API Design and Management

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Outline

Course Objectives

1. Provide good Arabic content for the topic

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2. Overview of API Design and Management

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3. Role and Importance of APIs in Distributed Systems

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1. Provide good Arabic content for the topic
2. Overview of API Design and Management
3. Role and Importance of APIs in Distributed Systems
4. The best practices you should follow today

Understanding APIs

Definition *wikipedia*

Application programming interface (API) is a way for two or more computer programs or components to communicate with each other. It is a type of software interface, offering a service to other pieces of software.

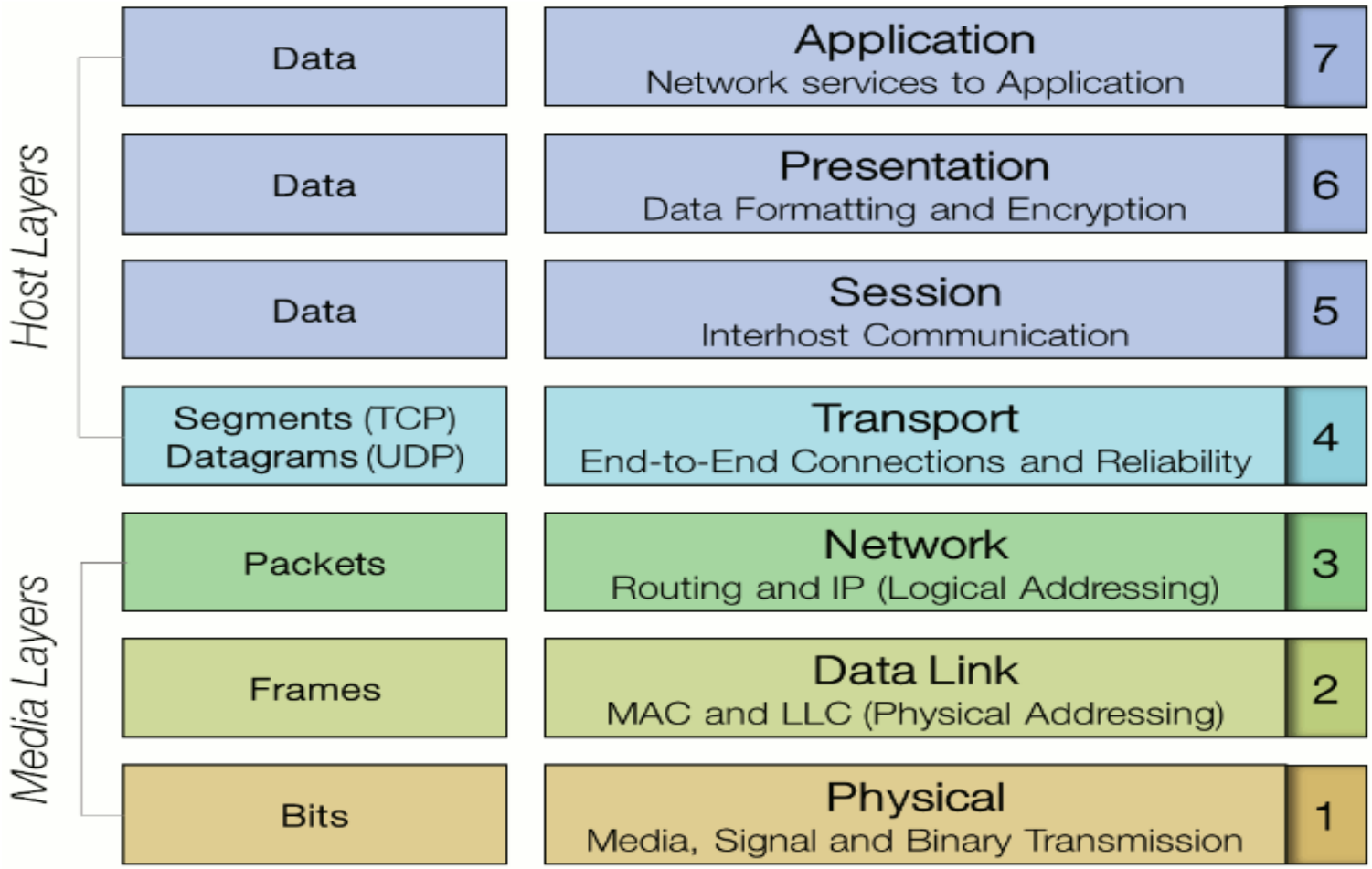
Definition *ChatGPT*

API (Application Programming Interface) is a set of rules, protocols, and tools for building software applications. It specifies how software components should interact and is used to enable the integration between different software systems.

