REST APIs – Designing, Specifying (OpenAPI) and Generating (OpenAPI-Generator)

Design API, Write Spec, Autogen client/server code

A REST API is the most practical way of connecting clients and servers in a distributed heterogeneous world.

We start by discovering what is involved in creating high-quality REST APIs and how to best go about designing them, in a contract-first manner. Later in the course we also explore advanced API design topics.

Then we need to specify the API. OpenAPI is essentially a well-written standard for a messaging schema, describing the messages and their headers and body contents. "The OpenAPI Initiative (OAI) was created by a consortium of forward-looking industry experts who recognize the immense value of standardizing on how REST APIs are described."

Once we have written our OpenAPI schema, the final task is to generate code to produce and consume messages that comply with that schema. For this, we use the OpenAPI Generator open source project. "OpenAPI Generator allows generation of API client libraries (SDK generation), server stubs, documentation and configuration automatically given an OpenAPI Spec". It supports dozens of languages/frameworks.

Contents of One-Day Training Course		
Target Audience Software architects and senior developers tasked with efficiently creating and/or consuming REST APIs **Prerequisites** Sound understanding of at least one client programming environment and one server environment (from the OpenAPI Generator list of supported languages) Some previous experience of network programming would be useful.	**Need for REST APIs** Representational state transfer Principles of REST architecture Reliably connecting distributed pieces of functionality **Review of JSON and YAML** How we represent information on the wire JavaScript Object Notation (advanced) "YAML Ain't Markup Language" What enhancements YAML brings **Tasks To Build REST APIs** Need to consider design of API Need to specify API Need to generate client library to call API Need to integrate client library with UX Need to generate server stubs to host API Need to integrate server stubs with DB, etc Need to comprehensively test everything **Designing a REST API** What to take into consideration Functionality discoverability Identifying resources and selecting verbs Integration with HTTP methods **OpenAPI Overview** OpenAPI Initiative (Linux Foundation) The OpenAPI specification (https://github.com/OAI/OpenAPI-Specification/tree/master/versions) **OpenAPI Usage** Contract Driven API (create contract first) Handling paths Defining components Creating API documentation	**OpenAPI In Detail** Detailed look at important constructs in spec file and how best to use them Boilerplate layout and sections **OpenAPI Generator Overview** A modern open source community API Generator toolset for building REST APIs Compliant with OpenAPI Spec v3 (fork of Swagger Codegen) A set of useful tools for code generation for client libraries and server stubs e.g.: OpenAPI Generator v4 supports Angular 8 code generation. **OpenAPI Generator Features** Setup and tooling Integrate with build Useful command line arguments List of options and their uses Exploring OpenAPI Generator source tree **Practical REST API Creation** Security (avoiding code injection) Testing Working with CI/CD Error handling Documentation generation **Style Guide** How best to structure OpenAPI files Naming conventions Preparing for future API version evolution **Project** Building an end-to-end application involving all steps in REST API design, specification, implementation and usage