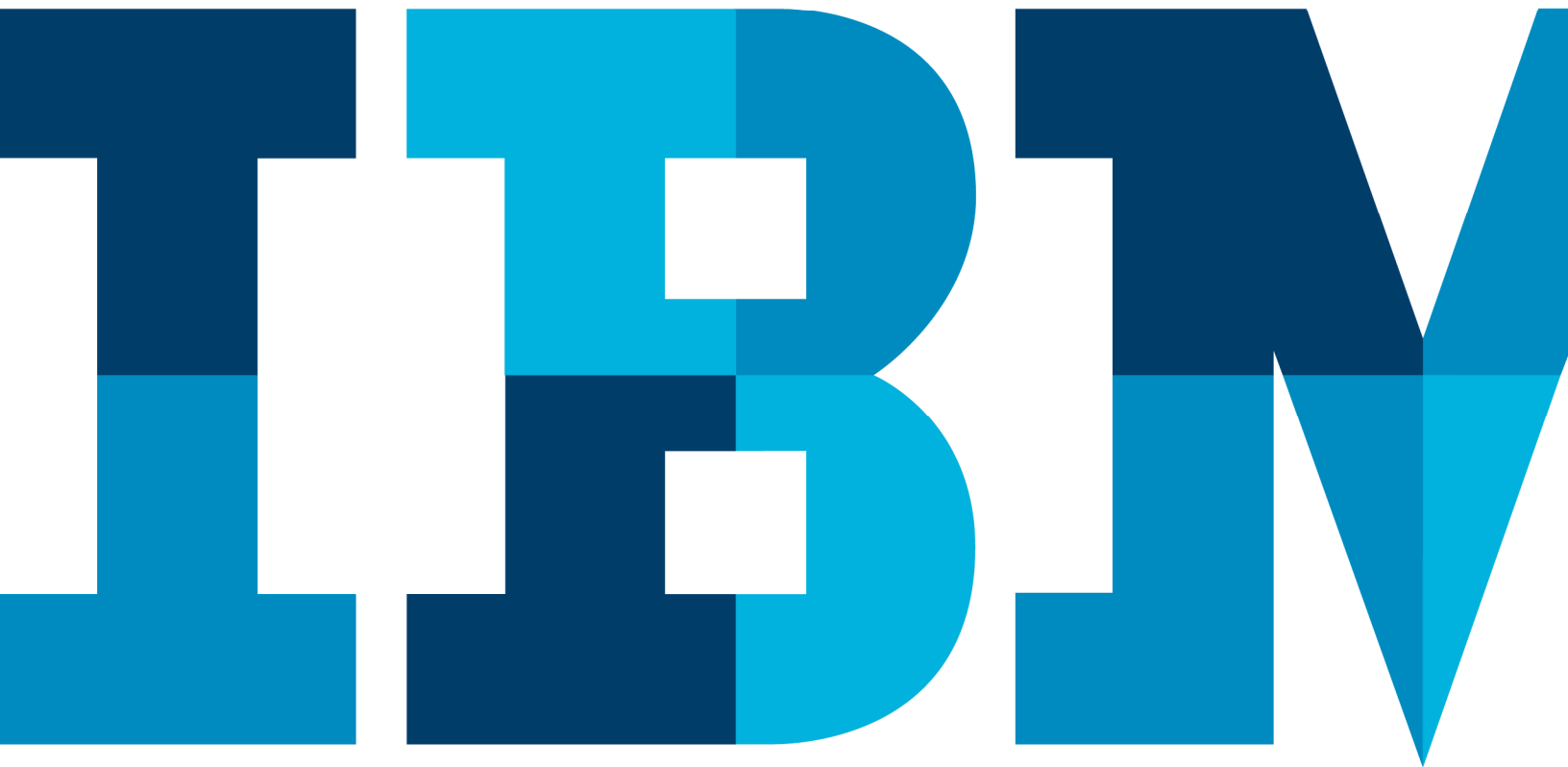


IBM Blockchain Proof of Technology Blockchain Explained

Lab One - Exercises



Contents

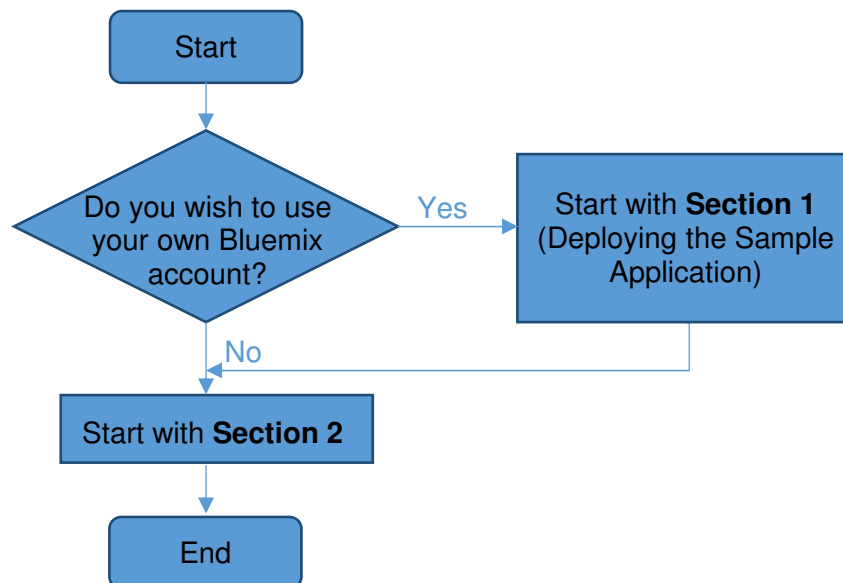
OVERVIEW	INTRODUCTION TO THE LAB	3
SECTION 1.	DEPLOYING THE SAMPLE APPLICATION.....	4
	1.1. DEPLOYING THE SAMPLE APPLICATION	4
	1.2. STARTING THE SAMPLE APPLICATION.....	7
SECTION 2.	ASSET TRANSFER AND DISPOSAL SCENARIOS	8
	2.1. STARTING THE ASSET TRANSFER DEMO	8
	2.2. SCENARIO: TRANSFER: MANUFACTURER TO DEALERSHIP	9
	2.2.1. VERIFY THE TARGET DEALERSHIP ASSETS	9
	2.2.2. TRANSFER THE ASSET (FROM MANUFACTURER TO DEALERSHIP)	12
	2.2.3. VERIFY MANUFACTURER HAS NO CONTROL OVER TRANSFERRED ASSET	16
	2.3. SCENARIO: VIEW THE BLOCKCHAIN ACTIVITY	17
	2.4. SCENARIO: TRANSFER: DEALERSHIP TO LEASING COMPANY	18
	2.4.1. VERIFY THE DEALERSHIP CAN NOW CONTROL THE ASSET	18
	2.5. SCENARIO: TRANSFER: LEASE COMPANY TO LEASEE	22
	2.5.1. VERIFY THE LEASE COMPANY CAN NOW CONTROL THE ASSET.....	22
	2.6. SCENARIO: TRANSFER: LEASEE TO SCRAP MERCHANT.....	24
	2.6.1. VERIFY THE LEASEE CAN NOW CONTROL THE ASSET	24
	2.7. SCENARIO: SCRAP MERCHANT - ASSET DISPOSAL.....	26
	2.7.1. VERIFY THE SCRAP MERCHANT CAN CONTROL THE ASSET.....	26
	2.8. SCENARIO: VERIFY TRANSACTION ACTIVITY USING THE REGULATOR VIEW	28
APPENDIX A.	REMOVING THE SAMPLE APPLICATION	32
APPENDIX B.	NOTICES	33
APPENDIX C.	TRADEMARKS AND COPYRIGHTS	35

Overview Introduction to the Lab

The aim of this lab is to introduce you to the concepts of a blockchain by showing you how a blockchain could be used to transfer assets between participants in a business network. We will use Car Leasing as the scenario for the demo.


The lab runs inside the IBM Bluemix environment, however for this lab we will ignore Bluemix and focus on the car leasing demo itself. There is a follow-on lab that will properly introduces you to the Bluemix environment, and allows you to create and monitor the blockchain service and application.

Usually, the car leasing demo will have been set up for you prior to starting this lab and you can simply log on to the demo web page without having to log into Bluemix. If you wish to use your own Bluemix account (or if you are an IBMer), then you first need to deploy the Car Leasing demo into your account; details of how to do this are listed in Section 1. If you are using the application that has been already set up for you, just start with Section 2.




Section 1. Deploying The Sample Application



In this section we will log onto Bluemix and instantiate the Car Leasing Demo application.

	<p>You only need to complete this section if:</p> <ul style="list-style-type: none">(a) You wish to sign up for Bluemix, OR(b) You wish to use your existing Bluemix account, OR(c) You are an IBMer.
---	---

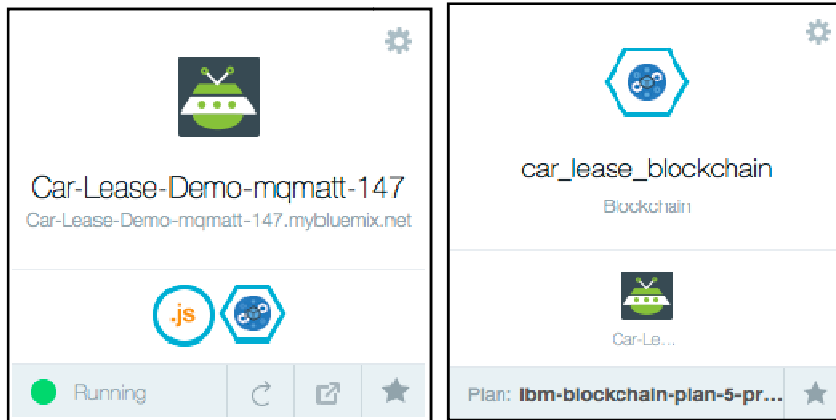
1.1. Deploying the Sample Application

- __1. Open a web browser and go to www.bluemix.net.

	<p>It is recommended to use Firefox or Chrome.</p> <p>Problems can generally be resolved by clearing the browser's cache and cookies, or running the browser in private mode.</p>
---	---

- __2. Click 'Sign Up' or 'Log In' to create a new Bluemix account or log into your existing account.
- __3. Once you have successfully signed up and logged into Bluemix, select  from the top bar.
- __4. Scroll down to the Network section and click **Blockchain**.
- __5. Review the service description and information about the service.
- __6. Click  and learn about the process of creating a blockchain environment.
- __7. Click 'Sample Apps and Tutorials' on the left of the page to view the available apps.

