

MX702500B

Log to Scenario Converter

**MX702500B
Log to Scenario Converter
(LSC)
Product Introduction**

Version 3.0

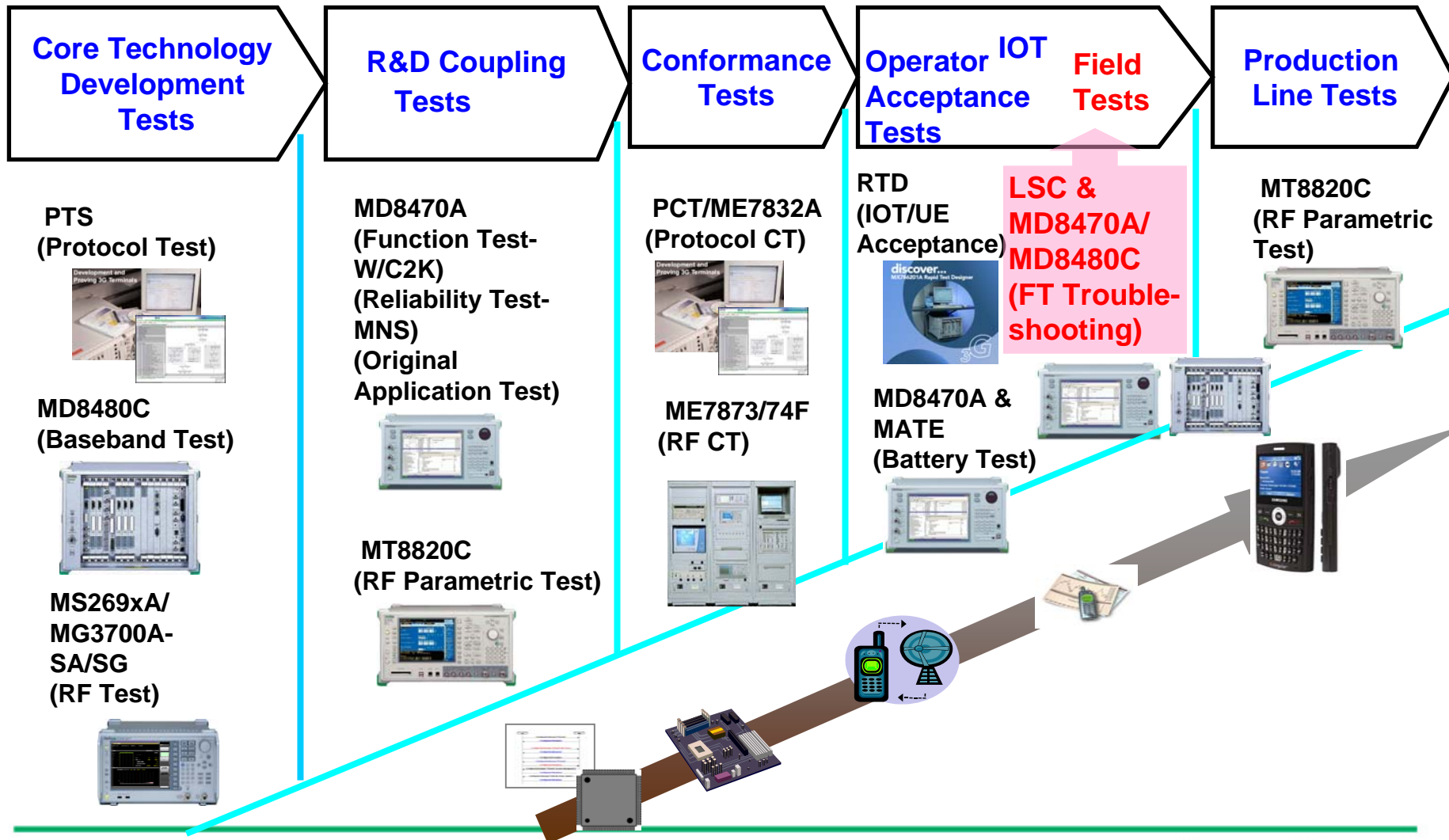
Anritsu Corporation

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MX702500B Log to Scenario Converter

Anritsu UE Test Solutions

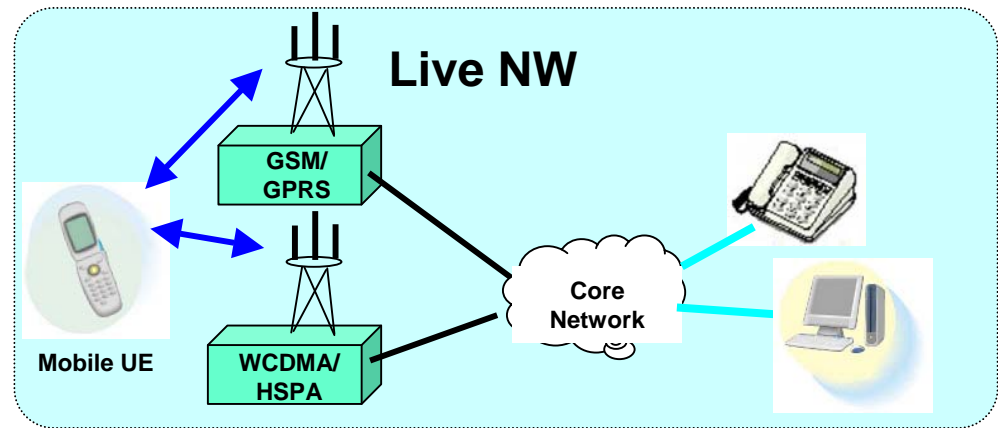
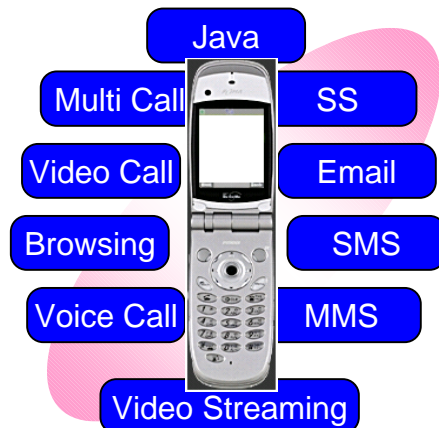


