



Motorola Israel Project:

# Authentication Center for SDP Federation

ADD

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# Table of Contents

- ❶ Remainder
- ❷ System Requirements
- ❸ System Architecture
- ❹ Main Classes and Relationships
- ❺ User Interface
- ❻ Tests
- ❼ Tasks List

# Reminder...

## Reminder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

## Network Authentication:

A client (supplicant) of one SDP wants to use infrastructure of local (reachable) SDP.

An authentication process is a precondition for establishing a connection between the client and the desired SDP.

One Authentication Center will receive all requests for AAA and handle it, including:

- Ⓜ Protocols conversion (*RADIUS - DIAMETER*).
- Ⓜ Routes authentication request to SDP that the user is subscribed to.

# Reminder...

## Reminder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

## SDP Authentication :

- ❶ Application needs to use specific services. The services are provided and available in several servers. In order to get the services, the application needs to authenticate with services servers.
- ❷ An authentication center will implement the authentication process and service request, using standard API (*Parlay & MD5*).  
The center will connect the application with the available and relevant services.

# System Requirements

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

- ❶ Establishment of Authentication Center.
- ❷ Management of the authentication process:
  1. User network authentication.
  2. Application authentication.
- ❸ Route authentication requests and response :
  1. Network requests.
  2. Service requests.
- ❹ Managing a repository for SDP and services records.

# System Requirements

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

- ❶ Authentication protocols conversion:  
*RADIUS to DIAMETER*  
*DIAMETER to RADIUS*
- ❷ Implementation of standard authentication protocols & obtain services: *EAP-MD5 & Parlay*.
- ❸ GUI for a detailed visual trace of the system's states including graphic logger window.

