

Restful API Programming

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1.Name of Skill

Restful API Programming

1.1 Introduction

REST (*Representational State Transfer*) is a way of accessing the web services. REST as an architecture style does not require processing and is more simple and flexible than SOAP(*Simple Object Access Protocol*) which is another standards-based Web services access protocol developed by Microsoft. REST is much easier and more widely used than SOAP (about 70% web services API uses RESTful API) and is the newcomer to the block which seeks to fix all problems with SOAP.

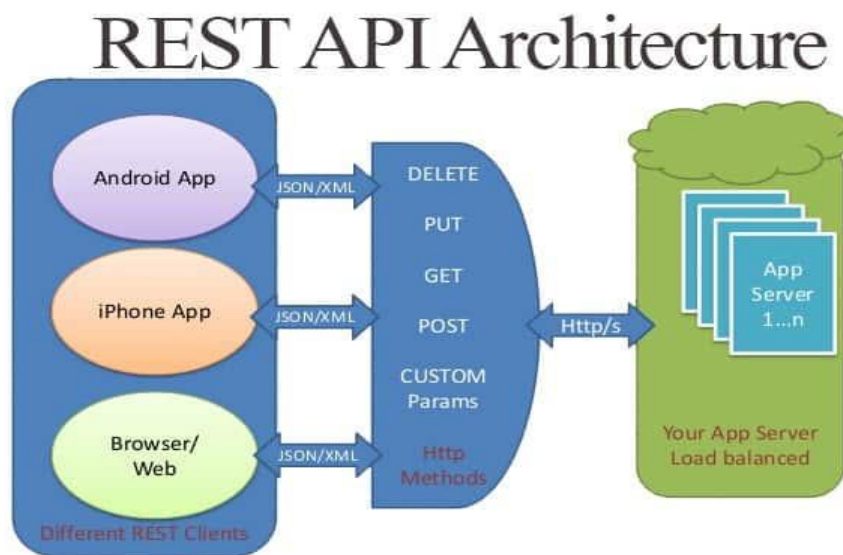


Fig.1 REST API Architecture (Source: <https://shareurcodes.com/blog/creating%20a%20simple%20rest%20api%20in%20php>)

2. Classification of Skill

Hard Technical Skill

Programming skills are gained and improved by practice, training and education. It is a skill that people can learn by investing their time and effort in studying and practicing. It is also improved as people gain more experience.

3. Prerequisites for Skill

- Good understanding of HTTP/HTTPS protocol.
- Familiar with at least one of the programming languages that support server end web application, such as Java, Javascript, Go and PHP.
- Able to design API in the RESTful style
- Good understanding of Representational state transfer
- Programming skills
- Familiar with API verification tool Postman
- The project should be client/server architecture

4. Related Software Engineering Area

Restful API programming is directly related to **Software Construction** knowledge area, since it more focus on the code implementation.

5. Rationale for Skill

Restful API programming is one of the most popular concepts in modern web application and it is of great importance. It provides a great deal of flexibility. Data is not tied to resources or methods, so REST can handle multiple types of calls, return different data formats and even change structurally with the correct implementation of hypermedia. The REST style architecture is also famous for its scalability which is one of the most important concerns in a large project.

REST architecture style and RESTful APIs are now considered as one of the most popular Web application skills in the market. It generally becomes a really essential skill for web developers.

6. Roles for Skill

Backend Developer, Full-stack Developer, Software Maintainer

7.Work-Related to Skill

- **Design, integrate, manage and test RESTful API;**
 - Artifacts: API Documents and Source Code
- **Implement backend service and functions;**
 - Artifacts: Source Code.
- **Mapping the java objects with database entities;**
 - Artifacts: Source Code.