- __8. Click **DASHBOARD** to view any created services. If running this lab as part of the Proof-of-Technology workshop you should see the following services already created for the car leasing application (and associated blockchain service):

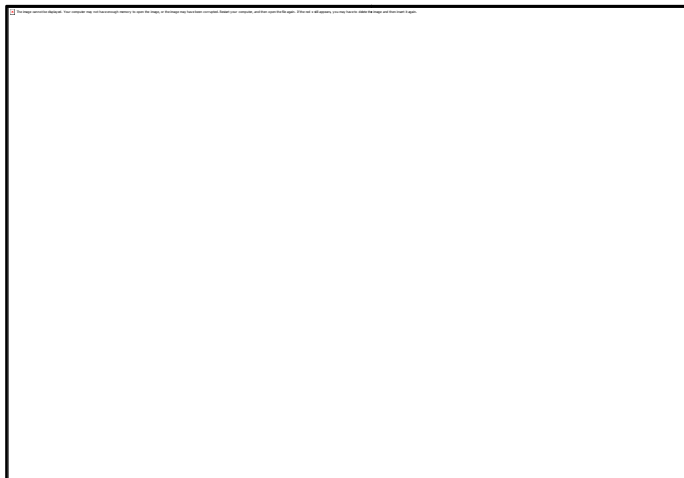



If these services exist then go to step 11!

- __9. Click **Deploy to Bluemix** against the Car Lease demo. Log in to Bluemix again if necessary.

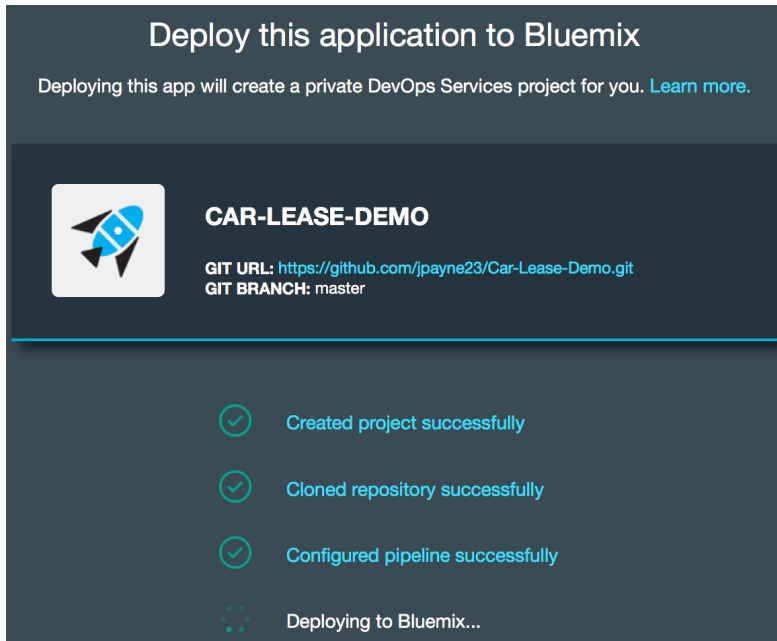


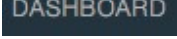
The first time a Bluemix ID creates a sample, a new DevOps alias is required. **Pick a unique ID** and click acceptance of the terms and then click create. For Proof-of-Technology workshops, use the first part of the email address, for example ibmpot000101 (without the '+' character). Then click continue on the following page.



- ___10. Leave the App Name, Region, Organization and Space default and click . (You might first need to wait a few seconds for the default field values to be populated.)

Clicking Deploy will cause the car leasing demo to be deployed into your Bluemix environment, and may take a couple of minutes to complete.



Once you see the 'Success!' message click  to see the new car leasing application (and associated blockchain service) you created.

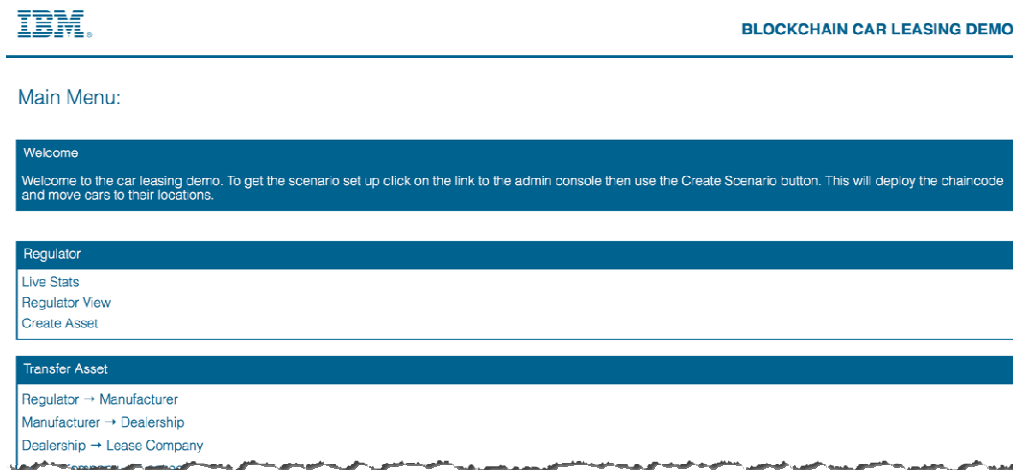
- ___11. Click the application's icon in the dashboard (your icon may vary!)



This will show you information about the application, including the memory that it is consuming and activity log.

1.2. Starting the Sample Application

- ___1. Click the 'Routes' URL (something like **Routes: Car-Lease-Demo-mqmatt-147.mybluemix...**) in order to run the scenario.

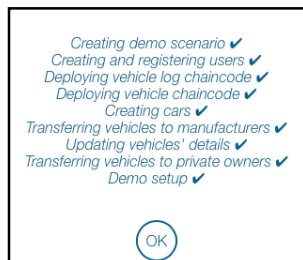


If running this lab as part of the Proof-of-Technology workshop, and the sample has already been created, you should now move to section 2.

- ___2. Click 'Admin Console' and then 'Create Simple Scenario' to load the initial set of assets into the blockchain. This will take several minutes to complete.



- ___3. The scenario setup is complete when 'Demo setup' is displayed.



If an error occurs during creating the scenario, go to Appendix A for instructions on how to delete the service.

Section 2. Asset Transfer and Disposal Scenarios

In the following sections you will discover how blockchain technology can be used to track ownership of an asset across multiple parties. The scenario describes how blockchain technology could be used to model the lifecycle of vehicle ownership and control between the following participants:

- 1) Manufacturer to Dealership
- 2) Dealership to Leasing Company
- 3) Leasing Company to Leasee
- 4) Leasing Company to Scrap Merchant


The Scrap Merchant's role in this scenario will also demonstrate how asset disposal can be represented using blockchain technology.

In this business scenario each participant has entered into a business agreement with each other and all parties are known and trusted by each other. The above process of transferring vehicles has been negotiated and agreed with all participants. As a result the order in which the above processes take place is strictly defined within the demo showing that for example a Manufacturer cannot transfer directly to a Leasee by missing out the dealership and Leasing company transfers.

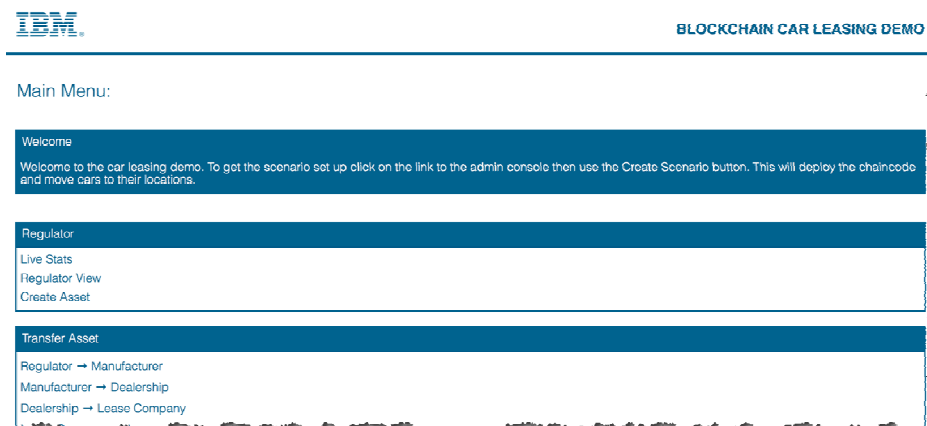
This demo has been simplified so that by default each role (EG "Manufacturer") will only show one participant (e.g. "Alfa Romeo") in the transfer assets page.

2.1. Starting the Asset Transfer Demo

1. Bring up a web browser and go to the URL that your instructor has provided. (If you completed Section 1, just use the URL of the application that you already created.)

	<p>It is recommended to use Firefox or Chrome.</p> <p>Some people have previously reported problems working with Bluemix in Internet Explorer and Safari.</p>
---	---

You should be able to see the home page of the Car Leasing Demo.



