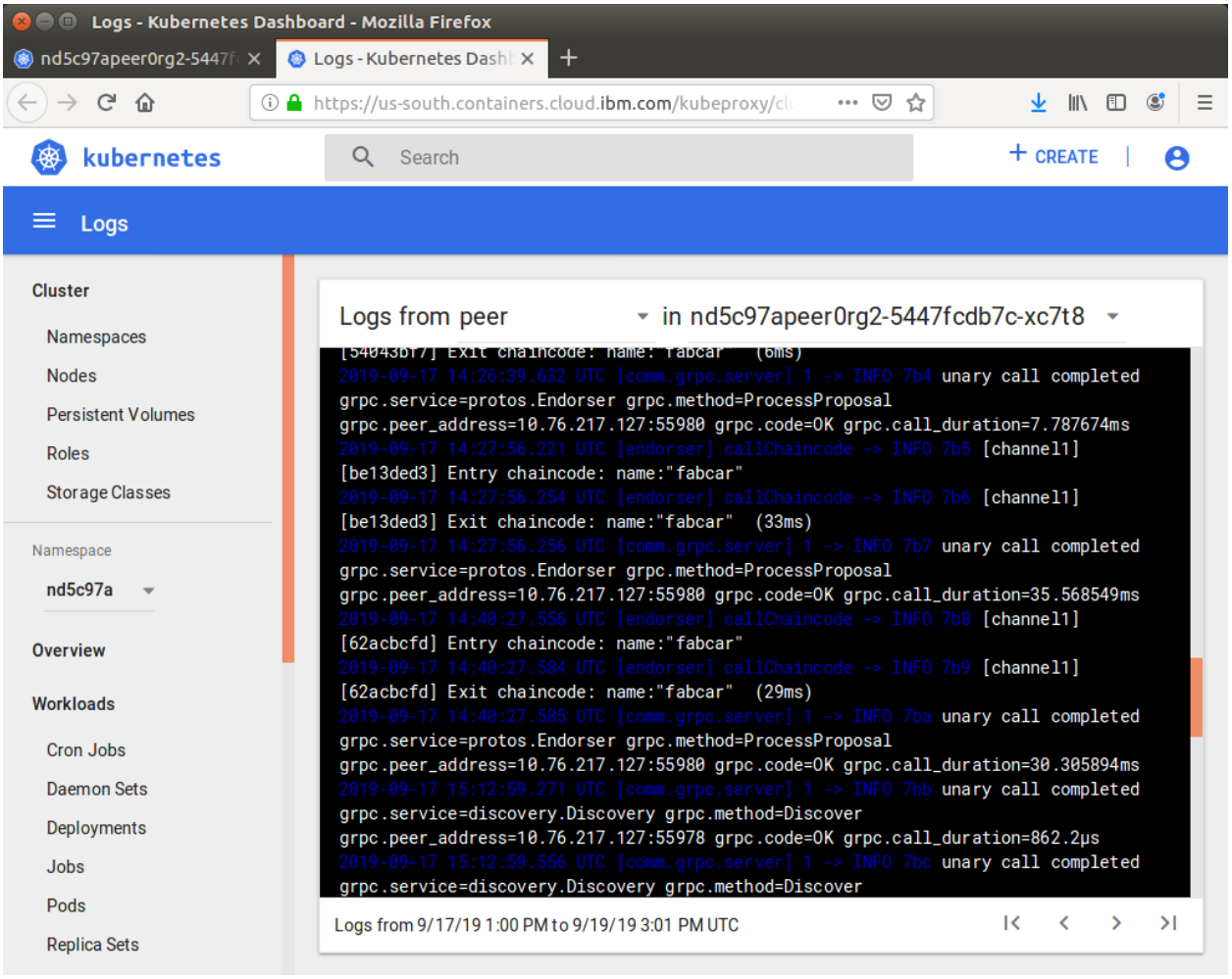


__ **8.** Find the Pod that contains your peer which should be the one containing the name **peerOrg2** or **peerOrg1** depending on which tutorial you ran and click on it:



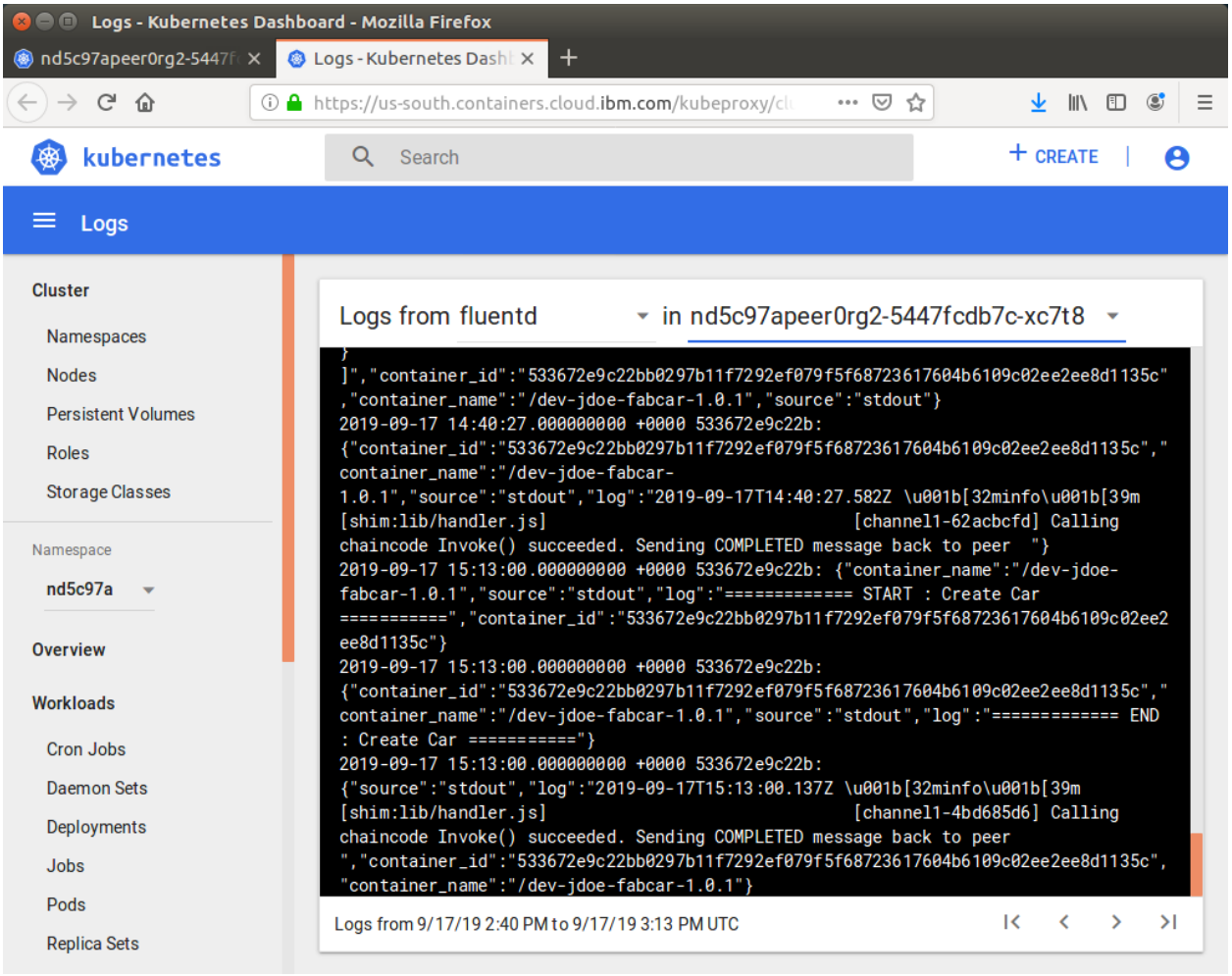
You can now see the details of the containers that make up the Pod, along with their environment and configuration details. You should see containers for the **Peer**, **couchdb**, **dind**, **proxy** and **fluentd** along with an **Init** container. At the bottom you will be able to see the **Persistent Volume Claims** made by the Pod as well.

