- Name of Skill

## Restful API Programming

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 REST API) and is the newcomer to the block which seeks to fix all problems with SOAP.

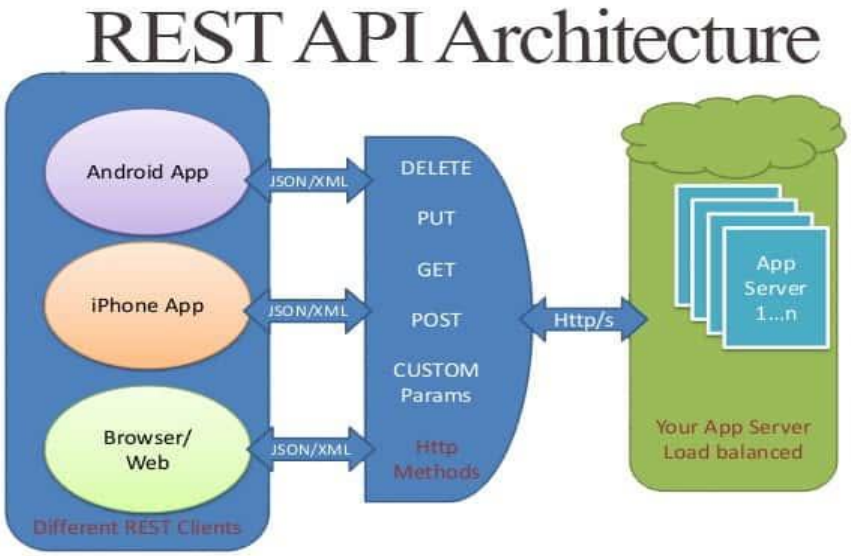


Fig.1 REST API Architecture (Source: https://shareurcodes.com/blog/creating%20a%20simple%20rest%20api%20in%20php)

- 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 the their time and effort in studying and practicing. It is also improved as people gaining more experience.

- Perquisites

✧ Good understanding of HTTP/HTTPS protocol.
✧ Familiar with at least one of the programming language 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

- Related Software Engineering Area(s)

Software Construction, Software Maintenance, Software Design

- Rationale for Skill

REST API is extensively considered as the standard protocol for the web APIs. Whereas, other protocols used for the Web APIs are less popular than REST API. They also provide 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.

- Roles for Skill

Backend Developer, Full-stack Developer, Software Maintainer

- Work Related to Skill (Related Activities and Artifacts)

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

- Real-World Example/Scenario of Skill (Text, Graphic, Audio, Video)

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.** The example 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. The programmer will wrap the business logic into functions which can be reused by different services.

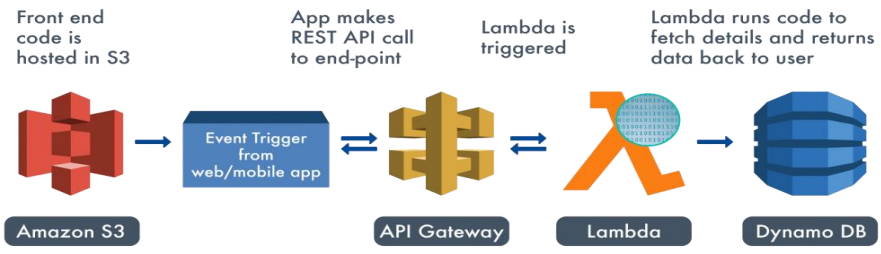

Fig 2.Amazon S3 REST API serverless implementation

- Role of Academia or Industry in Cultivating the Skill

**Academia:** Roy Thomas Fielding is the one who bring 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 most developer starts to learn the programming skills. The programming language courses and algorithm courses really help student to have a good programming fundations. And network courses and web development related courses gives students a good understanding of how HTTP protocols works, and also help students become more familiar with web application development.

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

- Tools Supporting the Skill

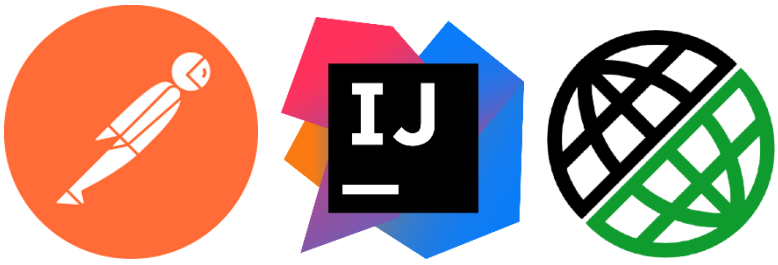


Fig.3 Postman, intellj IDEA and Rest Assured

**Postman**: Postman is a collaboration platform for API development, it facilite 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.

- Skill Self-Assessment (My Skill Score (1 – 10) and Reasons for Self-Assigned Score)

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 theorical 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.

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