2.2. Scenario: Transfer: Manufacturer to Dealership

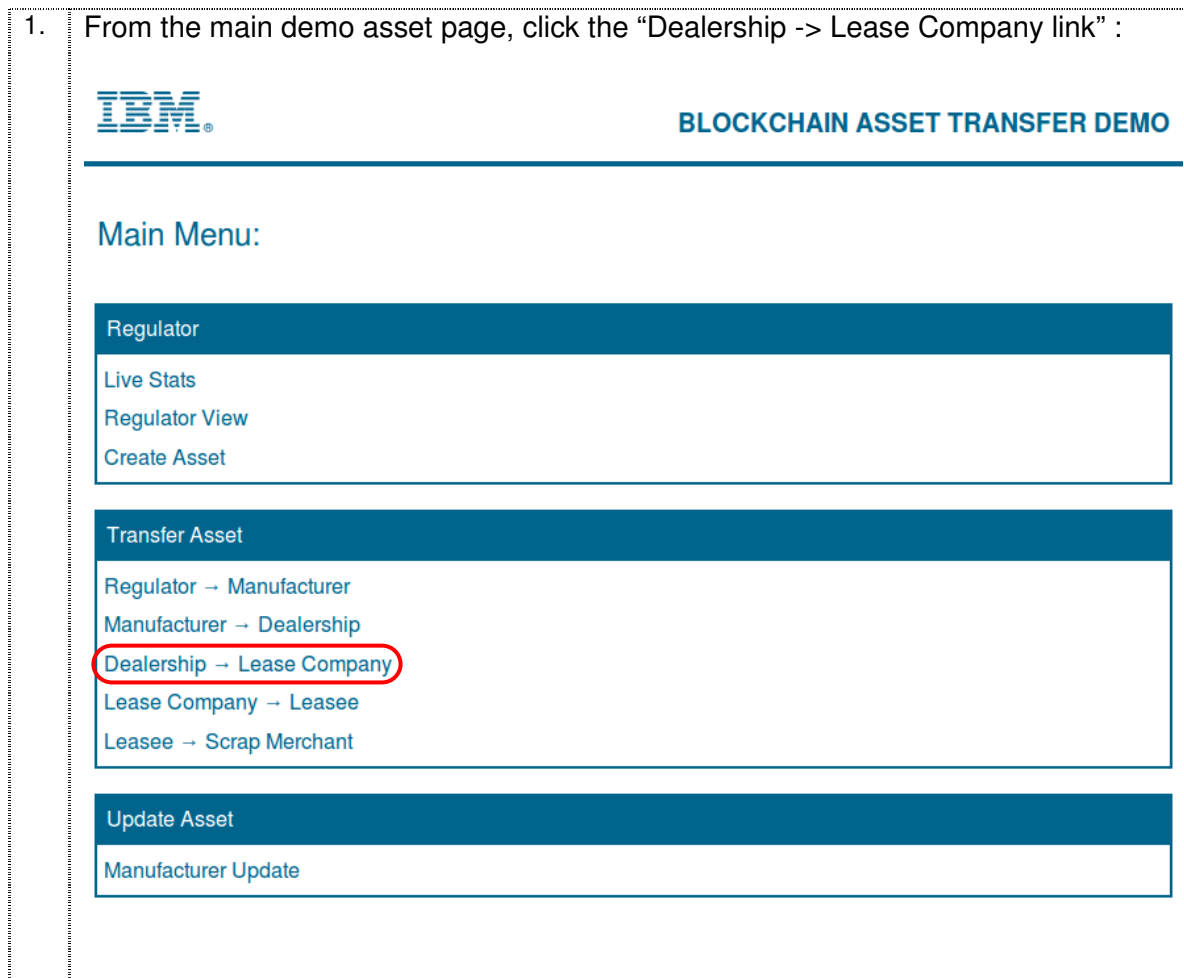
In the following section you will transfer the ownership of a vehicle from a Manufacturer to a Dealership (known as “Beechvale Group”) using the blockchain.

Before transferring the vehicle to the dealership you will verify which assets the target Dealership currently owns.

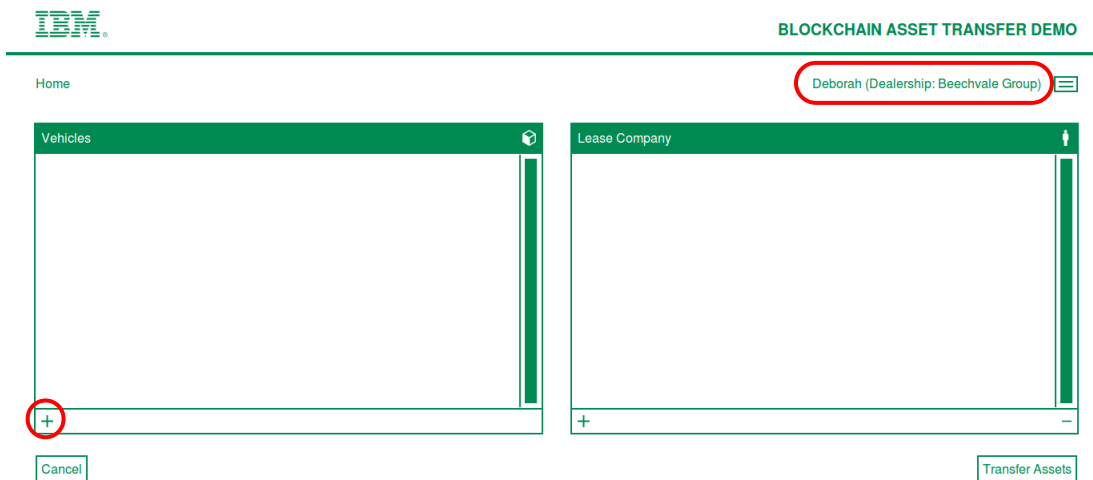
2.2.1. Verify the target Dealership Assets

In this section you will act as a Dealership and verify which assets the Beechvale Dealership owns and is permitted to transfer.

1. From the main demo asset page, click the “Dealership -> Lease Company link” :



- In the Dealership Transfer window, click the plus sign in the “Vehicles” window to verify which vehicles are owned by the Dealership known as “Beechvale Group” according to the blockchain.
The demo asset interrogates the blockchain to identify all vehicles owned by the Dealership and will present a window with the results (note the dealership user “Deborah” will only see vehicles owned by the dealership).



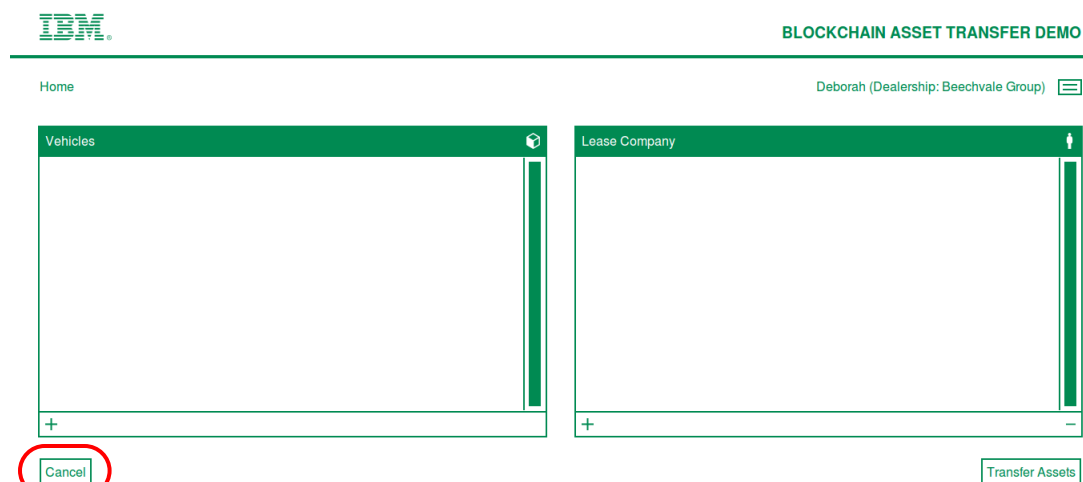
3. In the results window, verify the number of cars and their make. Note the number in the first column of this table is used to model the Vehicle Identification Number (or VIN).

Vehicles		
549523556856725	Jaguar F-Type, Red, HE16 WDZ	<input type="checkbox"/>
523447019546831	Land Rover Defender, Silver, EY16 FRV	<input type="checkbox"/>
948881310167423	Toyota Celica, Silver, DG16 FVG	<input type="checkbox"/>

According to the blockchain, the Beechvale dealership owns 3 cars (none of which are Alfa Romeo's).

Click the cross to dismiss the window.

4. Press Cancel on the Dealership page to return to the Main demo menu:



You will now transfer an Alfa Romeo car to the Beechvale Dealership, from the cars owned by Alfa Romeo (the Manufacturer).

2.2.2. Transfer the asset (from Manufacturer to Dealership)

1. From the demo main menu, click the “Manufacturer -> Dealership” link in the Transfer Asset section:



BLOCKCHAIN ASSET TRANSFER DEMO

Main Menu:

Regulator

Live Stats

Regulator View

Create Asset

Transfer Asset

Regulator → Manufacturer

Manufacturer → Dealership

Dealership → Lease Company

Lease Company → Leasee

Leasee → Scrap Merchant

Update Asset

Manufacturer Update

2. The Transfer Asset window shows an identity “Martin” (the manufacturer of Alfa Romeo vehicles). Click the plus sign in the Vehicles box:



BLOCKCHAIN ASSET TRANSFER DEMO

Home

Martin (Manufacturer: Alfa Romeo)

Vehicles

Dealership

+

Cancel

+

Transfer Assets

3. The demo asset collects details from the blockchain on cars that Martin (the Alfa Romeo manufacturer) owns and presents the results:

Vehicles	
880352730316924	Alfa Romeo MiTo, Blue, NL16 DTU <input checked="" type="checkbox"/>
747542562791231	Alfa Romeo 4C, Red, RZ65 RNG <input type="checkbox"/>
128994473011261	Alfa Romeo MiTo, Black, YD65 FTB <input type="checkbox"/>
546303780997253	Alfa Romeo Giulietta, White, JU65 XMH <input type="checkbox"/>
<div>X</div>	

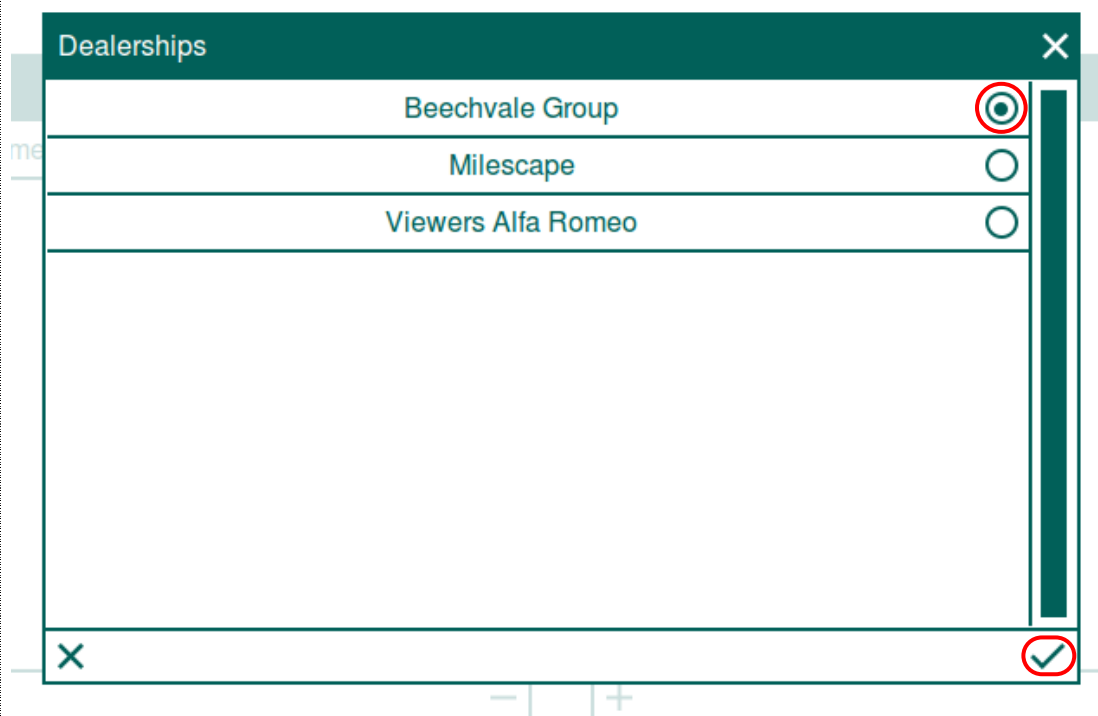
Click the tick box of the first car in the list to include it in the transfer request.