__ **9.** From the top of the screen, click on the "**Logs**" button to see the log viewer which will open in a new tab:



__ **10.** By default, you will be looking at the logs for the peer itself. However, it is more common to want to look at the logs for the smart contract. As there can be many smart contracts, each of which run in a separate container, there logs are piped to a "collector" container called "**fluentd**".

From the top of the log window, click on the drop-down list called "**Logs from peer**" and instead choose the logs from **fluentd**:



If you scroll down to the bottom you can see output from the most recent call to the "**createCar**" transaction. If you look at the source code for the fab car smart contract, you will see the "**console.info**" output from the **createCar** transaction is captured in these logs.

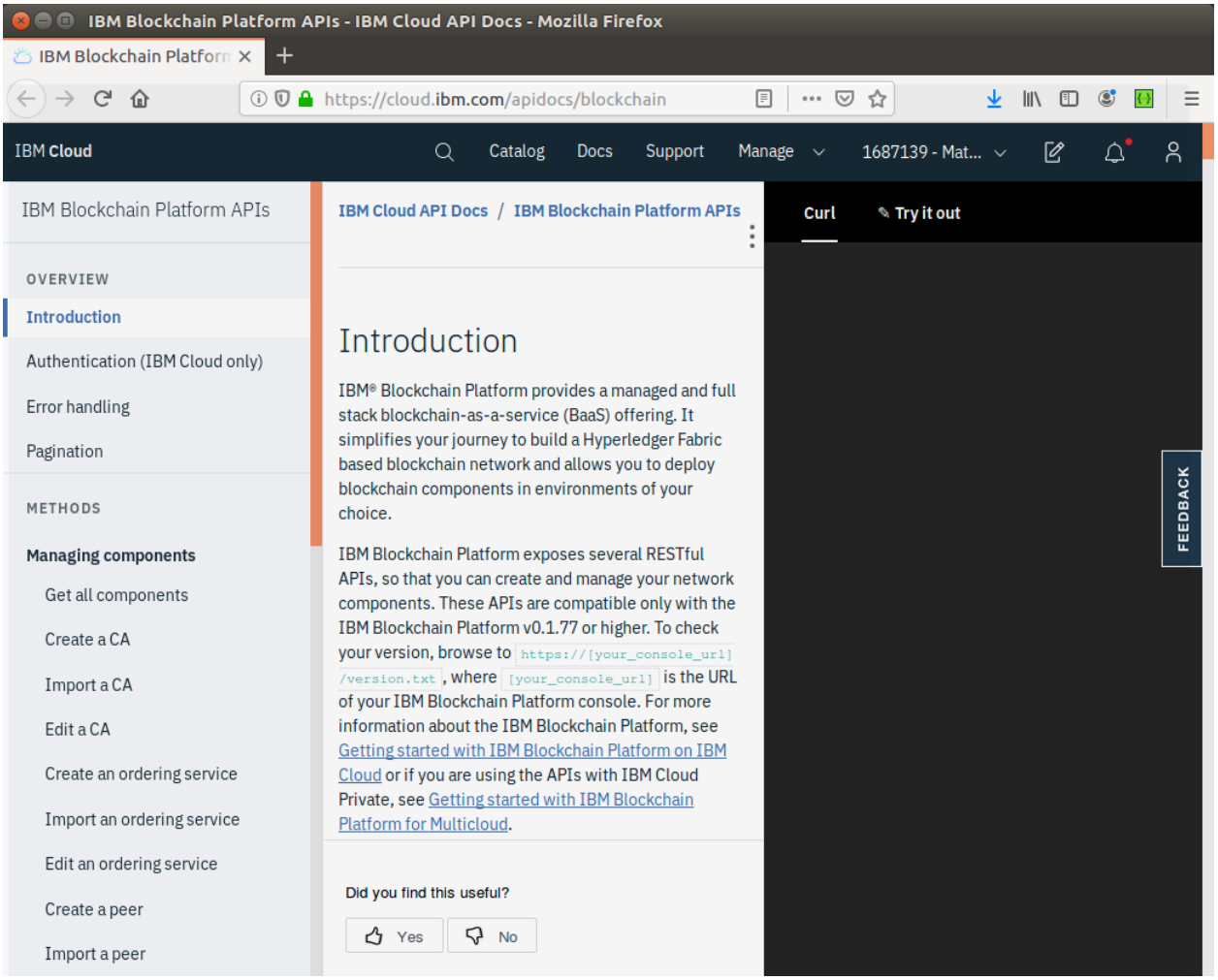
As a reminder you can quickly open the smart contract from a terminal with this command:

```
code ~/workspace/fabric-getting-started/fabric-samples/chaincode/fabcar/javascript/lib/fabcar.js
```

