

# MX848600A

SUPL Simulation Server

# MX848600A SUPL Simulation Server Product Introduction

## Anritsu Corporation

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- Product Overview
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## What is SUPL?

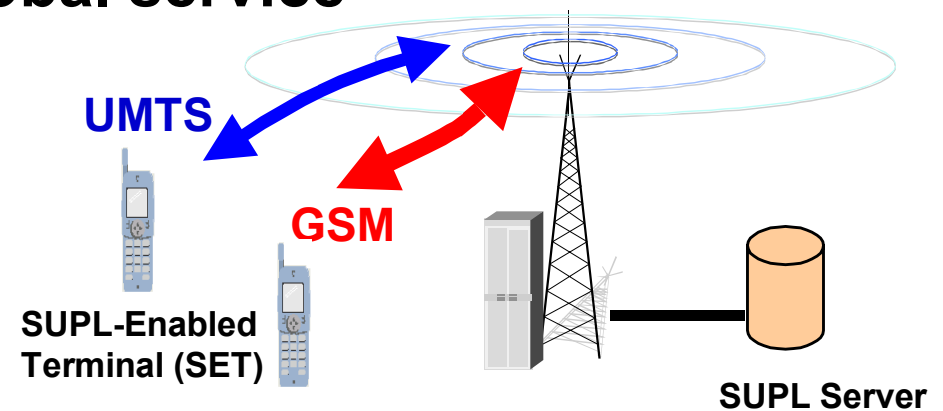
- **Secure User Plane Location**
  - ◆ A standard developed by the Open Mobile Alliance
- **Uses Assisted Global Positioning Systems (A-GPS) technology**
- **Supports highly accurate location-based services**
  - ◆ Allows any A-GPS-capable mobile handset client and a location server to communicate position data and requests for position data
  - ◆ Uses existing wireless IP networks

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## What is SUPL?

- **SUPL Features**
  - ◆ **Transmits and receives location information and assistance data using User Plane (IP packets)**
    - Commercial Services
    - Emergency Services
  - ◆ **Supports bearer-independent Secure Service with wireless network**
    - Maintains high security using Transport Layer Socket
  - ◆ **Supports borderless global service**
    - Global Roaming



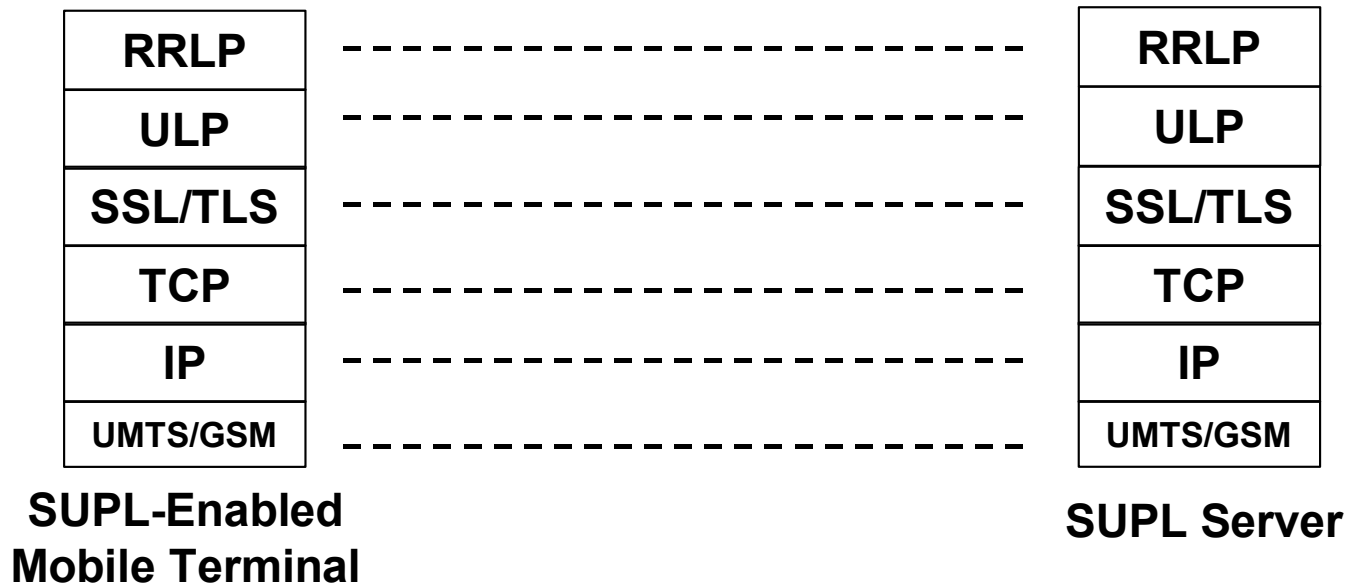
Example of SUPL A-GPS Service

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## What is SUPL?