Click the Tick mark at the bottom of the list of Vehicles to save the choice.

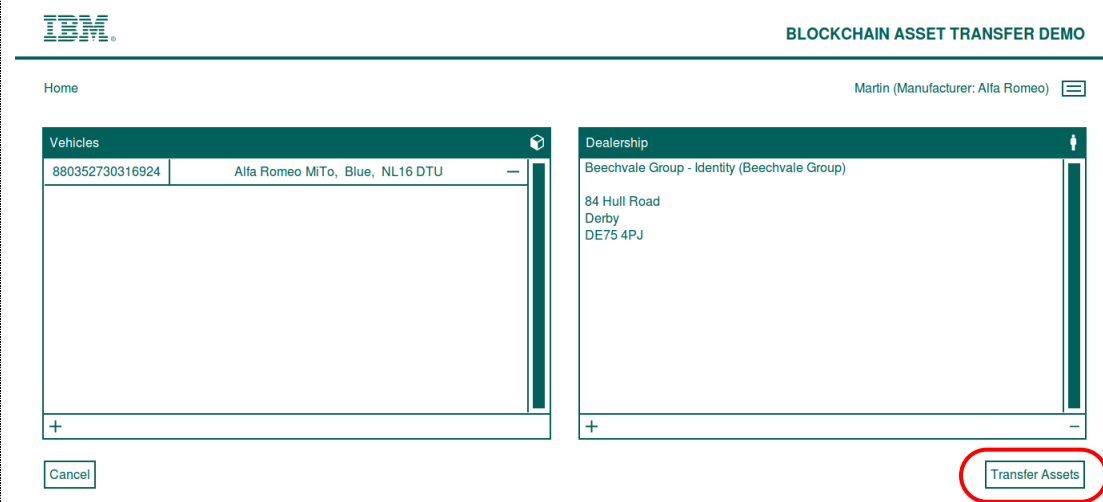
4. The Alfa Romeo with VIN number **"880352730316924"** now appears in the list of vehicles to be transferred:

Click the plus sign in the Dealership box.

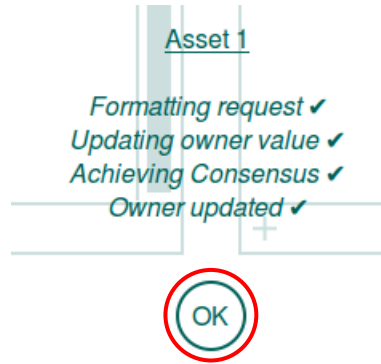
5. From the list of Dealerships, choose “Beechvale Group” then, click the tick mark to confirm your choice):



6. The Transfer menu should now have the following details. Click the “Transfer Assets” button:



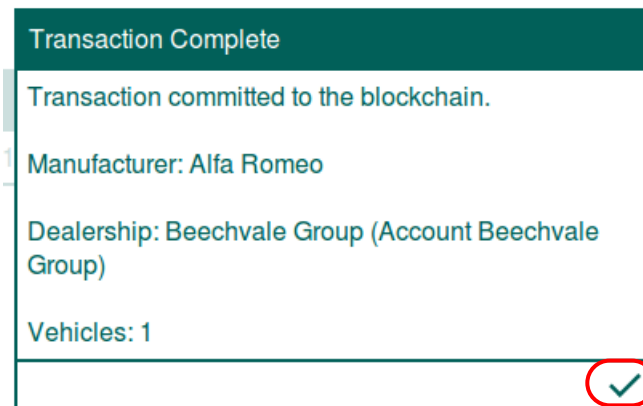
7. The Demo asset, highlights what it is doing with the blockchain in the status window:



The demo asset updates the Owner of the contract based on the Dealership specified in the transfer request. The Demo asset then waits for the open source blockchain technology to declare “consensus” shown by the stage “Achieving Consensus”. Once consensus is achieved the transfer request is “committed” to the blockchain. We then confirm the information update has been successful, as shown by the confirmation “Owner Updated”.

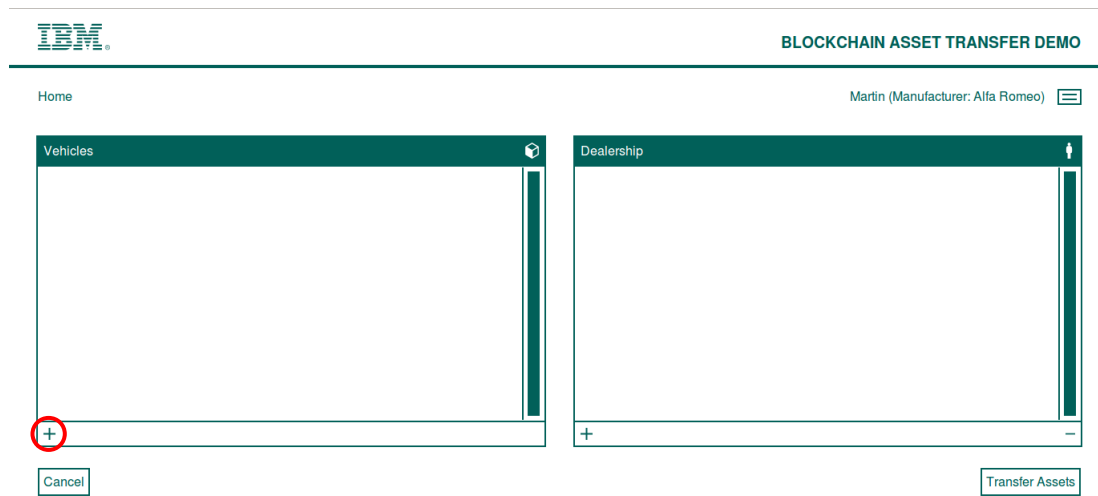
8. Click OK to acknowledge the transfer status messages.

9. Click the tick mark to acknowledge the Transaction Complete message:

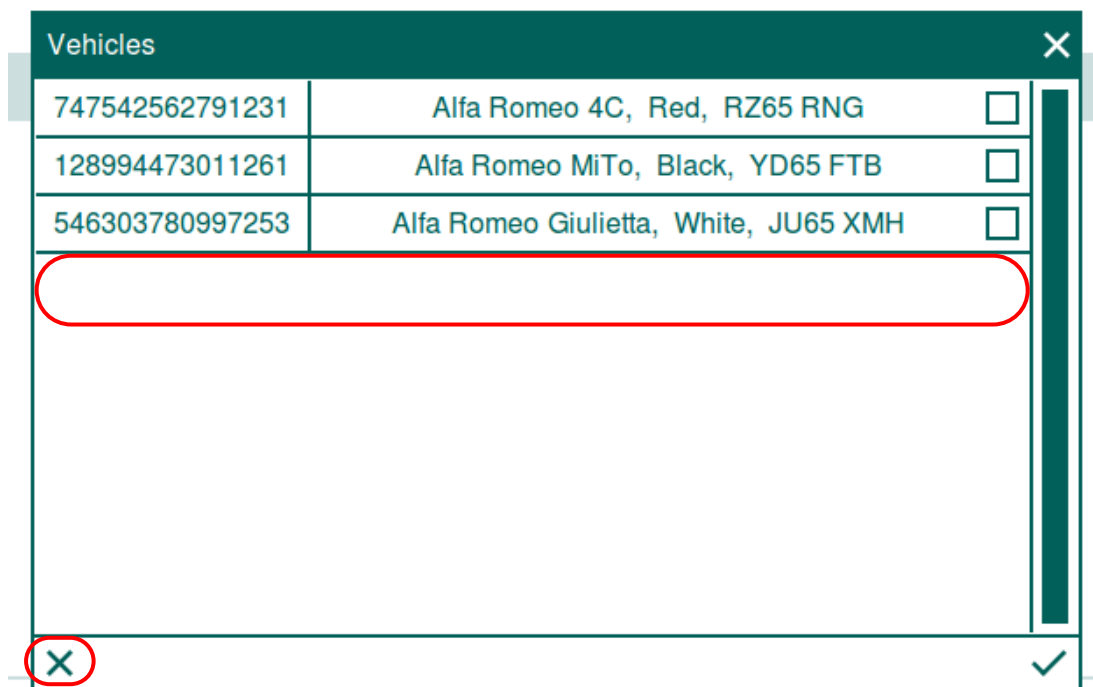


2.2.3. Verify Manufacturer has no control over Transferred Asset

1. The manufacturer's ability to control the asset has now been removed. Click the plus sign on the Vehicles box to verify that the manufacturer can no longer see the asset you transferred:

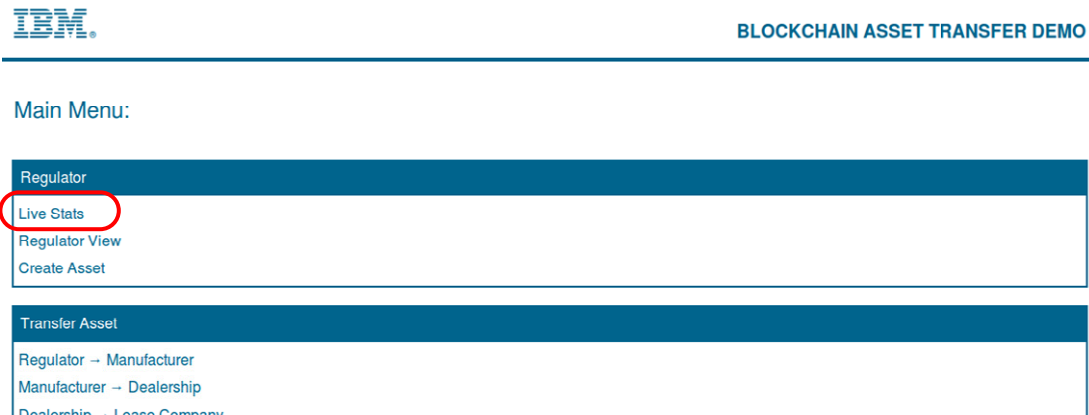


2. The manufacturer now controls only three assets, the transferred vehicle is no longer visible to the manufacturer. Click the cross mark to dismiss the window.

