Dreamwireless WCDMA/GSM

Wireless network testing and optimization system

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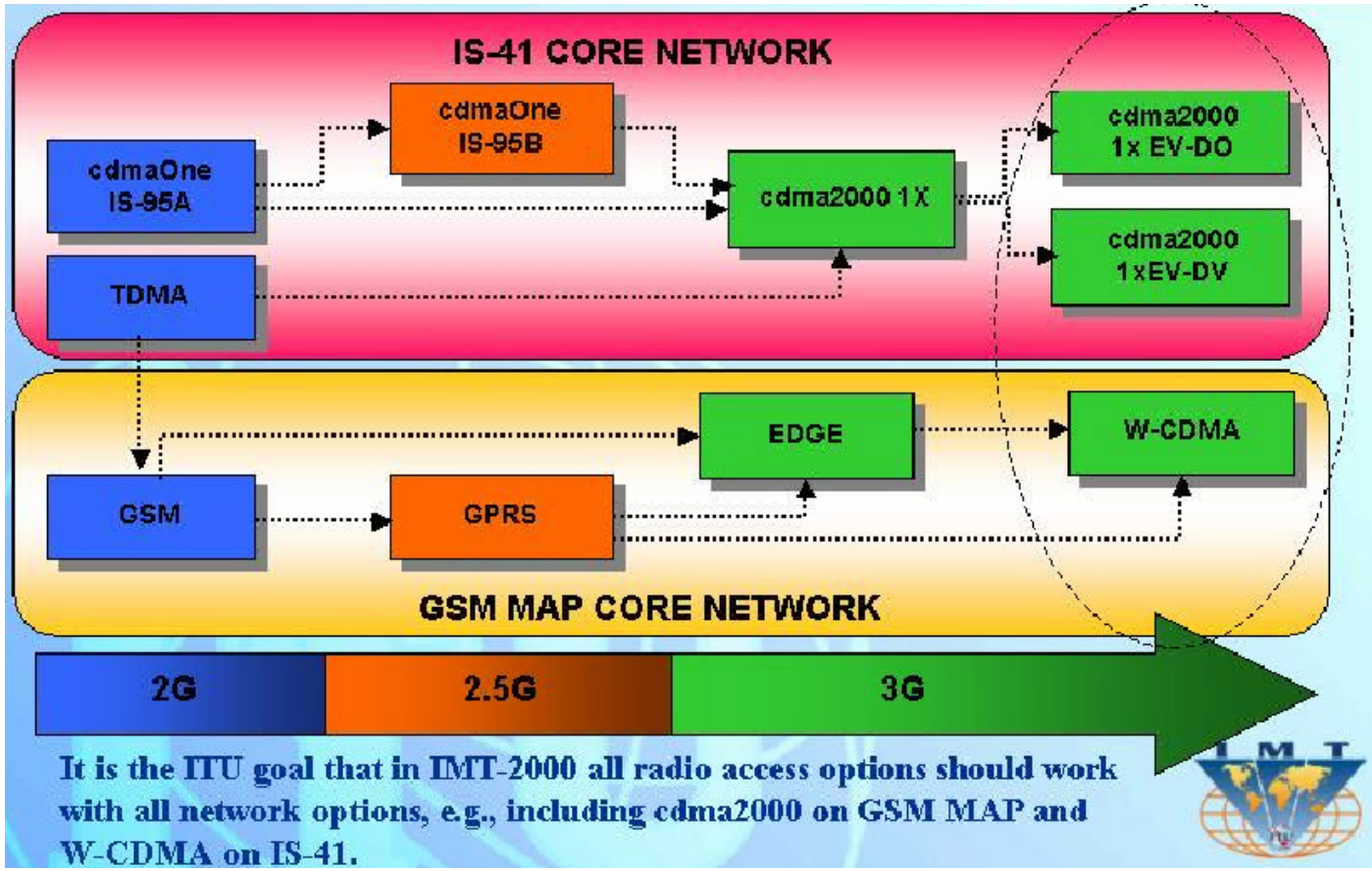
WCDMA

ITU 3G The evolution of technology plans



WCDMA Network Status

- The early stage of the WCDMA Network, small business.
- The large volume of Network business has not been the actual load test .
- System capacity is limited, we can hardly meet the needs of real users.
- system stability needs to be raised .
- Fewer types of business.

WCDMA Testing Tool Status

- Does not have accurate statistics
- Operator Interface unfriendly
- System instability
- Service is difficult to meet the needs of users

What can we do(1)

- Measuring network operations in WCDMA/GSM
- Actual test and analysis on MapX to show blind signal, thereby increasing the Node B to provide guidance.
- In the installation of Node B, Node B can be ready to sweep the region analysis, identify external interference.
- After the installation of Node B, Node B can be an effective service for testing to verify the actual installation of the base station coverage.

