

Cloud  
Computing  
Seminar

# Web Services

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# Overview

- ▶ Introduction to Web Services
- ▶ Functions of Web Services
- ▶ Components of Web Services
- ▶ How Web Services Work
- ▶ Features of Web Services
- ▶ Benefits of Web Services in Cloud Computing
- ▶ Web-Based Applications in Cloud Computing

# Introduction

- A web service is a set of open protocols and standards that allow data to be exchanged between different applications or systems
- Platform-independent
- Uses standardized protocols
- Distributed computing

# Functions of Web Services

**01**

**Enable communication  
between applications**

**02**

**Facilitate data exchange in  
real-time**

**03**

**Provide platform and  
language independence**

**04**

**Support integration of  
distributed systems**

# Components

## **SOAP**

Protocol for  
exchanging  
structured  
information

## **UDDI**

Directory for  
discovering and  
publishing web  
services

## **WSDL**

XML-based language  
for describing web  
services



# **SOAP (Simple Object Access Protocol)**

- **Messaging protocol for web services**
- **Uses XML for structured data exchange**
- **Platform Independent**
- **Relies on standard transport protocols (HTTP, SMTP)**

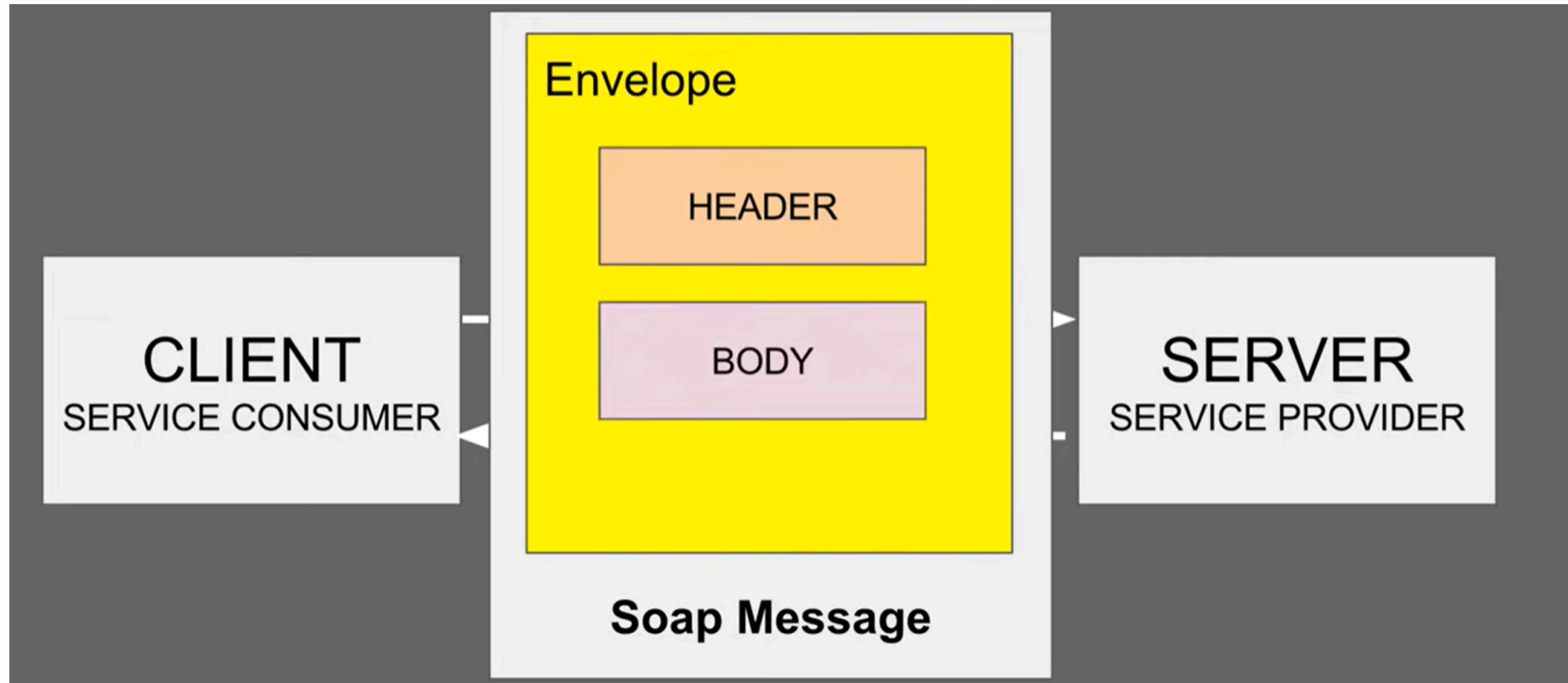
# SOAP (Simple Object Access Protocol)