Slide 3

MX702500B-E-L-1

Market Background of Field Tests (FT)

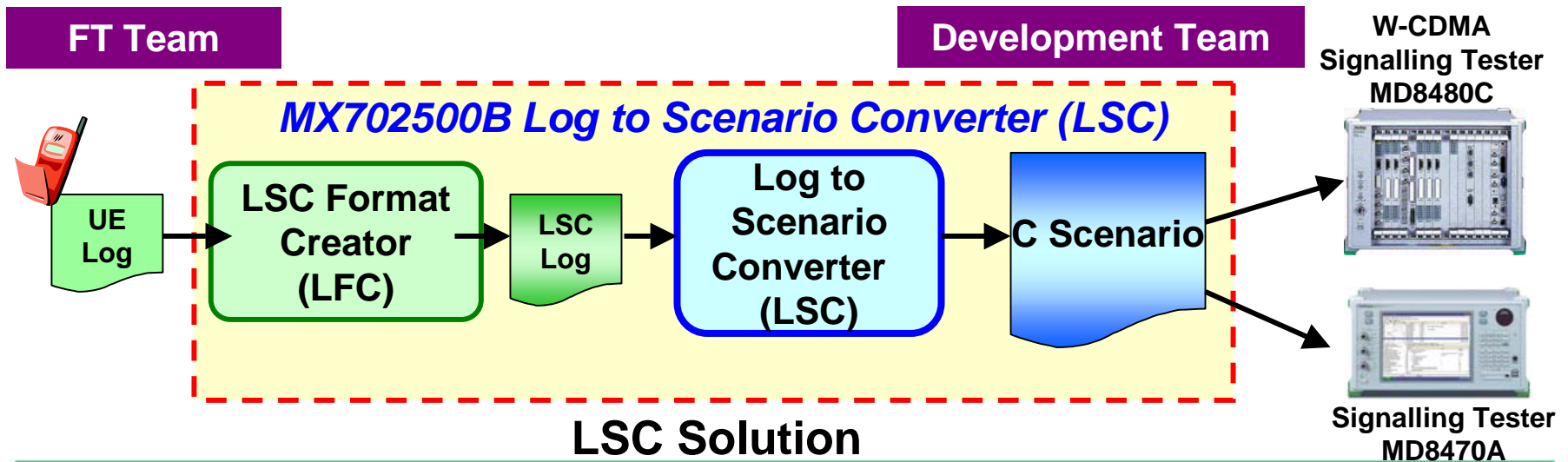
- Modern mobile networks have complex wireless systems and services, as well as more FT faults
- UE troubleshooting is:
 - ◆ Inefficient at finding faults from UE logs, and
 - ◆ Unable to reproduce FT faults easily



What if field faults could be reproduced easily at the lab bench?