2.2 Using the Admin REST API

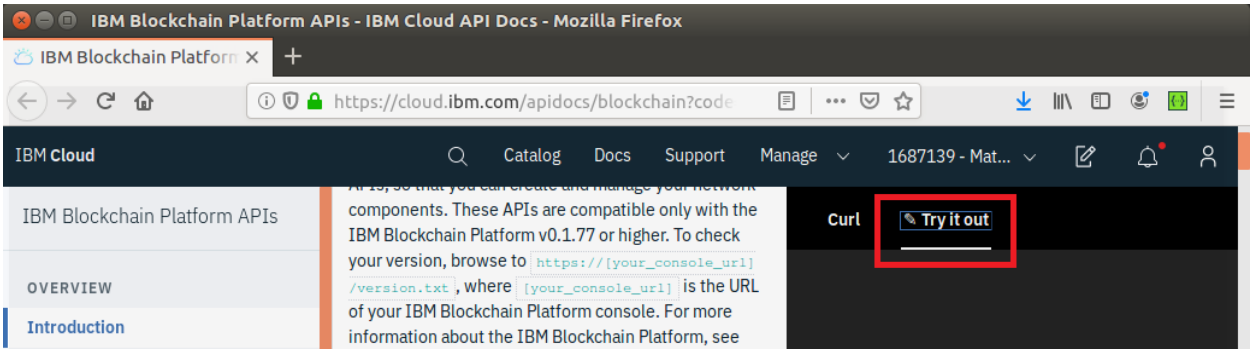
__ **11.** Many of the administration actions can be automated using the IBM Blockchain Platform REST API. So start using the API, openFirefox and navigate to the API home page:

`https://cloud.ibm.com/apidocs/blockchain`



You can also navigate to this page from the **Table of Contents** on either of the **Build** or **Join** tutorial pages by clicking on the **API Reference** link.

__ **12.** Spend a little time to read the **Introduction** section as this expands on what we will do next, then click on the "**Try it out**" link on the top of the right-hand pane:

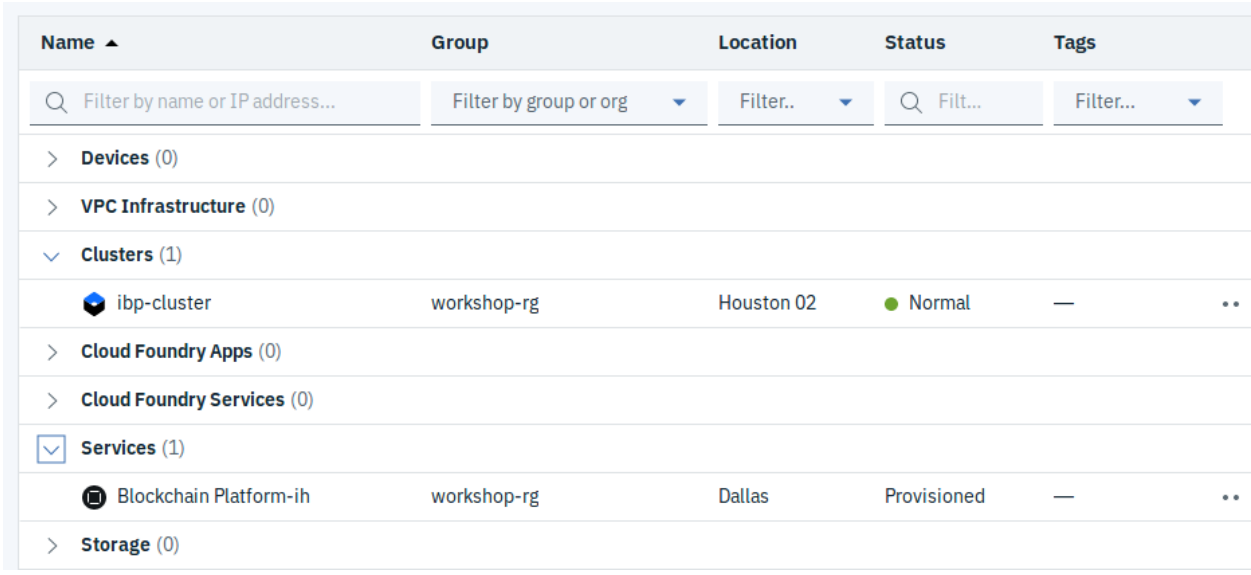


Next we need to perform Authentication which is a multi-step process.

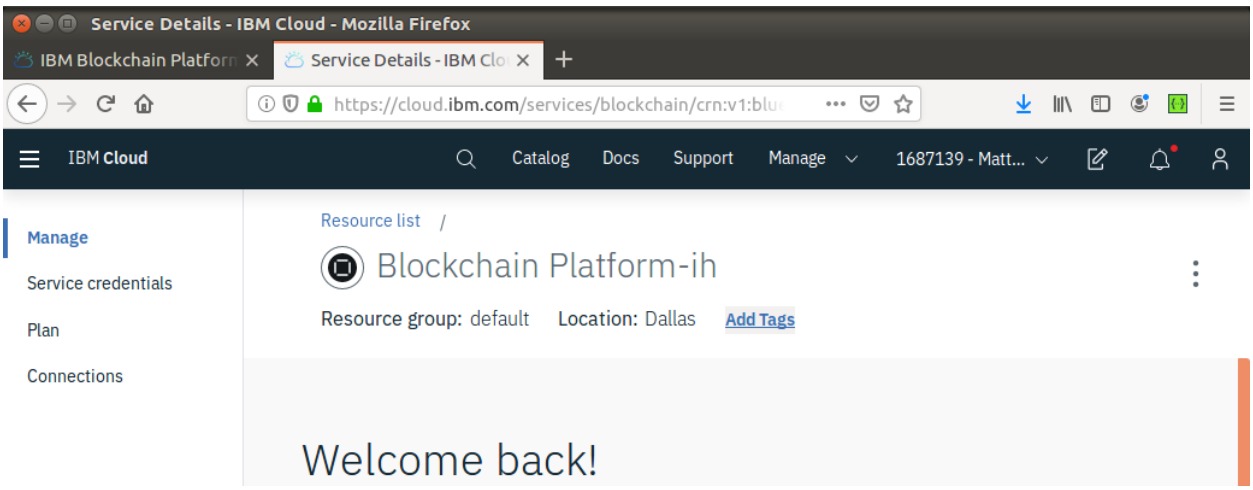
__ **13.** In the Authentication section, click on the "**IBM Cloud dashboard**" link which will open in a new tab, at this URL:

```
https://cloud.ibm.com/resources
```