**SOAP**  
**Message Consists of**

1. Envelope
2. Header
3. Body

# SOAP (Simple Object Access Protocol)







# **SOAP (Simple Object Access Protocol)**

## **Envelope**

- Root Element

## **Header**

- Optional
- can contain Authentication parameters, routing info

## **Body**

- Actual Data

# SOAP (Simple Object Access Protocol)

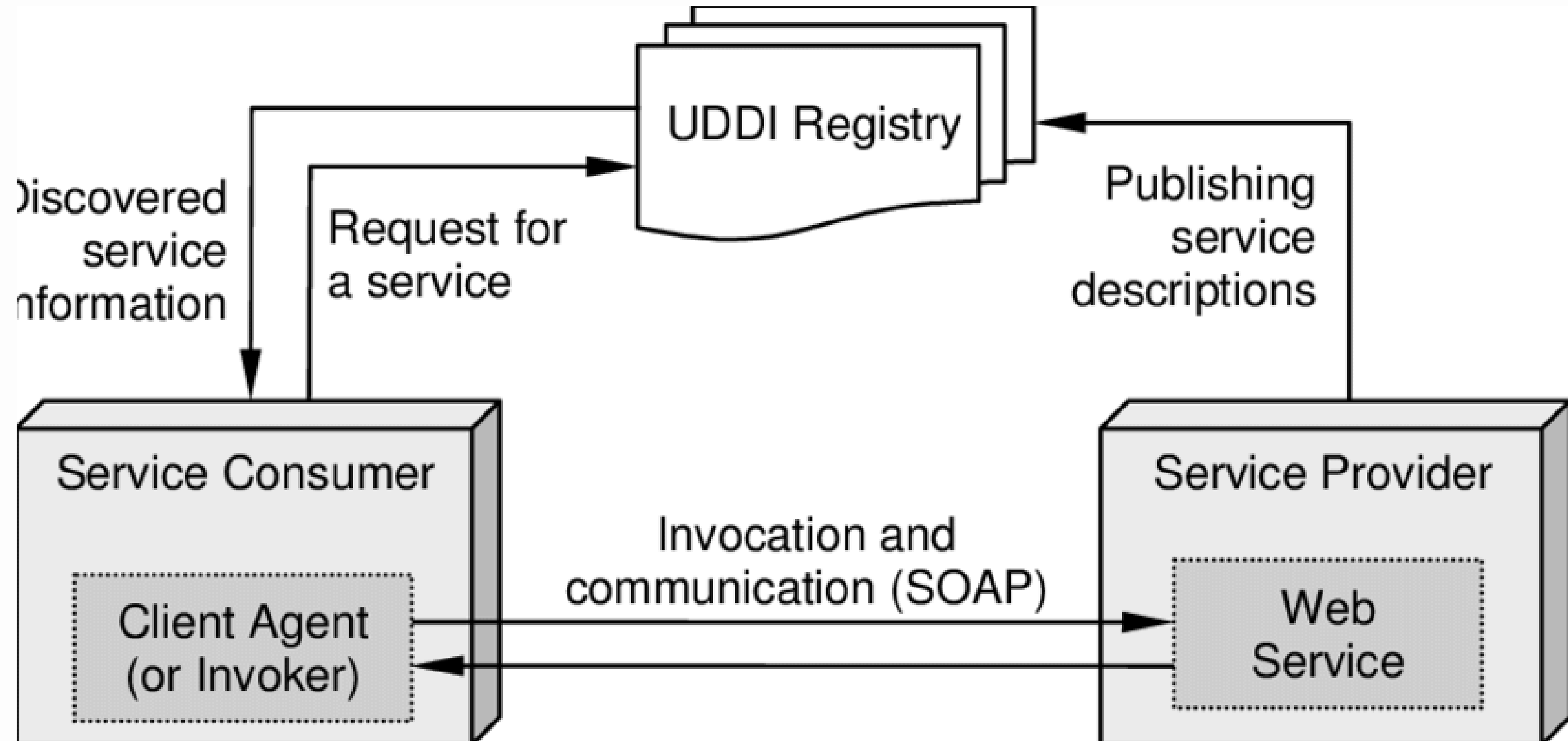
```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:c="http://www.acmeOrders.com/OrderService"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soap:Body>
    <c:OrderMessage>
      <localElement>
        <FirstName>John</FirstName>
        <LastName>Smith</LastName>
        <Street>High Street</Street>
        <City>London</City>
        <ZipCode>W1A1AA</ZipCode>
        <PartNumber>ABC1234</PartNumber>
        <Quantity>1</Quantity>
      </localElement>
    </c:OrderMessage>
  </soap:Body>
</soap:Envelope>
```