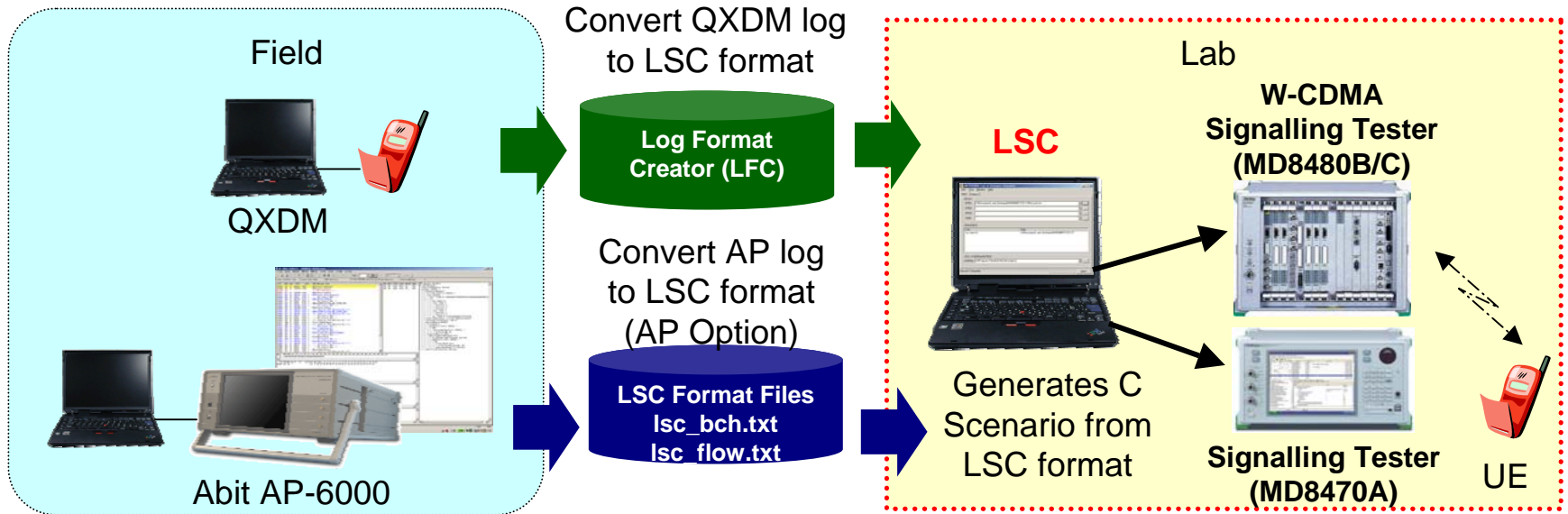
General Introduction

- The LSC is a tool for converting UE logs (Layer-3 messages) captured in real network environment to a file format for reproducing FT faults at the BTS simulator
- The LSC tool reproduces UE software faults at field tests



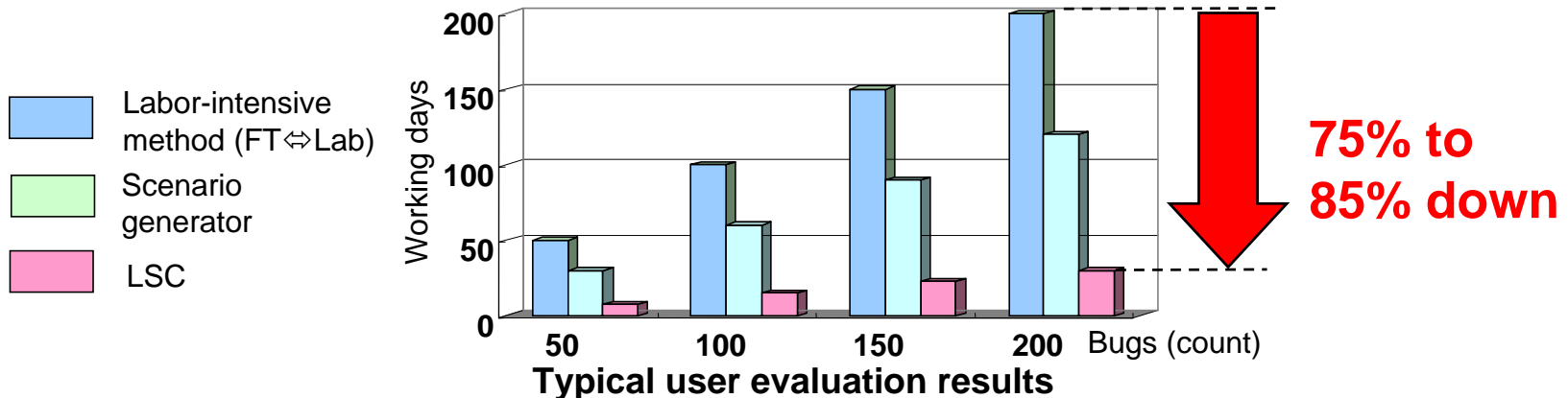
Application

- Reproduces FT fault at the lab
 - ◆ Generates test scenario from the UE or Air Monitor log
 - QXDM format log with Layer 3 message
 - MX702500B-011 Log Importing for QXDM
 - C-plane log of the Air Protocol Monitor
 - AP-4000 or AP-6000 + LSC format export function by Abit



Benefits of LSC

- Improves efficiency of FT fault analysis
 - ◆ Cuts UE software evaluation time and costs
 - Cuts troubleshooting downtime by up to 85% (with user evaluation results)
 - Supports parallel replay using multiple evaluation UEs
 - Generates scenario files that run on all signalling testers with one license
 - Finds infrequent errors
 - Improves quality through repeated tests



Benefits of LSC

- **Improves efficiency of FT fault analysis**
 - ◆ **Excellent operability**
 - **Easy and convenient operation using GUI**
 - **Easy reproduction of software faults based on QXDM log**
 - **Log Importing for QXDM (MX702500B-011)*¹**
 - **Graphical setting of downlink power control*²**
 - **LSC Format Creator (MX702500B-010)*³**
 - ◆ **Excellent flexibility**
 - **Easily change generated reproduction scenarios**
 - **Layer 3 message modification at fault isolation**

*1: Log importing function for QXDM by format to LFC.

*2: Does not reproduce propagation environment, such as downlink power and fading status, in actual FT.

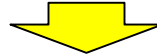
*3: The tool converts the UE log format to LSC log format with GUI setting of downlink signal power control and modified Layer 3 messages.