# System Architecture

Remainder

System Requirements

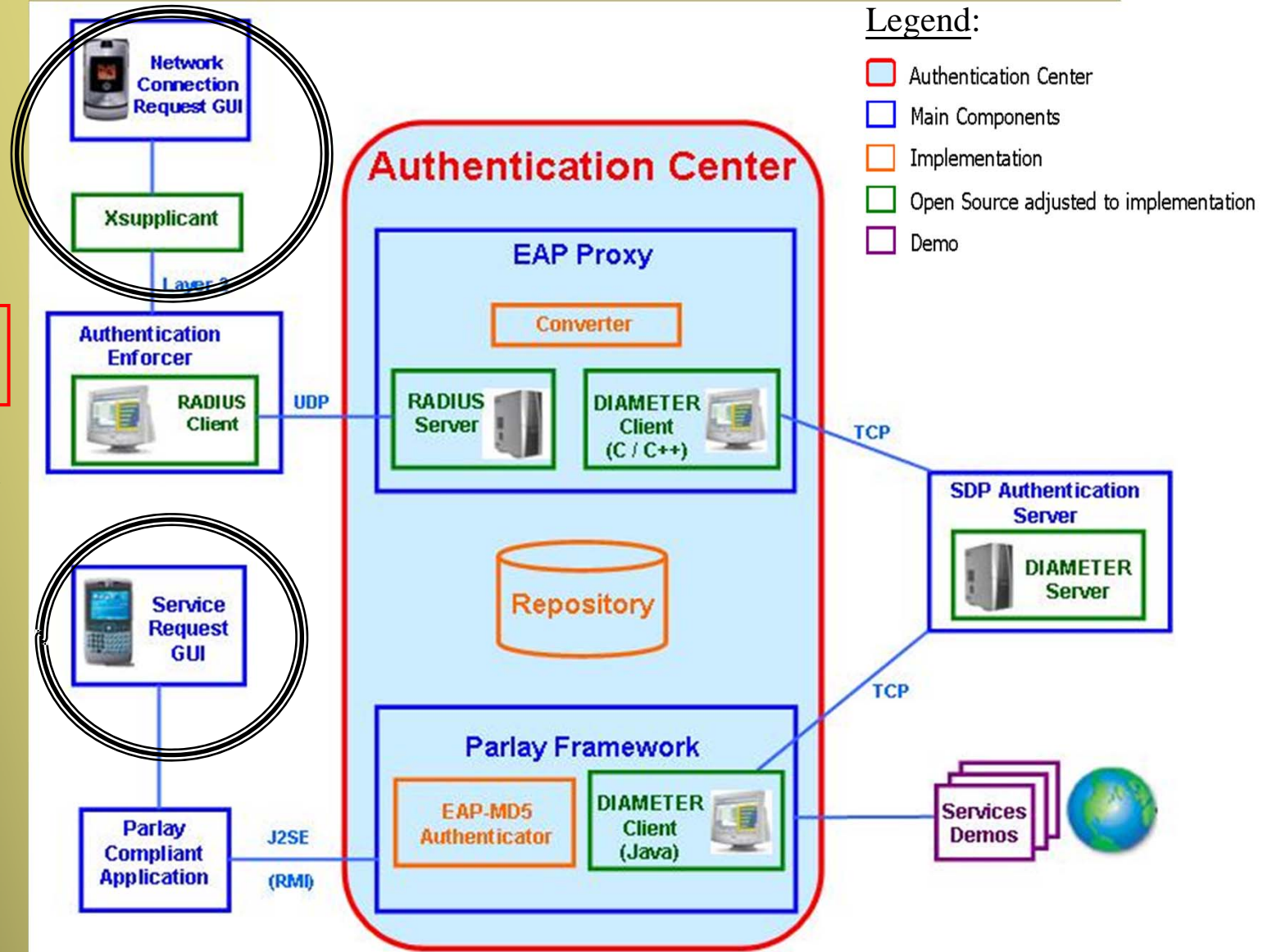
System Architecture

Main Classes and Relationships

User Interface

Tests

Tasks List



# Main Classes and Relationships

## Network Authentication - Package Diagram

Remainder

System  
Requirements

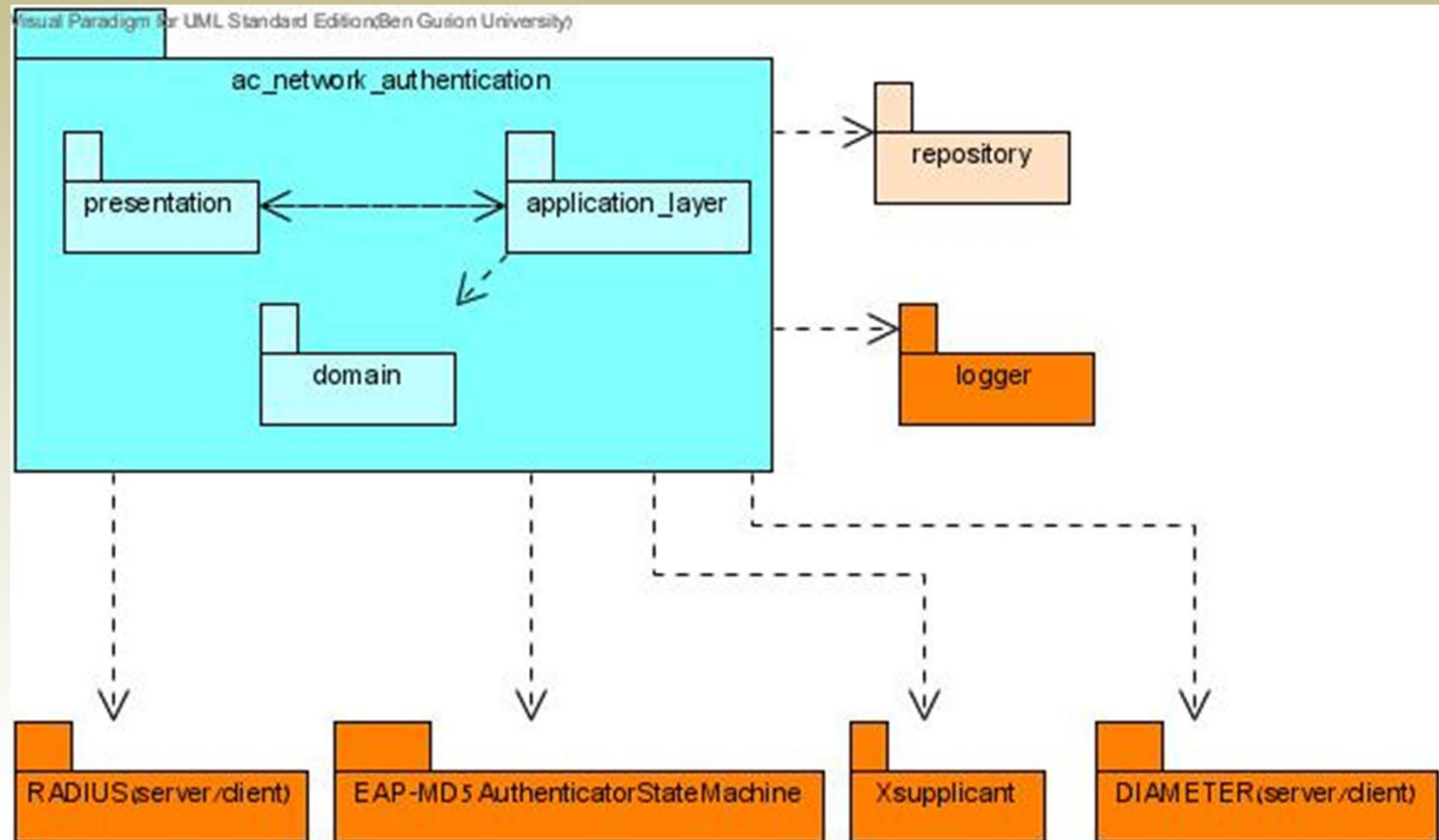
System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List