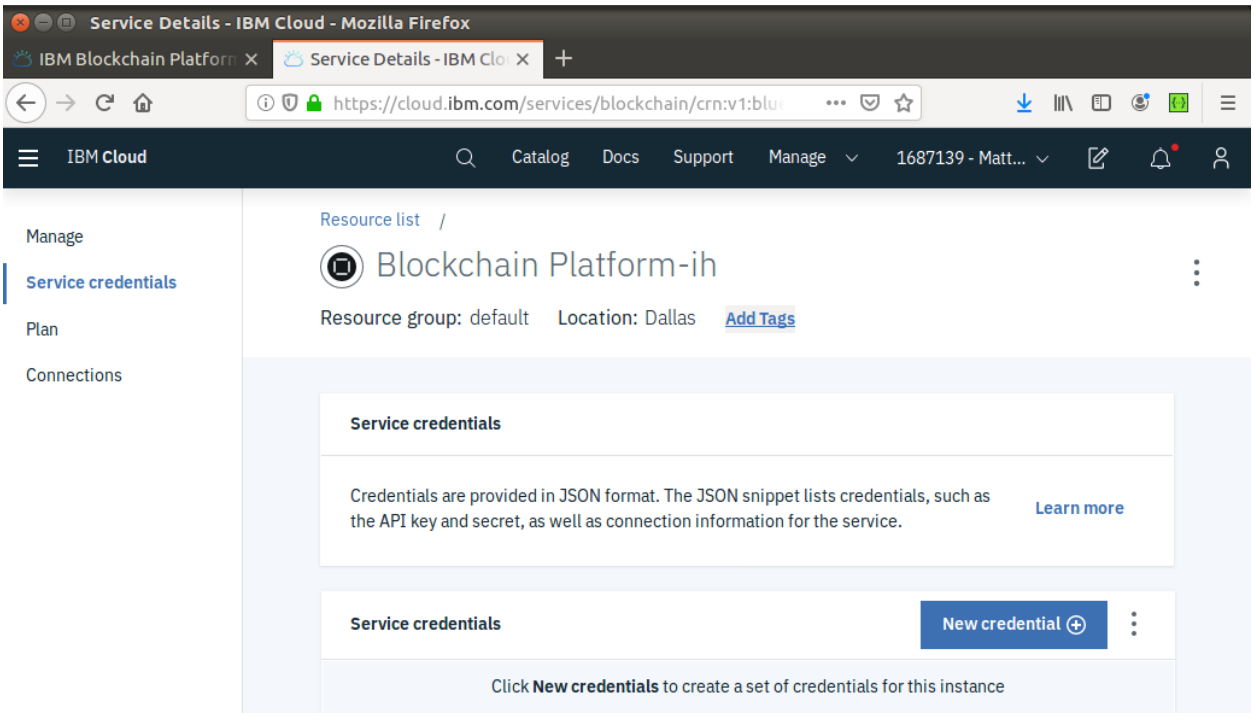
__ **14.** From your **Resources List** expand the **Services** section and you should see the **IBM Blockchain Service** that you created back at the beginning of the Lab:



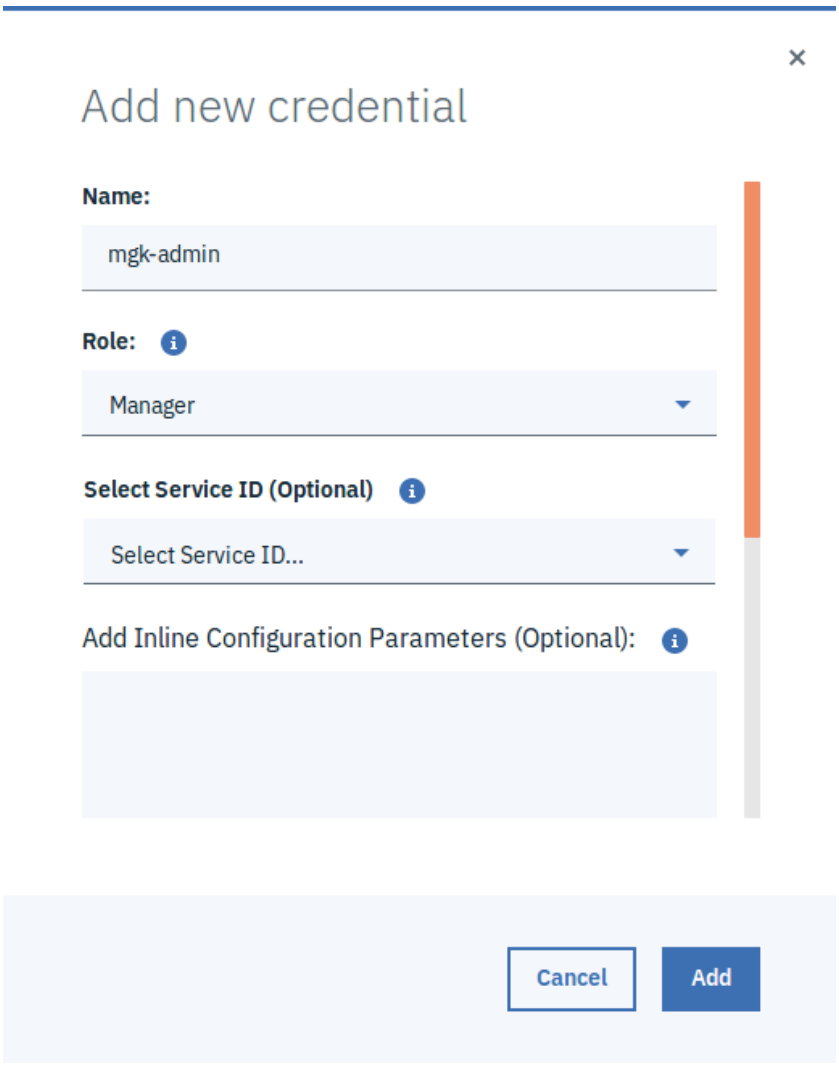
__ **15.** Click on the IBM Blockchain Platform Service and you will see the "**Welcome Back**" page:



