DAML

DAML Certification Syllabus

DAML Applications Engineer

October 2020

Introduction

DAML Applications Engineer Certification Exam

The DAML Applications Engineer exam is the entry-level exam in the DAML Application track. The exam covers all that a developer needs to know to produce an application that depends on a DAML back-end for business logic and data persistence.

In the certification exam, you will be tested on understanding API queries, general understanding of the operations of a DAML application (e.g., creating and consuming contracts and choices), managing data types, and handling error messages.

This certification exam does not cover how to create DAML contracts (i.e., business logic; covered in “DAML Contracts”) or operate a DAML back-end (i.e., DAML Runtime + ledger; not yet covered in a certification exam).

DAML-Certification Program

The DAML Applications Engineer is the entry level exam in the DAML Applications track. The DAML Applications track tests you on the technical knowhow to develop applications that depend on a DAML back-end for business logic and data persistence. APIs, general DAML contract operation, data types, development stack, and error handling are covered in this track.

Prerequisites

Minimum

- Working knowledge of the DAML JSON API, Ledger API, data types, and common tool chains
- Experience using at least one of these: JSON API, gRPC, Websocket, or related technologies
- Familiarity with asynchronous workflows

Helpful but Not Necessary

- Working knowledge of at least one of the following languages: Java, Scala, Javascript, or Typescript
- Some knowledge of how distributed ledgers operate
- Some knowledge of functional programming languages

Exam Outline

The exam takes approximately 90 minutes to complete and will be conducted online at the time of your choosing. Questions will be a combination of multiple choice and matching exercises.

The 34 exam questions will be separated into 4 main topics. The total score on each topic counts as a percentage of your final score as shown below. Each topic will be scored separately, with all questions for a topic having the same weight.

The exam score will be the total of the topic scores. To be DAML-certified, you must have a total exam score of 70%.

Exam Topics

You will be tested on your knowledge and proficiency in the following:

JSON API [1] (45%)

- Creating contracts
    - How to pass a JSON-encoded request to the JSON API
    - Uniquely identifying commands for later use
- Exercising choices on contracts
- Performing a Create and Exercise command in the same transaction
- Retrieving contracts

    - How to construct queries to retrieve the currently active set (or a subset) of contracts visible or usable by a specific party
    - Fetching a contract by its Contract ID or Contract Key
- Handling parties
    - How to construct queries to retrieve all known parties visible on ledger
    - Fetching parties by Identifiers
- Handling responses and error codes from JSON API queries
- Creating and using JWT authentication token to authenticate with the JSON API
    - Pass the authentication token over HTTP and Websockets

Ledger API [1] [2] (45%)

- Sending commands to the ledger
    - How to send commands to the ledger that may change its state
    - How to get the status of commands submitted to the ledger
    - When and how to choose between services
    - Understanding the command deduplication functionality of DAML ledgers
- Receiving streams of data (transactions and events) from the ledger
    - Listening to changes in the ledger state
    - Resuming a connection from an arbitrary starting point to ensure your application can resume from any interruption
    - Understanding the types of subscriptions for transactions
    - What data is included in responses and how to get more data (Record IDs, Field Labels, Variant IDs) when you need it
    - Getting a view of all contracts currently visible to your party
- DAML type translation to Protobuf and DAML LF

Data Types [1] [2] (5%)

- General DAML and DAML-LF data types and how DAML datatypes translate to DAML LF
- Passing data to and from DAML applications via the JSON API (via JSON formatted messages)

Common Toolchains [1] (5%)

- Toolchains that have Ledger API bindings
- Generating classes from DAML templates
- DAML's codegen tool

Example Questions

Correct answers are marked in **bold**

Tracking Contracts

What are the TWO unique ids you can use to exercise a choice on a contract using the JSON API?

- Command ID
- Record Key
- **Contract ID**
- **Contract Key**

Auth

What is the JWT used for with the JSON API?

- The JSON API uses it to authenticate with the DAML Ledger
- **It authorizes actions on behalf of a party**
- It's not used with the JSON API

Tracking Submissions

Which TWO services can you use to get the status of commands via the Ledger API?

- **Command Submission Service**
- Command Orchestration Service
- Status Service
- **Command Service**

Tracking Contracts

When would you use the Command Completion Service instead of the Transaction Service?

- When you want to know the completion status of all commands
- **When you want to know the status of specific commands you have submitted**
- When you need to know if another party's command was completed

Data Types

Do you need to include the UTC time zone designator in a Timestamp sent to the JSON API?

- No, the JSON API will assume all times are UTC
- **Yes, you must include the UTC ("Z") designation**