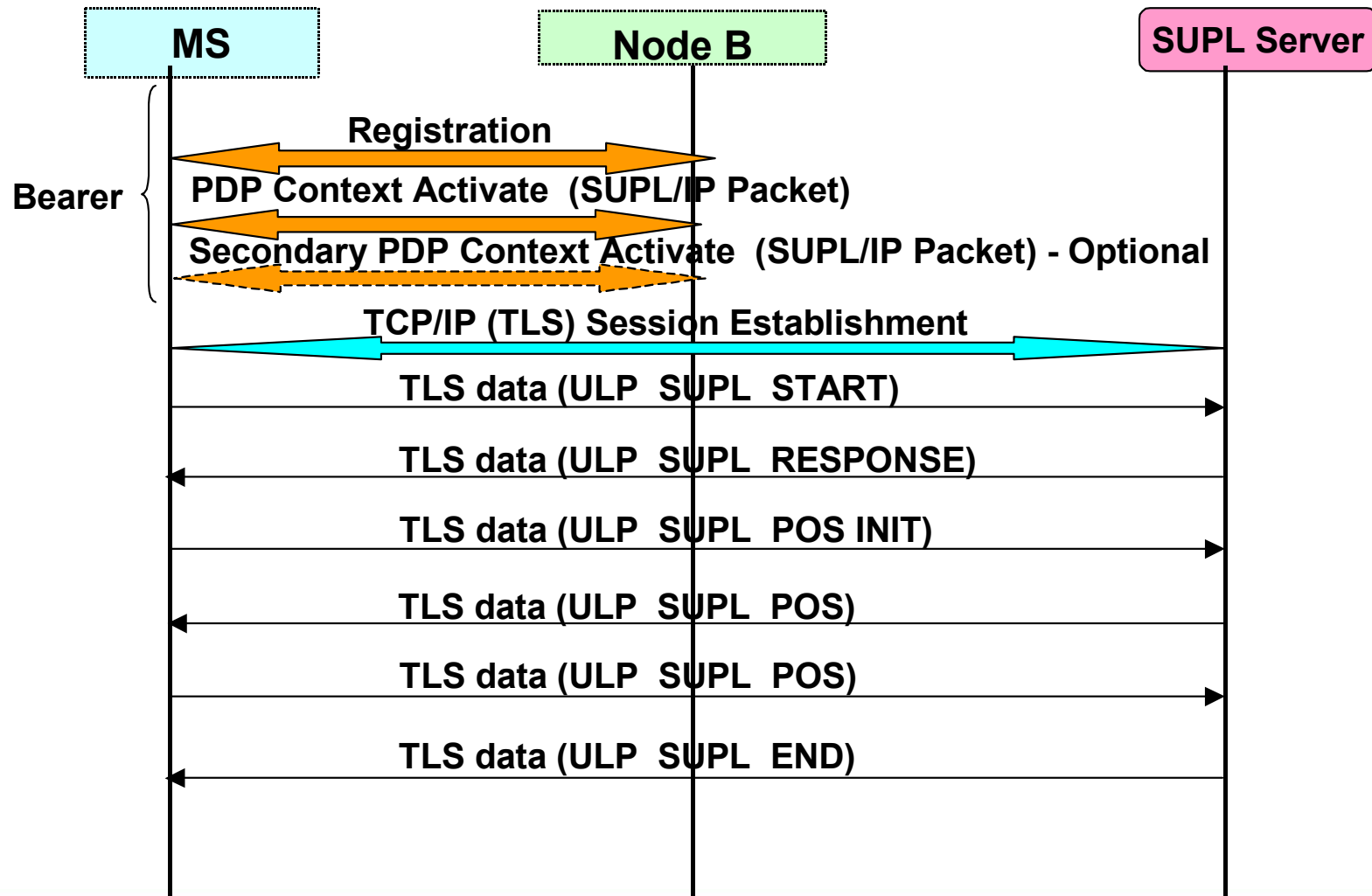
- **SUPL Protocol Stack**
  - ◆ **RRLP: Radio Resource LCS Protocol**
  - ◆ **ULP: User Plane Location Protocol**
  - ◆ **TLS: Transport Layer Socket**



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## What is SUPL?

