**Web Servers (Middleware):**

1. Web server1 (simulate Public DMZ) (Middleware1): built on JBoss, use SOAP technology and return XML format
2. Web server2 (simulate Local LAN) (Middleware2): built on Apache, use SOAP technology and return JSON format
3. Web server3 (Bank Network): as it’s hard to use such real web server, we will simulate its web service on the Apache web server (middleware2)

**Web Services:**

1. Detailed description and Invocation scenarios of the existing web Services:
2. Login: Portal (Php) or Mobile (Andriod), use web service “Login” built on Middleware1, this service call web service “Login” built on Middleware2 which return authentication as a value of “true”, ”false”
3. Retrieve Customer Information:

Portal (Php) or Mobile (Android), use composite web service “GetCustomerData” built on Middleware1, this composite web service calls 2 atomic web services on Middleware2:

* + 1. 1st atomic service “GetCustomerInfo”, return customer information (name, address, email, etc.)
    2. 2nd atomic service “GetCustomerServices”, return customer services such as (subscription fees, caller\_id, international calls, etc.)

1. Retrieve Bills:

Portal (Php) or Mobile (Andriod), use web service “GetCustomerBills” built on Middleware1. This web service calls atomic web service “GetCustomerBills” on Middleware2 to retrieve all customer unpaid bills information.

1. Pay for bill:

Portal (Php) or Mobile (Android), use composite web service “PayBill” built on Middleware1 to pay for specific bill, this web service calls 3 atomic web services on Middleware 2:

* + 1. 1st atomic web service “GetCustomerBills” retrieve customer bill amount.
    2. 2nd atomic web service “BankAuthinticationPayment”, this service to pay the bill amount from “GetCustomerBills” on the bank and return payment status.
    3. 3rd atomic web service “UpdatePayment”, to update bill status with the payment status from “BankAuthinticationPayment”.

1. Table shows the services and the relations between them:

|  |  |  |
| --- | --- | --- |
| *Is compsite* | *Web server1 (DMZ) (Middleware1) JBoss server* | *Web server2 (LAN) (Middleware2) PHP Apache server* |
| False | Login | Login |
| True | getCustomerData | getCustomerInfo |
|  |  | getCustomerServices |
| False | getCustomerBills | getCustomerBills |
| True | payBill | getCustomerBills |
|  |  | bankAuthntectionPayment |
|  |  | updatePayment |

1. Web services (Input/Output)

|  |  |  |
| --- | --- | --- |
| ***Web server1 (DMZ) (Middleware1) JBoss server*** | | |
| **Service** | **Input** | **Output** |
| Login | areaCode, telNo, password | True or false |
| getCustomerData | areaCode,telNo | accountNumber, customerName, address, mobile, email, telephoneNumber, areaCode, faxNumber, customerClassification, customerType, subscriptionDate, lineStatus  and list of services (serviceName, serviceStatus, subscriptionDate) |
| getCustomerBills | areaCode,telNo | accountNumber, billNumber, telephoneNumber, billPeriod, billAmount, currency, dueDate |
| payBill | areaCode,telNo,billNumber | Message |

|  |  |  |
| --- | --- | --- |
| ***Web server2 (LAN) (Middleware2) PHP Apache server*** | | |
| **Service** | **Input** | **Output** |
| Login | areaCode, telNo, password | True or false |
| getCustomerInfo | areaCode, telNo | accountNumber, customerName, address, mobile, email, telephoneNumber, areaCode, faxNumber, customerClassification, customerType, subscriptionDate, lineStatus |
| getCustomerServices | areaCode, telNo | serviceName, serviceStatus, subscriptionDate |
| getCustomerBills | areaCode, telNo, billNumber | accountNumber, billNumber, telephoneNumber, billPeriod, billAmount, currency, dueDate |
| bankAuthntectionPayment | billNumber,billAmount,currency,visaNumber | True or false |
| updatePayment | areaCode,telNo,billNumber | True or false |