Amazon Managed Blockchain

How to build an application with Amazon Managed Blockchain

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Housekeeping

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Housekeeping

- Everyone on mute
- During the hands-on part, I'll explain every step in detail
- We are recording the session
- If you have questions use the chat box
- We will answer questions in the chat box during the webinar
- We will spend time on Q&A at the end of the webinar
- We have our team leads on the call: Product: Jon Fritz (jonfritz@) & Mert Hocanin (hocanint@), Business Development: Shruthi Rao (shrurao@), Marketing: Chirag Dhull (cdhull@)

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Agenda

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Agenda

Hands-on: create a Fabric network on Amazon Managed Blockchain

Discussion: where are the Fabric components located, and how to interact with the network

Discussion: smart contracts, or ‘chaincode’

Hands-on: create channels, deploy chaincode

Discussion: Hyperledger Fabric SDK

Hands-on: deploy RESTful API server, which uses Fabric SDK

Hands-on: deploy web application

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Hands-on webinar objectives

We will create a Fabric network on Amazon Managed Blockchain, then deploy an application that interacts with the Fabric network:

- Create a Fabric network on Amazon Managed Blockchain
- Create a peer node in the network
- Create a new channel, install and instantiate chaincode
- Query the chaincode and invoke transactions
- Deploy a RESTful API which connects to the Fabric network and exposes the chaincode functions as REST endpoints
- Test the RESTful API
- Deploy a Node.js web application that calls the RESTful API

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Announcing

General availability of Amazon Managed Blockchain

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Hyperledger Fabric available today and Ethereum coming soon

AMB is now ready for production workloads with availability in US East (N. Virginia)

- Customers can simply go to the AWS Management Console and get started
- For more info go to https://aws.amazon.com/managed-blockchain

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Resources

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Blogs

- https://aws.amazon.com/blogs/database/build-and-deploy-an-application-for-hyperledger-fabric-on-amazon-managed-blockchain/
- https://aws.amazon.com/blogs/database/add-new-members-to-a-hyperledger-fabric-channel-on-amazon-managed-blockchain/

GitHub repo

- https://tinyurl.com/y7h6369b
- https://github.com/aws-samples/non-profit-blockchain

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Amazon Managed Blockchain

Fully-managed blockchain service, supporting both Hyperledger Fabric and Ethereum frameworks

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What is Amazon Managed Blockchain?

Amazon Managed Blockchain is a fully-managed service that makes it **easy** to create and manage scalable blockchain networks using popular open source frameworks: **Hyperledger Fabric** and **Ethereum**

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Let’s get started

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Let’s get hands-on

Create the Fabric network on Amazon Managed Blockchain

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Hyperledger Fabric components