- Example of SUPL Protocol Sequence

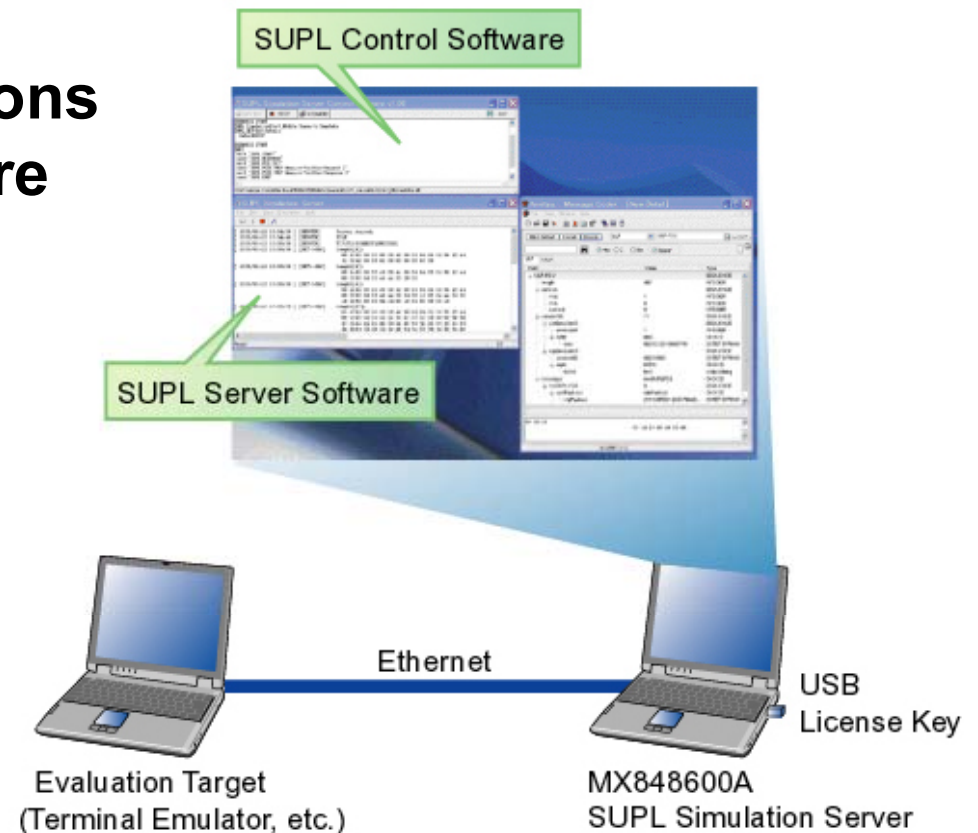


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# MX848600A SUPL Simulation Server

## Product Overview

- **MX848600A SUPL Simulation Server**
  - ◆ Windows PC software for emulating a SUPL server
  - ◆ Allows users to use their own mobile terminal emulators to test SUPL protocols and applications before terminal hardware is developed
    - Verify mobile terminal OS and middleware
    - Verify location-based service applications