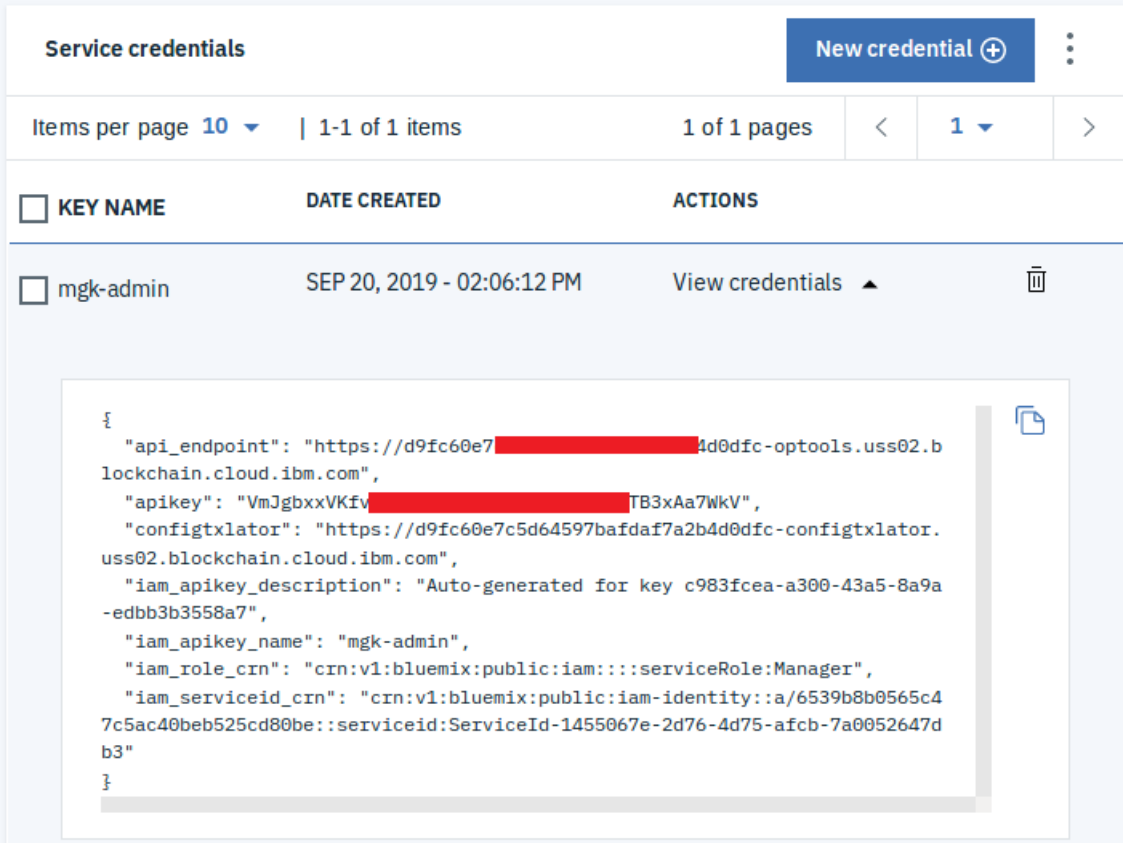
__ **16.** Next, click on the "**Service credentials**" in the left-hand bar to show the Service credentials page:



__ **17.** Click on the "**New Credential**" button and enter your initials followed by **"-admin"** such as **mgk-admin** for the **Name** parameter. You can leave the **Role** as **Manager** and the other fields at their default and click **Add**:

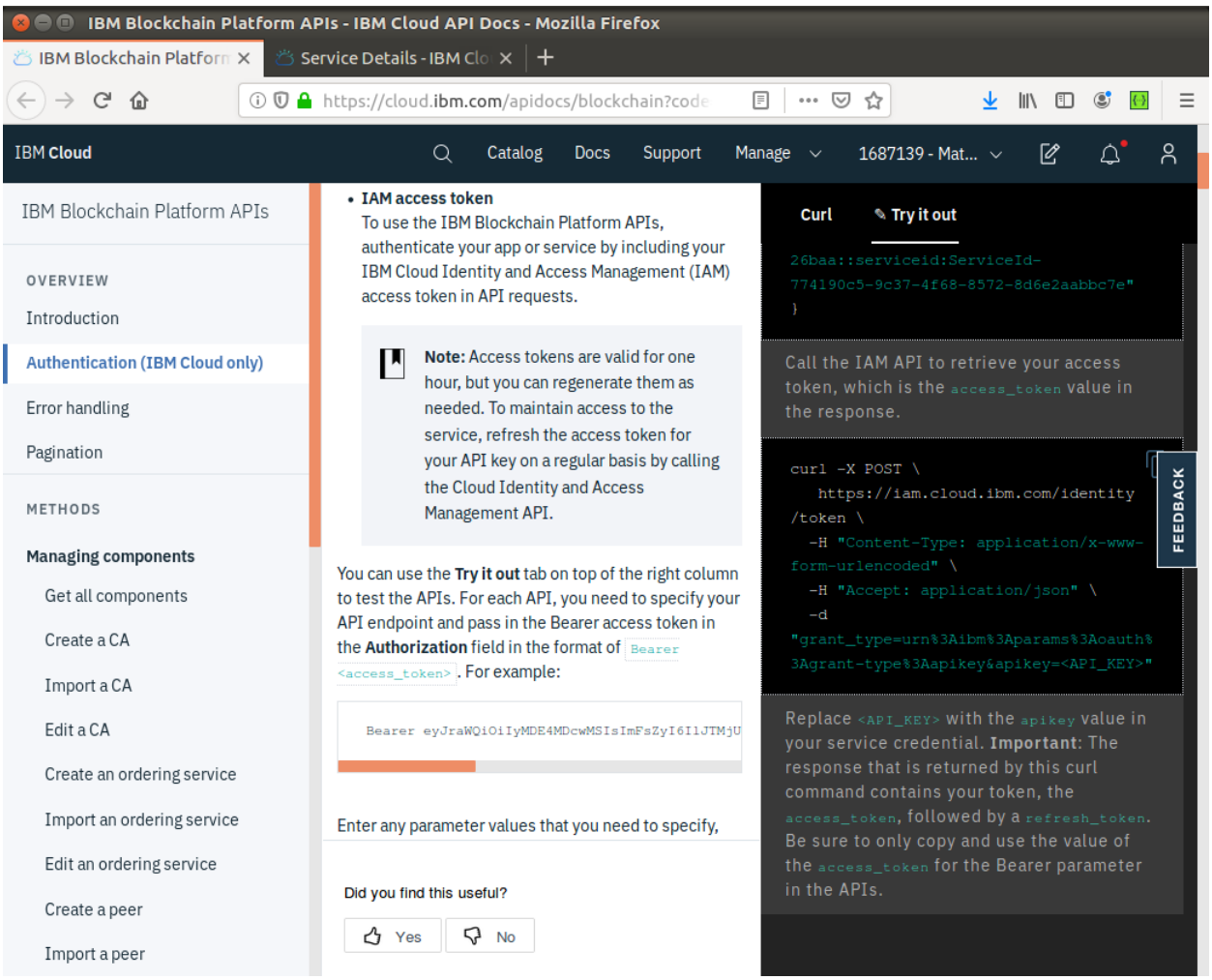


__ **18.** Click on the "**View credentials**" Action to see the contents of the credential and copy the "**api_endpoint**" and the "**apikey**" to a new empty file in **VS Code**:



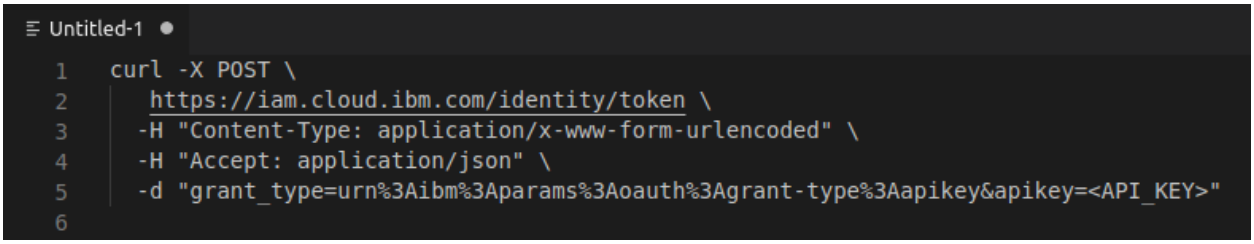
Note: Some parts of the above screenshot have been anonymized.

__ **19.** Now switch back to the first API Docs tab that we were on earlier and scroll down to read the **IAM access token** part of the **Authentication** section:

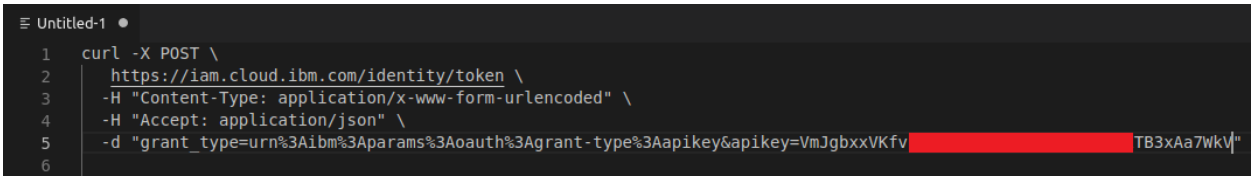


On the right-hand side you can see instructions for **curl**. We now need to follow these instructions in a **terminal** window, but first we need to construct the **curl** command to use in the **VS Code** file that the copied our **apikey** to above.

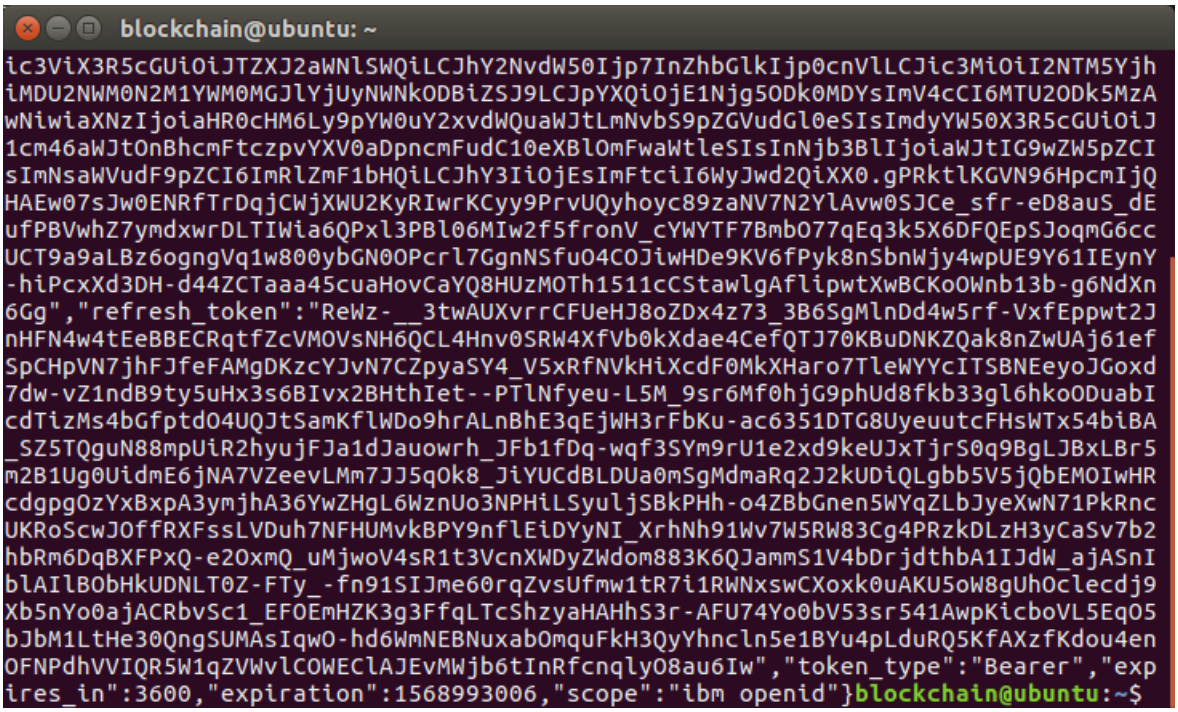
__ **20.** Copy the **curl** command text into the VS Code file and replace the text <API_KEY> with the apikey we copied earlier. Initially the text should look like this:



But then you replace the <API_KEY> it will look like this:

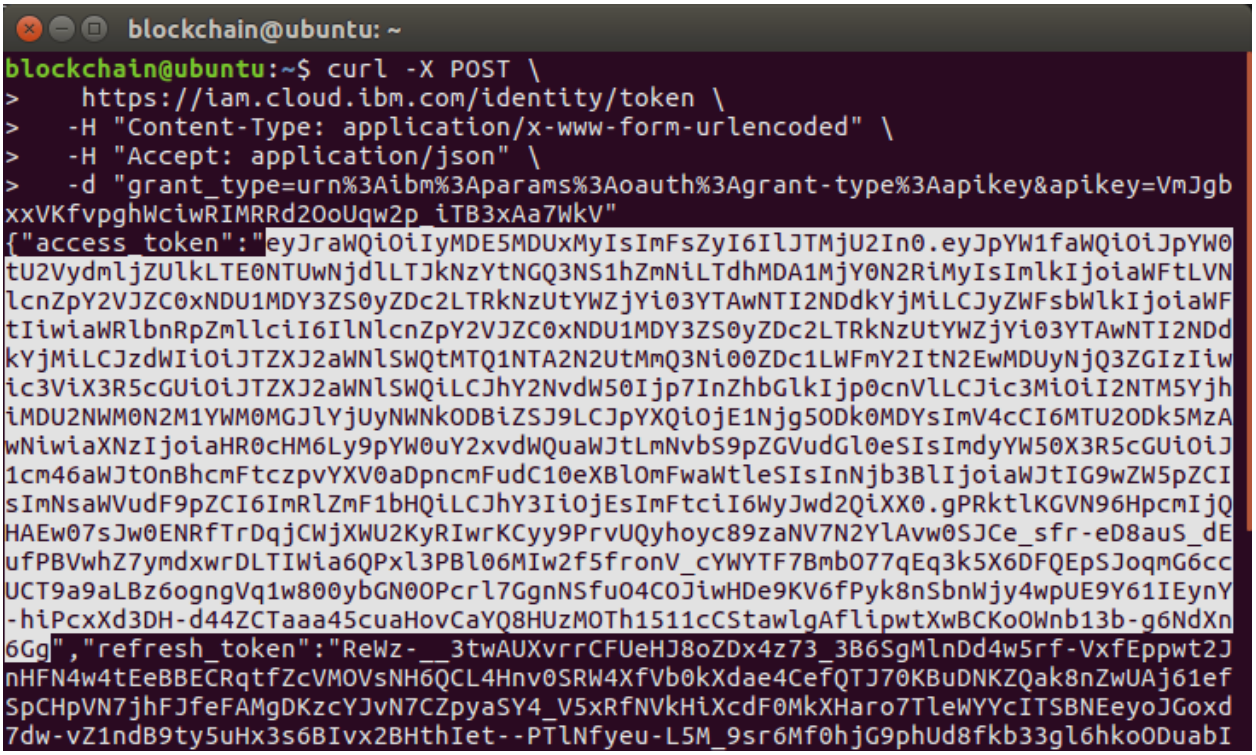


__ **21.** Copy the completed **curl** command to a new terminal window and paste it into the terminal to execute it. When it completes you should see a lot of output in a simple json format:



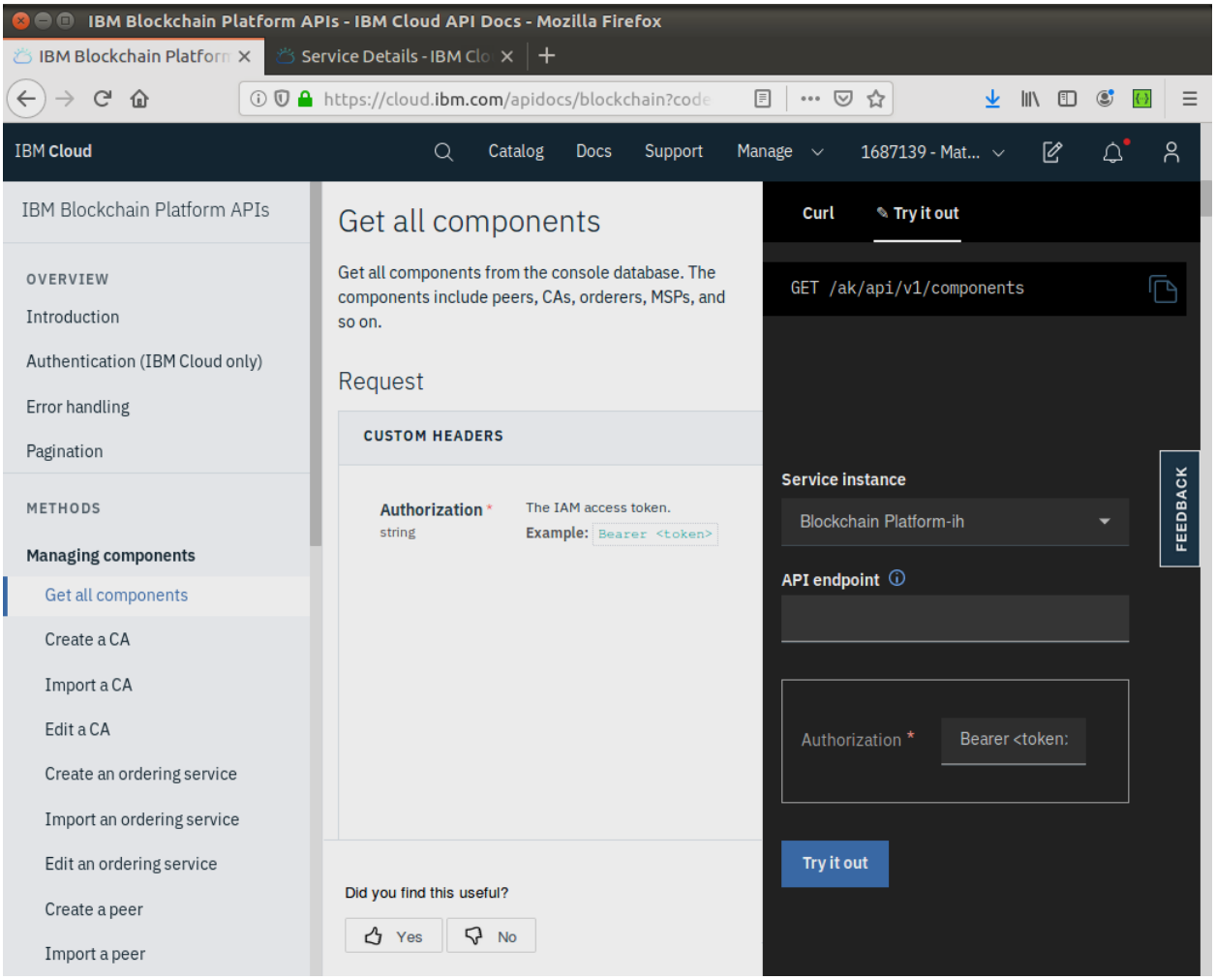
The output contains a new token, which will only he valid for one hour.

