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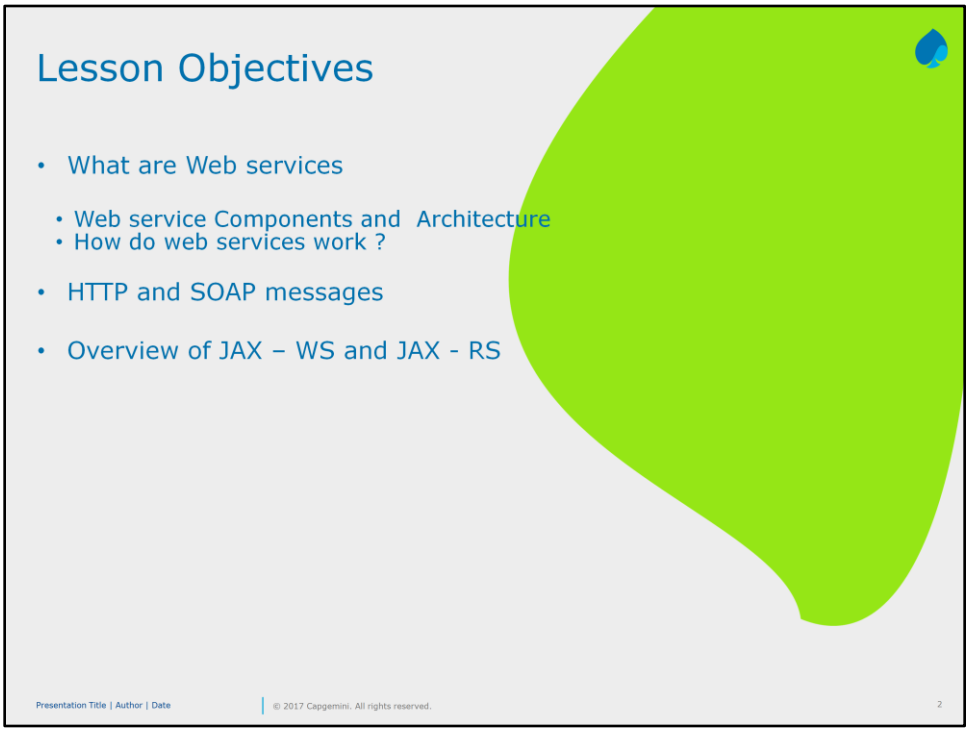

Following contents would be covered:

1.1 : What are Web services

1.1.1 Web service components and architecture

1.1.2 How do Web services work

1.2: HTTP and SOAP messages

1.3: Overview of JAX – WS and JAX – RS

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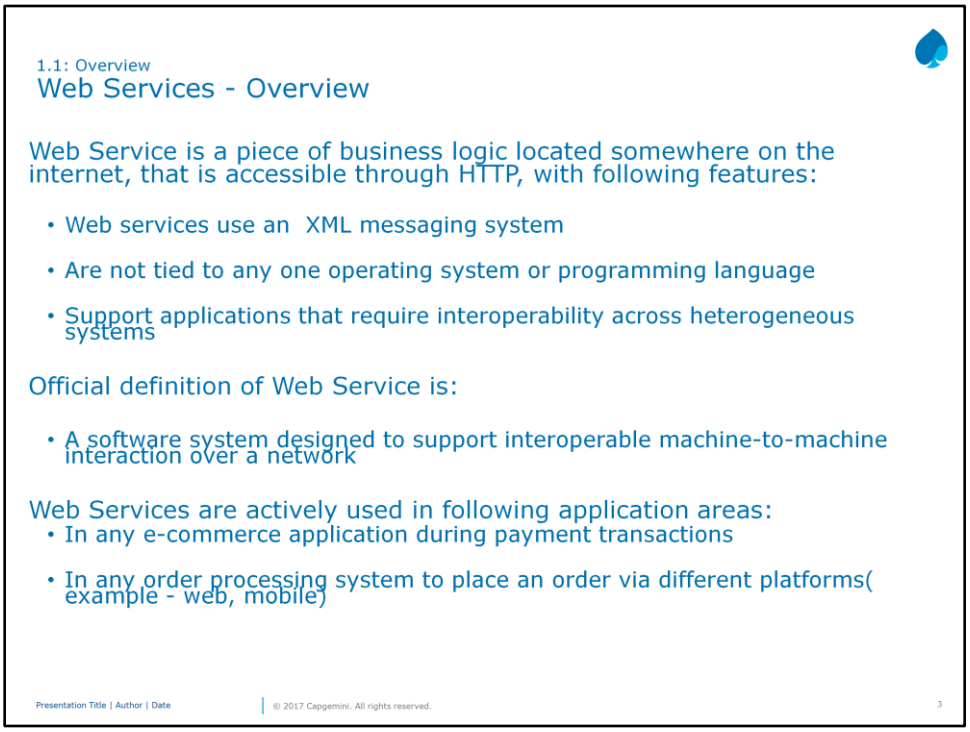


A web service is any piece of software that makes itself available over the internet and uses a standardized XML messaging system

Web services are XML-based information exchange systems that use the Internet for direct application-to-application interaction

A web service is a collection of open protocols and standards (promotes interoperability between clients / servers without the need of proprietary or trademark software)

Software applications written in various programming languages and running on various platforms can use web services to exchange data. For example, interoperability between Java and Python, or Windows and Linux applications can be facilitated through web services.