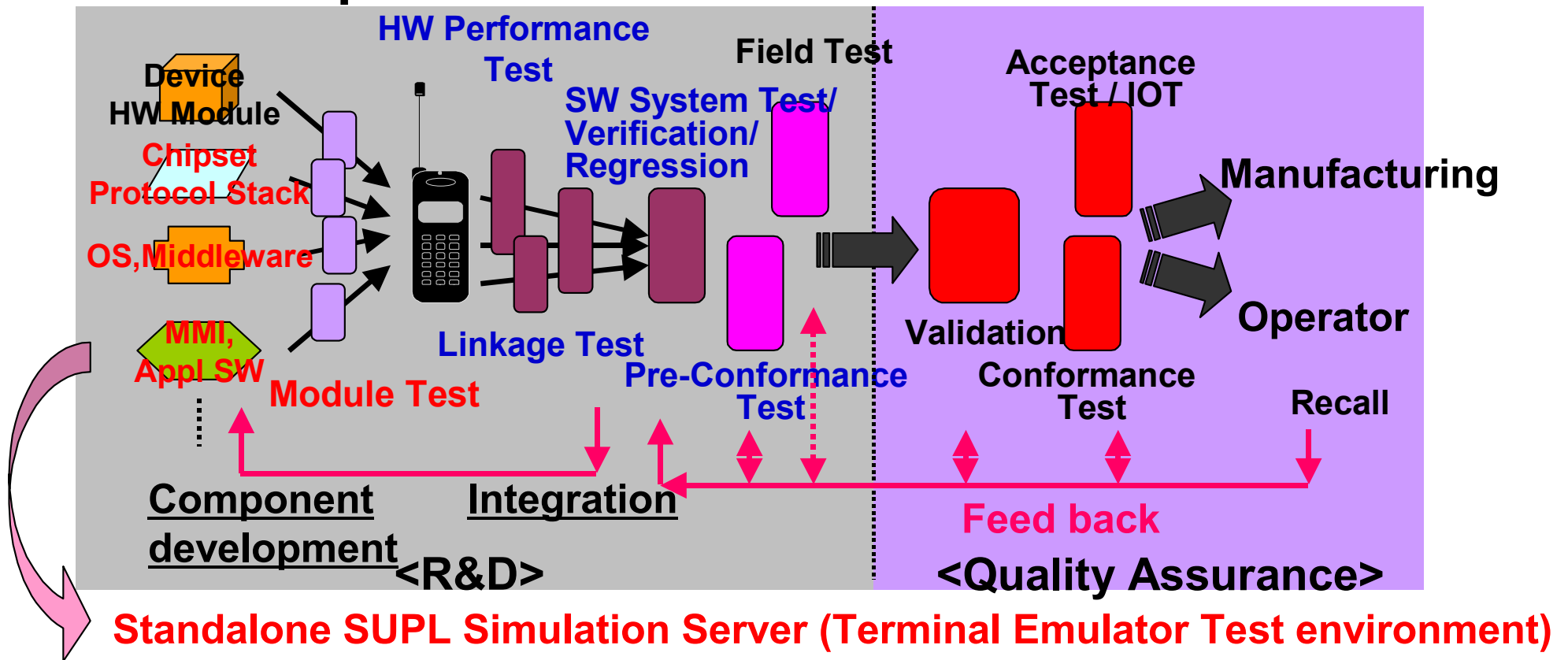




# MX848600A SUPL Simulation Server

## Target R&D Applications

- Test steps and environment of A-GPS Mobile Terminal



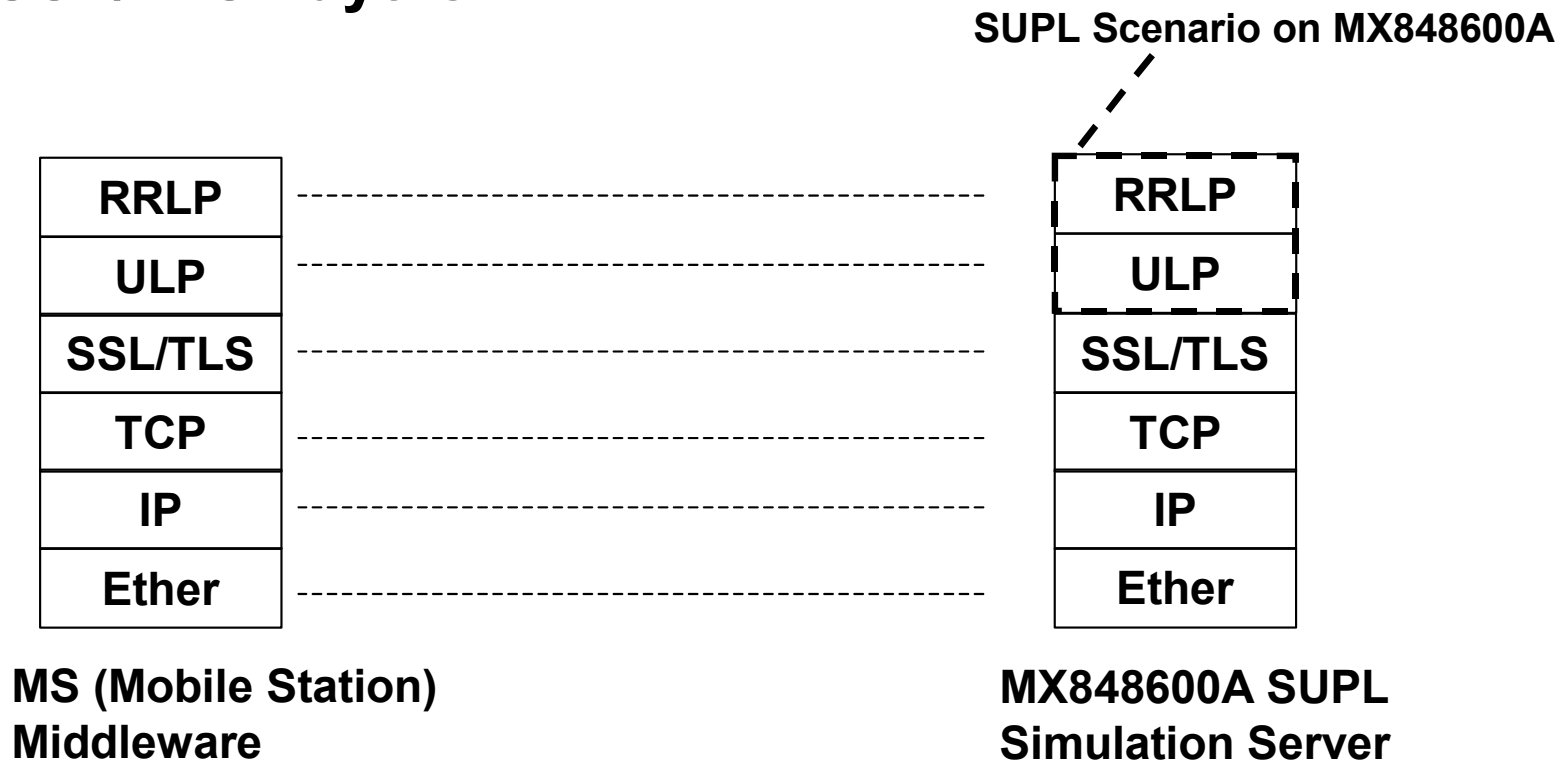
## Target R&D Applications

- **Verification of Mobile Terminal Software**
  - ◆ **OS verification**
    - Implementation of location-based service application software such as maps and route navigation
  - ◆ **Middleware verification**
    - Versatile SUPL (ULP/RRLP Layer) protocol sequence test
    - Application Program Interface (API) function testing
- **Verification of Mobile Terminal Applications**

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## Target Applications

- Support Protocol Stack
  - ◆ SUPL Scenario controls RRLP/ULP protocol
  - ◆ Server PC handles protocol stack for TCP/IP and SSL/TLS Layers



