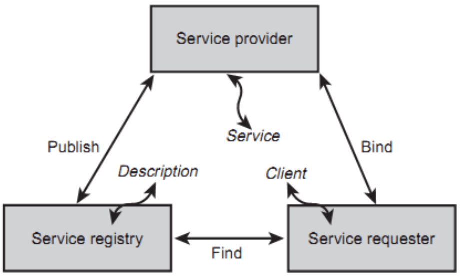
SOA, ARCHITECTING WEB SERVICES, TECHNOLOGY STACK

The Service-Oriented Architecture (SOA)

In order for Web Services to be able to work well together, they must participate in a set of shared organizing principles we call a service-oriented architecture (SOA). The term service-oriented means that the architecture is described and organized to support Web Services' dynamic, automated description, publication, discovery, and use.

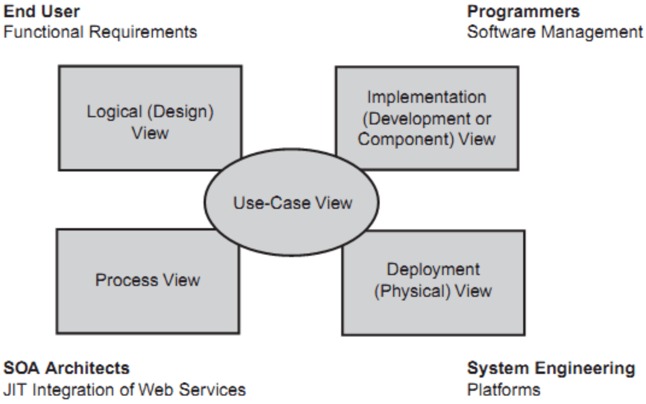
The SOA organizes Web Services into three basic roles: the service provider, the service requester, and the service registry. The relationships among these three roles are shown in Figure.



Architecting Web Services:

Oneestablishedmodelforhowarchitectsvisualizethesystemsbeforethemisthe*4+1ViewModelofSoftwareArchitecture*,popularizedbyPhilippeKruchtenofRational Software.Whereasthefourblindmeneachtouchtheelephantinadifferentplaceand thereforecometodifferentunderstandingsofit,thearchitecthasclearvision,seeingthe elephantfromallfourviews.Asaresult,thearchitecthasacomprehensivepicture oftheelephant.

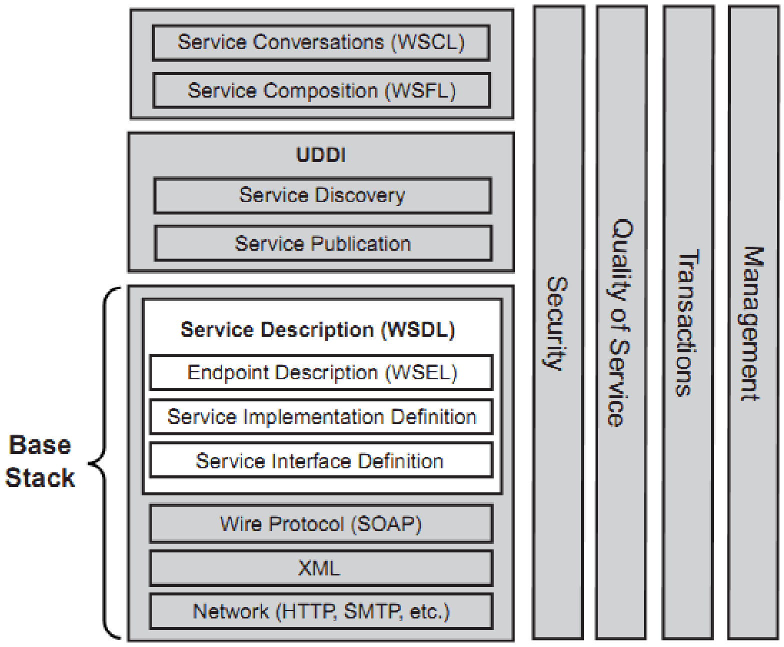
Thisisthesamewiththe4+1ViewModel.Thismodeldescribesfourdistinctwaysof lookingatthearchitectureforasystem,plusafifthviewthatoverlapstheothers,as showninFigure.



The Web Services Technology Stack:

Thebasestackincludesthosetechnologiesnecessarytocreateandinvoke WebServices. Atthebottomisthenetworklayer,whichfundamentallyallowsWeb

Servicestobe availabletoservicerequesters.AlthoughHTTPisthedefactostandardnetworkprotocol, thearchitectmayconsideranyofanumberofotheroptions,includingSMTP(fore-mail),FTP,IIOP,ormessagingtechnologiessuchasMQ.Someofthesechoicesare request/responsebased,whereasothersaremessagebased;furthermore,somearesynchromos,whereas othersareasynchronous.Thearchitectmayfindthatinalargesys- tem,acombinationofdifferentnetworkprotocolsisappropriate.


Service Conversations (WSCL)
Service Composition (WSFL)
UDDI
Service Discovery
Service Publication
Service Description (WSDL)
Endpoint Description (WSEL)
Service Implementation Definition
Service Interface Definition
Wire Protocol (SOAP)
XML
Network (HTTP, SMTP, etc.)
Base Stack
Security
Quality of Service
Transactions
Management

On top of the SOAP layer comes three layers that together form the service description. WSDL is the de facto standard for service descriptions, with the addition of the still- tentative WSEL for endpoint descriptions. The service interface definition contains the binding, portType, message, and type elements, which form the portion of the service description that is reusable from one implementation to another.

The service implementation definition, however, contains those elements that are specific to each implementation: the service and port elements. A third party (say, a standards body) might specify the service interface definition for a particular type of Web Service, leaving the service implementation definition up to each implementation team.

Next comes the endpoint description, which introduces semantics to the service descriptions that apply to a particular implementation. Endpoint descriptions can contain security, QoS, and management attributes that help to define the policies for each of these vertical columns.

Once the architect has dealt with all the issues in the base stack, the Web Services are essentially fully constructed. Next, the development team uses UDDI to publish the services to a registry or another repository of information about available Web Services. Once Web Services are published, UDDI can then be used to discover them in the registries.

Source : http://nprcet.org/e%20content/Misc/e-Learning/IT/VIII%20Sem/IT1451%20-%20XML%20and%20Web%20Services.pdf