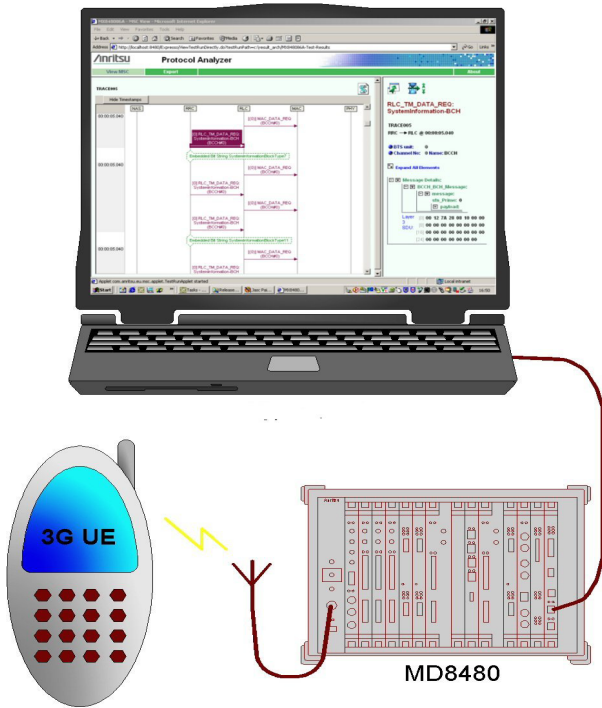# 3GPP Protocol Analyzer
MX848086A

MD8480

Introduction

Users of MD8480 W-CDMA Signaling Tester can now analyze their trace logs instantly and fully decoded. The MX848086A 3GPP Protocol Analyzer is an additional tool for the MD8480, providing fast and accurate analysis of the messages between a UE and the MD8480 system simulator. This tool provides a real advantage for development teams involved in 3GPP UE advancement where the number of scenarios needed is growing rapidly.

The tool is intuitive to use and provides the ideal graphical environment to allow study of the complex protocol messages that pass to and from the UE under test; particularly the RRC and NAS messages.

Tool Overview

The MX848086A has been designed to support the iterative process that cycles between Design, Test Analysis, Test Execution and Results Analysis. It is one tool in the family of Anritsu products that

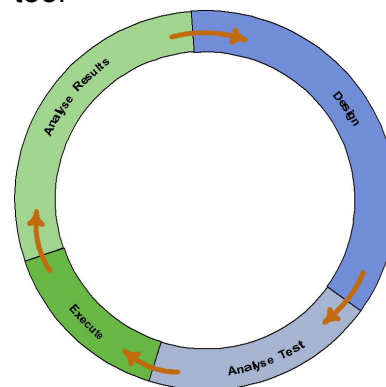has shaped the way 3rd Generation UEs have developed.

