



# Ethereum

## Blockchain Development

### Week 3

Dr Ian Mitchell

## 1 Linux

If using another operating system create a virtual machine with Ubuntu. If you are already using Linux then you should not need to do anything. Much of what we do will be based on Ubuntu 18.04 LTS (64 bit).

Create a directory CST4025 and a subdirectory 3. Save all your work in this directory.

## 2 CTO - Trader Example - MyFirstBlockchain

The trader example is available at:

<https://hyperledger.github.io/composer/latest/tutorials/developer-tutorial.html>

Open your EthereumVM.

Start a new blockchain example.

### 2.1 Trader Assets

The trader example is a simple description of an asset changing ownership via a transaction. Complete the access control tutorial at:

<https://hyperledger.github.io/composer/v0.19/tutorials/acl-trading.html>

### 3 Pizza

Download pizza. Create a new network. Now create rules for the following.

### 4 Car Owner

Use the car owner CTO you used from last week. The CTO should include:

- Participant: individual, name, id, address
- Asset: car, reg, make, model, and a relationship of owner (an individual who owns the car)
- Transaction: should facilitate the change of ownerships between different individuals

Write a list of at least three rules, list these rules then write the associate ACL.

### 5 Bank

Before designing the data model for the bank and line-of-credit model. Look at some of the other examples available on hyperledger composer. Finally, look at the model carefully and design a CTO for the bank and line-of-credit example we discussed in the lecture.

### 6 Coursework

You need to think of a blockchain application. None of the examples on hyperledger, or in the series of tutorials, is permitted. Your idea needs to be original and fairly complex, to reflect the complications we experience from day to day. If you have an idea discuss this with your tutor and start to think of the data model exercise.

```
1 /*
2  * Licensed under the Apache License, Version 2.0 (the "License");
3  * you may not use this file except in compliance with the License.
4  * You may obtain a copy of the License at
5  *
6  * http://www.apache.org/licenses/LICENSE-2.0
7  *
8  * Unless required by applicable law or agreed to in writing, software
9  * distributed under the License is distributed on an "AS IS" BASIS,
10 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
11 * See the License for the specific language governing permissions and
12 * limitations under the License.
13 */
14 /**
15  * Commodity trading network
16  */
17 namespace org.example.trading
18
19 asset Commodity identified by tradingSymbol {
20     o String tradingSymbol
21     o String description
22     o String mainExchange
23     o Double quantity
24     --> Trader owner
25 }
26
27 participant Trader identified by tradeId {
28     o String tradeId
29     o String firstName
30     o String lastName
31 }
32
33 transaction Trade {
34     --> Commodity commodity
35     --> Trader newOwner
36 }
37
38 event TradeNotification {
39     --> Commodity commodity
40 }
41
42 transaction RemoveHighQuantityCommodities {
43 }
44
45 event RemoveNotification {
46     --> Commodity commodity
47 }
```

Figure 1: Trader Code for CTO, taken from Hyperledger website

## 6.1 ACL for coursework

Continue with your development of the CTO for your application. Start thinking of the access control required when writing the CTO, use comments to remind yourself about how to restrict access. Finally, to get ahead, start to write the rule descriptions for the ACL.

## 6.2 Preparation for Formative Feedback next week

For next week bring along your CTO file and Dr Ian Mitchell will give you some feedback for your submission the following week.