How to Convert from UE Log to Test Scenario



STEP 1: Load UE log into LFC

1. Select format change engine
2. Change protocol sequence (if required)



STEP 2: Edit with LFC GUI

1. Easily modify Layer-3 message (if required)
2. Easily control downlink power with GUI



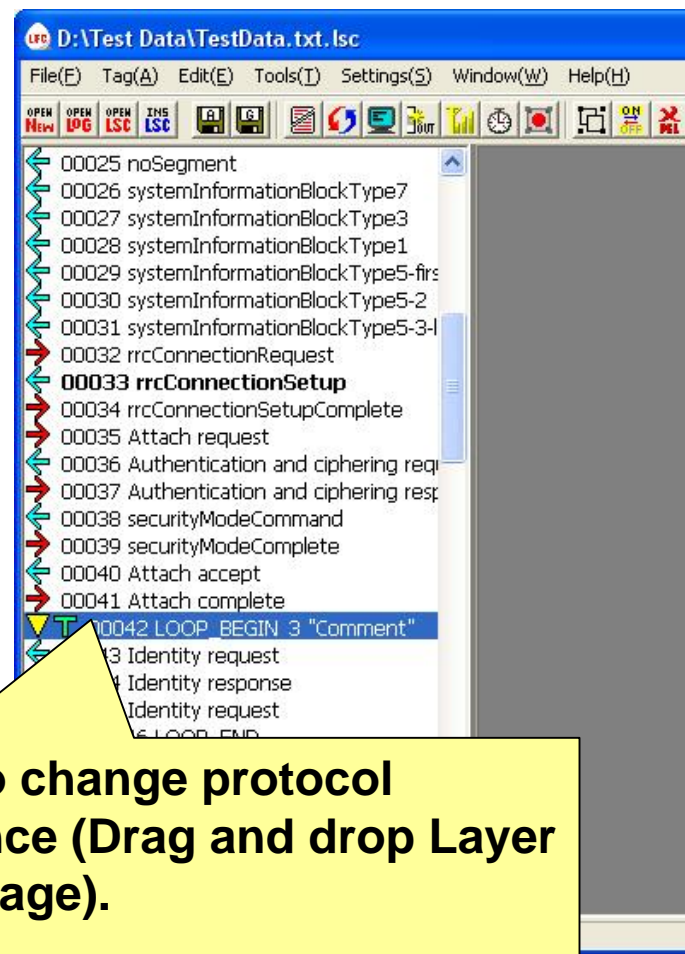
STEP 3: Save LSC format log

1. Save BCCH information log and protocol sequence log separately

How to Convert from UE Log to Test Scenario

Step 1: Load UE log into LFC

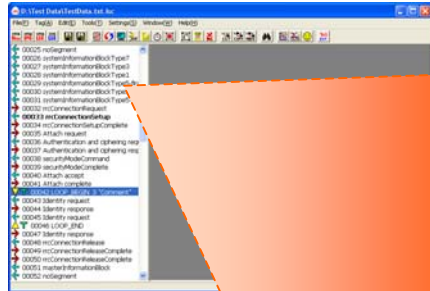
- Select format change engine
- Load UE log into LFC to create protocol sequence on LFC GUI
- 'Log Importing for QXDM' loads QXDM logs



How to Convert from UE Log to Test Scenario

Step 2: Edit with LFC GUI

(Easy to modify Layer 3 message)



LFC 00033 rrcConnectionSetup

Hex Dump

30	E7	20	00	00	20	02	01	01	01	01	8C	26	E2	49	83	03	49	D3	E2	84	F8	EA	30	00	14	61	67	95	20	B4	
E6	8A	C2	E7	4F	92	13	E5	A9	40	00	52	8A	13	A7	CD	09	F3	D4	E0	00	29	C7	09	D3	E8	84	FA	6A	90	00	15
08	00	06	17	81	4B	FC	03	E4	19	00	04	80	11	DC	32	00	01	04	13	F7	EB	49	FF	04	42	6E	27	7F	20	19	14
00	02	00	90	00	03	02	00	00																							

Type: Hex Bit C(0x)