# Main Classes and Relationships

## Network Authentication - Class Diagram

Remainder

System Requirements

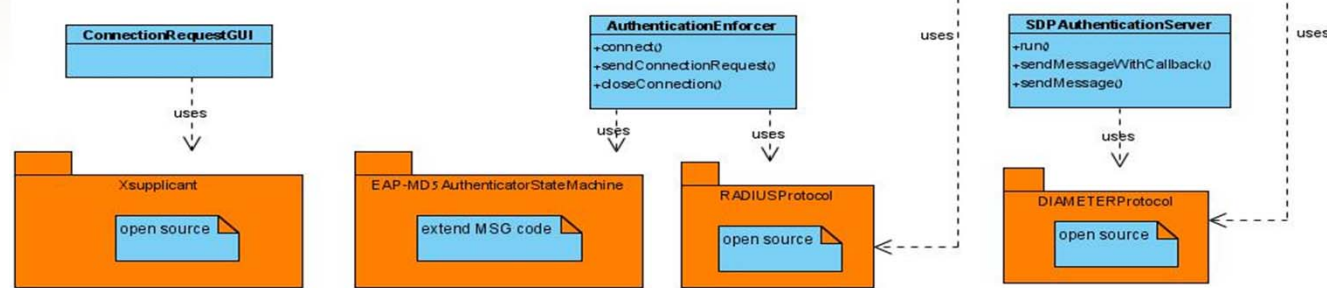
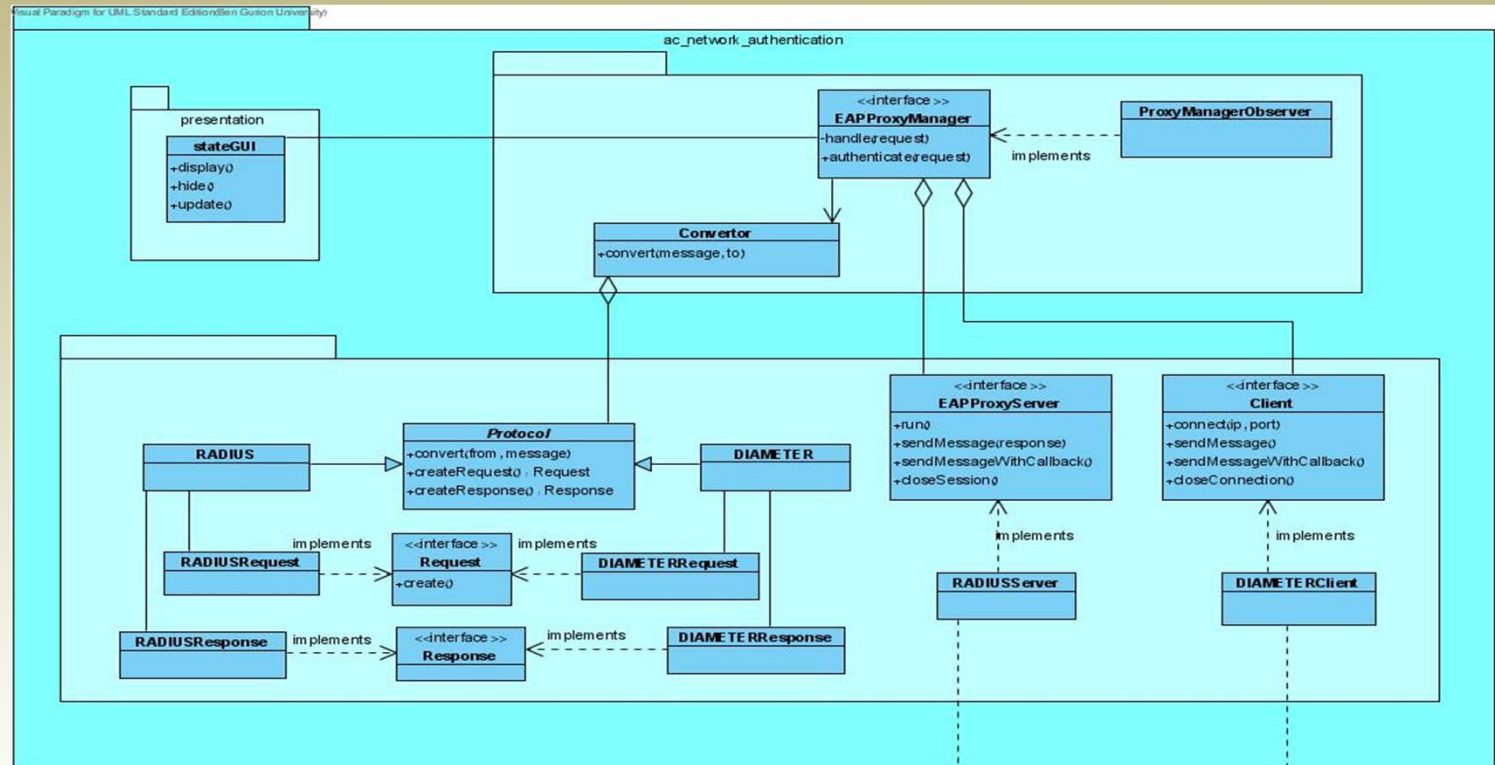
System Architecture

**Main Classes and Relationships**

User Interface

Tests

Tasks List



# Main Classes and Relationships

## SDP Authentication - Package Diagram

Remainder

System  
Requirements

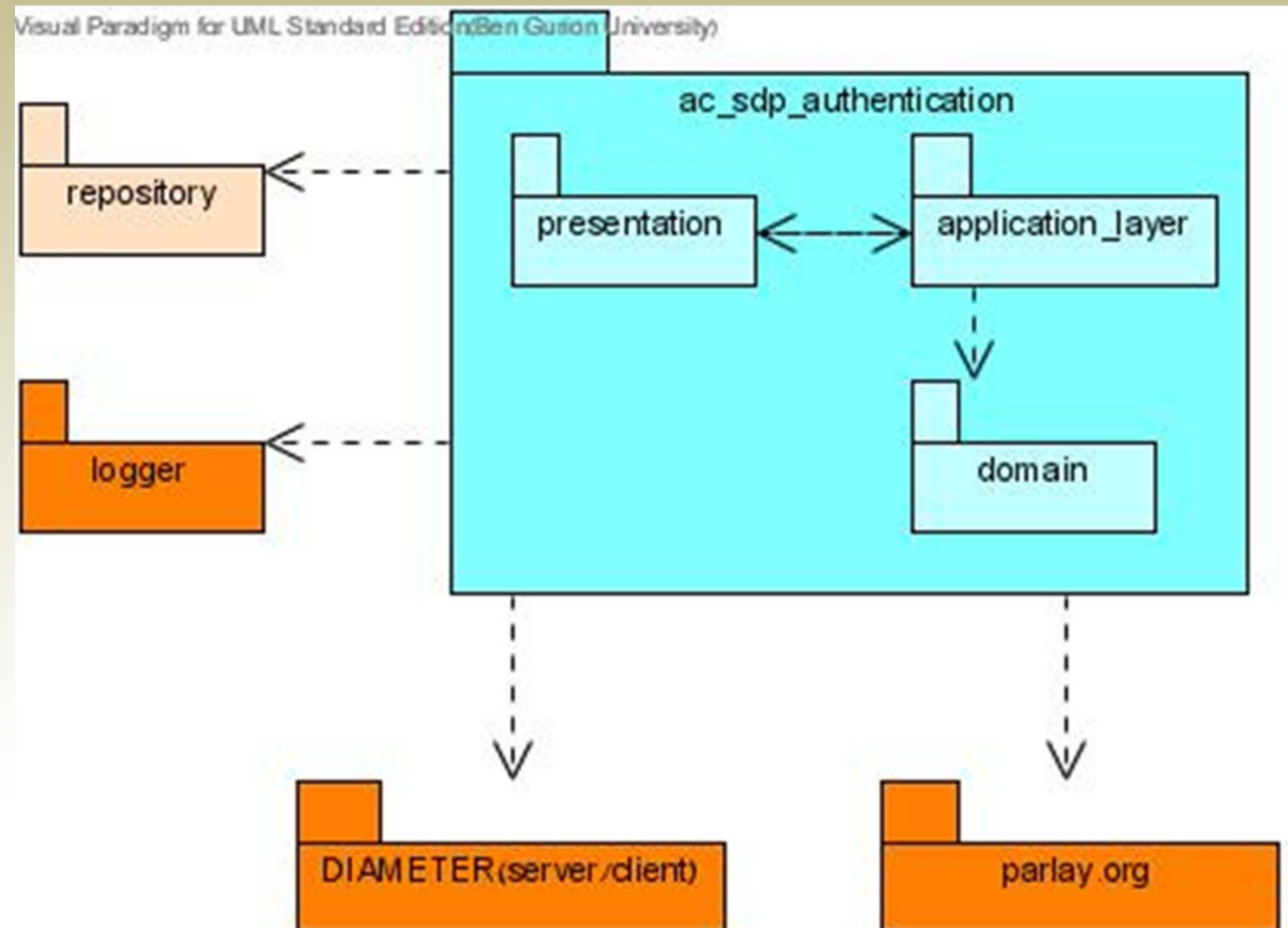
System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List



