

Unifie X Common Gateway Server (N – Tier)

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ABSTRACT

The main objective of this project is to develop a generic tool for Common Gateway Architecture provide a communication flat form for integration of services to provide all the related services of a department as a Single Service in a single window. The Common Gate approach involves three different web servers to be located at same or three different geographical locations. The Common Gate way platform facilitates to integrate the services of any number of departments. This is going to be a revolution as it can be viewed as N-Tier system. The user request and service provider business logic have to be separated and the communication between the requesting machine (SDC Web Site) and the Service Provider Machine (SP Web Site) has to be routed through a Common Gate Way Broker Server. The Gate way Server is to maintain directory of services of service providers (Sps) for integration of services to provide services in a single window. Public Key Infrastructure (PKI) technology should be used for Accountability and Authenticity of data. The common User Interface will be hosted on the Service Delivery Web-site. All the user requests and responses will be routed through common gateway server. Requests and response data would be transmitted in XML Format for data Interoperability and Integration.

1. INTRODUCTION

To integrate information of all the departments to provide services in a single window. The objective is to develop an application for exchanging the data across the various departments in a common format in XML and in a secured way for interoperability and integration, irrespective of the various hardware and software platforms being used by various departments. This is also to separate the concerns of the front-end service providers from the backend applications using a intermediary broker Server called as Unifie X Gateway Server , and to guard the service provider machines from hackers. The user request and service provider business logic have to be separated and the communication between the requesting machine and the Service Provider Machine has to be routed through a Common Gate Way Broker Server. The Gate way Server is to maintain directory of services of service providers for integration of services to provide services in a single window. Accountability and Authenticity of data is to be provided using PKI technology. As delineated above, the main objective of this project is to develop a generic tool for Common Gateway Architecture to provide a communication flat form for integration of services to provide all the related services as a Single Service in a single window.

1. Purpose of the system

As it is the primary objective of this project that the sharing of data contents among the department in XML format is used for data transmission in common format and for easy understanding of data.

2. Purpose of the Gate Way Server:

- Gateway is like a Telephone Exchange
- Makes MANY-TO-MANY connections possible through MANY-TO-ONE connections
- promotes Inter-operability & Single-Sign-On
- Directory of Services will be maintained for integration of related Services

3. Pre-requirements:

- Availability of Common Gateway Architecture
- Availability of Service providers

The common Gateway approach for integrating services and providing the services to the citizens in a single window, involves development of three core modules such as

1. Connectors for transmission of data – Common Gateway Architecture
2. Integration of related Services to provide as a single service and
3. Implementation of PKI technology to ensure secured transmission of data over internet and Accountability and Authenticity of data updations at backend database.

2. PRIOR SYSTEM

1. SRO-MRO Integration (Registration data): The registration details of Agricultural Lands are being downloaded from a three tier internet based application. All the 112 Revenues Offices are provided with userids and passwords to access the web site. The Revenue Officers, on daily or weekly basis, would access the IGRS web site and down load the registrations data into their local Oracle database.
2. Existing methodology of providing citizen services
The citizen services – Land Details and Crops details are being provided on the three tier internet based application as two different services.

Problems in the present three tier system

- As the user interface and business site is on the same machine, the web server and database server are very much prone to hacking where both the machines can be damaged by the hackers.
- Data transmission over internet is not secure.
- Citizen services cannot be integrated to provide as a single service from a single window. Different web sites have to be accessed for different services.
- As many Internet Applications has to be opened as many service providers exist. This would eat away local memory and degrades the performance
- Same input has to be entered for as many service providers accessed at the same time. This would be more time consuming.
- The content / Services of web site cannot be shared by another web site, because of platform dependency. That is, it is not possible interoperability of data among the service providers

It is not possible to integrate the related service into a single service viz. registration details and Land Details of a piece of Land.

3. PROPOSED SYSTEM

• Project Objective

Unifie X Common Gateway project view will ensure interoperability and integration of data though a set of standards such as data transmission in XML and to separate the concerns of the front-end service providers (SDC) from the backend applications, and to guard the service provider machines from hackers using a intermediary broker Server called as Unifie X (Unifie X Common Server).

The main objective of this paper:

1. To develop a generic tool for Common Gateway Architecture called as Unifie X Gateway (Server) to provide a communication flat form .
2. To create services at the Service Provider, directory of services on Unifie X Gateway Server for seamless accessing of related services and integration of the services and to develop a common user interface for rendering the Land related services a single service form a single window. The requests and responses should be routed through the Unifie X Common Gateway Server.