A test log from the MD8480 can be examined completely without the need to cut and paste elements into a separate tool.
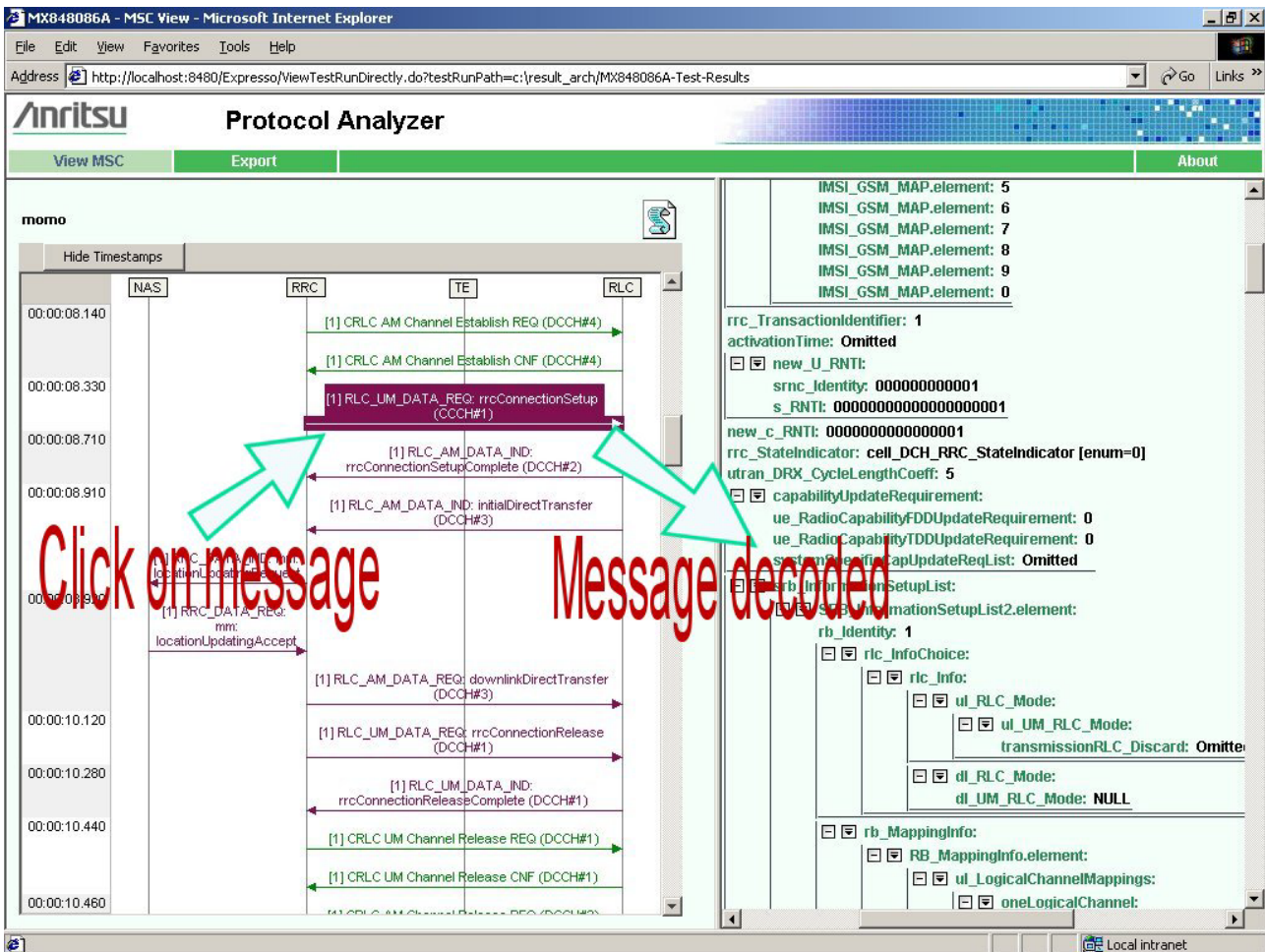
Decodes complex NAS and RRC messages.

A new challenge for W-CDMA protocol development is decoding RRC messages as these use ASN.1 Packed Encoding Rules (PER). PER adds a level of complexity over the TLV encoding used by GSM as information elements are not aligned to byte or nibble boundaries so even a hexadecimal display of the message is difficult to interpret. Further complexity is added by the extensive use of "optional" and "choice" elements throughout the RRC message specification. The result is that decoding the RRC messages manually is impractical.

The tool provides:

- Analysis to Information element level of protocol exchanges between MD8480 and UE
- Decodes RRC & NAS messages to format recognised by 3GPP
- Support for GSM / GPRS / WCDMA UEs
- Based on Globally recognised PTS and VST protocol development system
- 3GPP Standard compliant development tool

Typical cycle for scenario development and analysis

File   Edit   View   Favorites   Tools   Help

Address http://localhost:8480/Expresso/ViewTestRunDirectly.do?testRunPath=c:\result_arch/MX848086A-Test-Results   Go   Links »

/Anritsu   **Protocol Analyzer**

View MSC   Export   About

momo

Hide Timestamps

	NAS	RRC	TE	RLC

00:00:08.140   [1] CRLC AM Channel Establish REQ (DCCH#4)

                 [1] CRLC AM Channel Establish CNF (DCCH#4)

00:00:08.330   [1] RLC_UM_DATA_REQ: rrcConnectionSetup
                 (CCCH#1)

00:00:08.710   [1] RLC_AM_DATA_IND:
                 rrcConnectionSetupComplete (DCCH#2)

00:00:08.910   [1] RLC_AM_DATA_IND: initialDirectTransfer
                 (DCCH#3)

Click on message   location updating...

00:00:09.___   [1] RRC_DATA_REQ:
                 mm:
                 locationUpdatingAccept

                 [1] RLC_AM_DATA_REQ: downlinkDirectTransfer
                 (DCCH#3)

00:00:10.120   [1] RLC_UM_DATA_REQ: rrcConnectionRelease
                 (DCCH#1)

00:00:10.280   [1] RLC_UM_DATA_IND:
                 rrcConnectionReleaseComplete (DCCH#1)

00:00:10.440   [1] CRLC UM Channel Release REQ (DCCH#1)

00:00:10.460   [1] CRLC UM Channel Release CNF (DCCH#1)

