

Cloud Computing Concepts

CS3132

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A protocol stack for SOA showing the relationship of each protocol to its function

**Business
Processes**

Business Processes Execution Language for Web Services (WS-BPEL)

**Quality of
Service (QoS)**

Reliability

Transactions

Management

Management

Description

Web Services Description Language (WSDL)

Messaging

SOAP

Extensible Markup Language (XML)

Other Protocols and
Services

Communication protocols

- Services communicate using established rules that determine data transmission over a network
- These rules are called communication protocols. Some standard protocols to implement SOA include the following:
 - Simple Object Access Protocol (SOAP)
 - RESTful HTTP
 - Apache Thrift
 - Apache ActiveMQ
 - Java Message Service (JMS)

Web Services Description Language (WSDL)

Type- XML-based interface description language

Existing Version- WSDL 2.0.

Developed by- World Wide Web Consortium

Used Technology- Extensible Markup Language (XML)

Used by- UDDI

- Describe the service interface
- How to bind information
- Nature of the component's service or endpoint
- The WSDL is the key element that enables the web services
 - It is an XML file that describes the interface for the web service to the outside world
- WSDL allows a service provider to specify the following characteristics of a Web service:
 - The name of the Web service and addressing information
 - The protocol and encoding style to be used when accessing the public operations of the Web service
 - The type information such as operations, parameters, and data types comprising the interface of the Web service

Structure:

```
1.  <wsdl:definitions ...>
2.    <wsdl:types>
3.      ...
4.    </wsdl:types>
5.    types 2
6.    ...
7.    <wsdl:message ...>
8.      ...
9.    </wsdl:message>
10.  message 2
11.    ...
12.
```

```
13.    <wsdl:portType ...>
14.      <wsdl:operation ...>
15.        input
16.        output
17.      </wsdl:operation>
18.    </wsdl:portType>
19.
20.    <wsdl:binding ...>
21.      operation 1
22.      operation 2
23.      ...
24.    </wsdl:binding>
25.
26.    <wsdl:service ...>
27.      port 1
28.      port 2
29.      ...
30.    </wsdl:service>
31.
32.  </wsdl:definitions>
```

Structure:

```
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2.    <wsdl:types>
3.      ...
4.    </wsdl:types>
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```

