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#LifeKoKaroLift

SOLUTION IMPLEMENTATION PART - 2 (API SERVER)

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Course:

Topic: Solution Implementation Part -2 (API Server)

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RECAP

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1. Structuring smart contract application
2. Libraries used for smart contract development
3. Developing smart contracts
4. Hands-on exercise

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TODAY'S AGENDA

- Introduction
- Fabric SDK
  - Identity creation
  - Interacting with smart contracts
- Express.js
- UPSTAC application API server (a walkthrough)

INTRODUCTION

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- API server is an integral part of any application.
- Conventional API applications use databases to store data. API servers use connector libraries to write and read from these databases.
- In our application, we are storing data in smart contracts. To this end, we will use Fabric SDK library to interact with smart contracts.

fabric-network

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- Provides higher level APIs to interact with blockchain
- Gateway class in this is entry point to interact with fabric
- It enables connection to peers and access to channels through network class
- Access to smart contract is provided by contracts class
- Contract class lets user submit transactions and read data from chaincode

Fabric SDK

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- Fabric SDK facilitates interaction between APIs and smart contracts. This SDK allows:
  - Generation of identity
  - Writing to blockchain
  - Reading from blockchain

GENERATING IDENTITIES

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- Identity types:
  - Admin
  - User
  - Peer

- Functions:
  - register
  - enroll
  - revoke
  - re-enrol

WALLETS AND VAULTS

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- Wallet types:
  - File system
  - Memory
  - HSM
  - Database

- Vaults

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IDENTITY CREATION (UPSTAC Walkthrough)

INTERACTING WITH SMART CONTRACTS

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- Initialise gateway object
- Read identity from wallet
- Read connection profile
- Connect to desired network
- Choose network and channel
- Create transaction request
- Submit transaction
- Process response

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SMART CONTRACT INTERACTION (UPSTAC Walkthrough)

Introduction to Express.js

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- It is an open source framework developed by Node.js foundation
- Lightweight web application framework
- Widely used to write server APIs.
- Helps to organise server side applications in more modular fashion.
- Highly scalable and interoperable

Features of Express.js

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- Routing
- Middlewares
- Template Engines
- Error Handling
- Debugging

Routing in Express.js

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- It refers to how server application responds to client request. Request is a URI and an HTTP method
- Each route has functions that are executed when URI matches to the route.
- app.Method(path,callback[callback...])
    - App ➜ expressjs instance
    - Method ➜ HTTP request method
    - Path ➜ path on server. (Matches with URI)
    - Callback ➜ function to be executed

Middleware

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- These are functions that have access to request and response objects
- Generally called before routes callbacks
- They can perform any task
- Used to make changes to request and response object
- Perform some actions required for all the routes (eg. Authentication)

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API SERVER
(UPSTAC Walkthrough)

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In this class, you learnt

- Use of Fabric SDK to:
  - Create identities
  - Interact with smart contracts
- Creation of APIs using Express.js
- UPSTAC API server (a walkthrough)

HOMEWORK

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- Add API in UPSTAC application to delete user data.

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NEXT STEPS

- End to end demo of UPSTAC application
- Event listener

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Thank You!