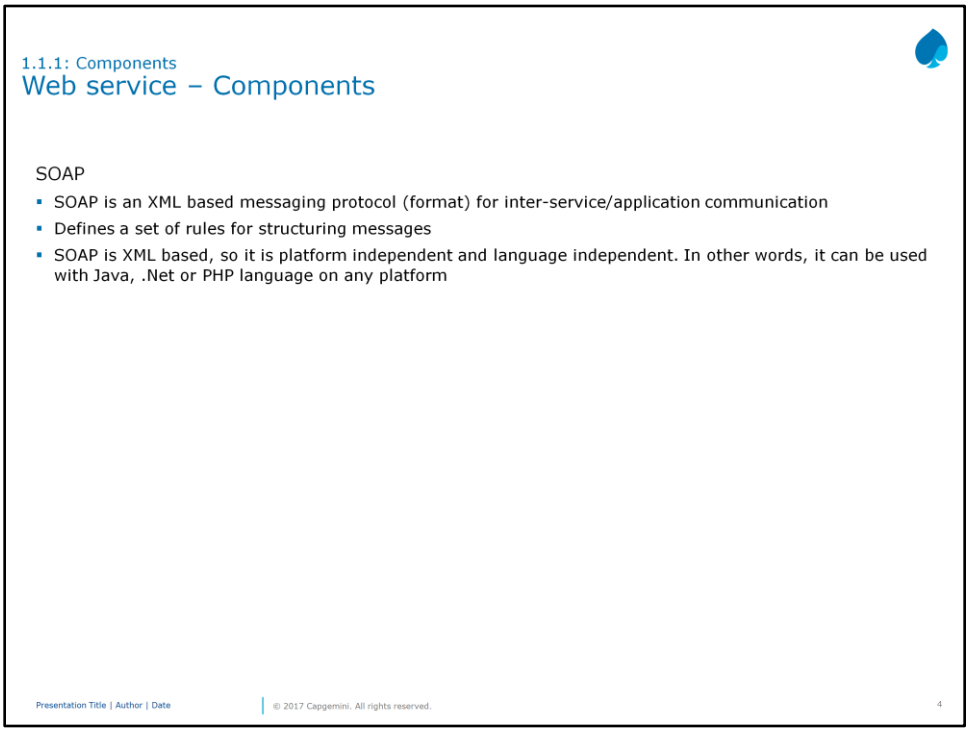
Web services has the ability to go through firewalls.

Web services are available anytime, anywhere and on any device.

Web services can be used, if clients are scattered across the web.

Instructor Notes:

Slide explains regarding the SOAP format



SOAP commonly uses HTTP.

SOAP can be used to exchange complete documents or to call a remote procedure

SOAP is a communication protocol

SOAP is for communication between applications

SOAP is a format for sending messages

SOAP is designed to communicate via Internet

SOAP is platform independent

SOAP is language independent

SOAP is simple and extensible

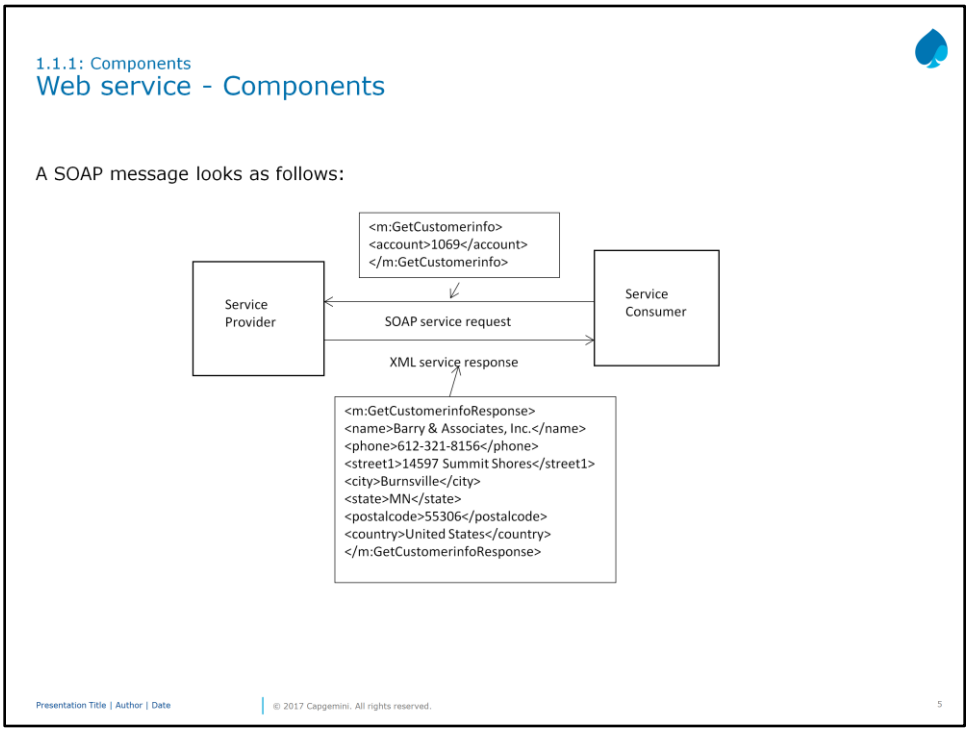
SOAP allows you to get around firewalls

SOAP is developed as a W3C standard

Basics of WSDL will be covered in next subsequent slides

Instructor Notes:

Slide explains that communication between service provider and consumer happen via SOAP messages



Service Provider is an interface created for the user. Based on this interface, service is configured and can be called at runtime by the consumer.