```
13.  <wsdl:portType ...>
14.    <wsdl:operation ...>
15.      input
16.      output
```

Definitions

Data type definitions
Message definitions

Data type definitions
Message definitions

Data type definitions
Message definitions

Operations

Operation

Operation

Operation

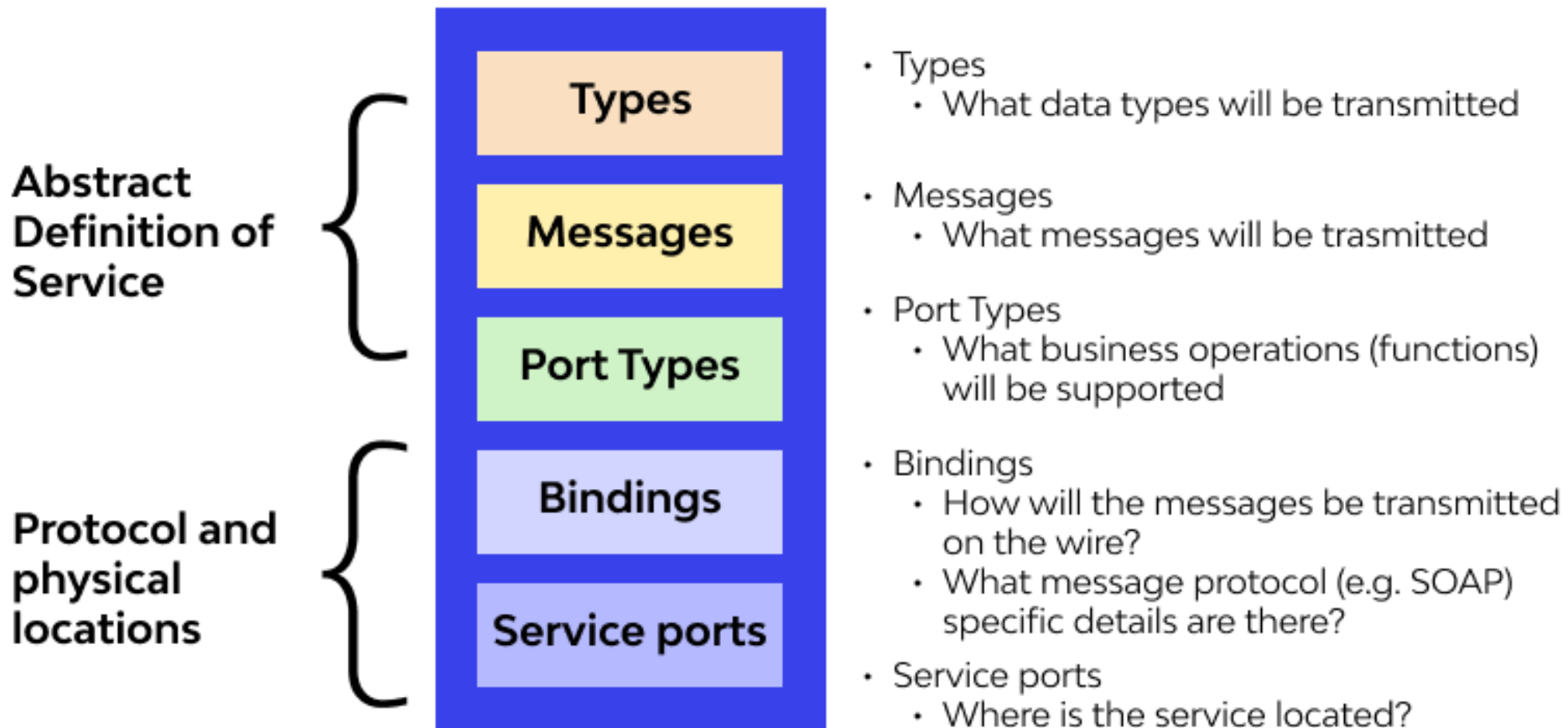
Service bindings

binding Port & network address

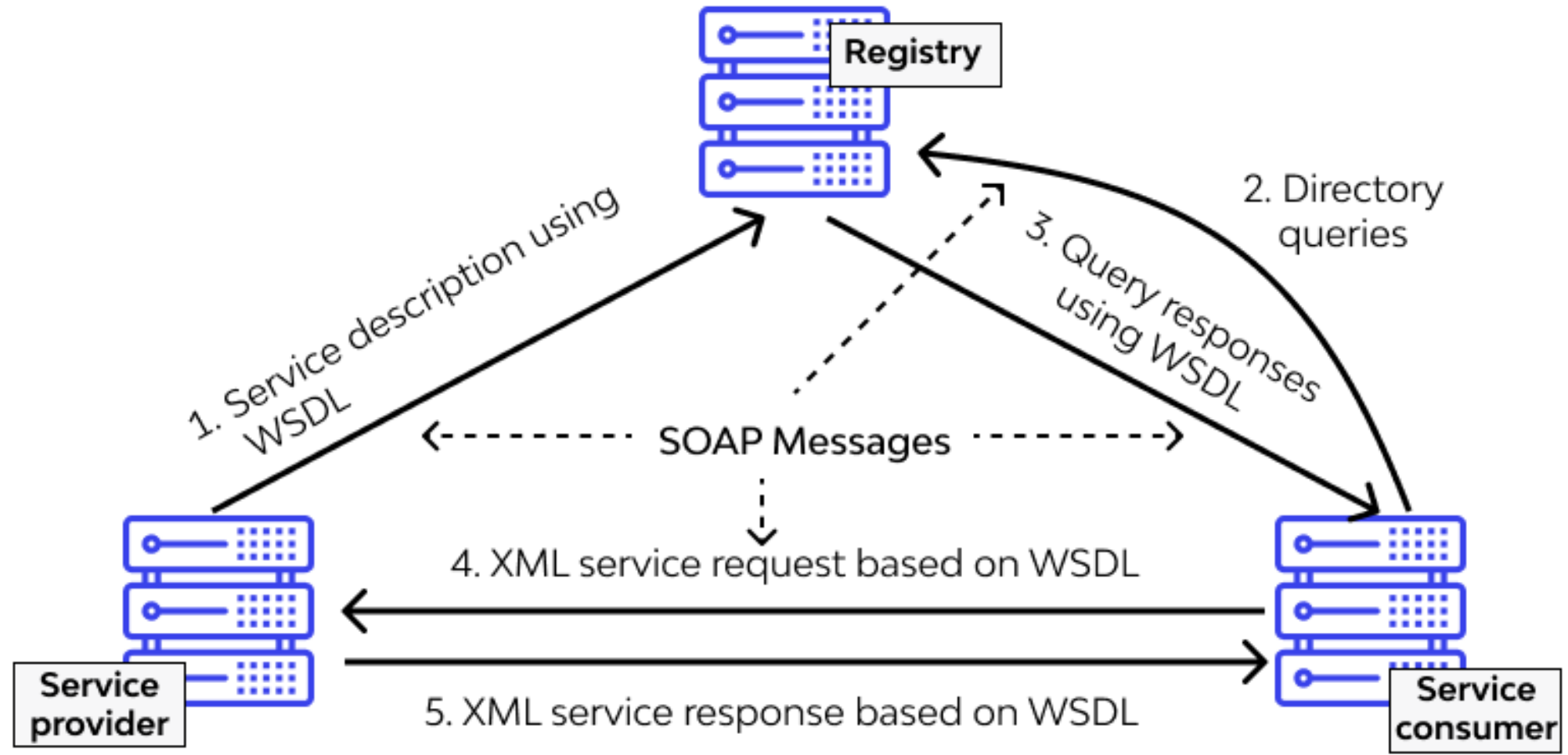
```
28.  port 2
29.  ...
30.  </wsdl:service>
31.
32.  </wsdl:definitions>
```

WSDL Elements

A WSDL document describes a web service using these major elements:



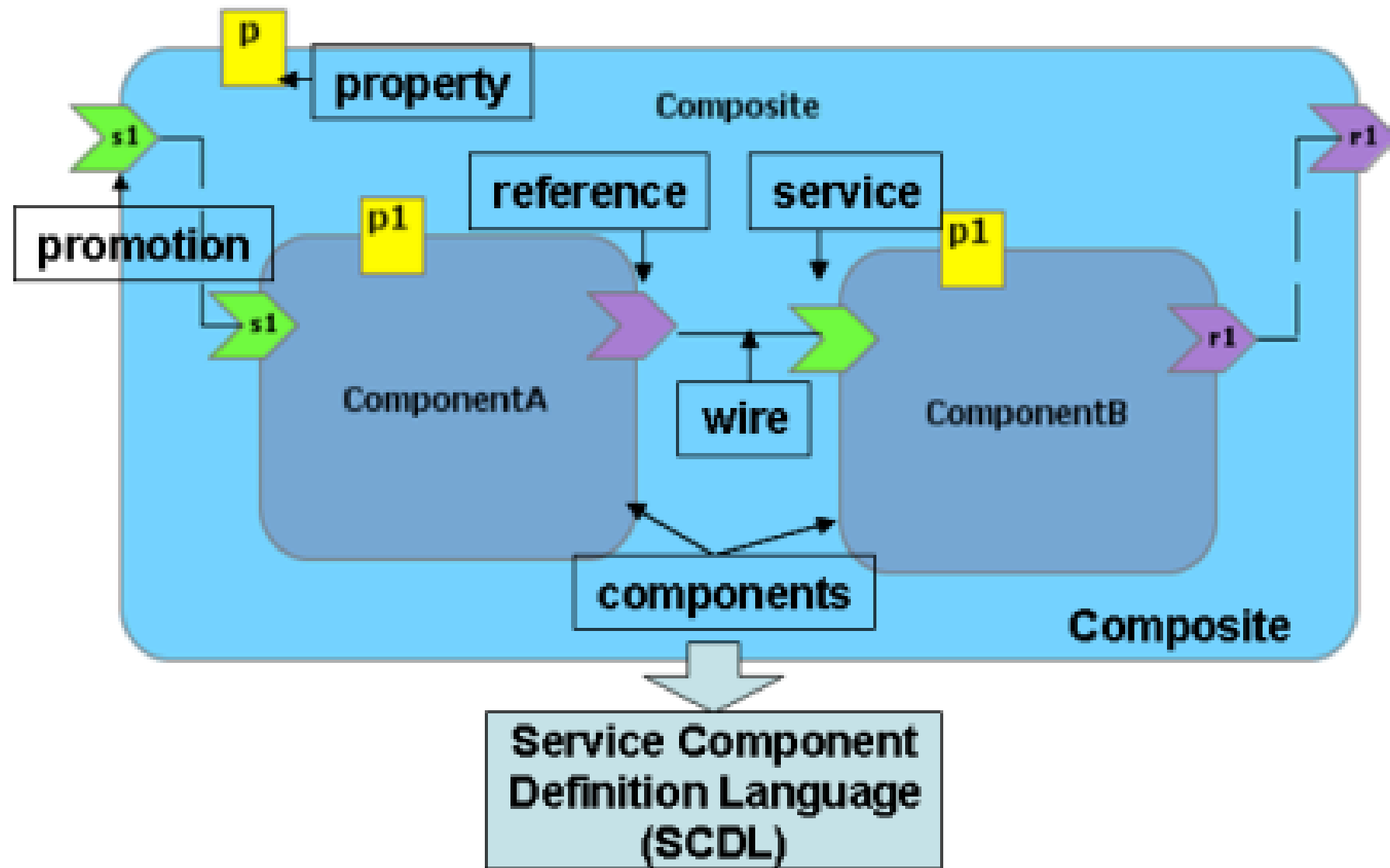
Use of WSDL



Service Component Definition Language (SCDL)

- To define the service component
- Performs the service
- Providing the component service information
- SCDL is an XML-based language used to describe Service Component Architecture (**SCA**) elements such as modules, components, references, imports, and exports.

SCDL is an XML-based language aimed at defining all the elements of a SCA composite.



Service component architecture (SCA) model

Universal Description Discovery & Integration (UDDI)

- Most commonly used to broadcast and discover available Web services
 - An XML-based lookup service for locating Web services in an Internet Topology.
- Often passing data in the form of an Electronic Business using eXtensible Markup Language (ebXML) documents
- UDDI provides a platform-independent way of describing and discovering Web services and Web service providers
- UDDI has two functions:
 - It is a SOAP-based protocol that defines how clients communicate with UDDI registries.
 - It is a particular set of global replicated registries.

UDDI registries

- UDDI manages the discovery of Web services by relying on a distributed registry of businesses and their service descriptions implemented in a common XML format
 - Before you can publish your business entity and Web service to a public registry, **you must first register your business entity with a UDDI registry.**
- UDDI registries come in two forms: public and private. Both types comply to the same specifications.
 - **A private registry** enables you to publish and test your internal e-business applications in a secure, private environment.
 - **A public registry** is a collection of peer directories that contain information about businesses and services.

The conceptual relationship between UDDI and other protocols in the Web services stack is illustrated