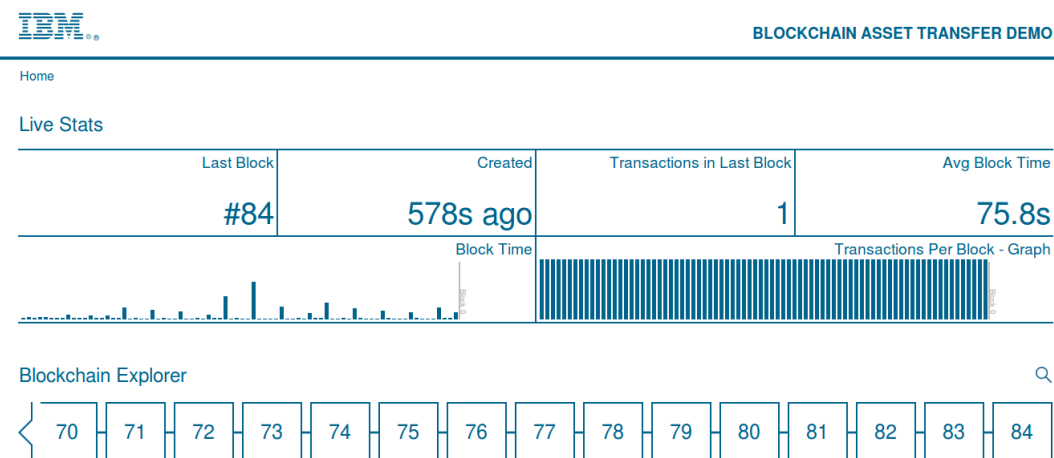


2.3. Scenario: View the blockchain Activity

1. From the Demo asset main menu, click the Live stats link:



2. The blockchain statistics page shows the transfer activity as a vertical bar in the Transactions window:



Last Block: what the block number is of the last committed Block

Created: How long ago since the Last Block was committed

Transactions in Last Block: How many transactions are in the Last Block

Avg Block Time: The average time between each block being committed

Block Time graph: A graph showing how long was between each block – also showing 'Block 0' if the scale allows

Transactions Per Block - Graph: How many transactions were in each Block – also showing 'Block 0' if the scale allows

Blockchain Explorer: Allows you to look at a specific block's details in the blockchain. More detailed explanation in Lab 02.

2.4. Scenario: Transfer: Dealership to Leasing Company

In this section you will act as “the Dealer”. First you will verify that the asset you transferred earlier is now available to you to transfer, you will then transfer the asset to the Leasing Company.

2.4.1. Verify the Dealership can now control the Asset

In the previous section you transferred the ownership of the vehicle **880352730316924** from the Alfa Romeo manufacturer to the dealership “Beechvale Group”. The vehicle will now appear in the list of vehicles Beechvale Group are able to control.

1. From the demo “Regulator View” click Main Menu, then click the “Dealership -> Lease Company” link:



BLOCKCHAIN ASSET TRANSFER DEMO

Main Menu:

Regulator

Live Stats

Regulator View

Create Asset

Transfer Asset

Regulator → Manufacturer

Manufacturer → Dealership

Dealership → Lease Company

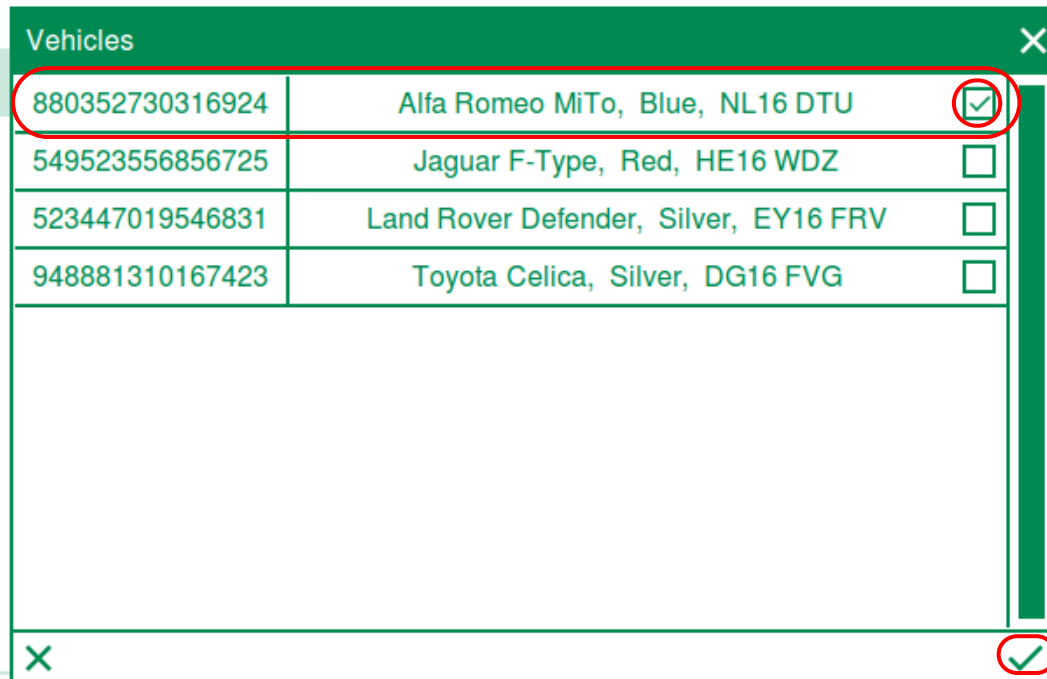
Lease Company → Lessee

Lessee → Scrap Merchant

Update Asset

Manufacturer Update

2. In the Dealership page, click the plus sign in the “Vehicles” box to show the list of vehicles controlled by the dealer, you should see the vehicle **880352730316924** is now under the control of the dealership:



Vehicles			
880352730316924	Alfa Romeo MiTo, Blue, NL16 DTU	<input checked="" type="checkbox"/>	
549523556856725	Jaguar F-Type, Red, HE16 WDZ	<input type="checkbox"/>	
523447019546831	Land Rover Defender, Silver, EY16 FRV	<input type="checkbox"/>	
948881310167423	Toyota Celica, Silver, DG16 FVG	<input type="checkbox"/>	

Select the vehicle 880352730316924 and click the tick at the bottom of the screen.

3. In the Lease Company window click the plus sign to add “LeaseCan” Lease Company window:



Lease Companies		
LeaseCan	<input checked="" type="radio"/>	
Every Car Leasing	<input type="radio"/>	
Regionwide Vehicle Contracts	<input type="radio"/>	

4. Check the Vehicle and Lease Company details are correct, then click the “Transfer Assets” button:

IBM. BLOCKCHAIN ASSET TRANSFER DEMO

Home Deborah (Dealership: Beechvale Group)

Vehicles

880352730316924	Alfa Romeo MiTo, Blue, NL16 DTU
-----------------	---------------------------------

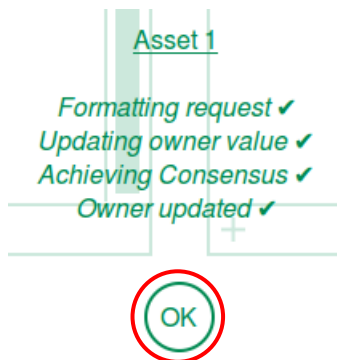
Lease Company

LeaseCan - Identity (LeaseCan)

64 Zoo Lane
Slough
Berkshire
SL82 4AB

Cancel Transfer Assets

5. As with the previous transfer the demo extracts the Contract details used to define the vehicle, updates the owner, waits for consensus to be achieved then confirms the update was successful, as shown by the message “Owner Updated”:



Click OK.

6. Dismiss the Transaction Complete message by clicking the Tick:

Transaction Complete

Transaction committed to the blockchain.