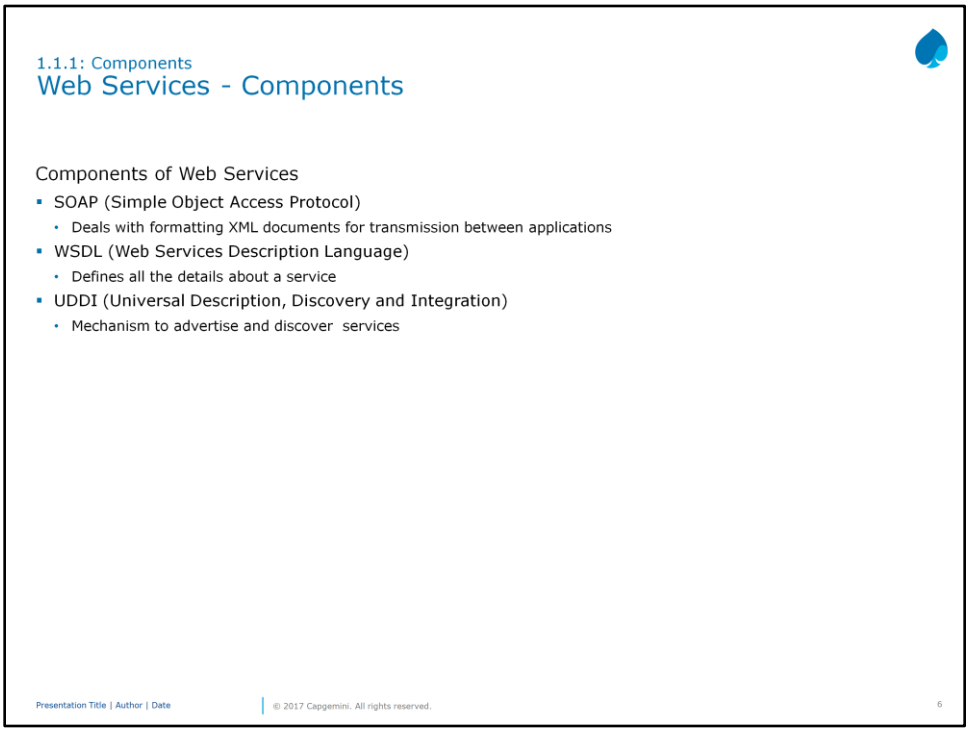
Service Consumer (also possible to generate a proxy). The service can be called from a program.

Both the service consumer and producer can be configured at runtime.

Note: ‘m’ used here in diagram for SOAP request and response is a prefix denotes message passing between Service provider and Service consumer.

Instructor Notes:

The slide explains in brief, the components which make up the web service



These are the components of Web services.

WSDL defines how incoming information, such as queries, need to be structured for the service application to make sense of it, and how outgoing data will be structured so that the requesting application can understand it.

These definitions are stored as XML (Extensible Markup Language) specifications

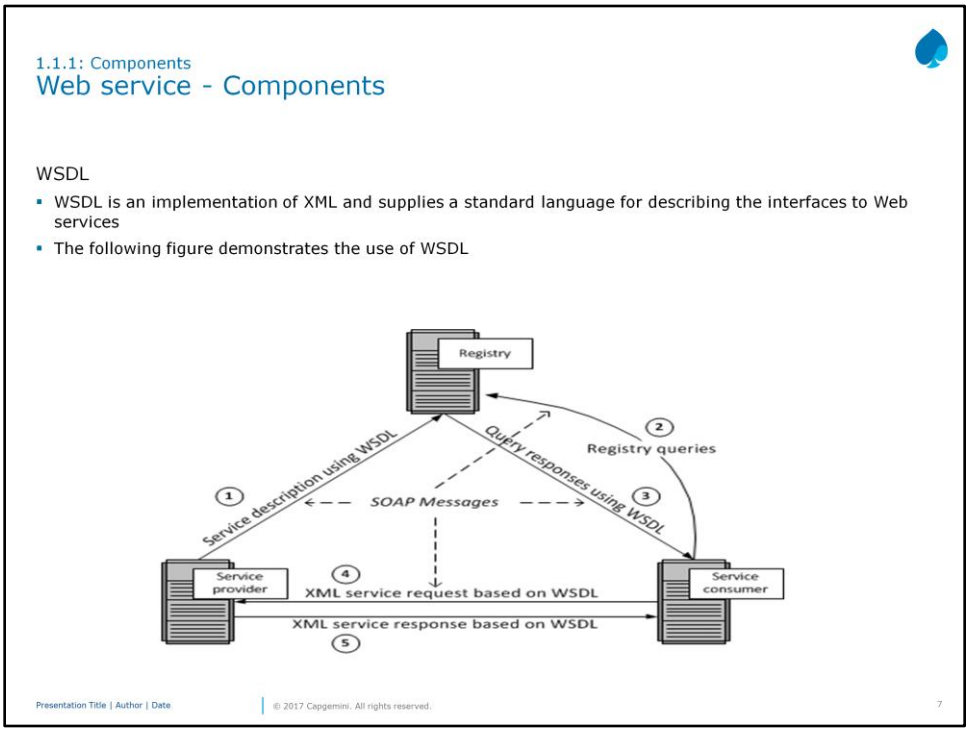
A common structure for WSDL information is the Simple Object Access Protocol (SOAP) that allows communication between applications

A UDDI is a directory structure to locate the web service

Instructor Notes:

Slide explains about WSDL and UDDI registry.