• Project Goal

To protect Backend Server of Service Providers from hacking and to provide Services from a single window.

• Design

Out of nine departments identified in this integration,

1. This application takes care of data exchange / transmission of registrations details from the Central Server of the Registration department and to the respective local servers/databases of the Revenue Offices of the Revenue Dept.
2. Takes care of services creation and integration of Land details from the Central Server of the Revenue Department and development of Common user interface.

The responses / business logic will be created as web service and hosted on Service Provider Website. The common User Interface will be hosted on the Service Delivery Website[4]. All the user requests and responses will be routed through Unifie X Common gateway server. Requests and response data would be transmitted in XML Format for data interoperability and Integration.

As the existing System is developed in VB.Net, the user interface is written in VB.Net. As mentioned in module 1, [4] SOAP, XML are embedded in VB.Net to generate http request and to receive response. This application captures user input – District Name, Mandal Name and Period, converts into XML format. The data in XML format is passed along

with URL address to the Unifie X Common Gateway Server. The Unifie X Common Gateway Server in turn call the Service provider URL using the service name.[4]The response in XML format will be parsed and inserted in the pre-defined table in the Oracle database at the Client Machine. This data be would used in another module for further processing by Office for effecting change of registry in land ownership.

This module provides two options such as 1. New Option and 2 .Old Option.

The **New Option** will fetch the records created from the last fetch. The New Option will update the flags in the corresponding tables on the central server of the Registration Department after successful transmission of the data. The **Old Option** will facilitate to fetch the records already fetch in a given period. Old Option can be used to transmit the data again in case of transmission failure.

The individual responses obtained in XML will be integrated into a single XML file at Unifie X Common Gateway server and passed to the Services Delivery Central Website. The generation and rendering of integrated certificate is done at Services Delivery Central Website taking integrated XML data as input [6]. The Input, the three XML files are

1. The Web services approach is used to meet the following requirements

- For interoperability between various different software applications running on different platforms (Operating systems).
- By utilizing HTTP, web services can work through many common firewall security measures without requiring changes to the existing firewall filtering rules. Other forms of RPC(Remote Procedure Call) may more often be blocked.
- For reuse of services and components within and among the departments
- For facilitating a distributed approach to application integration.

2. Purpose of data transmission in XML

As it is the primary objective of the this project that the sharing of data contents among the department, XML format is used for data transmission in common format and for easy understanding of data[7].

3. Pre-requirements

- Availability of Service provider Server

Availability of Unifie X Common Gateway Server with WeblogicServer installed and configured

4.MODULES

Module 1 - Connectors for transmission of data – Common Gateway Architecture

These are the communication connectors which will be hosted at the client machine – service delivery centers, the Common Gateway Server and the Service Provider Machine. These connectors are responsible for communication from the service delivery centers via Common Gateway Server to the Service Provider Machine and back

Module 2 - Integration of related Services to provide as a single service at Unifie X gateway

The common Gate way server called as Unifie X gateway server, will maintain a directory of services with corresponding service provider's URL details. That is the directory of services consists of **Main Service** and corresponding **Sub Services names** to be integrated, if any and **URL addresses** of sub services of Service Providers. The Unifie X gateway server takes the request from the client in XML format, searches the URL details of service provider and directs or re-transmits the request to the Service provider and sends the response back to the client in XML format. Requests and responses are touted through Connectors. If a request requires multiple services from different service providers, all such services will be consumed at common gate way server in XML format and integrates them into a single XML format to be consumed at Client end. The responses / business logic are created as web services on the service provider web site.

Module 3 - Implementation of PKI technology to ensure secured transmission of data over internet and Accountability and Authenticity of data updation at backend database.

This objective of this module is to develop a generic application for digitally signing the data updations for Accountability and Authenticity of updations and for secured transmission of data over internet.