# **UDDI (Universal Description, Discovery, and Integration)**

- **Registry to publish and find web services**
- **Facilitates service discovery via unique identifiers**
- **Standardized framework for service metadata**

# UDDI (Universal Description, Discovery, and Integration)

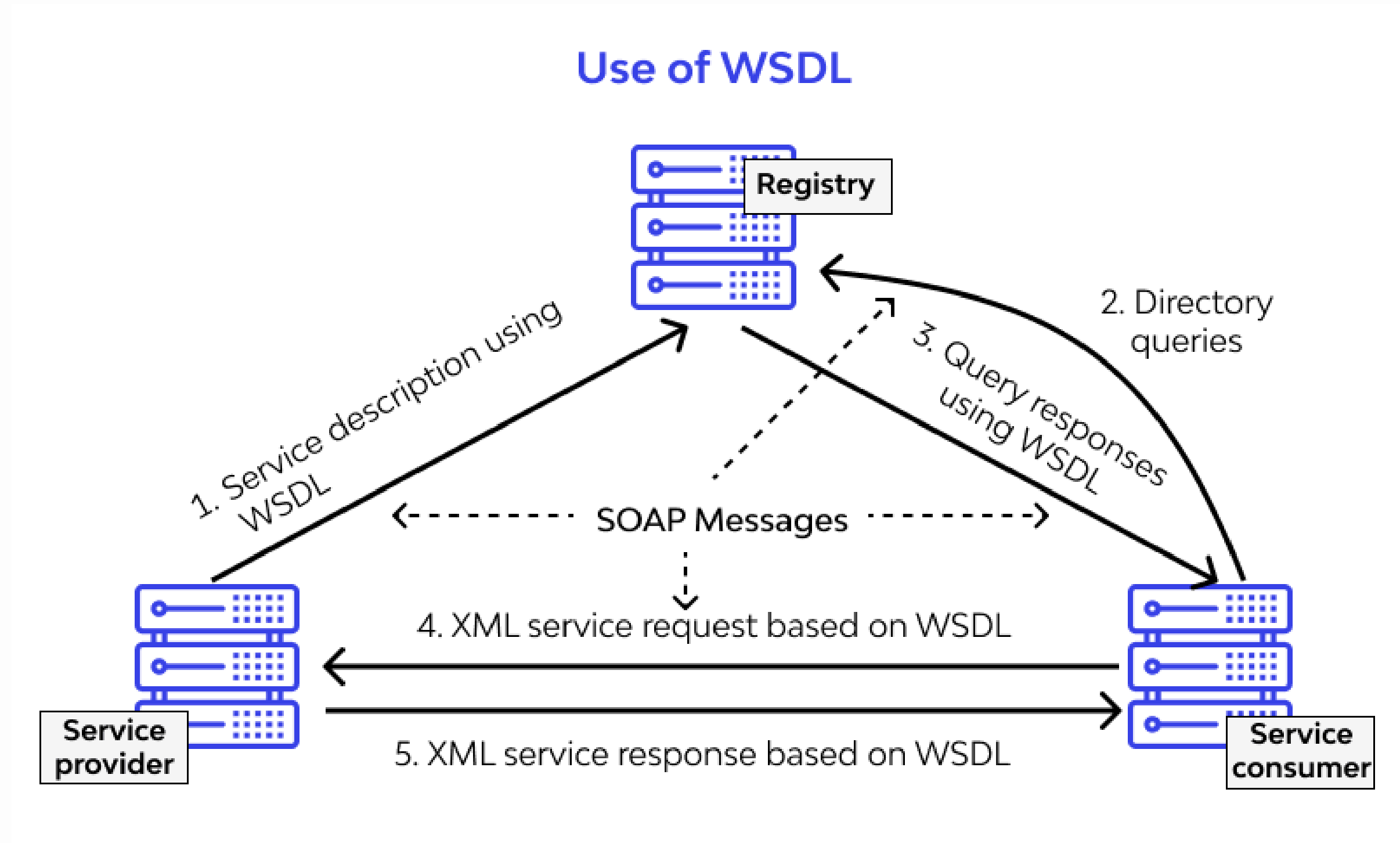




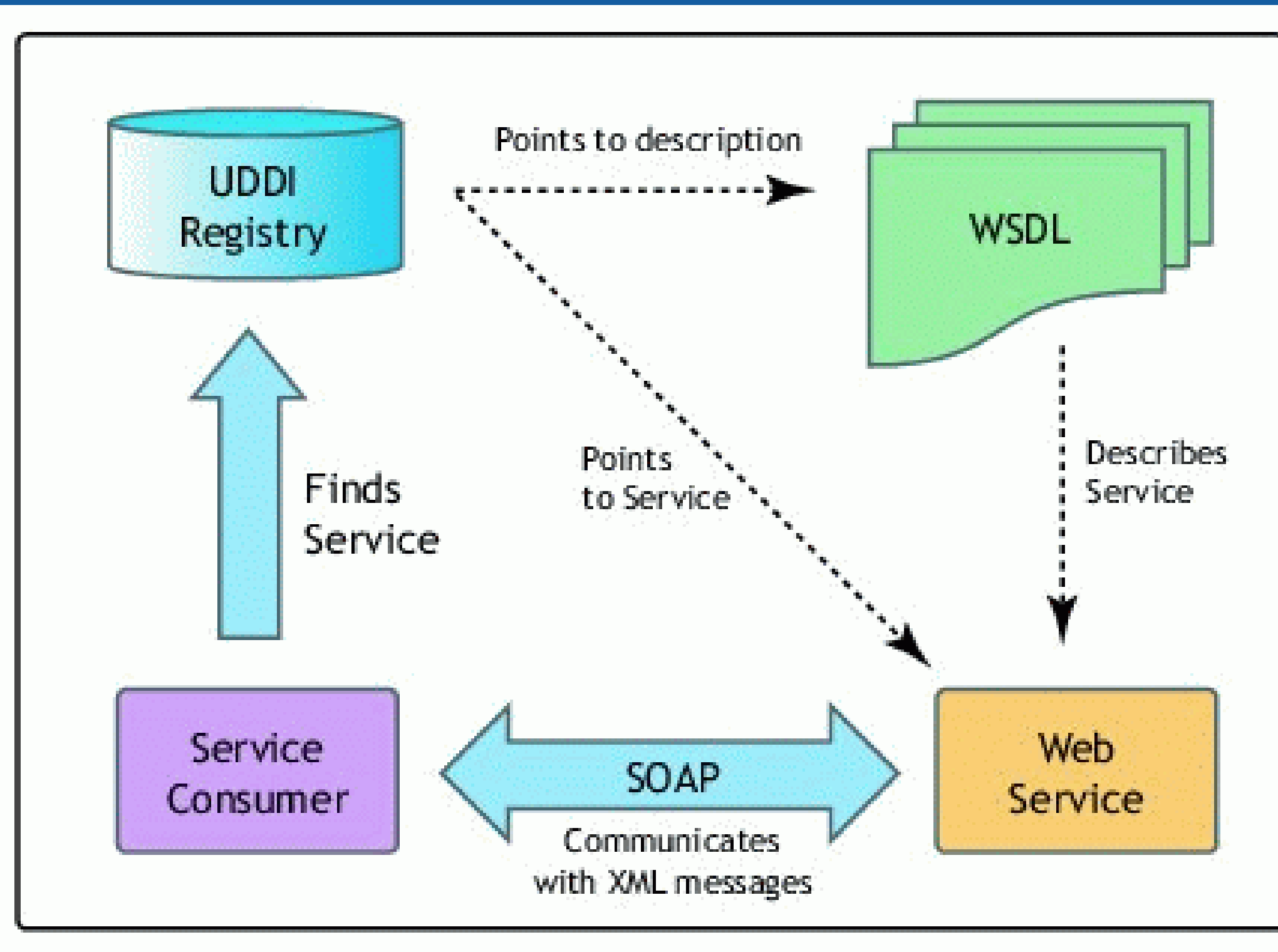
# **WSDL (Web Services Description Language)**