__ **22.** Scroll to the top of the terminal window, and you should see the start of an "**access_token**" section. As shown highlighted below, select and copy the contents on the access token, down to the next **refresh_token**. Make sure you do not include the quote marks:

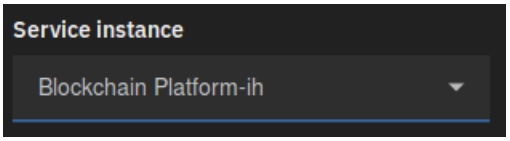


__ **23.** Paste the contents of the access token into the VS Code file to make it easier to copy it again in later steps.

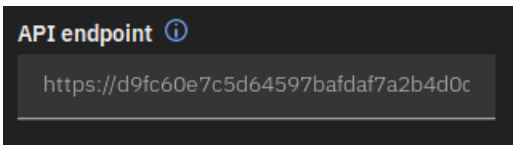
__ **24.** Now switch back to the **API Docs** tab in Firefox and click on the "**Get all components**" in the contents bar on the left:



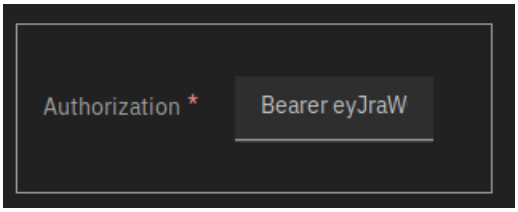
__ **25.** In the "**Try it out**" section on the right, make sure your "**Service instance**" is set to the IBM Blockchain Platform instance you created earlier:



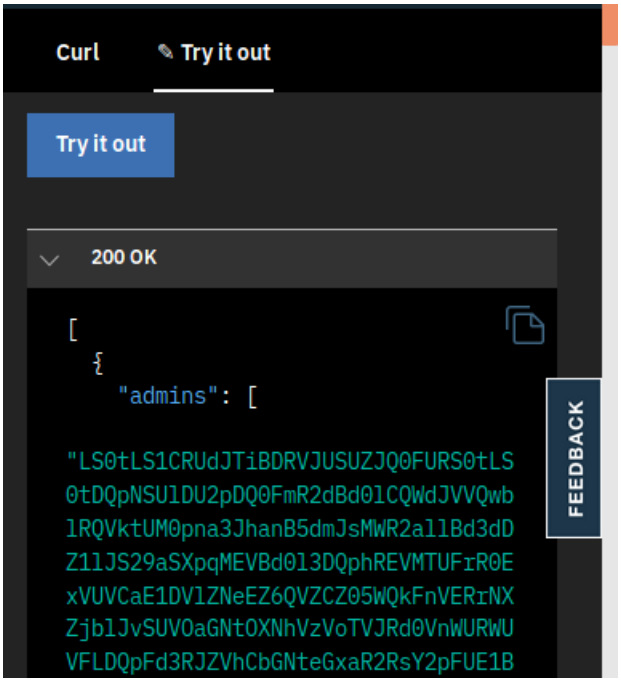
__ **26.** In the "**API Endpoint**" box, you need to paste the "**api_endpoint**" you obtained earlier from the "**Service Credentials**" and should have copied into your VS Code file. The **api_endpoint** will start with **https://xxx**:



__ **27.** Next, in the **Authorization** box, you need to paste in your access token that you obtained from the **curl** command in the terminal window. You need to make sure you paste your token over the **<token>** text present in the box, but leave the "**Bearer** " text alone so you end up with "**Bearer xxx**" where **xxx** is your token:

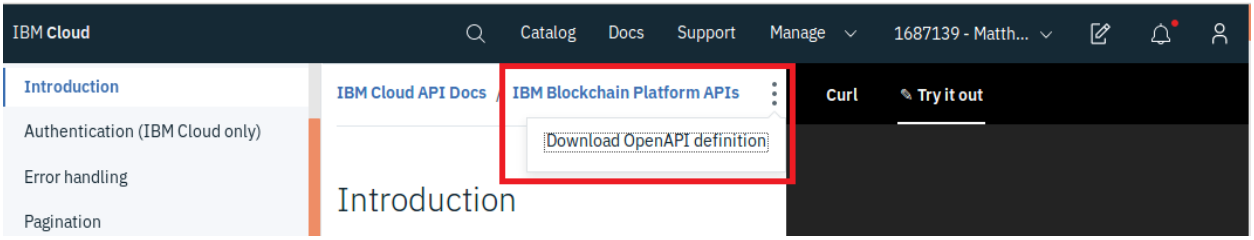


__ **28.** Finally, click on the "**Try it out**" button under the **Authorization** box. When the command completes, you should see a lot of output if you scroll down, listing the components in your network:



__ **29.** If you scroll through the list of APIs on the left in the table of contents, you can look at trying out others if you wish. You will need to use the **api_ endpoint** and **token** again as you did with the **Get all components** API call.

__ **30.** If you wish to obtain the **Swagger** "OpenAPI" definition for all the Admin API, you can click on the "**option**" button at the top of the API page, and chose the "**Download OpenAPI definition**" option:



__ **31.** Once downloaded, the **OpenAPI** definition can be used with other tools such as Swagger Builder (https://inspector.swagger.io/builder) but that's outside the scope of this Lab.

3 We Value Your Feedback!

- Please ask your instructor for an evaluation form. Your feedback is very important to us as we use it to continually improve the lab material.

- If no forms are available, or you want to give us extra information after the lab has finished, please send your comments and feedback to "**blockchain@uk.ibm.com**"