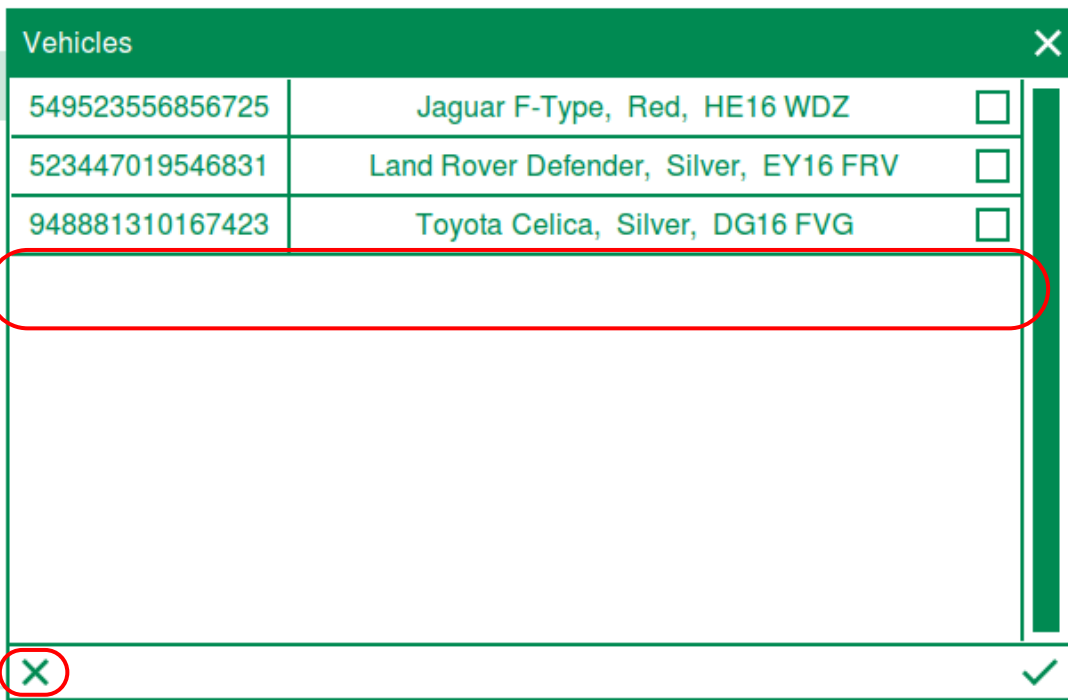
Dealership: Beechvale Group

Lease Company: LeaseCan (Account LeaseCan)

Vehicles: 1

✓

7. Click the plus sign in the “Vehicles” box to verify that the asset is no longer available to the Beechvale Group Dealer. You now will see only three vehicles. The vehicle you just transferred to the Lease Company should not appear:



Vehicles		
549523556856725	Jaguar F-Type, Red, HE16 WDZ	<input type="checkbox"/>
523447019546831	Land Rover Defender, Silver, EY16 FRV	<input type="checkbox"/>
948881310167423	Toyota Celica, Silver, DG16 FVG	<input type="checkbox"/>

8. Close this window and “Cancel” out of the Dealership’s Transfer Assets page.

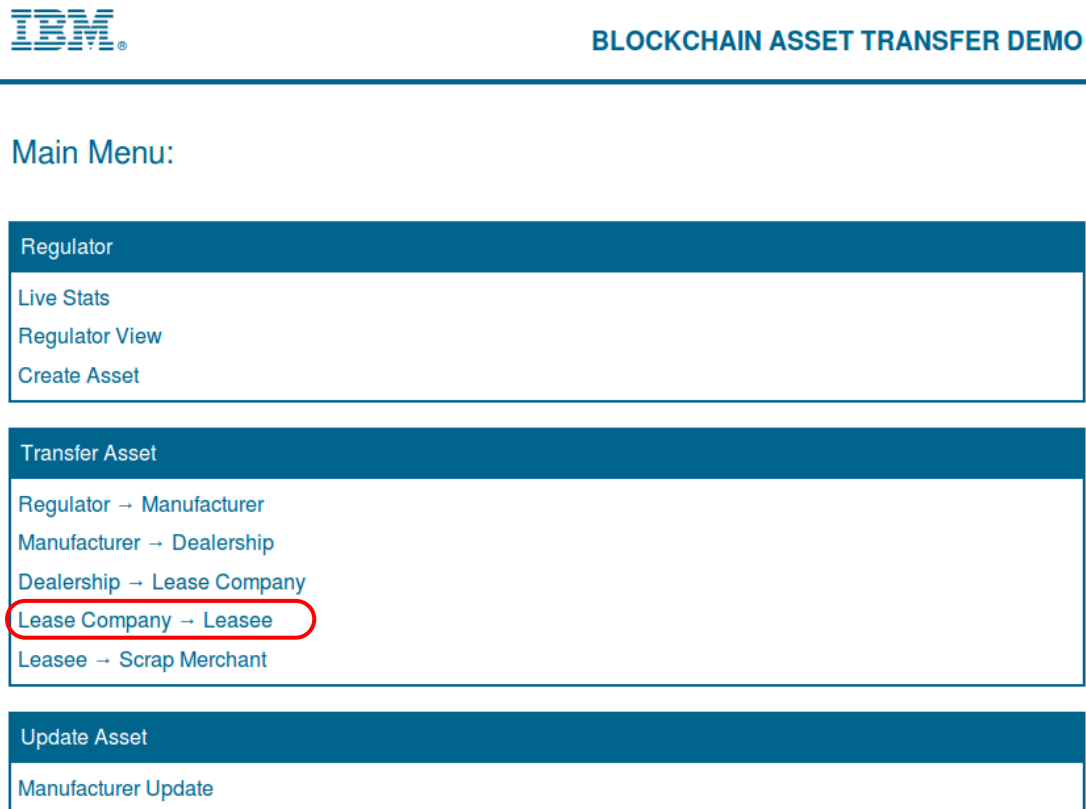
2.5. Scenario: Transfer: Lease Company to Leasee

In this section you will act as the Lease Company. First you will verify that the asset you transferred earlier is now available to you acting as the Lease Company to transfer, you will then transfer the asset to a Leasee.

2.5.1. Verify the Lease Company can now control the Asset

In the previous section you transferred the ownership of the vehicle **880352730316924** from the dealership “Beechvale Group” to the Lease Company “Leasecan”. The vehicle will now appear in the list of vehicles LeaseCan are able to control.

1. From the demo Main Menu, click the “Lease Company -> Leasee” link:



2. Use the plus signs to prepare a transfer as follows Click the transfer Assets button when ready:

IBM. BLOCKCHAIN ASSET TRANSFER DEMO

Home Lesley (Lease Company: LeaseCan)

Vehicles

880352730316924	Alfa Romeo MiTo, Blue, NL16 DTU
-----------------	---------------------------------

Leasee

Joe Payne - Identity (Joe Payne)

84 Byron Road
Eastleigh
SO50 8JR

Cancel Transfer Assets

3. When Consensus has been achieved click the OK button.
4. Dismiss the Transaction Complete message by clicking the tick.
5. Verify that the vehicle is no longer available to the Lease Company (click the plus sign in the vehicles box, the vehicle **880352730316924** should not appear in the list of vehicles).

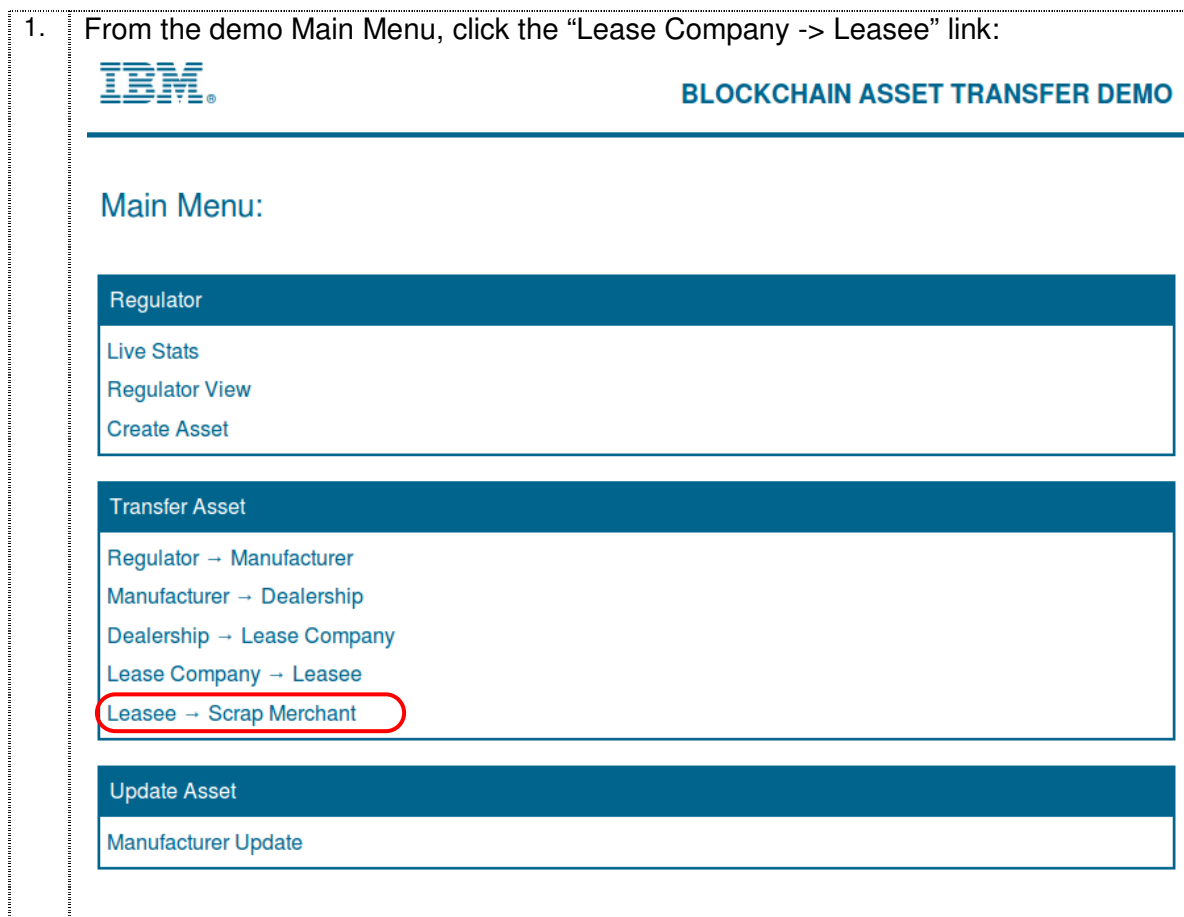
2.6. Scenario: Transfer: Leasee to Scrap Merchant

In this section you will act as the Leasee (individual). First you will verify that the asset you transferred earlier is now available to you acting as the Leasee to transfer, you will then transfer the asset to a Scrap Merchant.

2.6.1. Verify the Leasee can now control the Asset

In the previous section you transferred the ownership of the vehicle **880352730316924** from the Lease Company “LeaseCan” to the individual “Joe Payne”. The vehicle will now appear in the list of vehicles Joe is able to control.

1. From the demo Main Menu, click the “Lease Company -> Leasee” link:



2. Use the plus signs to prepare a transfer as follows, click the transfer Assets button when ready:

IBM. BLOCKCHAIN ASSET TRANSFER DEMO

Home Joe (Leasee: Joe Payne) [Menu]

Vehicles

880352730316924	Alfa Romeo MiTo, Blue, NL16 DTU
-----------------	---------------------------------

[+]

Cancel

Scrap Merchant

Cray Bros (London) Ltd - Identity (Cray Bros (London) Ltd)

26 Electric Eel Avenue
Twickenham
Greater London
SE51 9DR

[+]

Transfer Assets

3. When Consensus has been achieved click the OK button.
4. Dismiss the Transaction Complete message by clicking the tick.
5. Verify that the vehicle is no longer available to Joe Payne (click the plus sign in the vehicles box, the vehicle **880352730316924** should not appear in the list of vehicles).