MessageType: UL DL DLcch

TransferMode: Unacknowledged

RbIdentity: 0 FN Time: 14:55:54.00

MessageName: rrcConnectionSetup

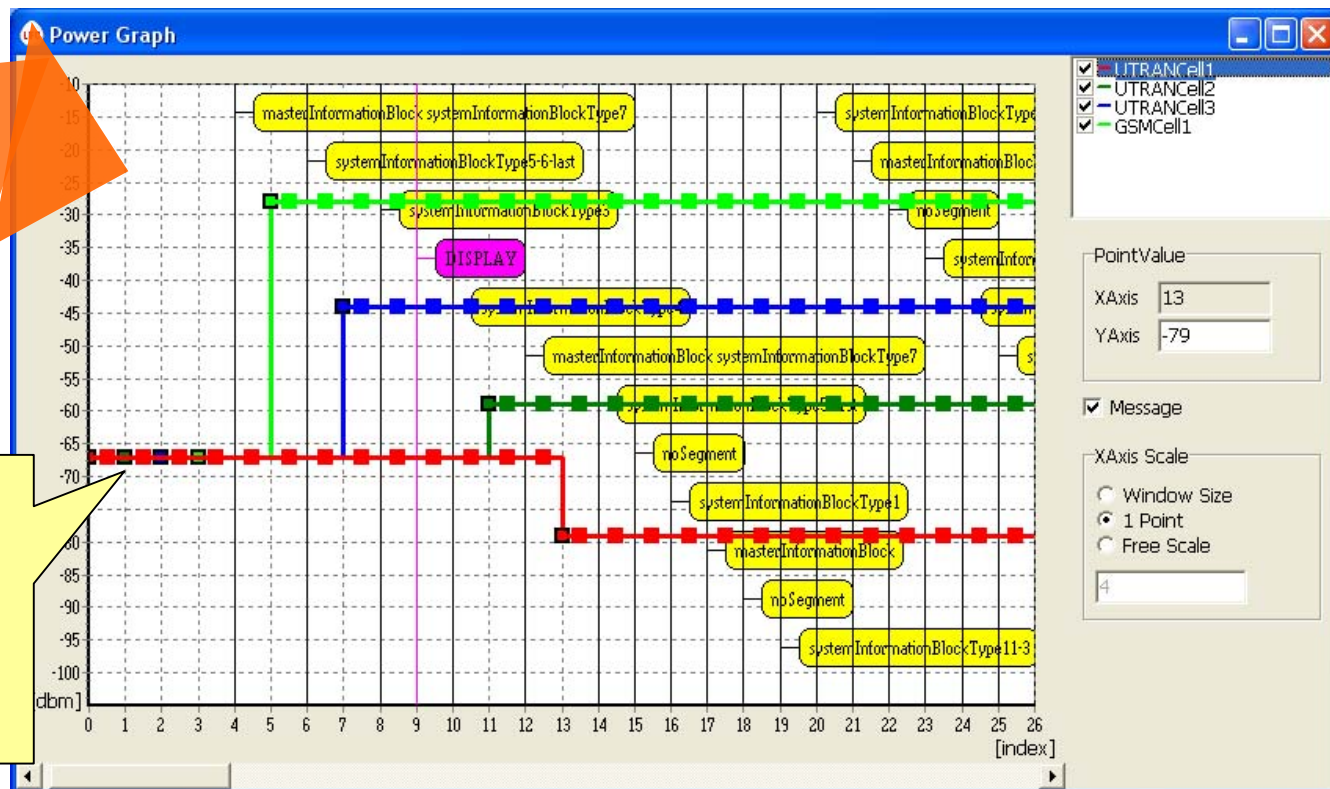
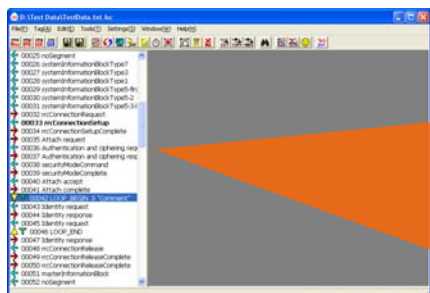
Comment: #Decoded by LFC str
Ver:3,0,5,0
DL-CCCH-Message ::= SEQUENCE [0]
+-integrityCheckInfo ::= SEQUENCE OPTIONAL:Omit
+-message ::= CHOICE [rrcConnectionSetup]
+-rrcConnectionSetup ::= CHOICE [r3]
+-r3 ::= SEQUENCE [0]
+-rrcConnectionSetup-r3 ::= SEQUENCE [0011100111]
| +-initialUE-Identity ::= CHOICE [tmsi-and-LAI]
| | +-tmsi-and-LAI ::= SEQUENCE
| | | +-tmsi ::= BIT STRING SIZE(32) [00000000000000000000000000000001]

Decode NAS

Click [Decode] to open Layer 3 Message Editing screen.

How to Convert from UE Log to Test Scenario

Step 2: Edit with LFC GUI (Easy to control downlink power)



The power level of each cell is displayed and can be changed using the mouse.

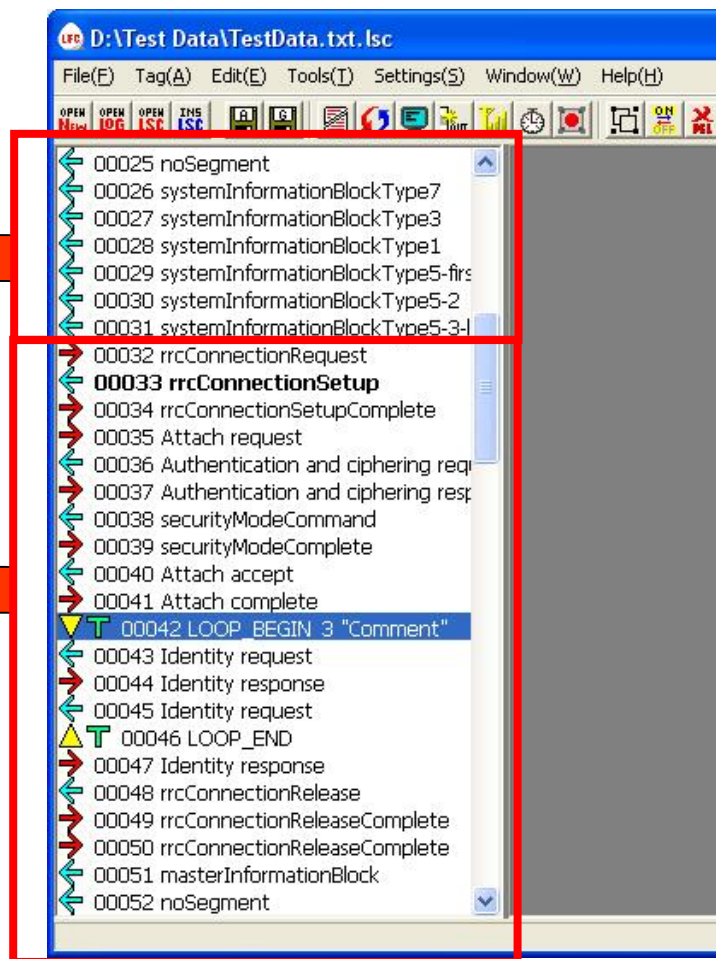
How to Convert from UE Log to Test Scenario

Step 3: Save LSC format log

- Save BCCH information and protocol sequence separately as LSC log
- The LSC log helps to make a data base for reproducing various field conditions without relying on UE log format and version differences by accumulating each LSC log files