Also explains regarding web service communication



The messaging exchange format between producer and consumer is based on SOAP.

Step 1: A service provider describes its service using WSDL. This definition is published to a repository of services; which is the Universal Description, Discovery, and Integration (UDDI). This is Registry in diagram.

Step 2: A service consumer issues one or more queries to the repository (UDDI) to locate a service and determine how to communicate with that service

Step 3: Part of the WSDL provided by the service provider is passed to the service consumer. This tells the service consumer what are the requests and responses needed by the service provider.

Step 4: The service consumer uses the WSDL to send a request to the service provider.

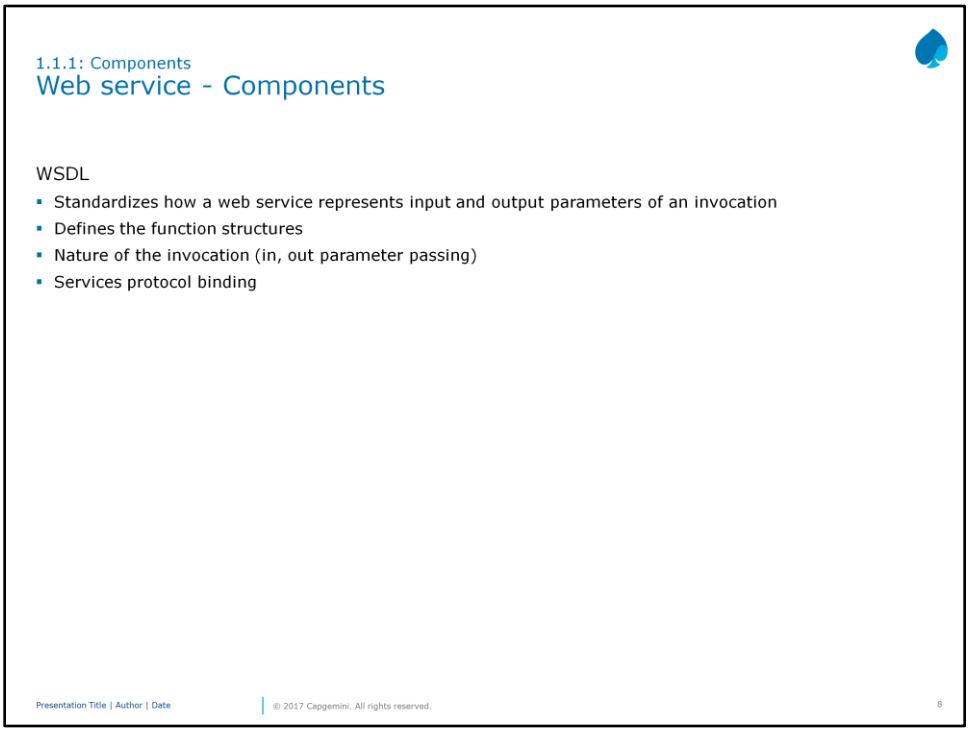
Step 5: The service provider provides the expected response to the service consumer.

For example:

1. Web services can be used to retrieve information about books at Amazon
2. Similarly another web service can be used to place an order for a book to Amazon

Instructor Notes:

Basic information regarding WSDL



WSDL is an acronym for Web Services Description Language.

WSDL is a xml document containing information about web services such as method name, method parameter and how to access it.

WSDL is a part of UDDI. It acts as a interface between web service applications.

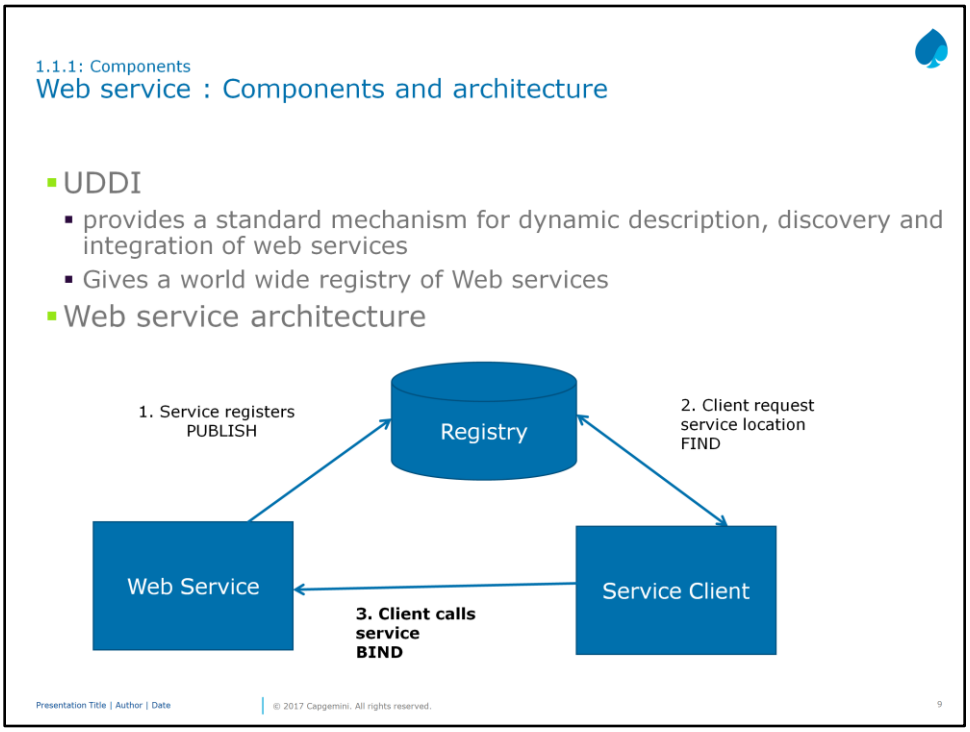
WSDL is pronounced as ”wiz-dull”.