## Features

- **Efficient SUPL Function Emulation Environment**
  - ◆ **Objective SUPL evaluation with user-provided standalone terminal emulator**
- **Versatile Fault Testing**
  - ◆ **Message elements and parameters freely defined in C++ scenarios**
    - Messages decoded to find problems using accessory ULP/RRLP Message Encode/Decode tool (MessageCoder)
  - ◆ **Easy Assistance Data parameter variation test**
    - Automatic encoding of assistance data in .csv format
    - Automatic message decoding and display the measured position from SUPL-enabled terminal

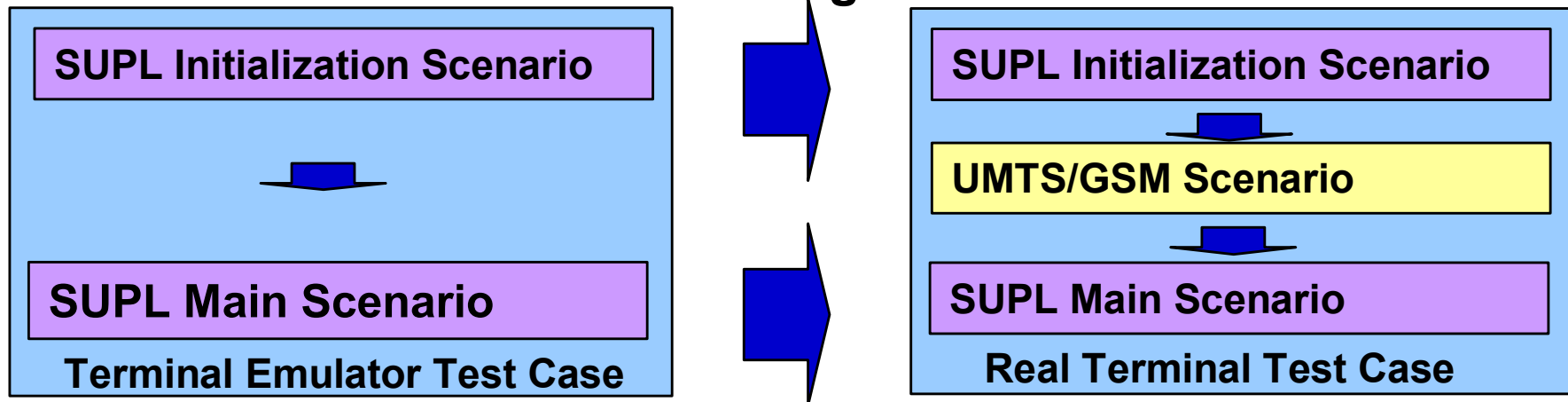
## Features

- **Immediate Testing**
  - ◆ **Proven sample scenarios describing basic SUPL sequences bundled with control software**
    - Supports Proxy Mode, SET Initiated, Normal Test Sequence
- **24/7 Time-Saving Testing**
  - ◆ **External control by remote commands**
    - Simulation Server Execution, End
    - Simulation Start
    - Scenario Start, Status, and Stop
    - Trace Log Start & Stop

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## Features

- **Evaluation Results Reflected in Real Terminal Tests**
  - ◆ **Test efficiency increased by reflecting SUPL test scenarios created in MX848600A terminal emulation environment in real terminal tests**
    - **Terminal Emulation Test – Software Emulation Environment for TCP/IP Layer**
    - **Real Terminal Test – Integration Test with Radio Bearer**