2.7. Scenario: Scrap Merchant - Asset disposal

In this section you will act as the Scrap Merchant (individual) and dispose of the asset. First you will verify that the asset you transferred earlier is now available to you acting as the Scrap Merchant, you will then dispose of the asset.

2.7.1. Verify the Scrap Merchant can control the Asset

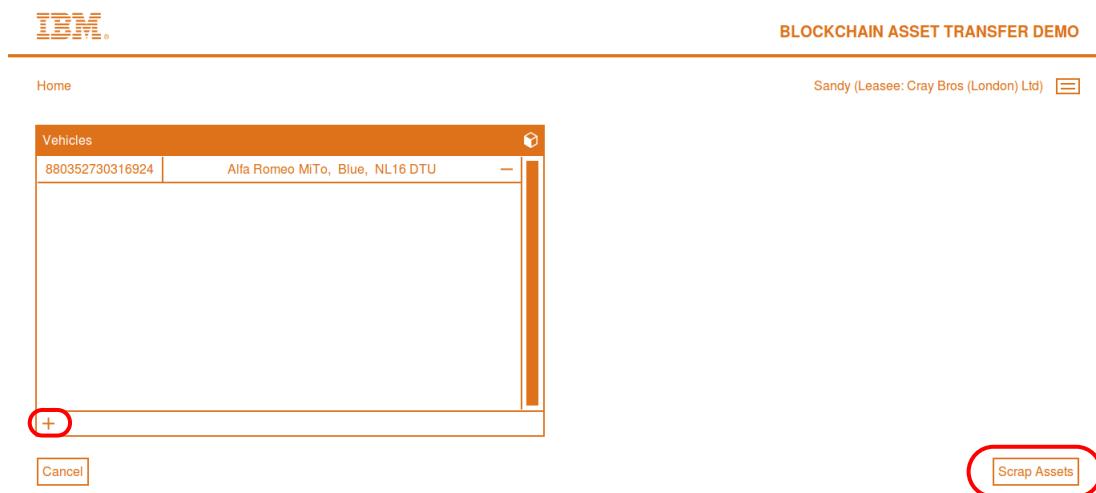
In the previous section you transferred the ownership of the vehicle **8803527303169234** from “Joe Payne” to the Scrap Merchant. The vehicle will now appear in the list of vehicles that the Scrap Merchant is able to control.

1. From the demo Main Menu, click the “Scrap Merchant -> Scrap” link:

The screenshot shows the 'BLOCKCHAIN ASSET TRANSFER DEMO' interface. At the top left is the IBM logo, and at the top right is the title 'BLOCKCHAIN ASSET TRANSFER DEMO'. Below the title is a 'Main Menu:' section. The menu is organized into five main categories, each with a blue header bar:

- Regulator**: Contains links for 'Live Stats', 'Regulator View', and 'Create Asset'.
- Transfer Asset**: Contains a list of transfer paths: 'Regulator -> Manufacturer', 'Manufacturer -> Dealership', 'Dealership -> Lease Company', 'Lease Company -> Lessee', and 'Lessee -> Scrap Merchant'.
- Update Asset**: Contains a link for 'Manufacturer Update'.
- Dispose Asset**: Contains a link for 'Scrap Merchant -> Scrap', which is circled in red.
- Admin**: Contains a link for 'Admin Console'.

2. Use the plus sign to prepare for the disposal of the asset as follows, click the “Scrap Assets” button when ready (note there is no destination on this screen):



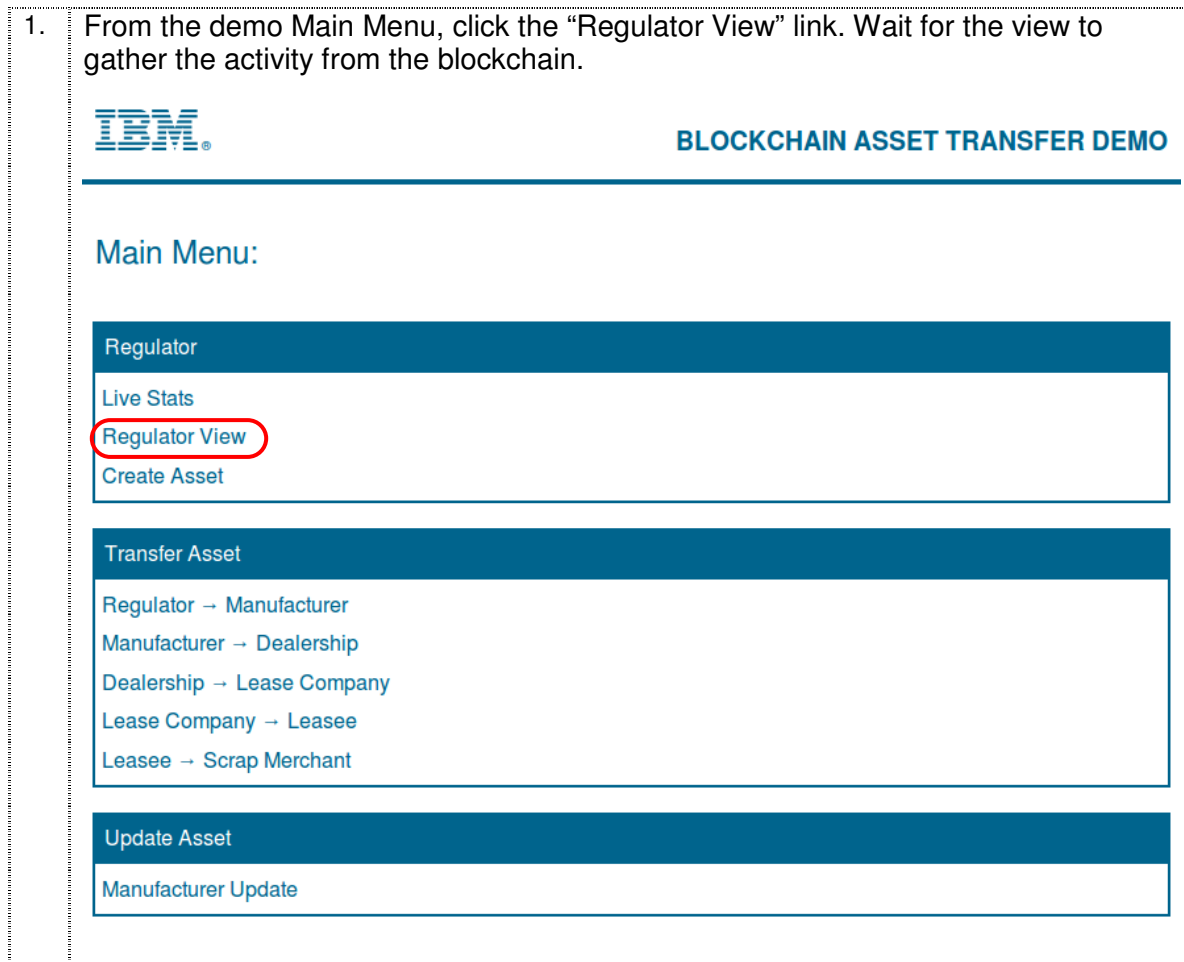
3. When Consensus has been achieved click the OK button.
4. Dismiss the Transaction Complete message by clicking the tick.
5. Verify that the vehicle is no longer available to the scrap merchant (click the plus sign in the vehicles box, the vehicle **880352730316924** should not appear in the list of vehicles).

2.8. Scenario: Verify Transaction activity using the Regulator view

In this section you will act as the Regulator and view the Asset Transfer and disposal activity you have performed above.


The regulator view has unrestricted access to all activities on the blockchain.

1. From the demo Main Menu, click the “Regulator View” link. Wait for the view to gather the activity from the blockchain.



2. When the list of transactions are shown on the screen, you will see the activity in chronological order (with the most recent activity at the top of the list of transactions):

IBM. BLOCKCHAIN ASSET TRANSFER DEMO

Home Ronald (Regulator: DVLA) 


Search by V5C ID... Filters v Sort v

[DA6060712]	Scrap: Cray_Bros_(London)_Ltd	Scrap V5C	18/03/2016 10:49
[DA6060712]	Transfer: Joe_Payne → Cray_Bros_(London)_Ltd	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: LeaseCan → Joe_Payne	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: Beechvale_Group → LeaseCan	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:34
[DA6060712]	Transfer: Alfa_Romeo → Beechvale_Group	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:19
[ZE3286321]	Transfer: Joe_Payne → Cray_Bros_(London)_Ltd	[720965981630055] Toyota Yaris, Red, QD65 YKR	18/02/2016 14:41
[ZE3286321]	Transfer: LeaseCan → Joe_Payne	[720965981630055] Toyota Yaris, Red, QD65 YKR	18/02/2016 14:40
[JM1779586]	Transfer: Beechvale_Group → LeaseCan	[287437467447767] Toyota Auris, Blue, LM16 YHU	18/02/2016 14:40
[ZE3286321]	Transfer: Beechvale_Group → LeaseCan	[720965981630055] Toyota Yaris, Red, QD65 YKR	18/02/2016 14:40
[GK8420732]	Transfer: Beechvale_Group → LeaseCan	[181255391772389] Jaguar XJ, Black, FM65 ESL	18/02/2016 14:39
[DA6060712]	Update: Alfa_Romeo	Registration: UNDEFINED → NL16 DTU	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Colour: UNDEFINED → Blue	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Model: UNDEFINED → MiTo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Make: UNDEFINED → Alfa Romeo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	VIN: 0 → 880352730316924	18/02/2016 14:38
[GW8812104]	Update: Alfa_Romeo	Registration: UNDEFINED → RZ65 RNG	18/02/2016 14:38
[GW8812104]	Update: Alfa_Romeo	Colour: UNDEFINED → Red	18/02/2016 14:38
[GW8812104]	Update: Alfa_Romeo	Model: UNDEFINED → 4C	18/02/2016 14:38

Note the regulator can see <all> blockchain transactions. The whole history of the vehicle can be seen in this view, this can be seen by the same vehicle being created By Alfa Romeo before.