More on WSDL in the next chapter.

In -> input arguments that need to be passed to a web service
Out -> output argument (return type) that a web service will return

Instructor Notes:

Slide explains regarding the basic web service architecture



UDDI is an acronym for Universal Description, Discovery and Integration.

UDDI is a XML based framework for describing, discovering and integrating web services.

UDDI is a directory of web service interfaces described by WSDL, containing information about web services.

There are three major roles within the web service architecture:

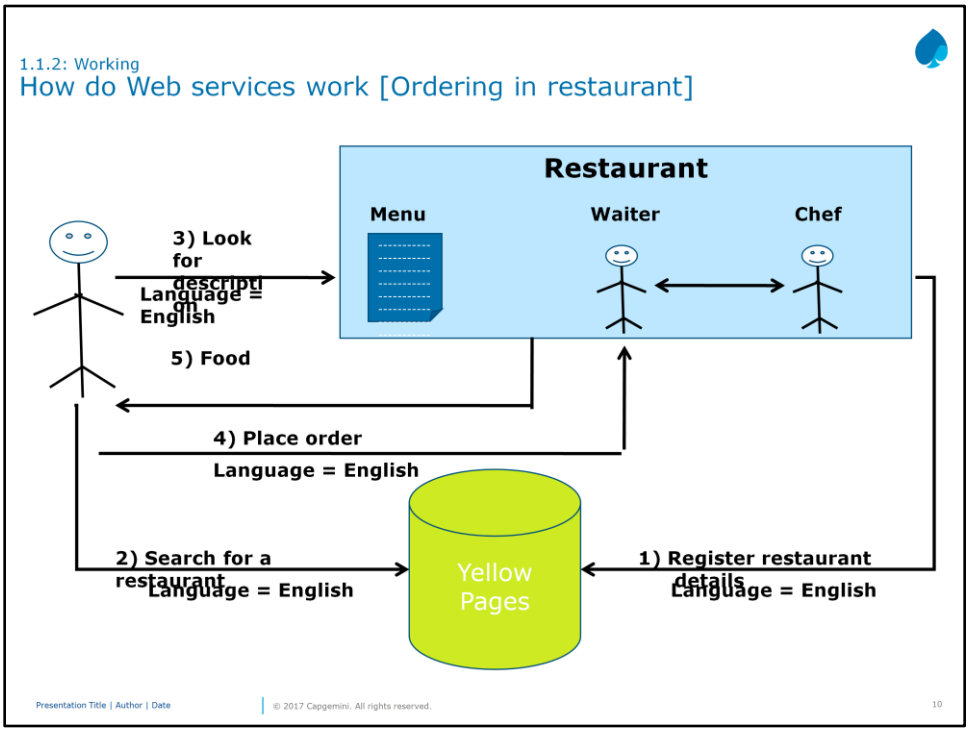
Service Provider (Web service)
This is the provider of the web service. The service provider implements the service and makes it available on the Internet.

Service Requestor (Service client)
This is any consumer of the web service. The requestor utilizes an existing web service by opening a network connection and sending an XML request.

Service Registry
This is a logically centralized directory of services. The registry provides a central place where developers can publish new services or find existing ones. It therefore serves as a centralized clearing house for companies and their services.

Instructor Notes:

Slide gives a layman view of working of web service



1. The restaurant would register itself under Yellow pages (Registry)
2. A customer would search for the restaurant under Yellow pages
3. Customer would then look for food options [descriptions] available in menu card (WSDL)
4. Customer places order (requesting for web service)
5. Waiter serves food to customer (response)

Instructor Notes:

Slide gives a technical view of working of web service

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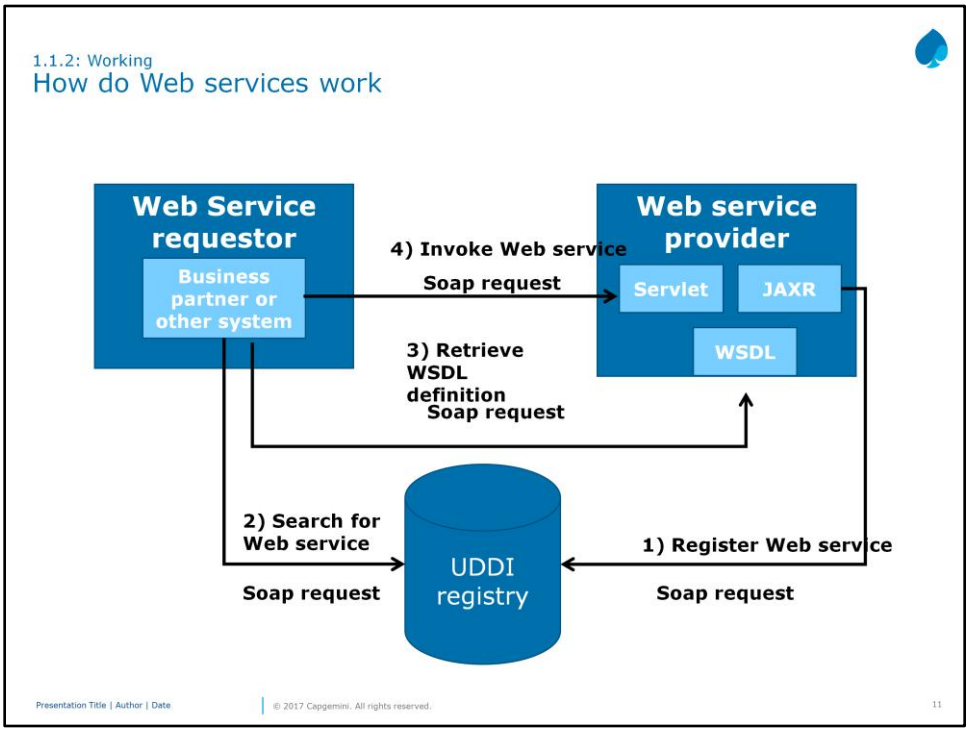


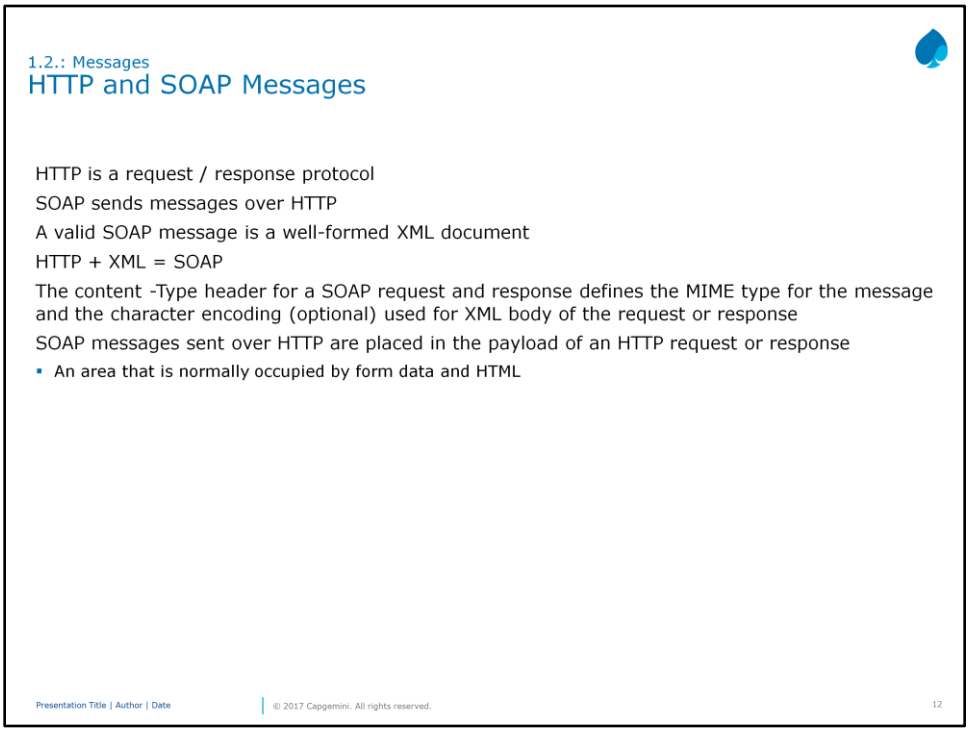
1. Web service provider needs to register the service under UDDI
2. Web service consumer (business partner, other system) would search for the web service in the registry
3. Web service consumer would then retrieve the web service definitions from provider (WSDL descriptions)
4. Now the service consumer can consume the web service given by producer

The communication between producers and consumers happen via SOAP messages.

JAXR : is one of the Java XML programming APIs. JAXR provides a uniform and standard Java API for accessing different kinds of XML-based registries, for example here it would be UDDI. Thus it would support in JAX – WS.

Instructor Notes:

Difference between HTTP and SOAP messages



You can serve any content over HTTP such as HTML, images, sound, video, etc. SOAP is an XML-based encoding of messages that are typically sent over HTTP.

Just like HTTP sits on top of TCP (TCP over IP), SOAP sits on top of HTTP.

Instructor Notes:

Overview of JAX - WS.

The JAX-WS API hides this complexity from the application developer. On the server side, the developer specifies the web service operations by defining methods in an interface written in the Java programming language.
The developer also codes one or more classes that implement those methods.