- **Describes web services' functionality**
- **Defines service location and operations**
- **XML based Interface**
- **Act as Blueprint**
- **How to Invoke?**

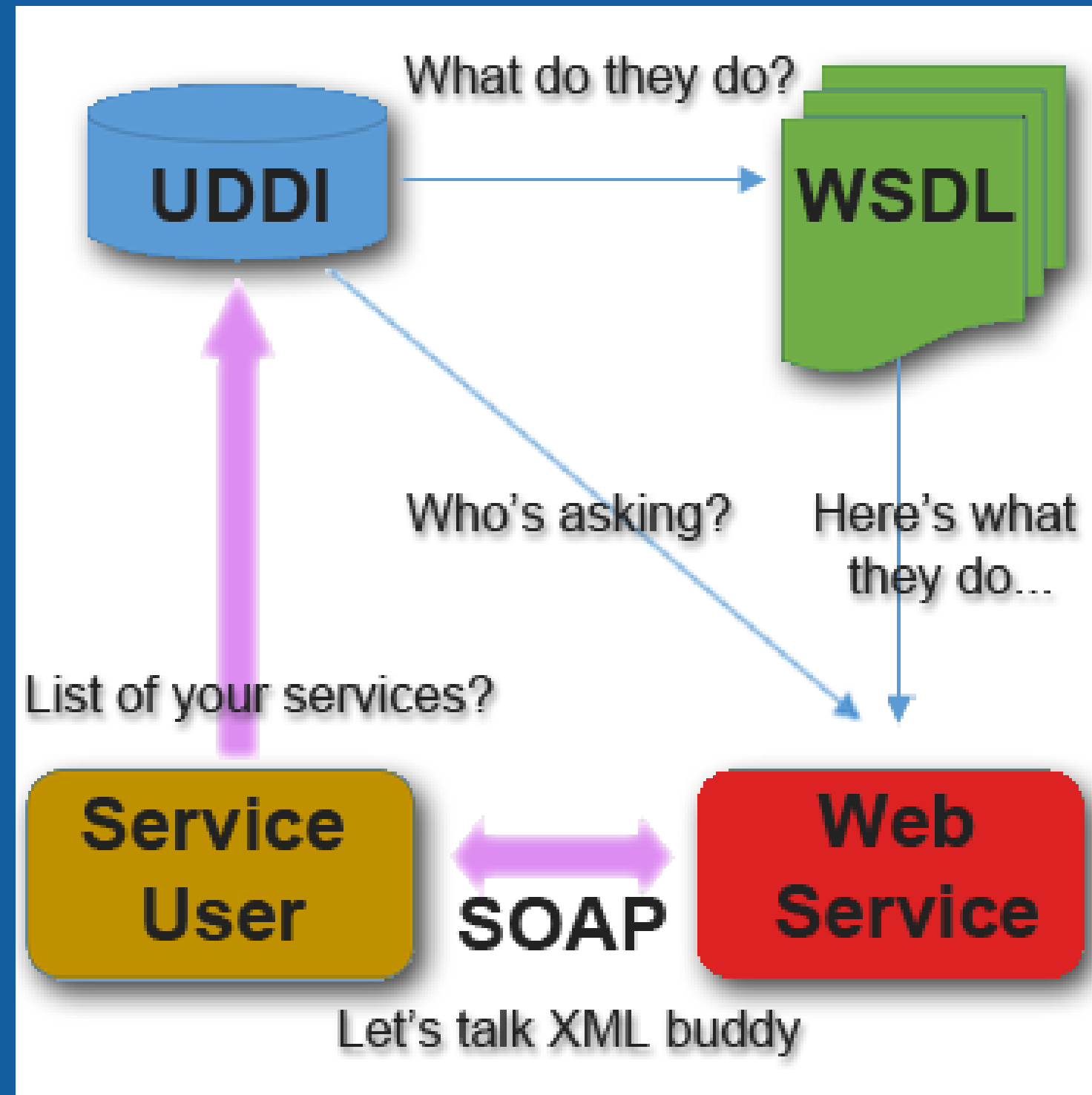
# WSDL (Web Services Description Language)