# Main Classes and Relationships

## SDP Authentication - Class Diagram

Remainder

System Requirements

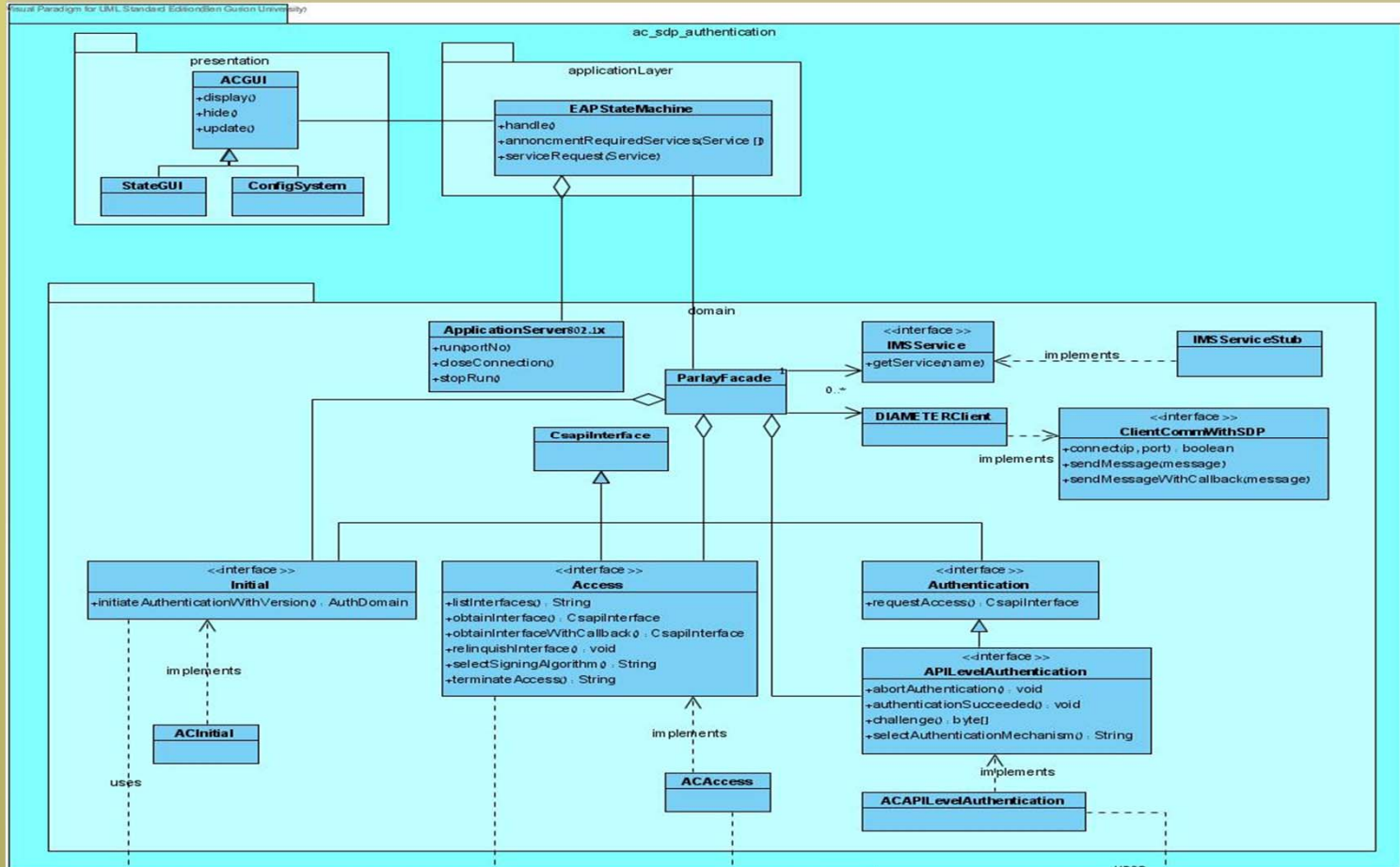
System Architecture

Main Classes and Relationships

User Interface

Tests

Tasks List



# Main Classes and Relationships

## Application - Package Diagram

Remainder

System  
Requirements

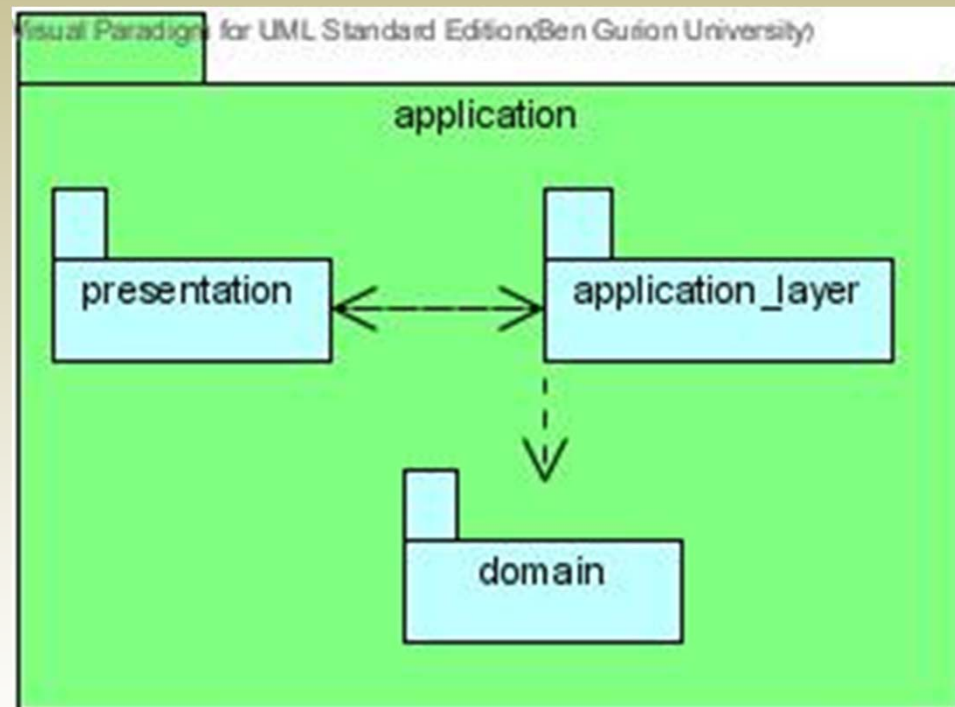
System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List