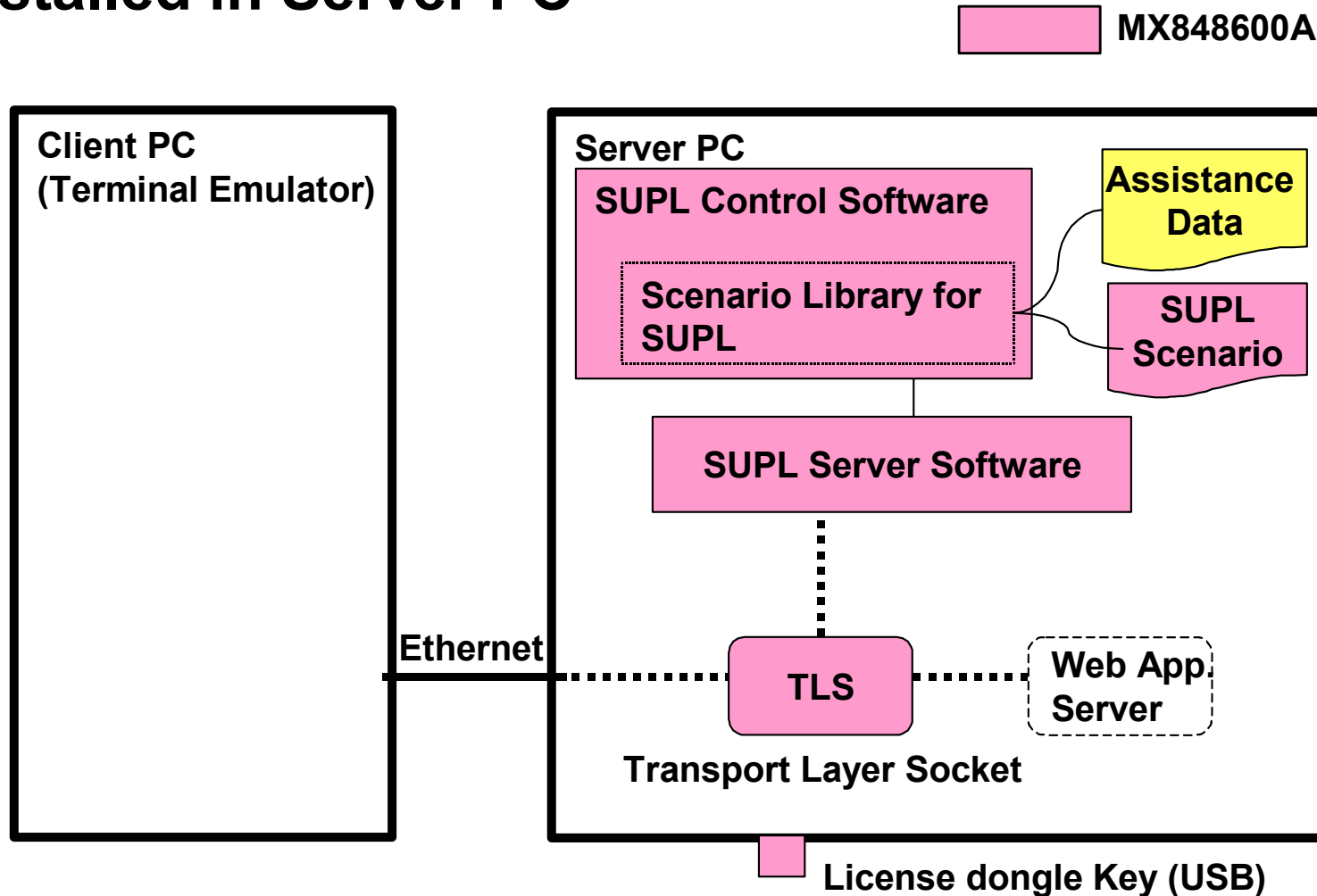


- ◆ **The SUPL sequence and parameters detected by the terminal emulator can be applied to real terminals**

# MX848600A SUPL Simulation Server

## Product Configuration

- Installed in Server PC



## Product Configuration

- **Server PC (sold separately)**
  - ◆ **MX848600A SUPL Simulation Server**
    - SUPL Control Software
    - SUPL Server Software
    - SUPL Sample Scenario
    - License dongle Key (USB)
    - Operation Manual (CD-ROM)
  - ◆ **MX848600A-TS110 Technical Support Service**
    - Technical support by e-mail
    - Web download of latest software
  - ◆ **MC0011A Web Access Key (for software download)**
- **Assistance Data File (.csv)**
  - ◆ **Assistance Data conversion tool**
- **Server Certification File, Passphrase Key (.pem)**



## Functions

- **Primary Software Elements**
  - ◆ **SUPL Server Software**
    - Establishes TLS connection
      - I/O of specific TCP/IP port data
  - ◆ **SUPL Control Software**
    - Controls SUPL Server software
    - Starts and stops SUPL scenario execution
    - Sets CA certificate defined by scenario for TLS
  - ◆ **Scenario Library for SUPL**
    - Encodes/decodes and sends/receives ULP/RRLP messages
  - ◆ **SUPL Scenario**
    - Describes ULP/RRLP Sequence and Information Elements
  - ◆ **Transport Layer Socket**
    - Encrypts using TLS 1.0

## Functions

- **SUPL Simulation Server Supported Functions**
  - ◆ **Normal TLS Test and Server Authentication**
    - Supports normal TLS testing and the Server Authentication mode
  - ◆ **Proxy and SET Initiated modes**
    - Supports Proxy mode and SET Initiated modes
  - ◆ **Connection of one evaluation target (mobile terminal) to one server**
    - Two terminals cannot connect to this simulation server simultaneously

## Functions

- **Supported Specifications**
  - ◆ **SUPL**
    - OMA: OMA-AD-SUPL-V1\_0-20070615-A
  - ◆ **RRLP**
    - 3GPP: TS 44.031 Radio Resource LCS Protocol v5.12.0
  - ◆ **ULP**
    - OMA: OMA-AD-ULP-V1\_0-20070615-A
  - ◆ **SSL/TLS**
    - IETF: RFC2246 The TLS Protocol v1.0

## Test Examples

- **Test Procedure (Terminal Emulator Test)**



1. Creates and compiles SUPL scenario
2. Selects and executes compiled scenario using Control Software
3. Makes Location Request from terminal
4. Confirms position estimation, Web server access, and contents evaluation

- **Timing Sync**

- ◆ **Manual Sync**

- Adjusts timing between scenario start on SUPL server and emulation start at terminal emulator

