

## Unit: 3

### \* Key Principles of SOA:

⇒ There are Main <sup>Seven</sup> ~~eight~~ Principles of SOA.

#### 1 Standardized Service Contract:

SOA was initially implemented using the SOAP Protocol. It is allow service customers access to service specifications.

#### 2 Loose Coupling:

Services designed as self-contained components and minimize dependencies on other services.

#### 3 Abstraction:

A Service provider can hide its underlying technology from the customer.

#### 4 Reusability:

~~the~~ Designed as components,

services can be used more effectively and reduce time and costs.

#### 5 Autonomy :

Service have control over the logic, customer does not require to know about their implementation.

#### 6 Discoverability :

Services description contains description Document and metadata of document that provide effective means for customer.

#### 7 Composability :

Using services as building blocks, we can implement complex operations.

Service Orchestration and Service choreography provide support for composing service.

\* Explain Difference between Object Oriented Architecture and Service Oriented Architecture.

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	Object-Oriented	Service-Oriented
1	Platform dependent	Platform independent
2	It is uses Objects to build system.	It is uses services to build system.
3	Application interface specifies its Object / class.	Application interface specifies to service description protocol.
4	Assume homogeneous platform and execution environment.	Assume heterogeneous platform and execution environment.
5	Cheap, transparent communication.	Cost, explicit communication
6	Share class not schemas.	Share schemas not class.

\* Explain SOA Standard Stack.

=> SOA defines a way to make software components reusable via service interface.

SOA Standard Stack contains Service Registry, Service Description, Transport protocol, Policy, Security related information.

Service Registry etc. UDDI, RMI	Business Process BPM, XPDL, WSCL etc.				
Registry	Service Description WSDL, XML, UDDI etc.				
Registry	Service Communication Protocol				
UDDI, RMI	SOAP, Binary data, XMLP	Policy- ws-policy	Security- ws-security, OMIG security	Transaction- ws-Transaction, ws-Coordination	Management- ws-management, wsQM
UDDI	Transport HTTP, JMS, HTTPS etc.				Reliable Messaging

Service Registry contains all the basic details of service and UDDI Registry.

Business Process is use to implements and optimize the business Process.

Business Process contains BPML which is stands for Business Process Management Layer.

Service Description is use to provides basic service information to the service consumer.

Service Description is contains WSDL, XML and UDDI for provide service details.

Service Communication Protocol is use to provides communication between service provider and service consumer.

Service Communication Protocol contains SOAP, Binary data and XML-RPC Protocol.

Transport is used to provide the service requests to the service provider.

Transport is contains basic Protocol which is either HTTP, HTTPS, JMS etc.

Policy is used to provide set of protocols that can be follow by service provider and Service Consumer.

ws-policy is contains all the protocol of service provider which is follow by service consumer.

Security is used to provide identification and Authorization for service.

ws-security is contains all the identification and authorization protocol for service.

Transaction can be defined as any service that performs JML operations.

Transaction is provides surety of consistent result which allow to perform either all operation or none operation.

Management is used to manage all the service which is present in Service Registry.

Management provides set of attributes that used to manage service.

Reliable Messaging is used to passed message between service consumer and service provider.

Reliable Messaging provides a framework for passed the message in SOA.

\* Explain SOA with Web Services Standard Stack.

=> SOA with Web Services is used to describe the communication between service provider and service consumer.

SOA with Web Services stack is contains all the basic protocol and basic process for web service.

Management WS-manageability	Presentation WSRP		
Business Process Orchestration BPML, WSCI, WSPI etc.			
Security WS-Security SAML	Reliable Messaging WS-reliable message	Transaction WS-coordination WS-Context	Provisioning SPML
Addressing - WS-addressing			
Discovery and Registry - UDDI, WS-discovery			
Description - WSDL, WS-policy			
Messaging - SOAP, XML, XML schema			
Transport - Http, Https, SMTP etc.			



- Transport Protocol: It is used for transporting a message between network.

HTTP is the network protocol that is support to passed the message between network.

- Messaging: It is used to encoding message in a XML format.

SOAP is used to perform three operation: Publish, Find and Bind operation.

- Description: It is used to provide the description of a service.

WSDL is used to provides basic service description to service consumer.

- Discovery and Registry: It is used to provide comman service description between service provider and consumer.

Using UDDI, Service Provider Register service in UDDI and service consumer find the services in UDDI Registry.

- Addressing: It is used to provide web service location and description.

Using ws-addressing, service consumer can find the web services location and description.

- Security: It is used to provide identification and Authorization for services.

ws-Security contains all the identification and authorization protocol for services.

- Reliable Messaging: It is used to passed message between service consumer and service provider.

Reliable Messaging provides a framework for how passed the message in SOA.

- Transaction: It can be defined as any services that performs DML operation.

Transaction is provides surety of consistent result which allow to perform either all operation or none operation.

- Provisioning: Using Simple wizard, Provisioning process is guide the consumer.

- Business Process Orchestration: It is used to provide web service workflow and technology to the end user.