# Main Classes and Relationships

## Application - Class Diagram

Remainder

System Requirements

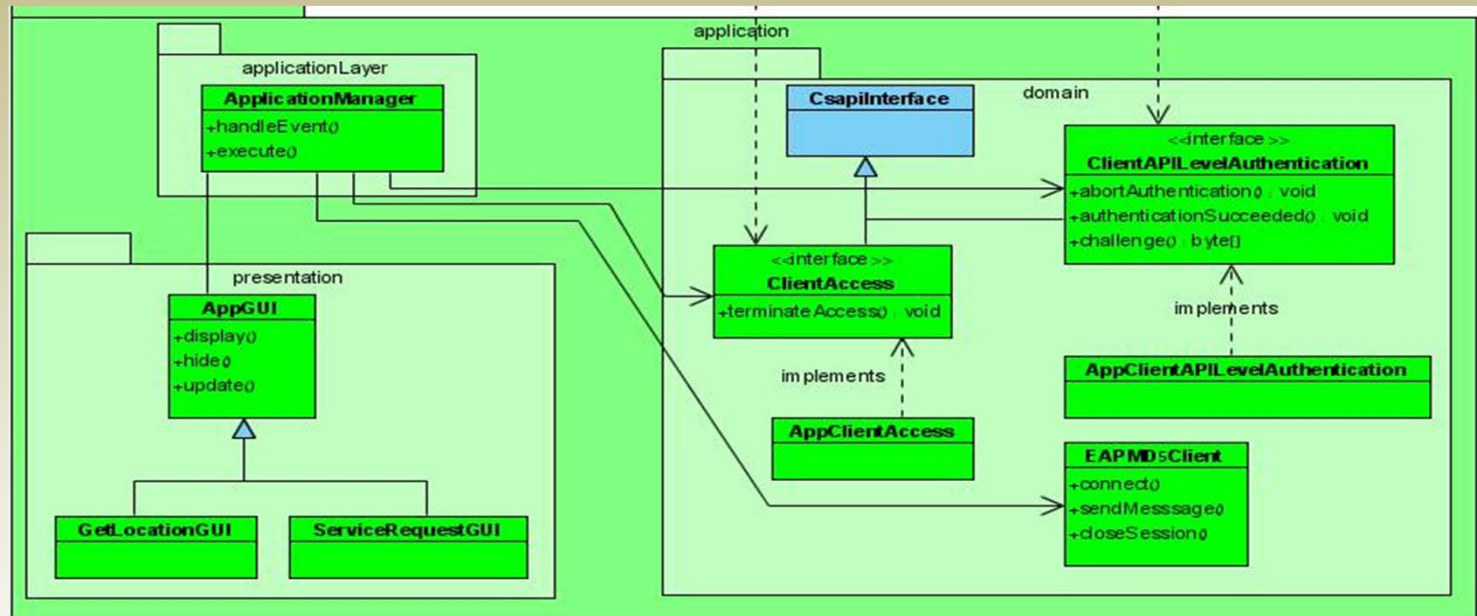
System Architecture

Main Classes and Relationships

User Interface

Tests

Tasks List



# Repository

## ERD (Entity-Relation Diagrams)

Remainder

System  
Requirements

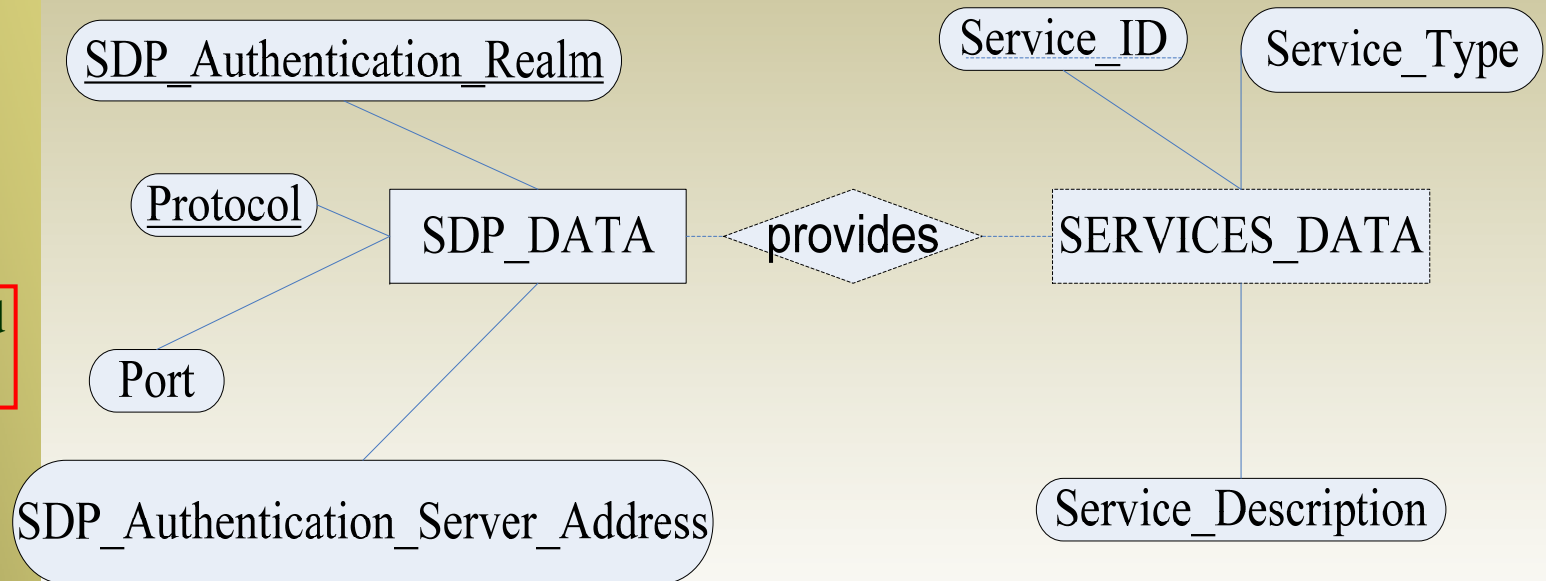
System  
Architecture

**Main Classes and  
Relationships**

User Interface

Tests

Tasks List



# User Interface

## 1. Initiate System and Configuration GUI

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

**User Interface**

Tests

Tasks List

**Username :** For example – admin

**Password :**

**Client Port :**

**Server Port :**

**Logger Location :**

**Repository Location :**



**Logger Window :**

For example: - User "admin" logged-in .  