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## Test Examples

- Setup
  - ◆ Starting MX848600A

The screenshot displays the 'SUPL Simulation Server' application window. The menu bar includes 'File', 'Edit', 'View', 'Simulation', and 'Help'. The toolbar contains icons for file operations and simulation control. A red box highlights the 'Run' button (a green play icon), and an arrow points from it to a text box labeled '1. Start SUPL Server.'. Below the toolbar, the main window shows a log of server activity. A second red box highlights the 'Send' button (a blue arrow icon), with an arrow pointing to a text box labeled '2. Start Control Software.'. The log shows the server starting, becoming idle, and receiving a connection. It then processes a 'SET->SLP' command, displaying hex data for the request and response.

```
[ 2008/09/12 13:09:29 ] [SERVER] Server started.  
[ 2008/09/12 13:09:35 ] [SERVER] IDLE  
[ 2008/09/12 13:09:47 ] [SERVER] TCP/TLS CONNECT(SUCCESS)  
[ 2008/09/12 13:09:47 ] [SET->SLP] Length[28]:  
00 1c 01  
51 02 42  
[ 2008/09/12 13:09:47 ] [SET<-SLP] Length[26]:  
00 1a 01  
00 00 00  
[ 2008/09/12 13:09:47 ] [SET->SLP] Length[46]:  
00 2e 01 00 00 c0 00 4c 00 04 04 85 0d 96 1f e4  
00 00 00 0d 03 e6 ae 39 34 08 12 6f 6a ee 04 30  
10 40 50 60 00 9d c4 00 10 04 00 00 00 10  
[ 2008/09/12 13:09:48 ] [SET<-SLP] Length[487]:  
01 e7 01 00 00 c0 00 4c 00 04 04 85 0d 96 1f e4  
00 00 00 0d 03 e6 ae 39 41 07 2c 84 44 03 fb 44  
a7 8d c2 aa e0 d5 54 41 d5 54 42 d5 54 43 55 54  
43 d5 54 44 d5 54 4c d5 54 4e 55 54 4d 90 7f ff
```

## Test Examples

- Scenario Execution
  - ◆ Selecting and executing compiled scenario

The screenshot displays the 'SUPL Simulation Server Control Software' window. The interface includes a menu bar with 'SAVE TEXT', 'STOP', and 'SCENARIO' buttons. The main area shows a log of test execution status, including 'SCENARIO START', 'IMSI', and various 'wait' and 'send' commands. A 'START' icon is highlighted in the menu bar, and a callout box points to it with the instruction '2. Start selected scenario by clicking START icon.' Another callout box points to the 'SCENARIO' button with the instruction '1. Select test scenario.' A third callout box points to the log output with the instruction 'Display test execution status.'

1. Select test scenario.

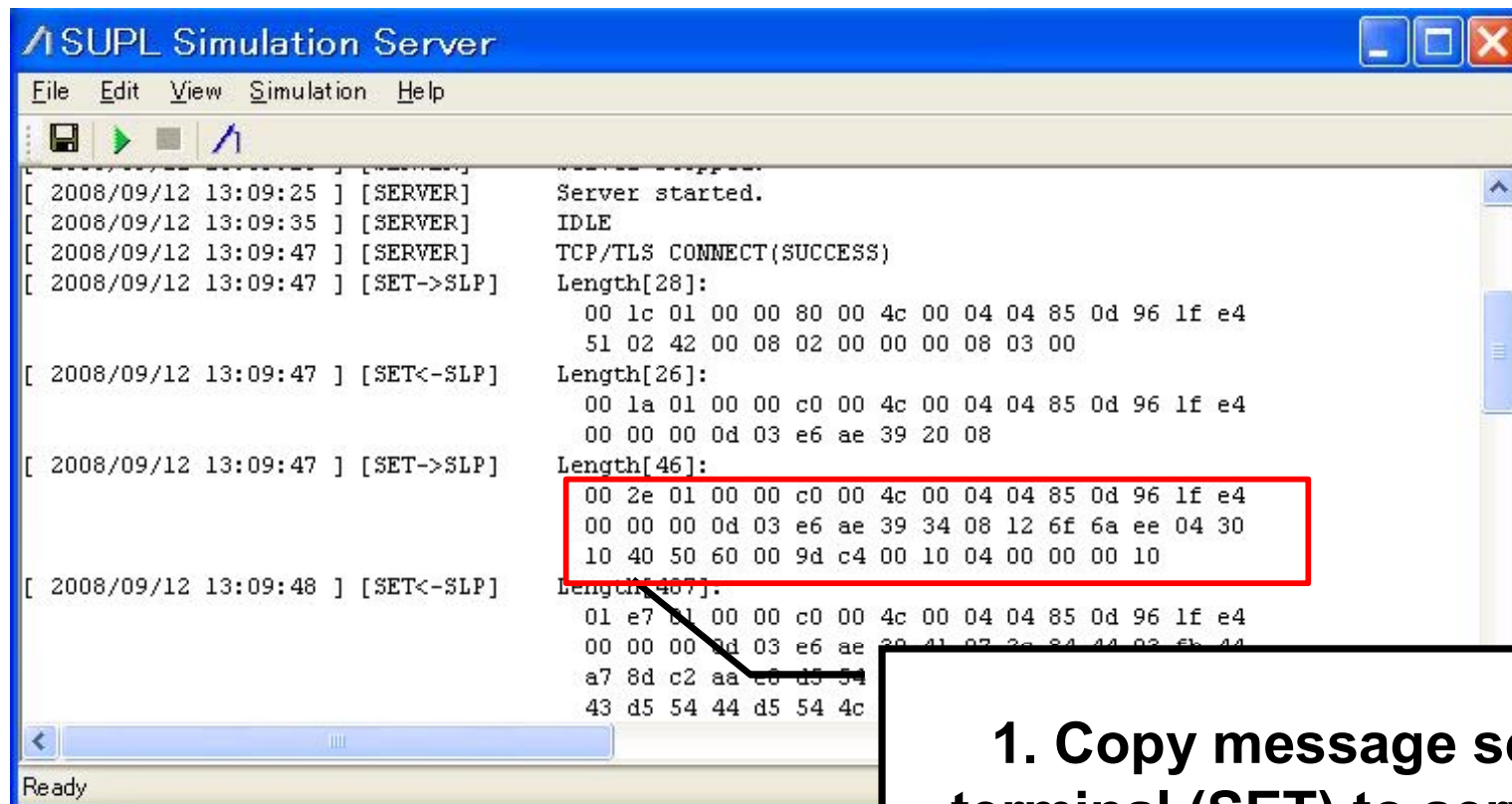
2. Start selected scenario by clicking START icon.

