Course Outline

Developing on Hyperledger Fabric 1.4

Course Summary

Description

This Hyperledger training course is designed for developers who want to take a comprehensive deep dive on Hyperledger Fabric v1.4. This course has been created to walk you through Chaincode Development, Testing, and Deployment for a Hyperledger Fabric Network catering specifically toward Golang written Chaincode (Fabric's original Chaincode Language) . Additionally as an Application Developer you will learn how to write, and prepare Client Applications using the most mature Standard Development Kit in Hyperledger Fabric, NodeJS.

This course has been meticulously put together and taught by world-class subject matter experts. The live training expert will walk you through both overview topics and deep dive topics, such as steps to integrate/develop an application with Hyperledger Fabric v1.4. There are use cases, proof of concepts, as well as interactive lab work about the concepts.

Objective

Upon completion of this course, Students will:

- Understand why Blockchain is needed and where
- Explore the major components of Blockchain
- Learn about Hyperledger Fabric and the structure of the Hyperledger Architecture
- Lean the features of the Fabric model including chaincode, SDKs, Ledger, Security and Membership Services
- Perform comprehensive labs on writing chaincode
- Explore the architecture of Hyperledger Fabric
- Understand and perform in depth labs on Bootstrapping the Network
- Perform comprehensive labs to integrate/develop an application with Hyperledger Fabric running a smart contract
- Build applications on Hyperledger Fabric

Topics

- Introduction to Blockchain
- How Blockchain Works
- Introduction To Hyperledger Fabric
- Getting Started With Fabric Model
- Chaincode
- Architecture Of Hyperledger Fabric
- Bootstrappping
- Introduction To Hyperledger Explorer
- Introduction to Hyperledge Composer
- Hyperledger Composer Playground

Prerequisites

This course is highly technical in nature and would require the student to be comfortable with coding. To prepare for the class all students MUST:

- Familiarity with Hyperledger Fabric Component Structure & purposes
- Knowledgeable on Golang Basics & Node JS basics
- Minimal Command Line Interface Familiarity

Duration

Three Days

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I. ***Introduction to Blockchain***
- A. What is Blockchain
- B. Types of network
  1. Public network
  2. Permissioned network
  3. Private network
- C. Need for Blockchain Components of Blockchain
  1. Consensus
  2. Provenance
  3. Immutability
  4. Finality
- D. Where can Blockchain be used
- E. Example on Blockchain

II. ***How Blockchain Works***
- A. How Blockchain Works
- B. Structure of Blockchain
  1. Block
  2. Hash
  3. Blockchain
  4. Distributed
- C. Lifecycle of Blockchain
- D. Smart Contract
- E. Consensus Algorithm
  1. Proof of Work
  2. Proof of Stake
  3. Practical Byzantine
  4. Fault Tolerance
- F. Actors of Blockchain
  1. Blockchain developer
  2. Blockchain operator
  3. Blockchain regulator
  4. Blockchain user
  5. Membership service provider
- G. Building A Small Blockchain Application

III. ***Introduction To Hyperledger Fabric***
- A. Introduction to Hyperledger
  1. What is Hyperledger
  2. Why Hyperledger
  3. Where can Hyperledger be used
- B. Hyperledger Architecture
  1. Membership
  2. Blockchain
  3. Transaction
  4. Chaincode
- C. Hyperledger Fabric
- D. Features of Hyperledger
- E. Fabric Installation of prerequisite

IV. ***Getting Started With Fabric Model***
- A. The Fabric Model
- B. Features of Fabric Model
  1. Chaincode
  2. SDKs
  3. Ledger
  4. Privacy through channels
  5. Security and Membership services
  6. Assets
  7. Consensus
- C. Components of Fabric Model
  1. Peer
  2. Orderer
  3. Certificate Authority
- D. Building your network

V. ***Chaincode***
- A. Chaincode
  1. Chaincode API
  2. How to write a Chaincode
  - Lab Work

VI. ***Architecture Of Hyperledger Fabric***
- A. Architecture of Hyperledger Fabric
  1. Transaction
  2. Ledger
  3. Nodes
  4. Peer
  5. Endorser
  6. Ordering Nodes
  7. Channels
  8. Certificate Authority
- B. Transaction Flow
  - Lab Work

VII. ***Bootstrappping***
- A. Bootstrapping the Network
- B. Introduction
  - Lab Work
  - Task 1 - Generate the crypto material for the various participants.

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Course Outline (cont.)

- Task 2 - Generate the genesis block for the Orderer node and start ordering service (solo node).
- Task 3 - Generated the configuration transaction block to create a new channel.
- Task 4 - Sign the configuration block and create the new channel.
- Task 5 - Make peers of all the organizations join the channel that we created in Task 4

VIII. ***Introduction To Hyperledger Explorer***

A. Introduction To Hyperledger Explorer
B. Block Details Peer List
C. Chaincode List
D. Transaction Details
E. Installation of Hyperledger Explorer
F. Starting the Explorer App

IX. *Introduction to Hyperledge Composer*

A. Introduction
B. Components of Hyperledger Composer
C. Benefits of Hyperledger Composer
D. Key Concepts
E. Hyperledger Composer Solution
F. Installation

X. ***Hyperledger Composer Playground***

A. Hyperledger Composer Playground
B. Introduction
C. Playground Overview Lab Work

Labs:

- Writing the Chaincode
- Unit Testing Using Mockstub
- Packaging & Deploying the Chaincode
- Creating the Connection Profile
- SDK Development Pt 1
- SDK Development Pt 2