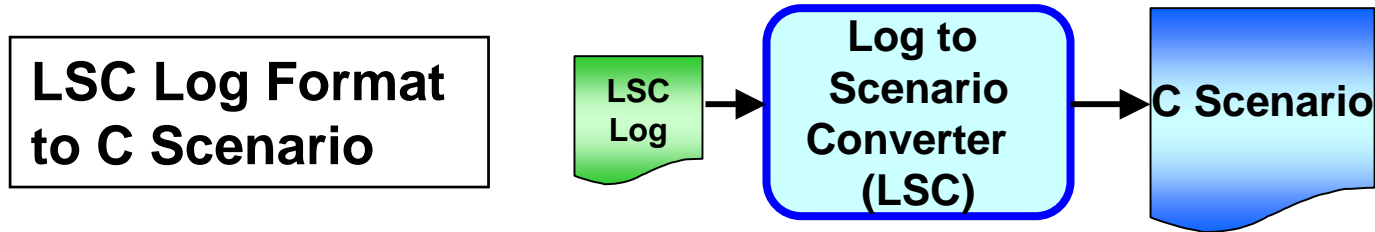
BCCH
Information
Log

Sequence
Log



```
D:\Test Data\TestData.txt.lsc
File(E) Tag(A) Edit(E) Tools(T) Settings(S) Window(W) Help(H)
OPEN LOG OPEN LSC THIS LSC
00025 noSegment
00026 systemInformationBlockType7
00027 systemInformationBlockType3
00028 systemInformationBlockType1
00029 systemInformationBlockType5-firs
00030 systemInformationBlockType5-2
00031 systemInformationBlockType5-3-l
00032 rrcConnectionRequest
00033 rrcConnectionSetup
00034 rrcConnectionSetupComplete
00035 Attach request
00036 Authentication and ciphering req
00037 Authentication and ciphering resp
00038 securityModeCommand
00039 securityModeComplete
00040 Attach accept
00041 Attach complete
T 00042 LOOP_BEGIN_3 "Comment"
00043 Identity request
00044 Identity response
00045 Identity request
T 00046 LOOP_END
00047 Identity response
00048 rrcConnectionRelease
00049 rrcConnectionReleaseComplete
00050 rrcConnectionReleaseComplete
00051 masterInformationBlock
00052 noSegment
```

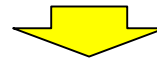

How to Convert from UE Log to Test Scenario



STEP 4: Load LSC format log into LSC



STEP 5: Edit CellConfig.lsc file (if required)

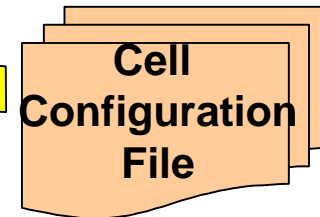
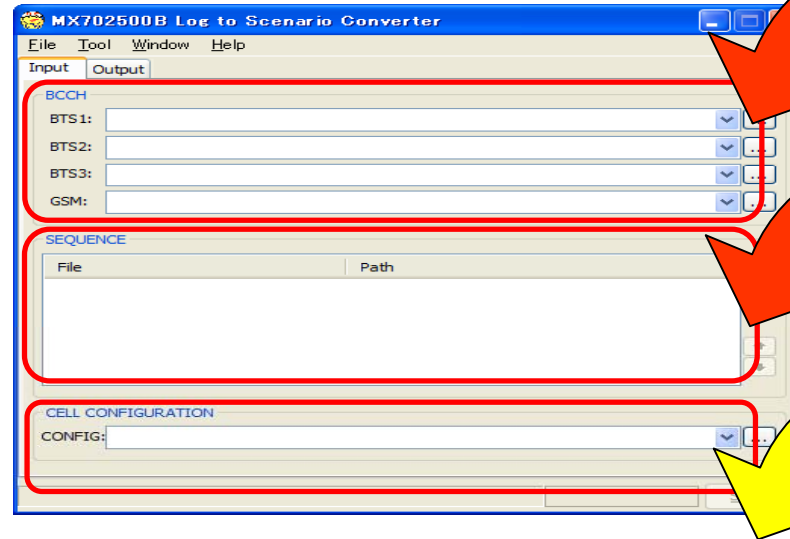


STEP 6: Generate C scenario

How to Convert from UE Log to Test Scenario

Step 4: Load LSC format log into LSC

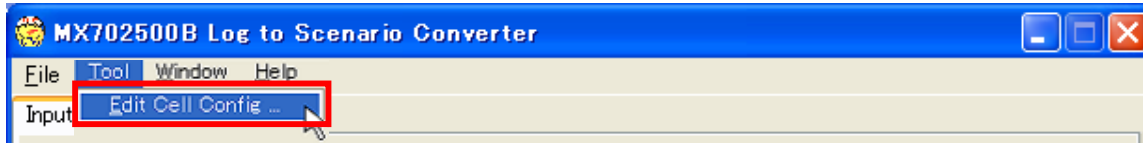
- Load BCCH information and protocol sequence saved in LFC
- Generates various test scenarios by changing LSC file combination here such as a same sequence simulation based on different network (cell) condition



MX702500B Log to Scenario Converter

How to Convert from UE Log to Test Scenario

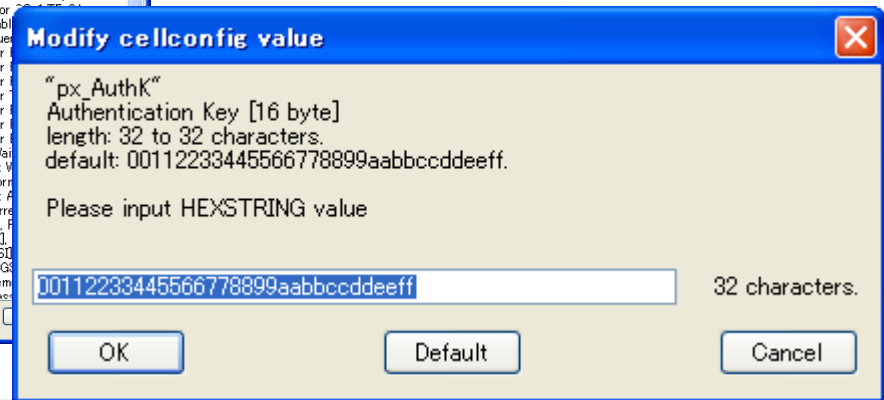
Step 5: Edit CellConfig.Isc file (if required)



Change most parameters such as MCC, MNC, Authentication Key, etc. These parameters are overwritten in C scenario.