Display test execution status.

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## Test Examples

- Analysis
  - ◆ Analyzing message information in log



```
^ SUPL Simulation Server
File Edit View Simulation Help
[ 2008/09/12 13:09:25 ] [SERVER] Server started.
[ 2008/09/12 13:09:35 ] [SERVER] IDLE
[ 2008/09/12 13:09:47 ] [SERVER] TCP/TLS CONNECT(SUCCESS)
[ 2008/09/12 13:09:47 ] [SET->SLP] Length[28]:
    00 1c 01 00 00 80 00 4c 00 04 04 85 0d 96 1f e4
    51 02 42 00 08 02 00 00 00 08 03 00
[ 2008/09/12 13:09:47 ] [SET<-SLP] Length[26]:
    00 1a 01 00 00 c0 00 4c 00 04 04 85 0d 96 1f e4
    00 00 00 0d 03 e6 ae 39 20 08
[ 2008/09/12 13:09:47 ] [SET->SLP] Length[46]:
    00 2e 01 00 00 c0 00 4c 00 04 04 85 0d 96 1f e4
    00 00 00 0d 03 e6 ae 39 34 08 12 6f 6a ee 04 30
    10 40 50 60 00 9d c4 00 10 04 00 00 00 10
[ 2008/09/12 13:09:48 ] [SET<-SLP] Length[46]:
    01 e7 01 00 00 c0 00 4c 00 04 04 85 0d 96 1f e4
    00 00 00 0d 03 e6 ae 39 41 07 2e 84 44 03 fb 44
    a7 8d c2 aa c0 d5 54
    43 d5 54 44 d5 54 4c
```

Ready

1. Copy message sent from terminal (SET) to server (SLP).

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## Test Examples

- Analysis (cont.)

The screenshot shows the Anritsu Message Coder interface. The 'Decode' button is highlighted in red. The 'ULP' dropdown menu is also highlighted in red. The 'ULP-PDU' message is selected in the dropdown. The decoded result is shown in a table format:

Field	Value	Type
ULP-PDU		SEQUENCE
length	28	INTEGER
version		
maj		
min		
servind		
sessionID		
setSessionID		
sessionid		
setId		
imsi		
slpSessionID		
message		
msSUPLSTART	1	CHOICE
ETCapabilities		SEQUENCE
posTechnology		SEQUENCE
agpsSETassisted	FALSE	SEQUENCE
agpsSETBased	TRUE	BOOLEAN
autonomousGPS	FALSE	
aFL	FALSE	
eCID	FALSE	
eOTD	FALSE	
oTDOA	FALSE	
prefMethod		
posProtocol		
tia801	FALSE	
rrlp	TRUE	
rrc	FALSE	
locationId		
cellInfo		
wcdmaCell	000	SEQUENCE

The hex dump at the bottom is highlighted in red:

```
00 1c 01 00 00 80 00 4c 00 04 04 85 0d 96 1f e4
51 02 42 00 08 02 00 00 00 08 03 00
```

2. Paste copied message to MessageCoder (accessory).

3. Select analysis layer and message and click Decode.

Decoded result analyzed here.



## Server PC Specifications

- **Server PC (for MX848600A SUPL Simulation Server)**
  - ◆ IBM-PC/AT or compatible machine
  - ◆ CPU: ?1.6 GHz Pentium 4
  - ◆ Memory: >1 GB (recommended)
  - ◆ Display:
    - Resolution ?1024×768 pixels
    - Display adapter (high color or better)
  - ◆ OS: Windows XP Professional SP2 (English)
  - ◆ USB: 1 port (USB version 1.1/2.0)
  - ◆ LAN: 2 ports (10BASE-T/100BASE-TX)
- **Compiler**
  - ◆ Microsoft Visual C++ 6.0, .net(2002), .net2003, 2005
    - Visual C++ 2008 not supported

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