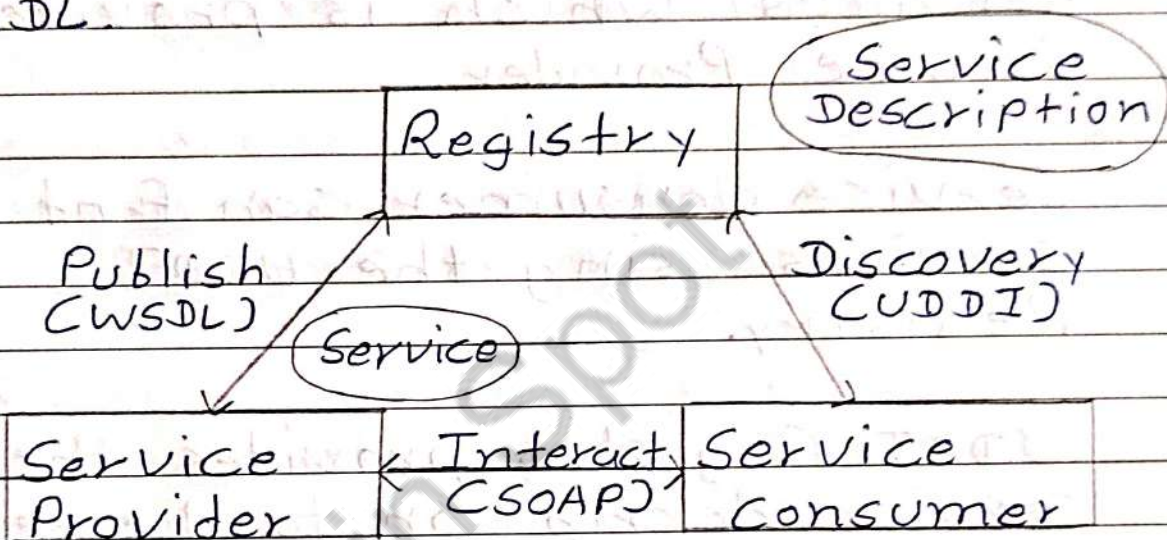
- Management: It is used to manage all the service which is present in service registry.

Management provides set of attributes that used to manage service.

- Presentation: It is Used to solve integration complexity problem in Service.

## \* Explain SOA Interaction Pattern.

=> SOA Interaction Pattern is used to define how Service Provider and Service Consumer communicate with each other using SOAP, UDDI Registry and WSDL.



- Service Provider: Service Provider can provide the services.

Service Provider can Publish the services in UDDI Registry.

Using WSDL, Service Provider can publish the service description in UDDI Registry.

Service Provider and Service Consumer can communicate

Using the SOAP Protocol.

SOAP provides the message in format of XML document.

- Service Consumer: Service Consumer can consume the services which is provided by Service Provider.

Service Consumer can find the services using the UDDI Registry.

UDDI Registry provides the service description to the service consumer.

Service Consumer and Service Provider can interact with each other using the SOAP Protocol.

SOAP Protocol provides the message in the form of XML Document.

- Registry: Registry is contains all the services descriptions which is provide by service provider.

Registry is allows to Services Provider to provide the service description in UDDI Registry.

Registry is also allows to services consumer to Find the service description in UDDI Registry.

\* Explain Web Service Design classification.

=> There are two type of Design classification.

1) Services Roles

2) Services Models.

1 Services Roles:

Services Roles is a temporary classification.

There are three types of Services Roles.

- ci) Service Provider
- cii) Service Consumer or Requestor
- ciii) Intermediaries

ci) Service Provider : Service Provider can provide a services which is consume by the service requestor.

Service Provider can provides any services in Registry.

There are two more part in Service Provider.

- ca) Service Provider Entity
- cb) Service Provider Agent.

ca) Service Provider Entity:

It can be Organization or single provider that can provides web services.

cb) Service Provider Agent:

The web services itself acting as an agent on behalf of.

its provider.

cii) Service Requestor:

Service Requestor can request for the services which is provide by service provider.

Service Requestor can Find the services in UDDI Registry.

There are two more part in Service Requestor.

ca) Service Requestor Entity

cb) Service Requestor Agent

ca) Service Requestor Entity:

It can be Organization or single requestor that can be request for a services.

cb) Service Requestor Agent:

The Web Services itself acting as a agent on behalf of its web services requestor.



### ciii) Intermediaries :

In Web Services, Intermediary receives and submits messages to the ultimate destination.

There are two types of Intermediaries.

- ca) Passive Intermediaries
- cb) Active Intermediaries

#### ca) Passive Intermediaries :

It is routing messages to a subsequent location and Processing a messages without modify its content.

#### cb) Active Intermediaries :

It is routing messages to Forwarding destination and Processing a messages and modify the its messages content.

~~2) Services Roles :~~

2) Services Models :

There are three types of Services Models.

(a) Business Service Model

(b) Utility Service Model

(c) Controller Service Model.

(a) Business Service Model :

Business Service Model represents the fundamental building block which represent the business logic.

It is also represent a corporate entity or business logic information set.

(b) Utility Service Model :

Utility Service Model is use to achieve reusable functionality which is use in SOA.

This model enables the characteristic of reuse within SOA.

c) Controller Service Model:

Controller Service Model support and implement the principle of composability.

It is also support the Autonomy in other service.