Message decoded

IMSI_GSM_MAP.element: 5
IMSI_GSM_MAP.element: 6
IMSI_GSM_MAP.element: 7
IMSI_GSM_MAP.element: 8
IMSI_GSM_MAP.element: 9
IMSI_GSM_MAP.element: 0
rrc_TransactionIdentifier: 1
activationTime: Omitted
new_U_RNTI:
    srnc_Identity: 000000000001
    s_RNTI: 00000000000000000001
new_c_RNTI: 0000000000000000
rrc_StateIndicator: cell_DCH_RRC_StateIndicator [enum=0]
utran_DRX_CycleLengthCoeff: 5
capabilityUpdateRequirement:
    ue_RadioCapabilityFDDUpdateRequirement: 0
    ue_RadioCapabilityTDDUpdateRequirement: 0
    system...ecific...apUpdateReqList: Omitted
...rb_Inf...tionSetupList:
    ...RB S...rmationSetupList2.element:
        rb_Identity: 1
        rlc_InfoChoice:
            rlc_Info:
                ul_RLC_Mode:
                    ul_UM_RLC_Mode:
                        transmissionRLC_Discard: Omitte...
                dl_RLC_Mode:
                    dl_UM_RLC_Mode: NULL
        rb_MappingInfo:
            RB_MappingInfo.element:
                ul_LogicalChannelMappings:
                    oneLogicalChannel:

Local intranet

MD8480 customers that utilize the MX848000A to create "C" based test scenarios currently can only view "hex-dump" format data. It is not really practical to manually decode RRC/NAS messages, and cut/paste of hex strings into available automated tools is very laborious.

It is desirable to have a tool that automatically displays logs as MSCs with RRC and NAS messages fully decoded.

The MX848086A 3GPP Protocol Analyzer provides analysis of the data logged during execution of MX848000 scenarios to a detail that makes it easy to debug and understand the messages between the MD8480A and the UE under test. The user is provided with a HTML based display that provides "Links" from all the message interchanges and decodes each message in an easily read format. This means that finding mismatches in the configurations or signaling is relatively straightforward.
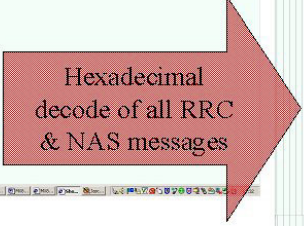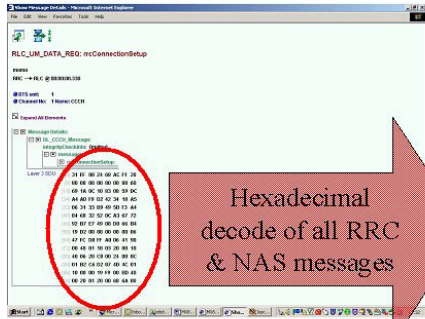
RRC & NAS messages can be decoded to information element level and can be correlated with the 3GPP specifications (see diagram below).

The MX848086A runs on the same PC as the MX848000A Test scenarios, allowing immediate analysis of the scenario. It can also be run on a separate PC if required. This allows more efficient use of the MD8480 hardware.
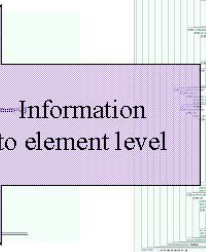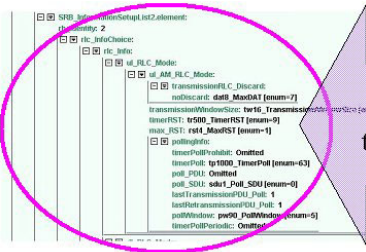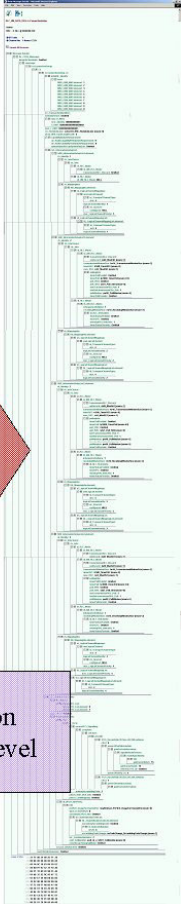
Complex messages including broadcast information, establishment, reconfiguration and release of bearers and RRC connection mobility functions can be decoded in a format that is easily compared with the relevant 3GPP specification.

Messages can be decoded
down to information elements

This diagram shows how any RRC or
NAS message from a trace log can be
decoded to information element detail

Hexadecimal
decode of all RRC
& NAS messages

Information
to element level

The decoded messages are easily compared with 3GPP documents as shown in the image above.

Ordering Information

Please specify model number and name and quantity when ordering.

Model / Order No.	Name
MX848086A	3GPP Protocol Analyzer
MX848086A-05	3GPP R99 March 02 Support
MX848086A-08	3GPP R99 December 02 Support
MX848086A-09	3GPP R99 March 03 Support
Z0682	Software update to latest version
For support of any other 3GPP Releases please contact Anritsu	

The recommended minimum specification is a 300MHz Pentium 2 PC with 128MBytes of RAM.

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Specifications are subject to change without notice.

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