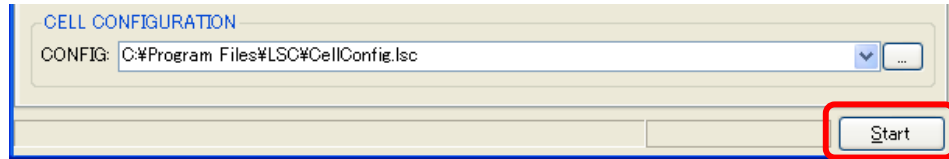
Section	Name	Type	Value	comment
COMMON	px_IMSI_Def	HEXSTRING	00000123456789	default IMSI
UTRANCell1	px_SIM_FIXED_MODE	BOOLEAN	FALSE	Fixed RAND and AUTH
UTRANCell2	px_AUTH	HEXSTRING	00112233445566778899aabbccddeeff	Fixed Authentication Key [16 byte]
UTRANCell3	px_AuthK	HEXSTRING	00112233445566778899aabbccddeeff	Authentication Key [16 byte]
CELL_GSM_1	px_RAND	HEXSTRING	33393630333239323339363033323932	Authentication Parameter Rand [32..
	px_IK	HEXSTRING	170377675F45BBA09F8BF7FED7CD3328	Integrity Key [32 byte]
	px_CK	HEXSTRING	28170377675F45BBA09F8BF7FED7CD33	Ciphering Key [32 byte]
	px_PktService	CHARSTRING	IP	Packet service type. IP or PPP or ..
	px_BtsIP	OCTETSTRING	01030001	BTS_IP [Hex] ex: 01030001 -> 1.3.0.1
	px_MsIP	OCTETSTRING	01030002	MS_IP [Hex] ex: 01030002 -> 1.3.0.2
	px_1stDNS_IP	OCTETSTRING	01030001	1stDNS_IP [Hex] ex: 01030001 -> 1..
	px_2ndDNS_IP	OCTETSTRING	01030003	2ndDNS_IP [Hex] ex: 01030003 -> 1..
	px_CS_TE_Connect_Flag	INTEGER	1	TE Type setting for CS. 1:TE, 2:Lo...
	px_PS_TE_Connect_Flag	INTEGER	1	TE Type setting for PS. 1:PS, 2:Lo...
	px_ULScrCode_Correct	BOOLEAN	FALSE	Correct UL Scrambl
	px_IntegrityModify_Correct	BOOLEAN	FALSE	Correct RRC sequ
	px_RadioBearerActTime	INTEGER	150	ActivationTime for
	px_RadioBearerActTimeForMultiCall	INTEGER	150	ActivationTime for
	px_PhyReconfigActTime	INTEGER	150	ActivationTime for
	px_TrchReconfigActTime	INTEGER	150	ActivationTime for
	px_RabReconfigActTime	INTEGER	150	ActivationTime for
	px_RadioBearerReleaseActTime	INTEGER	150	ActivationTime for
	px_BtsFreqActTime	INTEGER	20	ActivationTime for
	px_AM_CNF_TIMER	INTEGER	500	AM_DATA_CNF_Wai
	px_UM_Reconfig_TIMER	INTEGER	500	RLC UM Reconfig V
	px_DLInformationPerRLListNum	INTEGER	1	Number of DI-Infor
	px_AuthProcedure_Add	BOOLEAN	TRUE	Automatic correct A
	px_AuthResp	BOOLEAN	TRUE	Authentication corre
	px_ReadIMSI	BOOLEAN	TRUE	TRUE&Req[IMSI], F
	px_ReadTMSI	BOOLEAN	TRUE	TRUE&Req[TMSI], F
	px_ReadPTMSI	BOOLEAN	TRUE	TRUE&Req[PTMSI]
	px_GsmStartingTime	INTEGER	100	Starting Time for G
	px_GsmCodingScheme	INTEGER	1	GSM Coding Schem
	px_GsmMultiInfClass	INTEGER	1	GSM MultiInf Class

1. Change value of item



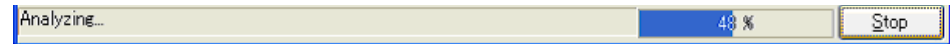
How to Convert from UE Log to Test Scenario

Step 6: Generate C scenario

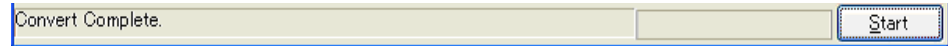


1. Click [Start] button to start generating scenario

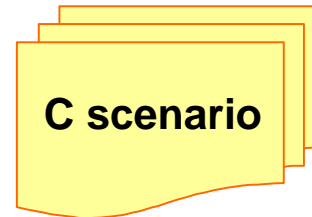
2. Progress bar displayed while scenario generated