- User "admin" initiate the system at 31-1-2007, 12:45:22 .

**Timer :**

For example:

- Init System: 31-1-2007  
12:45:22

# User Interface

## 2. Xsupplicant – “WIRE1x”

Remainder

System  
Requirements

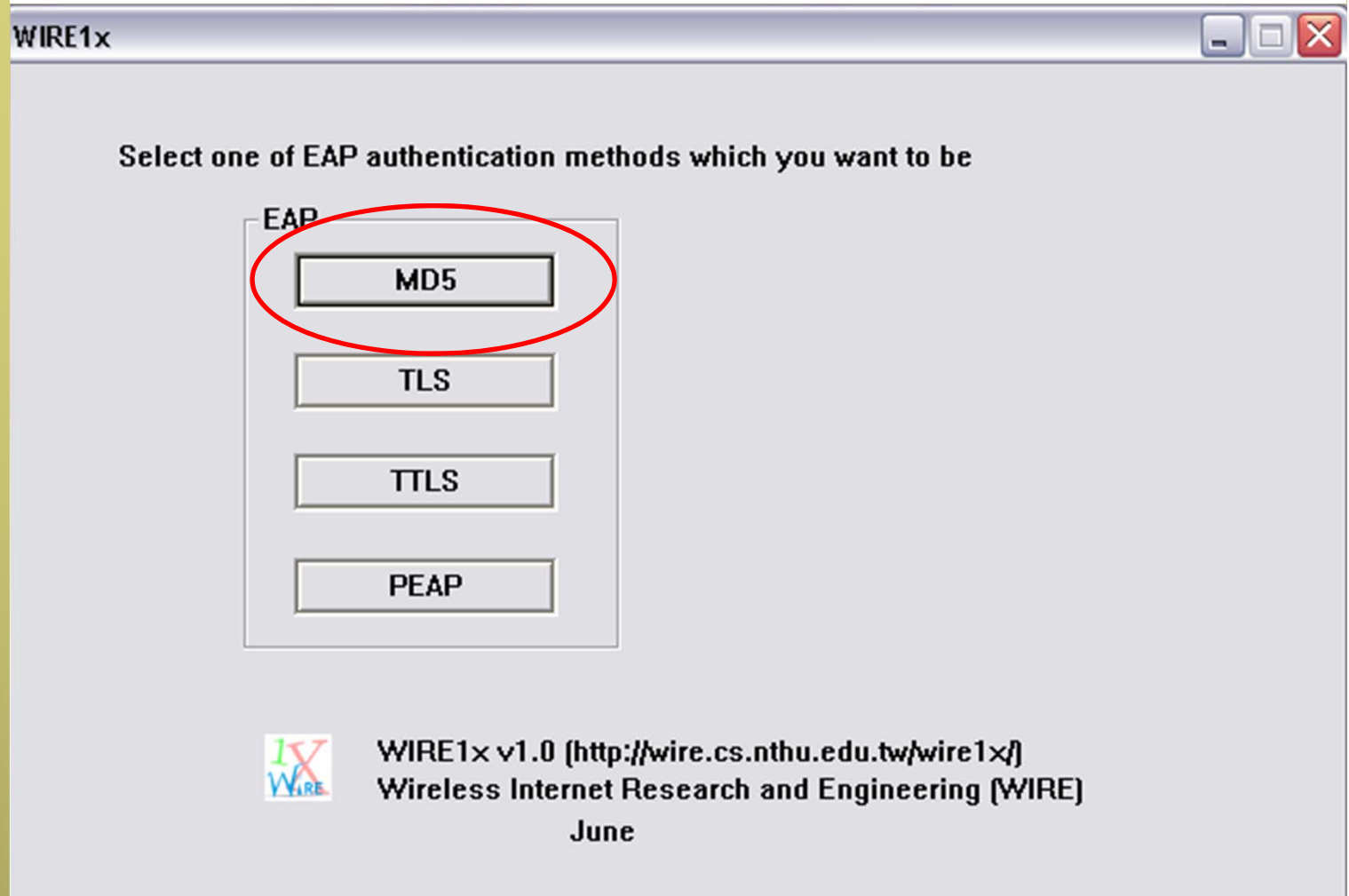
System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List





# User Interface

## 3. Xsupplicant – “WIRE1x\_MD5”

Remainder

System  
Requirements


System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List



WIRE1x\_MD5

LOGIN


LOGOFF

USERNAME  
Dudido

PASSWORD  
\*\*\*\*\*

INTERFACE  
RTL8023xp1 Realtek RTL8139/810x Family Fast Ethernet NIC

STATUS AUTHENTICATED  
(You are authenticated successfully!)