# How They All Work



# How They All Work





# Features

**Interoperability**

**Standardized Protocols**

**Loosely Coupled:**

**Supports Multiple Clients**

**Encapsulation**

# Benefits of Web Services in Cloud Computing

- Platform and Language Independence
- Seamless Integration of Distributed Systems
- Cost-Effective Communication
- Improved Scalability and Flexibility
- Encapsulation of Business Logic
- Reusability of Services
- Support for Asynchronous Processing
- Simplified Communication through APIs
- Interoperability with Legacy Systems
- Easy Maintenance and Updates

# Disadvantages of Web Services in Cloud Computing

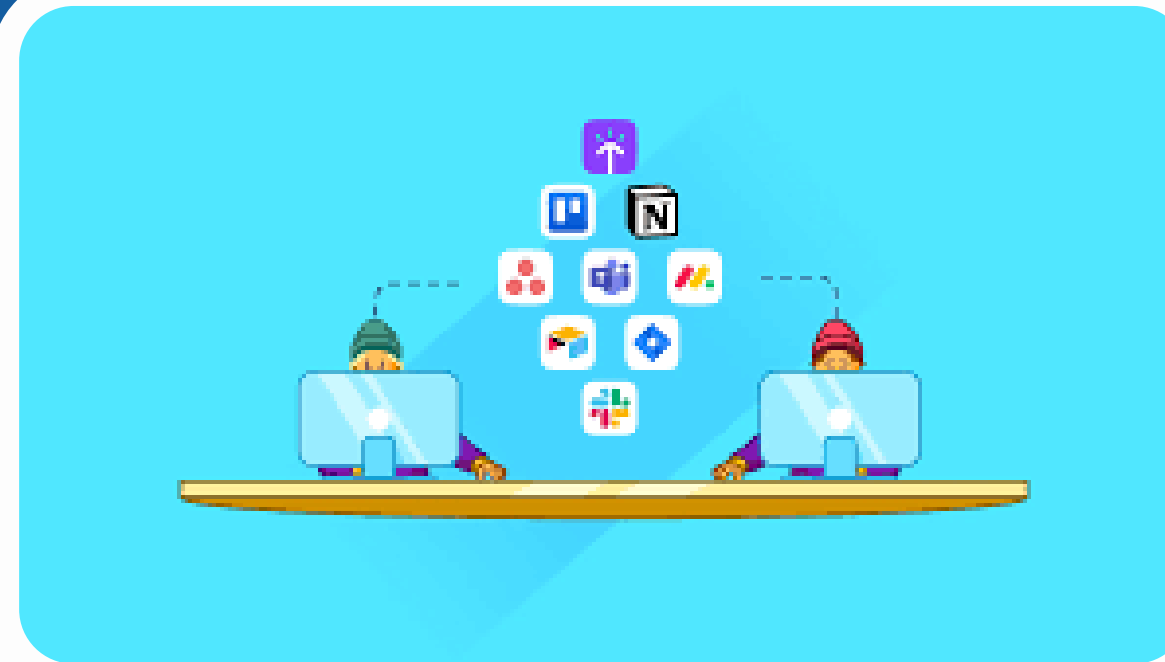
- **Dependence on Internet Connectivity**
- **Security and Privacy Concerns**
- **Limited Functionality Without Internet**
- **Vendor Lock-In Risk**
- **Performance Issues Due to Network Latency**

# Web-Based Applications in Cloud Computing



## Productivity & Office Tools

- Google Docs
- Microsoft Office 365



## Collaboration & Communication

- Slack
- Trello



## Cloud Storage & CRM

- Dropbox
- Salesforce

# THANK YOU!

Questions?