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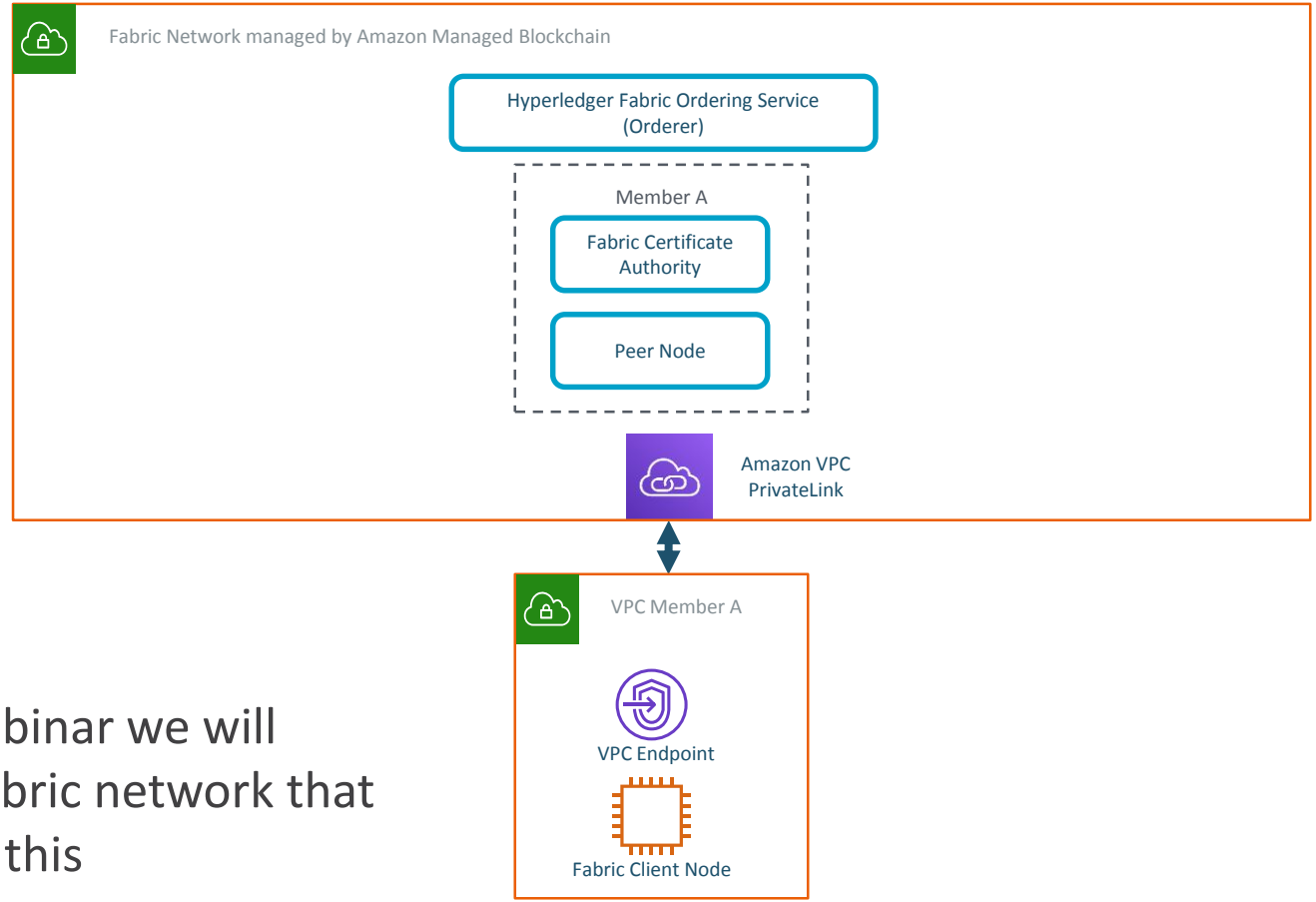