History *wikipedia*

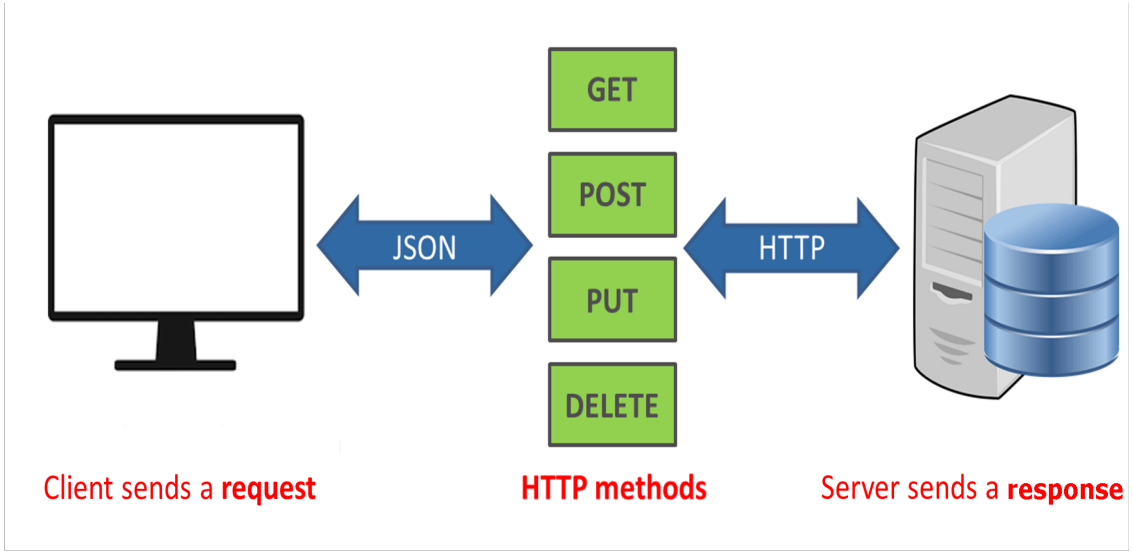
The term "application program interface" is first recorded in a paper called Data structures and techniques for remote computer graphics in 1968. The authors use the term to describe the interaction of an application "Graphics Program" with the rest of the computer system.

Understanding APIs *(OSI Model)*



source:coengoedegebure.com/osi-model

Understanding APIs



source:phpenthusiast.com/blog/what-is-rest-api

API Design Principles

- Fundamentals of Good API Design
- Designing for Scalability and Performance
- API Versioning Strategies

RESTful API Design

- RESTful Architecture Principles
- Designing RESTful Services (Endpoints, HTTP Methods, Status Codes)
- Best Practices in RESTful API

Advanced API Protocols

- Introduction to GraphQL and Its Advantages
- Implementing gRPC for Microservices
- Comparison of Different API Styles

API Documentation and Specification

- Importance of Comprehensive API Documentation
- Tools for API Documentation (Swagger, OpenAPI Specification)
- Maintaining and Versioning API Documentation

API Security

- Authentication and Authorization Mechanisms (OAuth, JWT)
- Securing API Endpoints
- Handling Sensitive Data and Privacy Concerns

API Testing and Quality Assurance

- Writing Effective API Tests
- Tools and Frameworks for API Testing
- Performance Testing and Load Testing for APIs

API Management and Lifecycle

- The Lifecycle of API Development
- API Deployment Strategies
- Monitoring and Analytics for APIs

Conclusion

- Recap of Key Learnings
- Emerging Trends in API Development