TECHNICAL NOTE

MD8470A
Signalling Tester

Scenario Test

ANRITSU CORPORATION
General Explanation of Scenario Testing

Contents
- Wireless Protocol Sequence Overview (W-CDMA)
- What is a scenario?
- How to write a scenario?
- Tools for writing a Layer3 message (Message Coder tool) and Debug functions
- Introduction of an example protocol scenario
- How to see a log?
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• Wireless Protocol Sequence Overview (W-CDMA)
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Wireless Protocol Sequence Overview (W-CDMA)
Sample Sequence of Registration

W-CDMA (Protocol Sequence)

Sample Sequence of Registration

W-CDMA (Protocol Sequence)
Sample Sequence of Registration & PDP activation (H3G case)
W-CDMA (Protocol Sequence)

Sample Sequence of Voice & Video Origination

W-CDMA (Protocol Sequence)

Sample Sequence of Voice & Video Termination

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MD8470A-E-E-2

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- Wireless Protocol Sequence Overview (W-CDMA)
- **What is a scenario?**
  - How to write a scenario?
  - Tools for writing a Layer3 message (Message Coder tool) and Debug functions
  - Introduction of the example protocol scenario
  - How to see a log?
What is a scenario? - Definition -

• “Scenarios” are used for testing UEs on MD8470A.
• A “Scenario” is a sequence of messages that are exchanged between a UE and BTS
  – Used for checking whether UE behaves as expected.

What is a scenario? - radio bearer configuration -

• For the purpose of efficient usage of radio resources, the network changes the radio bearer configuration while exchanging messages with the UE.
• Radio bearer information is also included in some messages, and a “Scenario” has to configure MD8470A hardware for sending/receiving messages.
What is a scenario? - The other party -

- MD8470A provides interfaces to the other party: handset, Ethernet, ISDN.
- In the case of service testing, these interfaces have to be configured.

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How to write a scenario? - General -

A scenario consists of the following 5 parts:

1. Beginning
2. Setting into MD8470A
3. Send message to UE
4. Receive message from UE
5. TE setting

Some scenarios are big and complex, but the scenario is the combination of the above 5 parts.

How to write a scenario? - 1. Beginning -

/***** INCLUDE *****/
#include    <windows.h>
#include    "primitive.h"
#include    "parameter.h"
#include    "scenario.h"
#include    "stdio.h"

/***** FUNCTION *****/
DLLEXPORT INT ScenarioMain(LPVOID);

INT ScenarioMain(LPVOID dmy) {
    SimulatorStart(0,NO_TIMEOUT );
}
How to write a scenario? - 2. Setting into MD8470A -

CalcRMPParameter(D_DPCH,
    &CphyRlSetup_D_DPCH_SDCCH, &CphyTrchConfig_D_DPCH_SDCCH);
CphyRlSetup(UNIT_BTS1, D_DPCH, 0,
    &CphyRlSetup_D_DPCH_SDCCH, ACTIVATE_NOW, NO_TIMEOUT);
CphyTrchConfig(UNIT_BTS1, D_DPCH, 0,
    &CphyTrchConfig_D_DPCH_SDCCH, ACTIVATE_NOW, NO_TIMEOUT);
CmacConfig(UNIT_BTS1, D_DPCH, 0,
    &CmacConfig_D_DPCH_SDCCH, ACTIVATE_NOW, NO_TIMEOUT);
CalcRMPParameter(U_DPCH,
    &CphyRlSetup_U_DPCH_SDCCH, &CphyTrchConfig_U_DPCH_SDCCH);
CphyRlSetup(UNIT_BTS1, U_DPCH, 0,
    &CphyRlSetup_U_DPCH_SDCCH, ACTIVATE_NOW, NO_TIMEOUT);
CphyTrchConfig(UNIT_BTS1, U_DPCH, 0,
    &CphyTrchConfig_U_DPCH_SDCCH, ACTIVATE_NOW, NO_TIMEOUT);

How to write a scenario? - 2. Setting into MD8470A -

CmacConfig( UNIT_BTS1, U_DPCH, 0,
    &CmacConfig_U_DPCH_SDCCH, ACTIVATE_NOW, NO_TIMEOUT);
CrlcConfig( UNIT_BTS1, CRLC_UM_ESTABLISH, DCCH, 0,
    &CrlcConfig_DCCH, RRC, NO_TIMEOUT);
CrlcConfig( UNIT_BTS1, CRLC_AM_ESTABLISH, DCCH, 1,
    &CrlcConfig_DCCH, RRC, NO_TIMEOUT);
CrlcConfig( UNIT_BTS1, CRLC_AM_ESTABLISH, DCCH, 2,
    &CrlcConfig_DCCH, RRC, NO_TIMEOUT);
CrlcConfig( UNIT_BTS1, CRLC_AM_ESTABLISH, DCCH, 3,
    &CrlcConfig_DCCH, RRC, NO_TIMEOUT);
How to write a scenario? - 3. Send message to UE -

/* Send Message: Identity Request */
{
    UCHAR SndData[] = {
        0x14, 0x00, 0x04, 0x0a, 0x30, 0x02
    };
    SendMessageIntegrity(UNIT_BTS1, RLC_AM_DATA_REQ, D_DCCH, 2, SndData, 47);
}

How to write a scenario? - 4. Receive message from UE -

/* Receive Message: RRC Connection Setup Complete */
{
    INT BtsNo, Frame, Lo_Ch, Lo_No, ret;
    UCHAR RcvData[255];
    for ( ; ; ){
        ret = RcvMessage(&BtsNo, &Frame, &Lo_Ch, &Lo_No, RcvData, NO_TIMEOUT);
        if (((Frame == RLC_AM_DATA_IND) && (Lo_Ch == U_DCCH) && (GetMessageTypeMsgNo(U_DCCH, RcvData) == Mar2002_RrcConnectionSetupComplete)) || (ret == TIME_OUT)){
            break;
        }
    }
}
How to write a scenario? - 5. TE setting -

CteConfig(DTCH,0,&CteConfigAmrA,NO_TIMEOUT);
CteConfig(DTCH,1,&CteConfigAmrB,NO_TIMEOUT);
CteConfig(DTCH,2,&CteConfigAmrC,NO_TIMEOUT);
...
CteConnect(DTCH,0,TE_PORT_LOOPBACK,TE_PORT_LOOPBACK,
   CALL_FROM_AIR,(UCHAR *)0,NO_TIMEOUT);
CteConnect(DTCH,1,TE_PORT_LOOPBACK,TE_PORT_LOOPBACK,
   CALL_FROM_AIR,(UCHAR *)0,NO_TIMEOUT);
CteConnect(DTCH,2,TE_PORT_LOOPBACK,TE_PORT_LOOPBACK,
   CALL_FROM_AIR,(UCHAR *)0,NO_TIMEOUT);

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• **Tools for writing a Layer3 message (Message Coder tool) and Debug functions**
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Message Coder

- One of the parts of a scenario is ‘send message to UE’.
- By using this tool, users can create messages via GUI.
- Copy the ‘HEX’ data (bottom portion of this tool) to the scenario.

Debug functions

- A message can be printed when something occurs: SequenceDisp().
- Users can select one from several patterns: SequenceBtn().
- Users can input any string message: SequenceStr().
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Introduction of an example protocol scenario

- Please look at the ‘W01_voice.c’ scenario located in c:\MX847010\Sample Scenario\W01
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How to see a log?

- Real-time Trace log
- Click
- Comment in the scenario
- Hex Data
- Decoded Data