In this webinar we will build a Fabric network that looks like this

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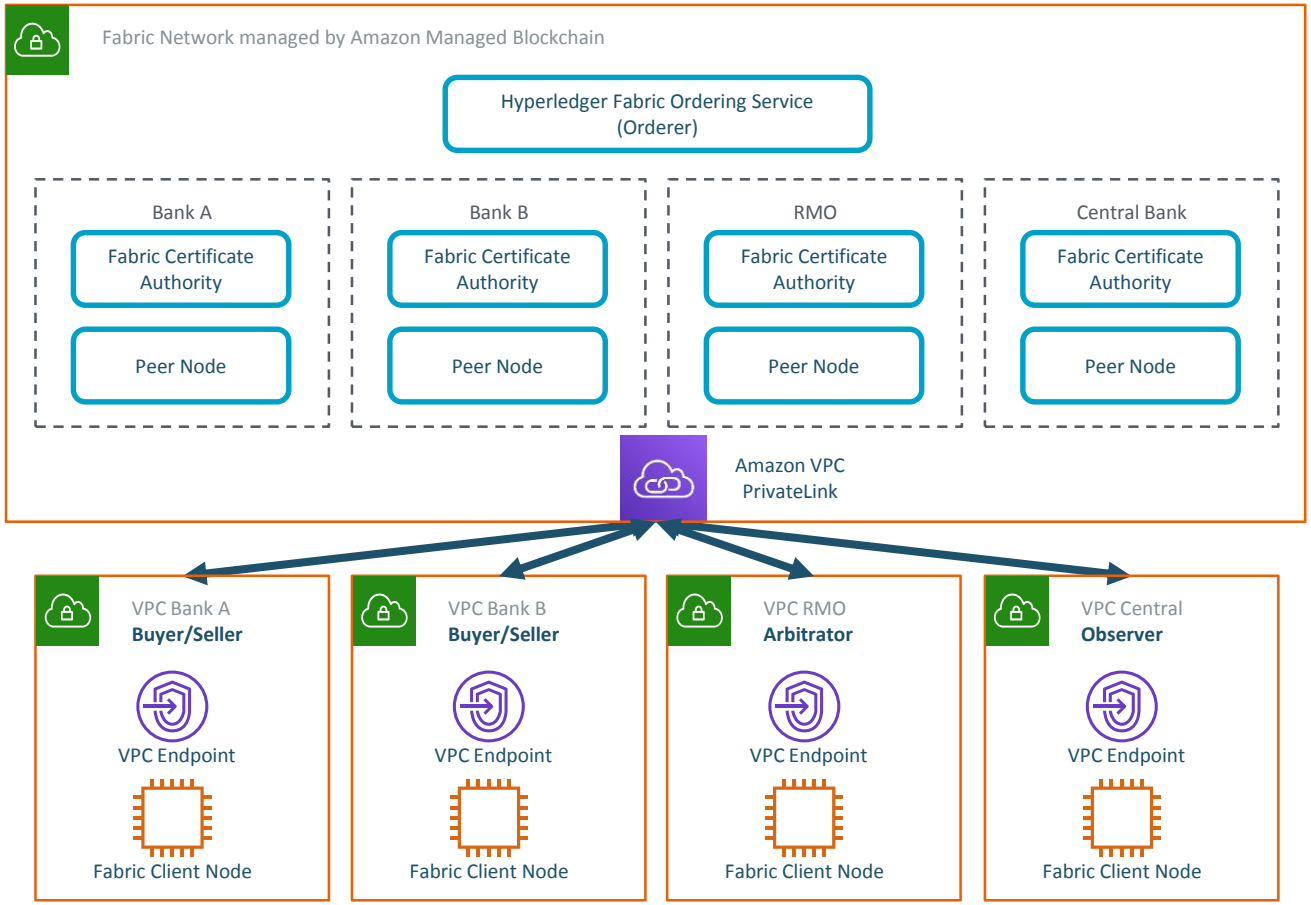

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Typical layered architecture

Layers we will build in this webinar:

1. Hyperledger Fabric network & chaincode that executes on the Fabric peer node
2. A RESTful API that uses the Hyperledger Fabric Client SDK to interact with the Fabric network
3. A user interface application that calls the API

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Enough talking, Edge; get back to building

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Hyperledger Fabric Chaincode

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Chaincode basics

- Code executed on the network, that can query and update ledger
- Fabric supports chaincode in three languages:

- Chaincode executes within a Docker container on peer nodes
- Chaincode has two operations in its interface:
  - Init()—Initializes the chaincode with parameters
  - Invoke()—Invokes the chaincode with parameters

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Chaincode example

Let’s take a look at chaincode written in Node.js

- https://github.com/aws-samples/non-profit-blockchain/blob/master/ngo-chaincode/src/ngo.js
- Lines 400 onwards show the implementation of the chaincode interface
- Line 455 shows how to add a new Donor to the ledger