8.Real-World Scenario of Skill

There are a lot of real-world examples that using restful API programming. For example, **Google Fit** - an open ecosystem that allows developer upload health data so that they can analysis the data anywhere. **Amazon S3 - Amazon Simple Storage Service is a online cloud based storage service. It also provides a list of restful APIs for developers so that Amazon S3 can be adapted to other projects.** Another real-world scenario can be an online book shop. The owner of the book shop can add, update, or delete products. So the programmer can provide restful a list of APIs to handle those requests and build a bridge between frontend and backend. The programmer will wrap the business logic into functions which can be reused by different services. Each of the service is stateless and will located to specific resource according to the URI and then perform the certain behavior such as modification.

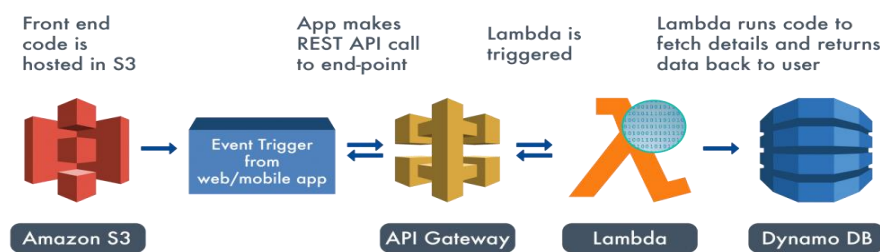


Fig 2.Amazon S3 REST API serverless implementation

9 Role of Academia or Industry in Cultivating the Skill

Academia: Roy Thomas Fielding is the one who brings up the idea of REST in his doctoral paper in 2000, it creates a new architecture style for the whole industry. What's more, he is also the major designer of HTTP(1.0 and 1.1) protocol. So academia is always a generic problem solver for software engineering. However, school is also where the most developer starts to learn programming skills. The programming language courses and algorithm courses really help the student to have a good programming foundation. And network courses and web development related courses give students a good understanding of how HTTP protocols work and also help students become more familiar with web application development.

Industry: Industry, on the other hand, is more focused on the vertical depth of a skill compares to academia. It defines the more specific standard and practice principles for RESTful API programming. It helps the developer to get to know more about this skill with production environments. By using the skill in the practical environment, the developer will understand the limitations, issues of current skill so that inspire them to make the evolution for current skill.¹⁰

Tools Supporting the Skill

11.Supported tools

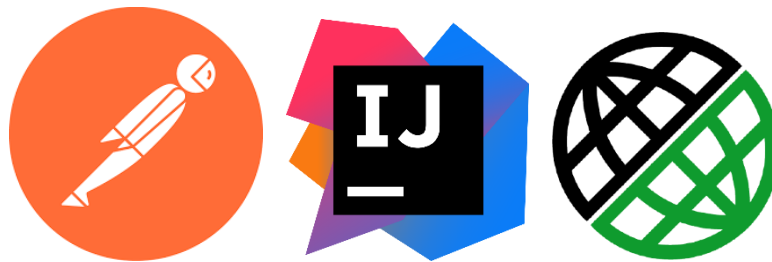


Fig.3 Postman, IntelliJ IDEA and Rest Assured

Postman: Postman is a collaboration platform for API development, it facilitates the API communication between frontend and backend developer, and also helps the developer to test API without any user interface.

IntelliJ IDEA: IntelliJ IDEA is an integrated development environment written in Java for developing computer software. It supports developer in Java, Javascript, Kotlin, c#, python programming and also provides the RESTful Web Services development support based on the Java EE: RESTful Web Services (JAX-RS) plugin.

Rest Assured: Rest Assured library is tailor-made API tool for Java domain using people to test and validate REST Services. It is also used to test HTTP, JSON and XML based web services, and it gives us a lot of key features like XPath validation, JSON Path syntax, easy file uploads, and specification reuse.

12.Skill Self-Assessment

Self-Assigned Score: 8.

I have been a web engineering 2 years, I get a lot of opportunities to use and practice the RESTful API programming skill in a industry environment. However since I learn this skill from industry instead of academia, I'm only familiar with appliance of this skill and lack of theoretical support. But after software process course project and research, it really gives me a deep understanding about the REST web service and programming. So before writing this document, I would rate myself 6, but after research and the project, I would rate myself 8.

13.References

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