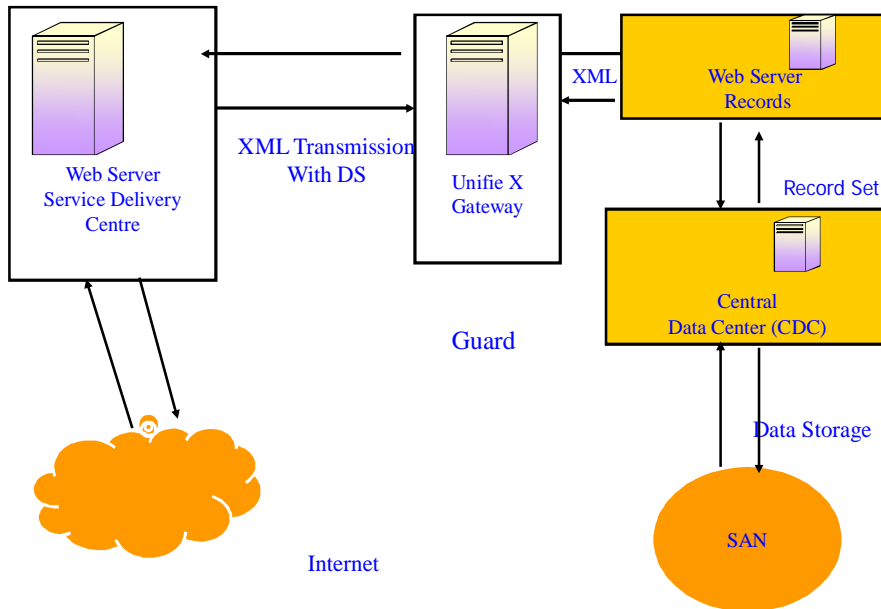


Figure 2:Block Diagram of Unifie-X Gateway Server

• **Workflow in Block Diagram**

In this system, the user request and business process are separated and hosted on different web sites. The user request is from a client machine from VB.Net application, whereas the responses / business logic are created as web services on the service provider web site. The user request will be converted into XML format and given to the connector hosted on the requesting client which will transmit the request to the connector of the Unifie X Common Gateway broker Server, the Unifie X Common Gateway will identify the service provider machine from its pre-defend database and forwards it to service provider connector.

The service provider connector identifies the web service and invokes, which will fetches and processes data from backend database, in this case, ORACLE 10g. The service provider connector sends the response back to Unifie X Common Gateway Server in XML format, which in turn passes to the requesting connector hosted at the requesting Client Machine. The user request interface would convert the data in XML format appropriately and updates in the local Oracle Database table, or displays the response in the form of report as the case may be.

This module consists of further three sub-modules such as

- Data entry / updation – digitally signs the data taking the private key from the PKI smart card and sends the digital signature along with the data in XML format to the web server. At the web server end before updating the data in the backend database, verifies secured transmission of data by comparing new and old hashes.
- Batch or Selective verification of data tampering at Backend database
- Verification of signature data for a select record to ascertain accountability and authenticity of data updations

Thus the Common Gate approach involves three different web servers to be located at same or three different geographical locations