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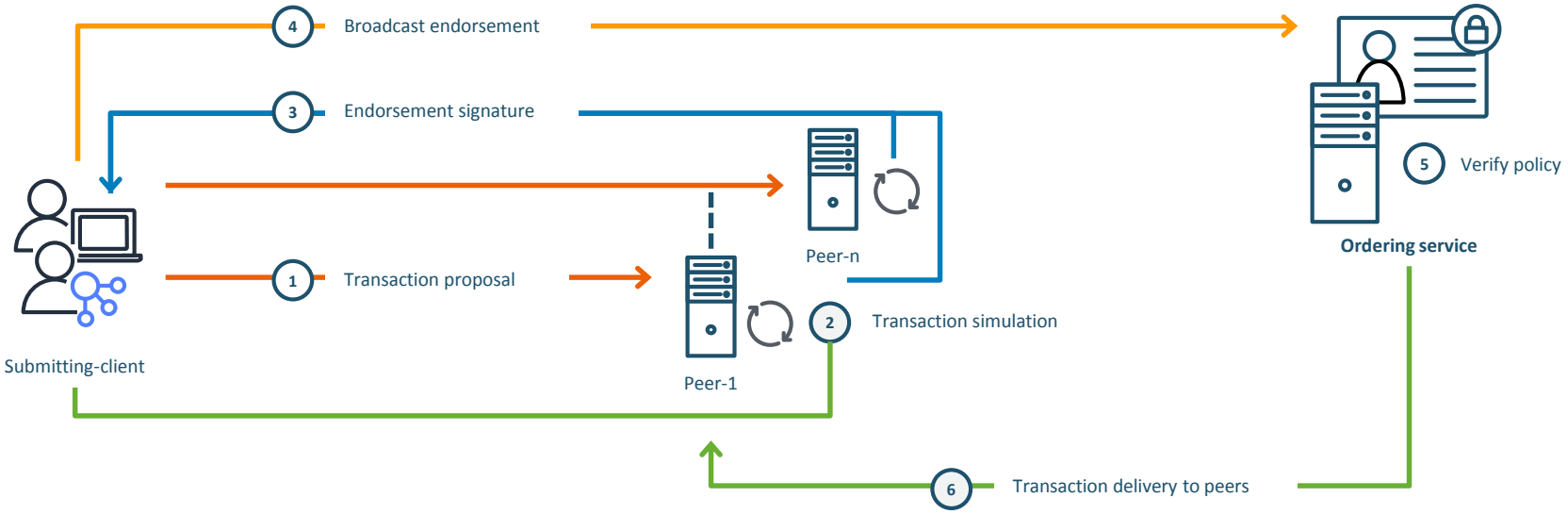
Transaction flow with Hyperledger Fabric



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Enough talking, Edge; deploy that chaincode

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Hyperledger Fabric SDK

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Hyperledger Fabric SDKs

- Fabric provides SDKs in Node.js and Java
- Coming soon are SDKs for Go, Python and a REST SDK
- The SDK allows you to
  - Register and enroll users
  - Create & join channels
  - Install & instantiate chaincode
  - Invoke transactions
  - Query the ledger

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Hyperledger Fabric SDKs—example

Let’s take a look at how to use the Fabric SDK

- https://github.com/aws-samples/non-profit-blockchain/blob/master/ngo-rest-api/app.js
- Line 203 shows how to post a new Donor—this calls the `createDonor` chaincode method we looked at earlier
- https://github.com/aws-samples/non-profit-blockchain/blob/master/ngo-rest-api/invoke.js
- The request is sent to the peer nodes for endorsement (line 51)
- All endorsements are packaged and sent to the orderer (line 127)

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Enough talking, Edge; wrap up the hands-on part

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Summary

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Summary of today's webinar

- We announced GA of Amazon Managed Blockchain
- We stepped through a hands-on lab where we created a Fabric network on Amazon Managed Blockchain
- On top of that network we deployed a RESTful API that talks to the network, and a web application that uses the RESTful API
- We discussed where the Fabric components located, how you would interact with the Fabric network
- We discussed chaincode, and how to use the Fabric SDK