Client programs are also easy to code.

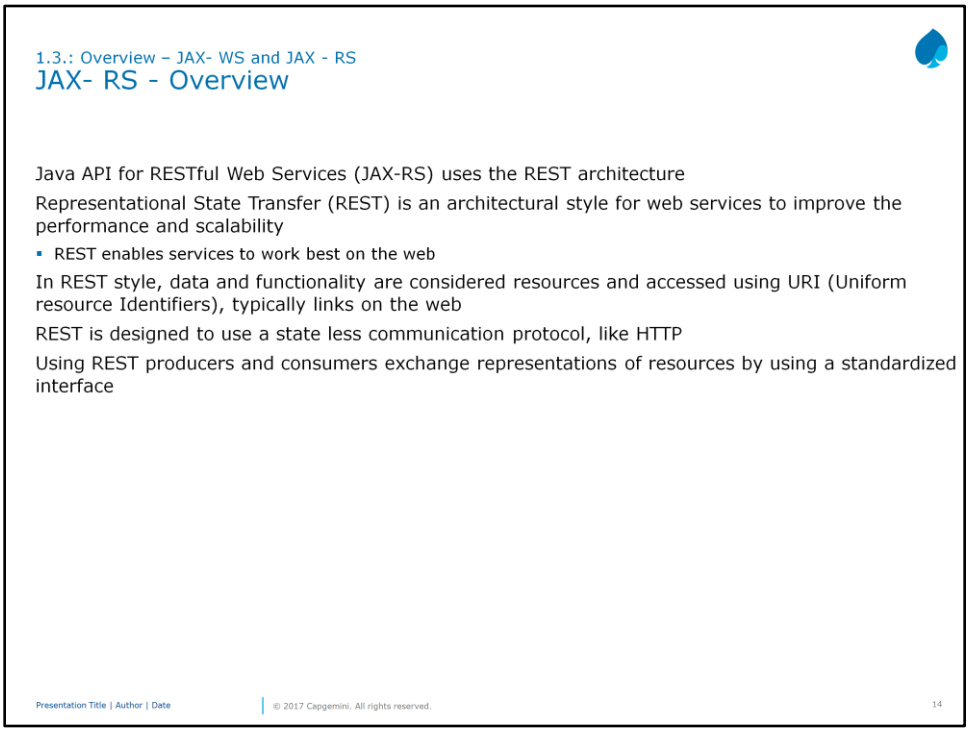
With JAX-WS, the developer does not generate or parse SOAP messages.

It is the JAX-WS runtime system that converts the API calls and responses to and from SOAP messages.

Details would be seen in the next subsequent chapters

Instructor Notes:

Overview of JAX - RS.



RESTful web services are built to work best on the Web.

Representational State Transfer (REST) is an architectural style that specifies constraints, such as the uniform interface, that if applied to a web service induce desirable properties, such as performance, scalability, and modifiability, that enable services to work best on the Web.

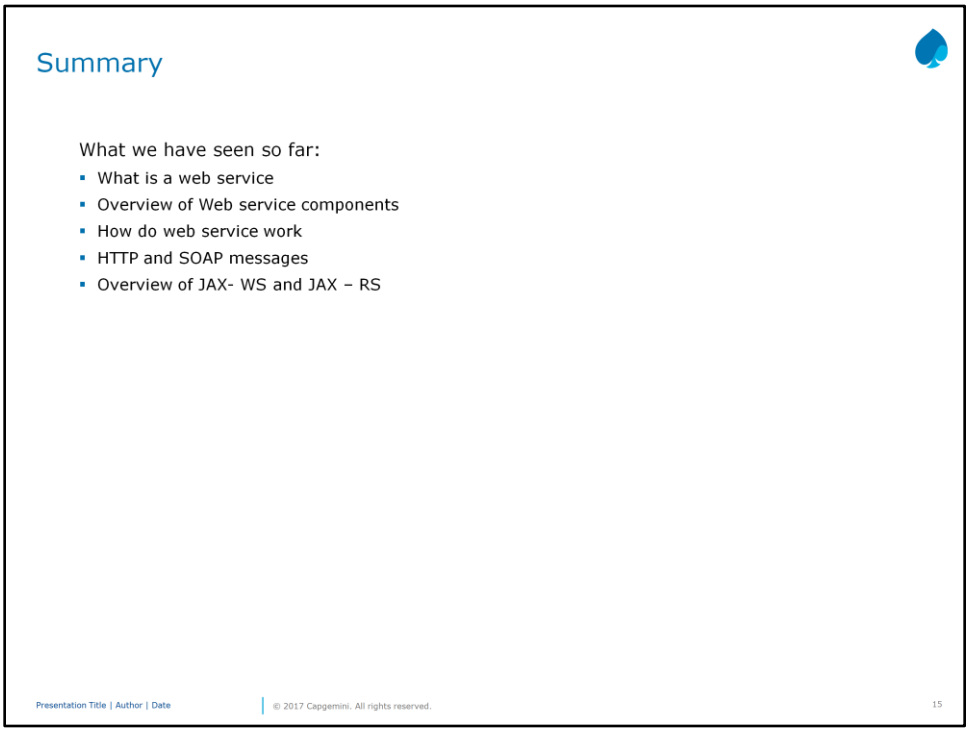
In the REST architectural style, data and functionality are considered resources and are accessed using Uniform Resource Identifiers (URIs), typically links on the Web.