 WIRE1x v1.0 (<http://wire.cs.nthu.edu.tw/wire1x/>)  
Wireless Internet Research and Engineering (WIRE)  
June 2004

# User Interface

## 4. Sniffer – “Ethereal”

Remainder

System Requirements

System Architecture

Main Classes and Relationships

**User Interface**

Tests

Tasks List

The screenshot shows the Ethereal network sniffer interface. The main window displays a list of captured packets with columns for No., Time, Source, Destination, Protocol, and Info. Packet 6 is highlighted, showing an ICMP Echo (ping) request from 132.72.140.46 to 132.72.140.47.

No. -	Time	Source	Destination	Protocol	Info
1	0.000000	132.72.140.46	132.72.140.47	ICMP	Echo (ping) request
2	0.000056	132.72.140.47	132.72.140.46	ICMP	Echo (ping) reply
3	0.017912	132.72.140.47	132.72.140.255	BROWSE	Domain/workgroup Announcement MSHOME, NT workstation, Domain
4	1.000830	132.72.140.46	132.72.140.47	ICMP	Echo (ping) request
5	1.000884	132.72.140.47	132.72.140.46	ICMP	Echo (ping) reply
6	1.999914	132.72.140.46	132.72.140.47	ICMP	Echo (ping) request
7	1.999964	132.72.140.47	132.72.140.46	ICMP	Echo (ping) reply
8	3.000063	132.72.140.46	132.72.140.47	ICMP	Echo (ping) request
9	3.000113	132.72.140.47	132.72.140.46	ICMP	Echo (ping) reply
10	3.999767	132.72.140.46	132.72.140.47	ICMP	Echo (ping) request
11	3.999819	132.72.140.47	132.72.140.46	ICMP	Echo (ping) reply
12	4.998276	Ibm_b6:f1:80	wistron_28:eb:3b	ARP	who has 132.72.140.47? Tell 132.72.140.46
13	4.998292	wistron_28:eb:3b	Ibm_b6:f1:80	ARP	132.72.140.47 is at 00:16:d3:28:eb:3b

The detailed view of packet 6 shows the following structure:

- Frame 6 (98 bytes on wire, 98 bytes captured)
- Ethernet II, Src: Ibm\_b6:f1:80 (00:11:25:b6:f1:80), Dst: wistron\_28:eb:3b (00:16:d3:28:eb:3b)
- Internet Protocol, Src: 132.72.140.46 (132.72.140.46), Dst: 132.72.140.47 (132.72.140.47)
- Internet Control Message Protocol

The hex dump at the bottom shows the raw data of the packet:

```

0000 00 16 d3 28 eb 3b 00 11 25 b6 f1 80 08 00 45 00  ...C;. %....E.
0010 00 54 00 02 40 00 40 01 19 b9 84 48 8c 2e 84 48  .T..@.@. ...H...H
0020 8c 2f 08 00 ee bb 26 32 00 03 ec c0 f2 45 0c 05  ./...&2 ....E..
0030 0d 00 08 09 0a 0b 0c 0d 0e 0f 10 11 12 13 14 15  .....
0040 16 17 18 19 1a 1b 1c 1d 1e 1f 20 21 22 23 24 25  ..... !"#$$%
0050 26 27 28 29 2a 2b 2c 2d 2e 2f 30 31 32 33 34 35  &'()*+,- ./012345
0060 36 37 67
  
```

# User Interface

## 5. Service Request GUI

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

**User Interface**

Tests

Tasks List

Application ID :

Password :

Choose the desired service name :

- User Location
- Access Mailbox
- Account Management
- Call Control



**Authentication  
Details:**

For example:

- Application Name:  
"Get Restaurants"
- Requested Service:  
"User Location"  
"Call Control"

**Logger Window :**

- For example:
- Send authentication request.
  - Returned answer = Accept

**Timer :**

For example:

- Request time  
15:48:32

# User Interface

## 6. A form that shows an example of using a service

Remainder

System  
Requirements

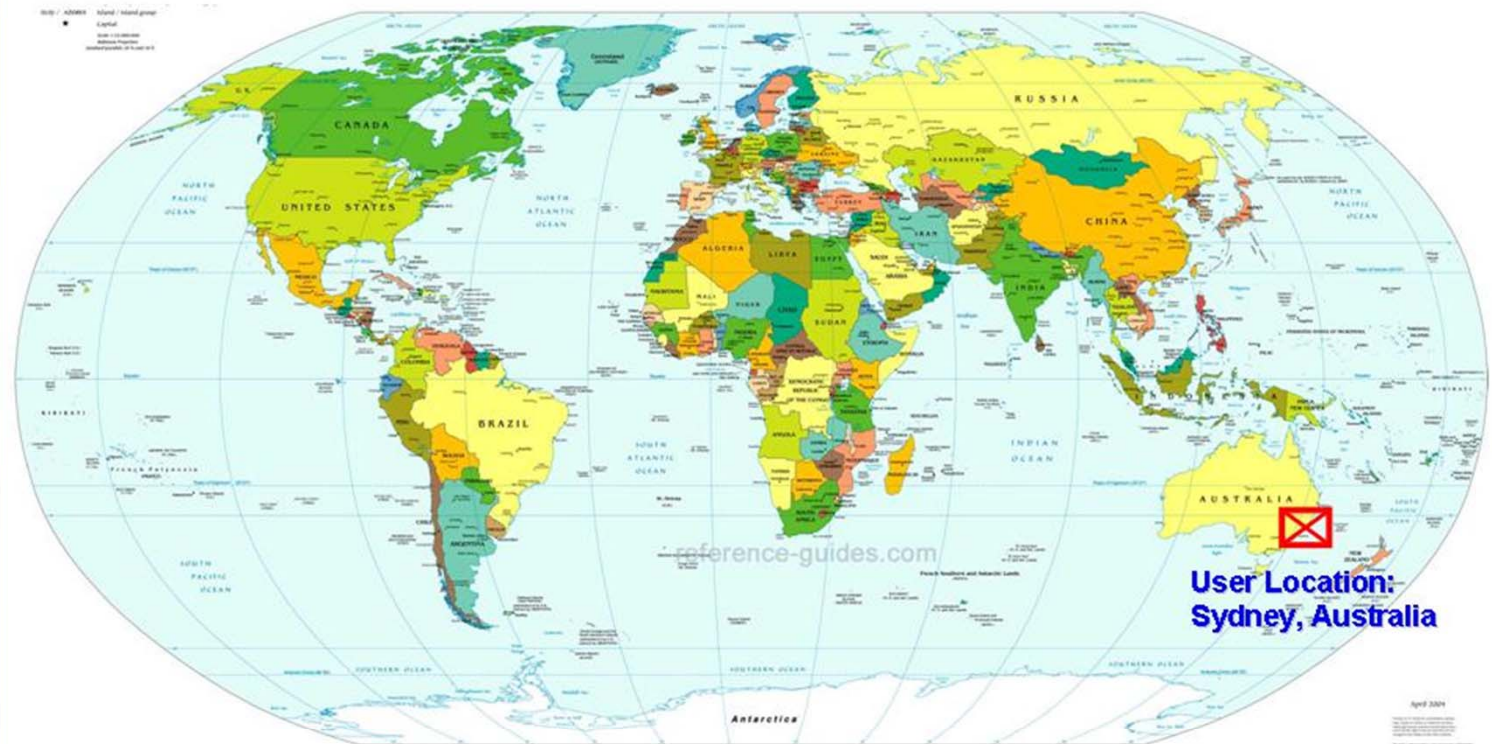
System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List