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Channels

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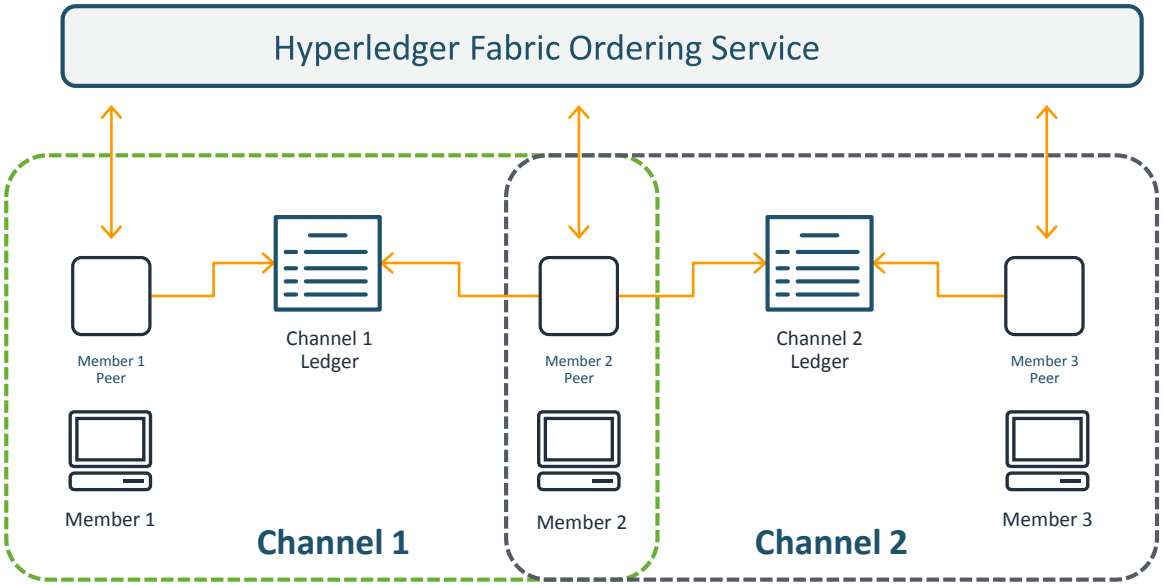
Channels for access control

Channels allow isolation of transactions among specific members in the network

Create or update a channel with configuration transaction (configtx)



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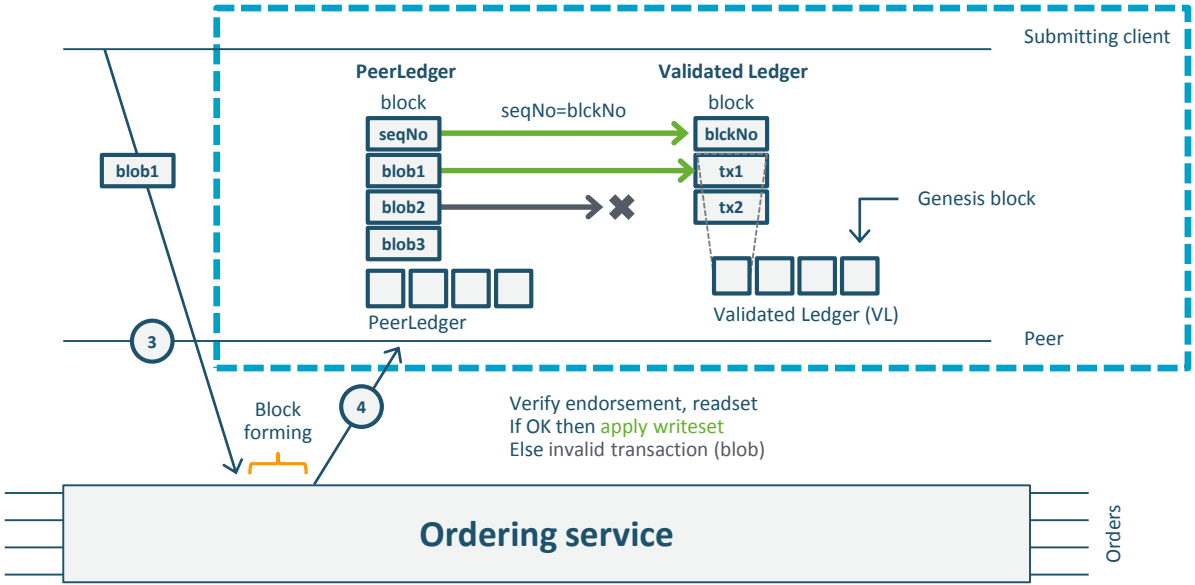
Peer nodes

- Stores a copy of the ledger database
- Executes chaincode and endorses transactions
- Validates transactions before the final commit to ledger



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