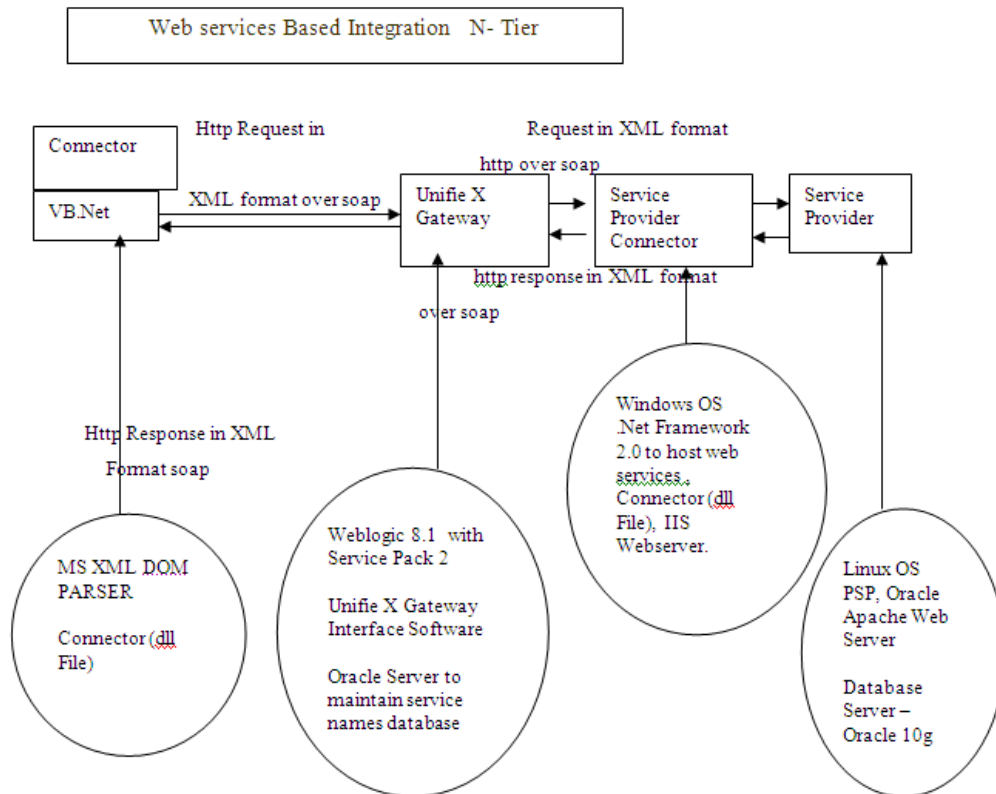


Fig 3. Workflow (DFD) - Interdepartmental Data Transmission (SRO and MRO)

The Common Gate way platform facilitates to integrate the services of any number of departments. This is going to be a revolution as it can be viewed as N-Tier system. In the proposed system, it is proposed to integrate the data / services of minimum 10 departments.

5. SCOPE OF FUTURE ENHANCEMENTS

Service Provider site can be made SSL enabled using Server Level PKI to ensure more secured and non-repudiation of data transfer. Once a site is SSL enabled, the data originating from it is encrypted, transmitted over internet and automatically decrypted in the internet browser.

Further, individual based PKI technology can be used to ensure Accountability and Authenticity of Data updations . This requires development of a separate user interface to affect the digital signature on the data being updated, for viewing the certificate details of person who has updated the data at the record level of the database.

List of the erroneous records which could not be transmitted into SDC centre is to be maintained and a facility for viewing the same may be provided to take remedial action. The continuous network connectivity is provided using leased line connectivity, the data of registrations can be transmitted without the user intervention at the SDC. This option facilitates data transmission much faster than the existing one. This does not require any changes in the application

6. CONCLUSION

This approach is more secure than normal three tier approach. Since, data transmission is done in XML document format, the transmission is faster than three tier system and interoperability and integration of Services are made easier without disturbing existing application environments. Because of these reasons, it would greatly help in a more easy and efficient way for delivery of integrated Services.

REFERENCES

[1]. Interoperability Interface Protocol (IIP) design document of Department of Information Technology Ministry of Communications and Information Technology, Government of India.

- [2]. Information Technology Act, 2000 and Information Technology(Amendment) Act, 2008 of Ministry of Communications and Information Technology, Government of India
- [3]. Information Technology Act, 2000, Government of Andhra Pradesh.
- [4]. SOAP Version 1.2, Part 1: Messaging Framework (second edition), W3C recommendation, M. Gudgin et al.,eds., 27 Apr. 2007; www.w3.org/TR/soap12-part1/.
- [5]. Web Services Description Language (WSDL) 1.1,"W3C note, E. Christensen et al., eds., 15 Mar. 2001; www.w3.org/TR/wsdl.
- [6]. Universal Description, Discovery, and Integration (UDDI), version 3, Organization for the Advancement of Structured Information Standards (Oasis), 2004; www.uddi.org/pubs/uddi_v3.htm.
- [7]. Interoperability Interface Protocol (IIP) design document of Department of Information Technology Ministry of Communications and Information Technology, Government of India.
- [8]. Information Technology Act, 2000 and Information Technology(Amendment) Act, 2008 of Ministry of Communications and Information Technology, Government of India
- [9]. Information Technology Act, 2000, Government of Andhra Pradesh.
- [10].SOAP Version 1.2, Part 1: Messaging Framework (second edition), W3C recommendation, M. Gudgin et al.,eds., 27 Apr. 2007; www.w3.org/TR/soap12-part1/.
- [11].Web Services Description Language (WSDL) 1.1,"W3C note, E. Christensen et al., eds., 15 Mar. 2001; www.w3.org/TR/wsdl.
- [12]. Universal Description, Discovery, and Integration (UDDI), version 3, Organization for the Advancement of Structured Information Standards (Oasis), 2004; www.uddi.org/pubs/uddi_v3.htm.
- [13]. C. Ferris and J. Farrell, "What Are Web Services?" Comm. ACM, vol. 46, no. 6, 2003, p. 31.
- [14].C. Ferris and J. Farrell, "What Are Web Services?" Comm. ACM, vol. 46, no. 6, 2003, p. 31.
- [15].C. Ferris and J. Farrell, "What Are Web Services?" Comm. ACM, vol. 46, no. 6, 2003, p. 31.

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