The resources are acted upon by using a set of simple, well-defined operations.

REST is designed to use a stateless communication protocol, typically HTTP. In the REST architecture style, clients and servers exchange representations of resources by using a standardized interface and protocol.

Instructor Notes:

Trainer can summarize the points



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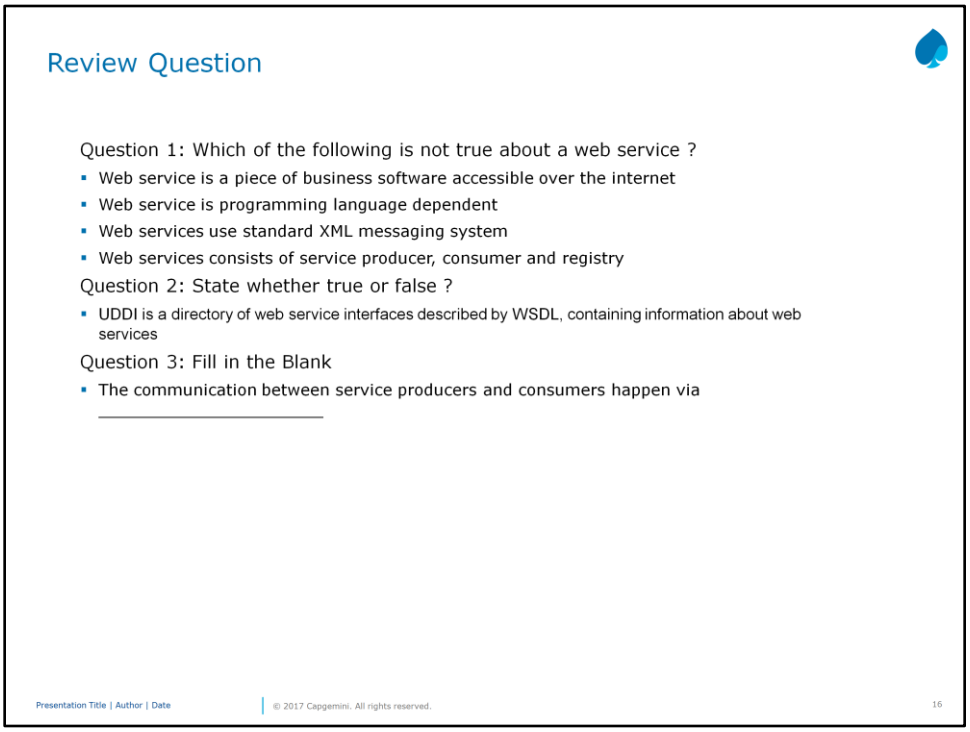
Instructor Notes:

Question 1: Option 2

Question 2: True

Question 3: SOAP messages



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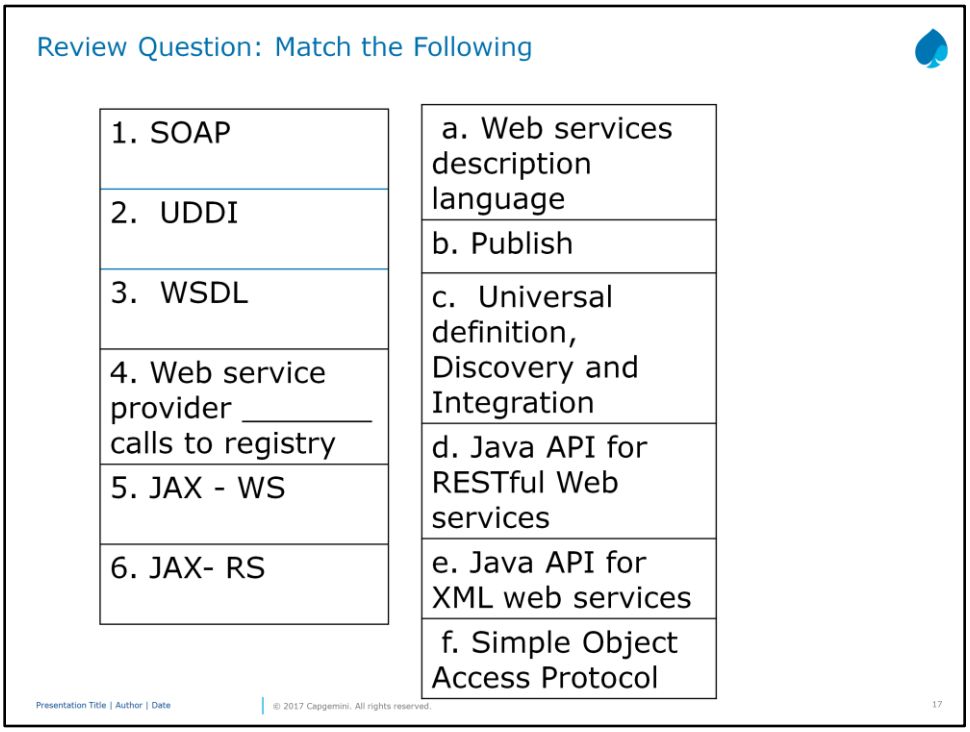

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