3. Copy The V5C ID **DA6060712** and use the search feature to show only the history of the one vehicle:

IBM. BLOCKCHAIN ASSET TRANSFER DEMO

Home Ronald (Regulator: DVLA) 

DA6060712 Filters v Sort v

[DA6060712]	Scrap: Cray_Bros_(London)_Ltd	Scrap V5C	18/03/2016 10:49
[DA6060712]	Transfer: Joe_Payne → Cray_Bros_(London)_Ltd	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: LeaseCan → Joe_Payne	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: Beechvale_Group → LeaseCan	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:34
[DA6060712]	Transfer: Alfa_Romeo → Beechvale_Group	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:19
[DA6060712]	Update: Alfa_Romeo	Registration: UNDEFINED → NL16 DTU	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Colour: UNDEFINED → Blue	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Model: UNDEFINED → MiTo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Make: UNDEFINED → Alfa Romeo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	VIN: 0 → 880352730316924	18/02/2016 14:38
[DA6060712]	Transfer: DVLA → Alfa_Romeo	Vehicle Template	18/02/2016 14:22
[DA6060712]	Create: DVLA	Create V5C	18/02/2016 14:21

4. Other users can only see part of the lifecycle of the vehicle. They are able to see what happened to the vehicle prior to their ownership and whilst they owned it but cannot see what happened to the vehicle after they transferred it.

Click the three lines in the top right corner of the page to view the ledger as another user. In the dropdown that appears hover over “Lease Companies” then click “Lease Can”.

The screenshot shows the IBM Blockchain Asset Transfer Demo interface. At the top, there is a header with the IBM logo and the text "BLOCKCHAIN ASSET TRANSFER DEMO". Below the header, there is a navigation bar with a "Home" link. On the right side of the navigation bar, there is a dropdown menu icon (three horizontal lines). The dropdown menu is open, showing a list of users: "Regulators", "Manufacturers", "Dealerships", "LeaseCan" (highlighted with a red circle), "Lease Companies" (highlighted with a red circle), "Leasees", and "Scrap Merchants". Below the dropdown menu, there is a search bar with the text "DA6060712". To the right of the search bar, there are two buttons: "Filters v" and "Sort v". Below the search bar, there is a table with the following data:

ID	Event	Details	Timestamp
[DA6060712]	Scrap: Cray_Bros_(London)_Ltd	Scrap V5C	18/03/2016 10:49
[DA6060712]	Transfer: Joe_Payne → Cray_Bros_(London)_Ltd	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: LeaseCan → Joe_Payne	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: Beechvale_Group → LeaseCan	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:34
[DA6060712]	Transfer: Alfa_Romeo → Beechvale_Group	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:19
[DA6060712]	Update: Alfa_Romeo	Registration: UNDEFINED → NL16 DTU	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Colour: UNDEFINED → Blue	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Model: UNDEFINED → MiTo	18/02/2016 14:38

5. The table has now changed and although the user can see the car they can't see what happened after it was transferred to “Joe Payne”.

The screenshot shows the IBM Blockchain Asset Transfer Demo interface. At the top, there is a header with the IBM logo and the text "BLOCKCHAIN ASSET TRANSFER DEMO". Below the header, there is a navigation bar with a "Home" link. On the right side of the navigation bar, there is a dropdown menu icon (three horizontal lines). The dropdown menu is open, showing a list of users: "Regulators", "Manufacturers", "Dealerships", "LeaseCan" (highlighted with a red circle), "Lease Companies" (highlighted with a red circle), "Leasees", and "Scrap Merchants". Below the dropdown menu, there is a search bar with the text "Search by V5C ID...". To the right of the search bar, there are two buttons: "Filters v" and "Sort v". Below the search bar, there is a table with the following data:

ID	Event	Details	Timestamp
[DA6060712]	Transfer: LeaseCan → Joe_Payne	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: Beechvale_Group → LeaseCan	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:34
[DA6060712]	Transfer: Alfa_Romeo → Beechvale_Group	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:19
[ZE3286321]	Transfer: Beechvale_Group → LeaseCan	[720965981630055] Toyota Yaris, Red, QD65 YKR	18/02/2016 14:40
[JM1779586]	Transfer: Beechvale_Group → LeaseCan	[287437467447767] Toyota Auris, Blue, LM16 YHU	18/02/2016 14:40
[ZE3286321]	Transfer: LeaseCan → Joe_Payne	[720965981630055] Toyota Yaris, Red, QD65 YKR	18/02/2016 14:40
[GK8420732]	Transfer: Beechvale_Group → LeaseCan	[181255391772389] Jaguar XJ, Black, FM65 ESL	18/02/2016 14:39
[DA6060712]	Update: Alfa_Romeo	VIN: 0 → 880352730316924	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Make: UNDEFINED → Alfa Romeo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Model: UNDEFINED → MiTo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Colour: UNDEFINED → Blue	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Registration: UNDEFINED → NL16 DTU	18/02/2016 14:38
[GK8420732]	Transfer: Jaguar_Land_Rover → Beechvale_Group	[181255391772389] Jaguar XJ, Black, FM65 ESL	18/02/2016 14:34
[GK8420732]	Update: Jaguar_Land_Rover	Model: UNDEFINED → XJ	18/02/2016 14:29
[GK8420732]	Update: Jaguar_Land_Rover	Colour: UNDEFINED → Black	18/02/2016 14:29
[GK8420732]	Update: Jaguar_Land_Rover	Registration: UNDEFINED → FM65 ESL	18/02/2016 14:29
[GK8420732]	Update: Jaguar_Land_Rover	VIN: 0 → 181255391772389	18/02/2016 14:28
[GK8420732]	Update: Jaguar_Land_Rover	Make: UNDEFINED → Jaguar	18/02/2016 14:28
[ZE3286321]	Transfer: Toyota → Beechvale_Group	[720965981630055] Toyota Yaris, Red, QD65 YKR	18/02/2016 14:26

6. Copy The V5C ID **DA6060712** and use the search feature to show only the history of the one vehicle:

The screenshot shows the IBM Blockchain Asset Transfer Demo interface. At the top, the IBM logo is on the left and 'BLOCKCHAIN ASSET TRANSFER DEMO' is on the right. Below the logo, there is a 'Home' link and a user profile 'Lesley (Lease Company: LeaseCan)' with a menu icon. A search bar contains the text 'DA6060712', which is highlighted with a red circle. To the right of the search bar are 'Filters v' and 'Sort v' buttons. Below the search bar is a table with 10 rows of vehicle history data.

[DA6060712]	Transfer: LeaseCan → Joe_Payne	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:42
[DA6060712]	Transfer: Beechvale_Group → LeaseCan	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:34
[DA6060712]	Transfer: Alfa_Romeo → Beechvale_Group	[880352730316924] Alfa Romeo MiTo, Blue, NL16 DTU	18/03/2016 10:19
[DA6060712]	Update: Alfa_Romeo	VIN: 0 → 880352730316924	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Make: UNDEFINED → Alfa Romeo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Model: UNDEFINED → MiTo	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Colour: UNDEFINED → Blue	18/02/2016 14:38
[DA6060712]	Update: Alfa_Romeo	Registration: UNDEFINED → NL16 DTU	18/02/2016 14:38
[DA6060712]	Transfer: DVLA → Alfa_Romeo	Vehicle Template	18/02/2016 14:22
[DA6060712]	Create: DVLA	Create V5C	18/02/2016 14:21

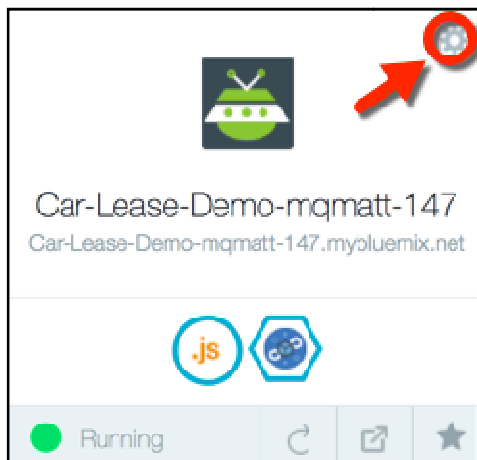
As you can see the user can see the entire lifecycle of the car from before they owned it up until they transferred it.

Appendix A. Removing the sample application

This appendix shows how to stop and remove the blockchain service you created.

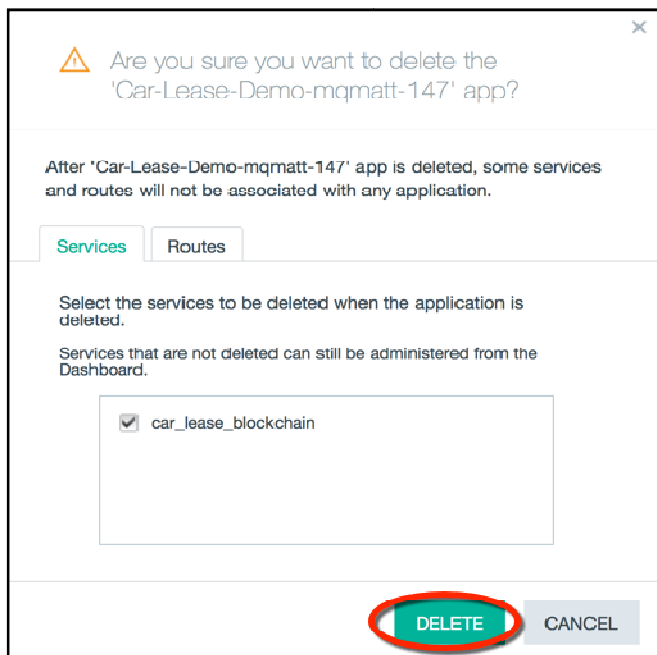
__1. Return to the Bluemix Dashboard by clicking **DASHBOARD**.

__2. Click the Settings icon in the car lease demo application.



__3. Select 'Delete App' from the menu.

__4. Ensure that the 'car_lease_blockchain' service is also selected for deletion and click 'Delete'.



__5. Wait for the items to be stopped and deleted. Once this is done, both the application and the associated service will no longer be visible in the Bluemix dashboard.

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