3. Process completed



4. Scenario generated



Displays details of any errors and warnings during processing

Date	Level	Code	Description	MessageName	File	Hexdata
05/12/15 19:48	3	11101	LSC changed PLMN on MasterInformationBlock. (UTRA	<MasterInformationBlock>	lsclog_bts1.txt(2)	00 DE 00 A0 00 0
05/12/15 19:48	3	12009	LSC deleted FrequencyInfo.	<rrcConnectionSetup>	lsclog.txt(9)	31 EF 20 00 00 0
05/12/15 19:48	3	13001	LSC changed PLMN on NAS Message.	<Attach accept>	lsclog.txt(72)	F4 CF 35 3D 91 :
05/12/15 19:48	3	12003	LSC deleted FrequencyInfo.	<rrcConnectionSetup>	lsclog.txt(142)	31 EF 20 00 00 0
05/12/15 19:48	3	12008	LSC deleted FrequencyInfo.	<radioBearerSetup>	lsclog.txt(198)	E5 D8 82 B1 13 :
05/12/15 19:48	3	13002	LSC changed IP Network setting.	<Activate PDP context acc	lsclog.txt(212)	91 F2 23 22 89 4:
05/12/15 19:48	0	0	Output: D:\work\2005_10_LSC#lsclog_1215_1948.c			

Supported Features

- **W-CDMA/HSDPA/HSUPA**
 - ◆ **Supported Number of Cells**
 - Three BTS (MD8480C) max
 - Two BTS (MD8470A) max
 - ◆ **Supported Services**
 - Voice Call
 - Video Telephony
 - Packet Communication
 - SMS
 - Multi-call
 - ◆ **Others**
 - State Transition
 - Handover
 - Cell Reselection and more
- **GSM/GPRS**
 - ◆ **Supported Number of Cells**
 - Two BTS max
 - ◆ **Supported Services**
 - Voice Call
 - Packet Communication
 - SMS
 - ◆ **Others**
 - Handover
 - Cell Reselection
 - Cell Change Order and more
- **InterRAT (W/G)**
 - ◆ **InterRAT Handover**
 - ◆ **InterRAT Cell Reselection and more**

Product Configuration

- **Main Frame**
 - ◆ **MX702500B** **Log to Scenario Converter**
 - ◆ **MX702500B-010** **LSC Format Creator**
 - **MX702500B-011** **Log Importing for QXDM**
 - **MX702500B-SS180** **Log Importing Customized Service**
- **Wireless System**
 - ◆ **MX702500B-020** **LSC InterRAT Package**
 - **MX702500B-030** **LSC WCDMA Package**
 - **MX702500B-040** **LSC GSM Package**
- **Technical Support Service**
 - ◆ **MX702500B-TS110** **1 Year Technical Support Service**
- **Time-based License (Optional)**
 - ◆ **MX702500B-TL051** **Time-based License (6 months)**
 - **MX702500B-TL052** **Time-based License (12 months)**
 - **MX702500B-TL053** **Time-based License (24 months)**

Summary

- The LSC tool reproduces UE software faults at field tests
- The tool converts the UE log file (Layer 3 message) captured at the FT to the signalling tester file format
 - ◆ More efficient FT fault troubleshooting
 - Easy and flexible
 - Simple and easy GUI and log importing function for QXDM
 - Generates flexible C scenarios when troubleshooting faults
 - Cuts UE software evaluation time and cost
 - Cuts troubleshooting downtime by up to 85%
 - Finds infrequent errors
 - Improves quality through repeated tests

Appendix: System Requirements

Item	Content
PC	IBM-PC/AT or compatible machine
CPU	1 GHz or faster Intel Pentium Processor
Memory	≥256 MB
Display	1024 x 768 pixels or more, and high-color or better
Drive	CD-ROM
OS	Microsoft Windows 2000 Professional SP4 or later or Microsoft Windows XP Professional SP2 or later
HDD	≥20 MB of free space
Keyboard/Mouse	1 port (USB version 1.1/2.0)
Signalling Tester	MD8480B/C Ver. 5.30 or later MD8470A Ver. 3.00 or later

Appendix: Technical Support

An annual support service contract is available to keep the LSC running efficiently

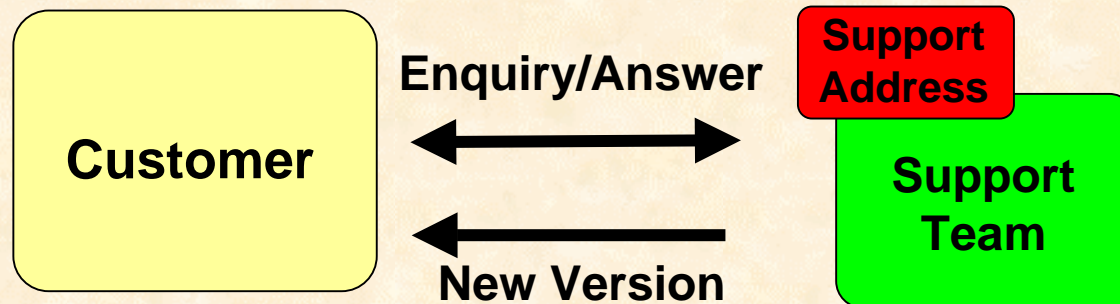
Service Contents

LSC Software upgrades

- Twice yearly MD8470A and MD8480C software upgrades to strengthen/improve functions

Email support for enquiries

*Logs, detailed information and reports may be required



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