IBM Watson IoT
Hyperledger Composer Application Demo using Node-RED

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Hyperledger Composer App

Hyperledger Fabric running on IBM Container Service

I created this application to learn about:

1. Blockchain use cases
2. Kubernetes
3. IBM Container Service
4. Hyperledger Fabric
5. Hyperledger Composer
6. Hyperledger Composer REST APIs
7. Node-RED Dashboard

IBM
Storm Alert Node-RED Dashboard

Blockchain Storm Demo

Create a Storm Event

Enter New Storm name
Storm Name *

Initial Severity *

SUBMIT CANCEL

Issue Storm Alert

Harvey
Create Alert
Description

SUBMIT CANCEL

Severity Warning

Change Storm Severity

Storm Severity

Alerts for Storm Harvey (CAT 2)
High Winds
Power Outages
Flooding
Hyperledger Composer Playground

- Create a Blockchain Business Network
- Track Storms
  - (Assets)
- Track Alerts
  - (Transactions)
- Change Severity
  - Transactions that modify asset properties

You must import identity cards with the correct admin rights for deploying new business networks.

Learn more.
Hyperledger Composer
Storm Model

- Define
- Assets
- Transactions
- Properties
- Participants
- Chaincode

```
/**
 * Sample business network definition.
 */
namespace org.acme.sample

/**
 * Participants
 */
abstract participant SampleParticipant identified by participantId {
  o String participantId
  o String orgName
  o Boolean notified
}
participant FirstAlert extends SampleParticipant {}
participant Hospital extends SampleParticipant {}
participant Bank extends SampleParticipant {}
participant FireDepartment extends SampleParticipant {}
participant InsuranceCompany extends SampleParticipant {}
participant PoliceDepartment extends SampleParticipant {}
```

Everything looks good!
Any problems detected in your code would be reported here
Hyperledger Composer

Storm REST APIs

- Swagger OpenAPI documentation

<table>
<thead>
<tr>
<th>Hyperledger Composer REST server</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alert</strong>: A transaction named Alert</td>
</tr>
<tr>
<td><strong>Bank</strong>: A participant named Bank</td>
</tr>
<tr>
<td><strong>BeginStorm</strong>: A transaction named BeginStorm</td>
</tr>
<tr>
<td><strong>EndStorm</strong>: A transaction named EndStorm</td>
</tr>
<tr>
<td><strong>FireDepartment</strong>: A participant named FireDepartment</td>
</tr>
<tr>
<td><strong>FirstAlert</strong>: A participant named FirstAlert</td>
</tr>
<tr>
<td><strong>Hospital</strong>: A participant named Hospital</td>
</tr>
<tr>
<td><strong>InsuranceCompany</strong>: A participant named InsuranceCompany</td>
</tr>
<tr>
<td><strong>PoliceDepartment</strong>: A participant named PoliceDepartment</td>
</tr>
<tr>
<td><strong>Storm</strong>: An asset named Storm</td>
</tr>
<tr>
<td><strong>System</strong>: General business network methods</td>
</tr>
<tr>
<td><strong>updateStormSeverity</strong>: A transaction named updateStormSeverity</td>
</tr>
<tr>
<td><strong>UpdateStormStatus</strong>: A transaction named UpdateStormStatus</td>
</tr>
</tbody>
</table>

BASE URL: /api, API VERSION: 1.0.0

https://openblockchain.readthedocs.io/en/latest/API/CoreAPI/
Storm Alert Node-RED Dashboard

Blockchain Storm Demo

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SUBMIT CANCEL

Severity Warning
Change Storm Severity
Storm Severity
2 units
Blockchain Node-RED Flow

1. Create a "Storm" Asset on the Blockchain
2. Fill the dropdown with a list of "Storm" Assets
3. Query the list of "Alert" Transactions attached to a Blockchain Asset
4. Change a "Severity" attribute of a Blockchain "Storm" Asset
5. Add an "Alert" Transaction to a Blockchain "Storm" Asset
Node-RED and Hyperledger APIs

Live demo / code review of a Node-RED flow which calls Hyperledger Composer REST APIs and creates a dashboard

- Node-RED Dashboard
  - Forms
  - Dropdown
  - Slider
  - Gauge
  - Template
- Node-RED HTTP Request Nodes
Build with Watson

References:
• https://ibm-blockchain.github.io/
• https://hyperledger.github.io/composer/reference/glossary.html
• https://nodered.org/
• https://console.bluemix.net/containers-kubernetes/catalog/cluster
• https://www.coursera.org/learn/developer-nodered

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