Web Services

By Rahul Barve

Objectives

- SOA Basics
- Understand: Web Services
- Web Services Concepts
- A Simple Example

What is SOA

What is SOA

- SOA stands for Service Oriented Architecture.
- SOA is a set of principles and methodologies for designing and developing software in the form of interoperable services.

What is SOA

- These services are well-defined business functionalities that are built as software components that can be reused for different purposes.

What is SOA

- The services are deployed or hosted on different machines and can communicate with each other using a remote protocol.

SOA Model

SOA Model

- SOA Model consists of 3 entities:
  - Service Provider
  - Service Broker
  - Service Consumer

Service Provider

Service Provider

- It is an organization or an individual that builds a service and makes it available for others to use.

Service Broker

Service Broker

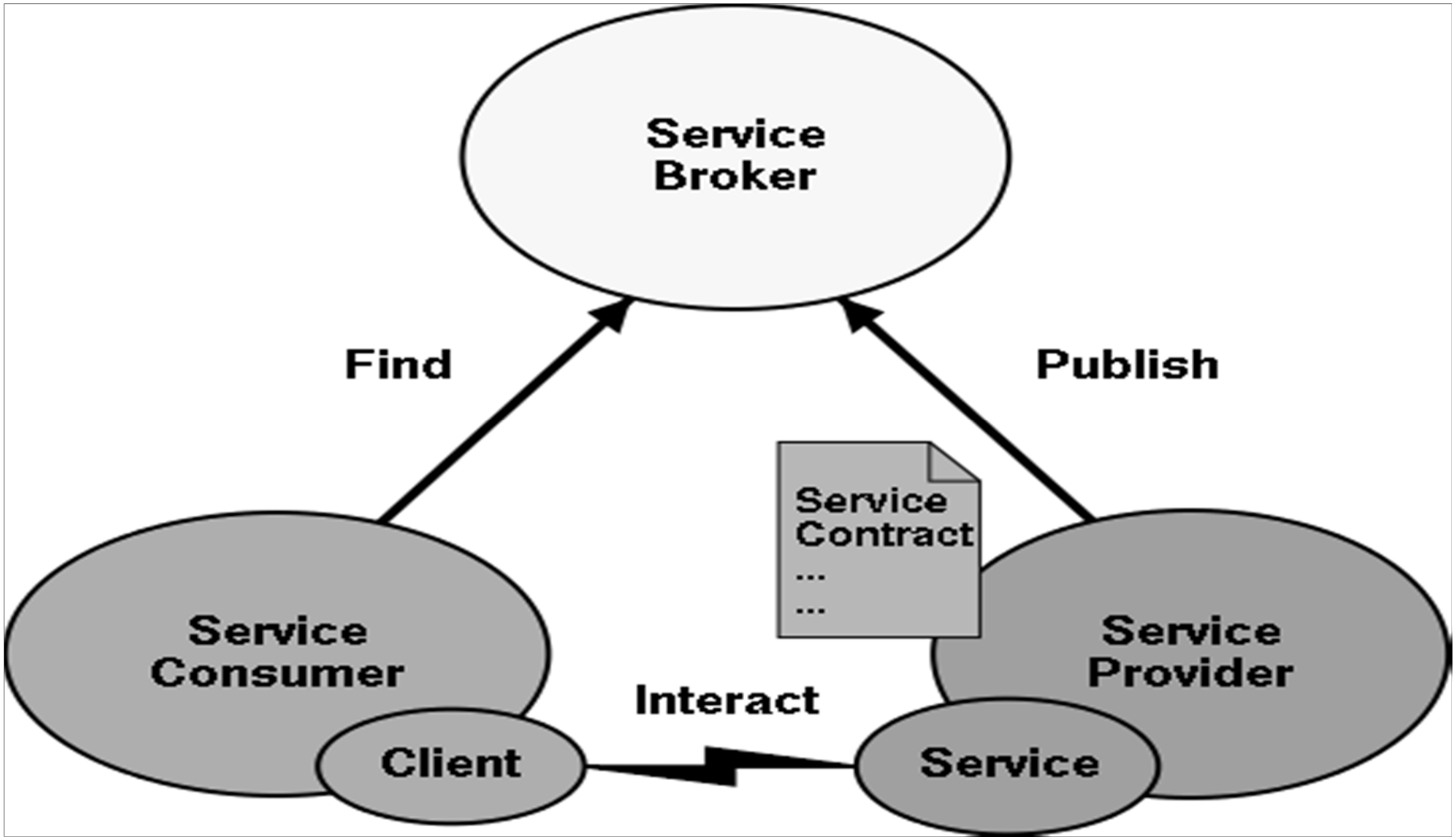
- It is a repository where Service Providers can publish their services so that the clients can find them without any complexities.

Service Consumer

Service Consumer

- A service consumer can locate or find the service in the repository and build the required client-side software components to bind and use the service.

SOA Model



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SOA Implementations

SOA Implementations

- RMI
- EJB
- Web Services

Web Services

Web Services

- Web Services is a set of standards and mechanisms for invoking software components remotely.
- All communication between the component and its client is in the form of XML and sent via a standard protocol such as HTTP.

Web Services

- Therefore, the component can be invoked by applications from anywhere on the Web (or intranet), without knowing any details of how the component is deployed.

Benefits of Web Services

Benefits of Web Services

- Organizations can make their services available, both internally and externally, to a wider range of platforms and clients.

Benefits of Web Services

- Provide a potential solution to the business-to-business (B2B) integration problems.
- Bring Interoperability between the applications.

Web Services – Major Pillars

Web Services – Major Pillars

- Web Services involves 3 major pillars:
  - SOAP
  - WSDL
  - UDDI

SOAP

SOAP

- Simple Object Access Protocol.
- A specification for making remote procedure calls (RPC) from one machine to another.

SOAP

- Simply defines the format of the messages that are transmitted between machines.
- Built on the top of XML, thus brings Interoperability and Platform Independence.

WSDL

WSDL

- Web Service Description Language
- Standardizes how a web service represents input and output parameters of an invocation.

UDDI

UDDI

- Universal Description and Discovery Integration
- It is the centralized repository where service providers can publish the service and service consumers can find the service.

Developing Web Services

Developing Web Services

- Web Services can be developed by using 2 standard approaches:
  - JAX-WS
  - JAX-RS

JAX-WS

JAX-WS

- Java API for XML-Based Web Services.
- JAX-WS maps to Java 5.0.
- Makes full use of Java 5.0 enhanced features e.g. Annotations.

JAX-WS

- Two major annotations are used:
  - `@WebService`
  - `@WebMethod`

@WebService

- Used to expose the component as a web service.
- Applied at the class level to expose the class as an Endpoint.

@WebMethod

- Used to specify further configurations for the methods of a class.
- If omitted, by default, every method is exposed as a Web Service operation.

Let’s Summarize

- SOA Basics
- Understand: What is Web Services
- Web Services Concepts
- A Simple Example