### Logger Window :

For example: - Application "Get Weather Forecast" authenticated.  
- Application activated service "User Location"  
- Service answer: "Sydney, Australia"

### Timer :

For example:  
- Answer time: 12:45:22

# User Interface

Remainder

System Requirements

System Architecture

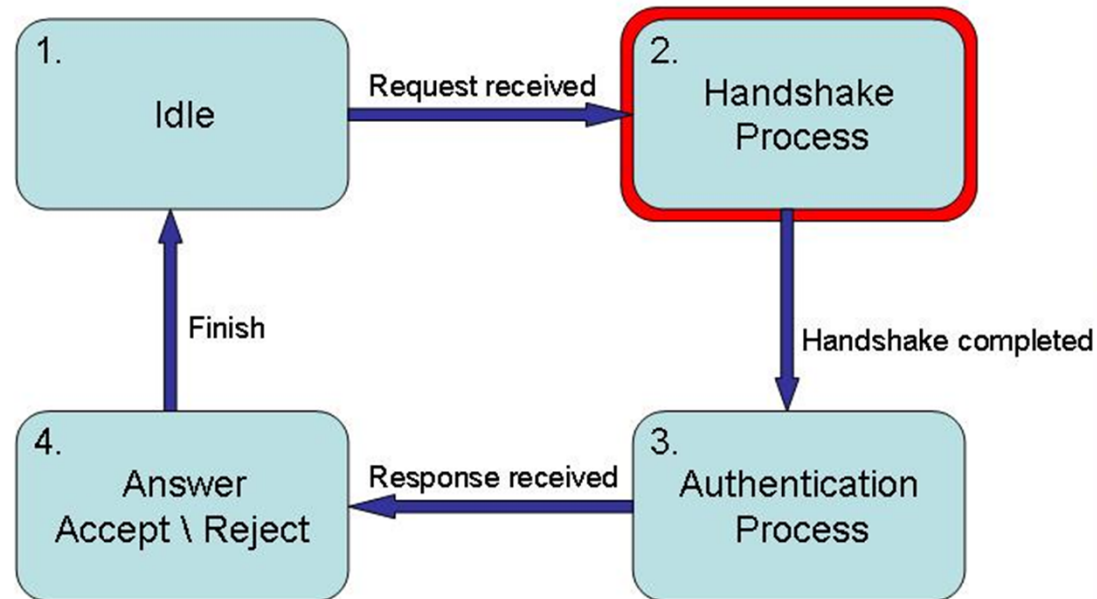
Main Classes and Relationships

**User Interface**

Tests

Tasks List

## 7. Authentication process GUI



### Authentication Details:

For example:

- Application Name: "Get Restaurants"
- Requested Service: "User Location"

### Logger Window :

- For example:
- Challenge transmitted.
  - SDP data received from repository.

### Timer :

For example:

- Start Handshake  
15:48:32

# Tests

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

## Main Scenarios Testing:

- ❏ Test Protocols Conversion
- ❏ Test Route Message
- ❏ Test Network Authentication Process
- ❏ Test SDP Authentication Process

# Tests

Remainder

System  
Requirements

System  
Architecture




Main Classes and  
Relationships

User Interface

Tests

Tasks List

## Non-Functional Testing:

-  Reliability Testing
-  Safety Testing
-  Platform Constrains Testing

# Tasks List

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

- ❶ Software installations, setup and configurations.
- ❷ EAP-MD5 authenticator State-Machine – Proxy (network authentication).
- ❸ Authentication Protocols Converter.
- ❹ DIAMETER server stub (prototype only).
- ❺ GUI.



# Tasks List

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

- ❶ Building Authentication Repository.
- ❷ Implementing Parlay interfaces.
- ❸ 802.1x EAP State-Machine (SDP authentication).
- ❹ IMS services stub.

# Tasks List

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

- ❏ Prototype establishment.
- ❏ Testing plan document.
- ❏ User manual.
- ❏ Unit-tests.
- ❏ Integration & Integration tests.

# Prototype

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

Prototype

## Network Authentication:

- Authentication process –  
part of EAP-MD5 state machine & GUI
- SDP Authentication server stub –  
(DIAMETER server)
- Protocols conversion (*RADIUS* ↔ *DIAMETER*)
- Xsupplicant (access request & GUI)
- Sniffer

# Prototype

Remainder

System  
Requirements

System  
Architecture

Main Classes and  
Relationships

User Interface

Tests

Tasks List

Prototype

## SDP Authentication :

- Ⓜ Authentication process –  
part of state machine & GUI
- Ⓜ SDP authentication server stub –  
(DIAMETER server)
- Ⓜ Parlay interfaces implementation (partial)
- Ⓜ Application (service request & GUI)
- Ⓜ Service stub
- Ⓜ RMI communication (server & client)



## **Authentication Center for SDP Federation**

# **Thank You !**