What can we do(2)

- **Through various testing tools for signal coverage of the statistics, analysis and adjustment of the location of the Node B to provide assistance.**
- **Passed the Drive Test can quickly and effectively verify wireless access network coverage, show invalid region, the statistics cover. discover blind spots, interference and calls poor quality, easy disconnection, switching failure lots.**
- **Complaints location of the actual tests can be provided for the engineering problem, to help solve the problem.**

WCDMA/GSM

Wireless network testing and optimization system

Configuration :

- **Qualcomm UMTS phone**
- **Scanner**

- **PC 1Set**
- **GPS 1Set**
- **DWL WCDMA/GSM 1Set**

WCDMA/GSM

Wireless network testing and optimization system

WCDMA Test Experience

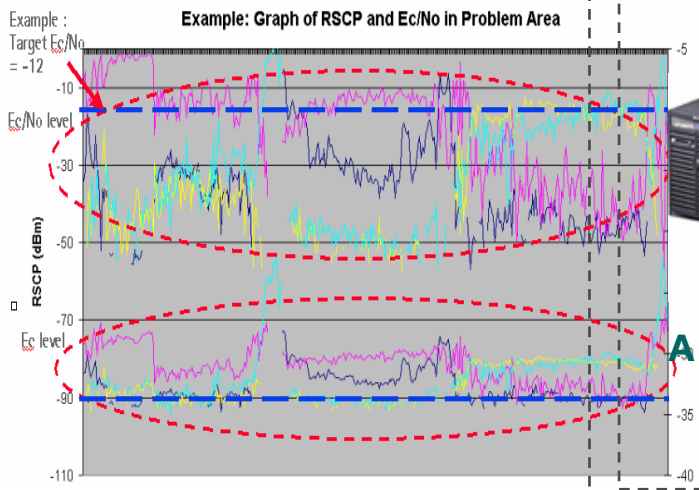
Configuration

KPIs

Data collection

WCDMA RAN

Air Interface



Analytical tool

UE Test

WCDMA **Scanner**

Dreamwireless WCDMA/GSM

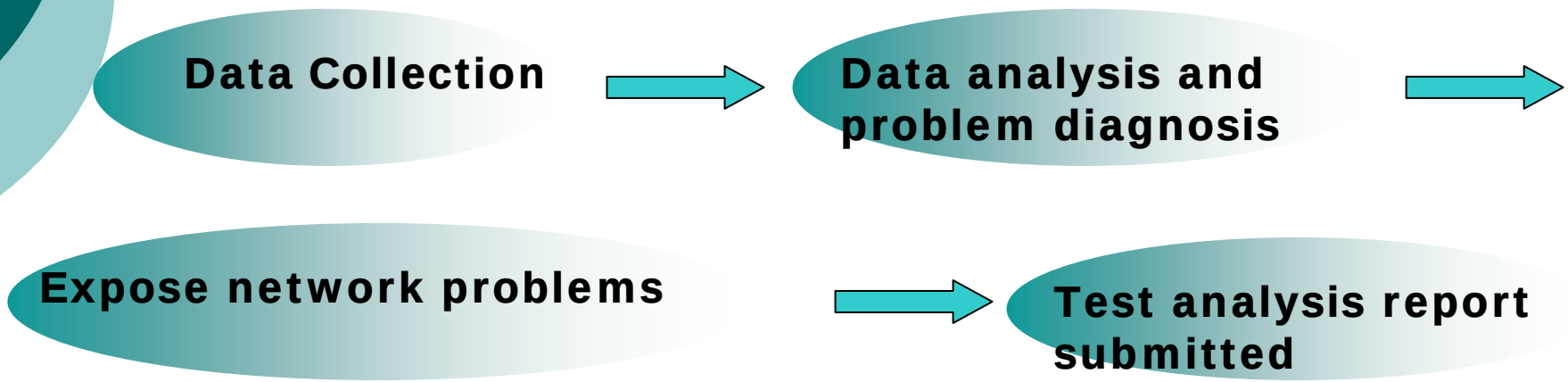
Dreamwireless WCDMA/GSM is WCDMA/GSM air interface testing tool.

The system is suitable for wireless network planning and optimization of test results, troubleshooting guidance, planning and optimization.

Feature:

- Wireless network test and quality parameters.
- Decoding air interface information and make data and geographic information Area real-time display together.
- Real-time monitoring, tracking and testing of the current system status.

Dreamwireless WCDMA/GSM



Collection Feature:

- 1. Support WCDMA/GSM mode testing
- 2. Support the test cell phones
- 3. Support Scanner test
- 4. Support the indoor test;
- 5. Support pre-testing program
- 6. Automatic log keeping record of support derived and Playback

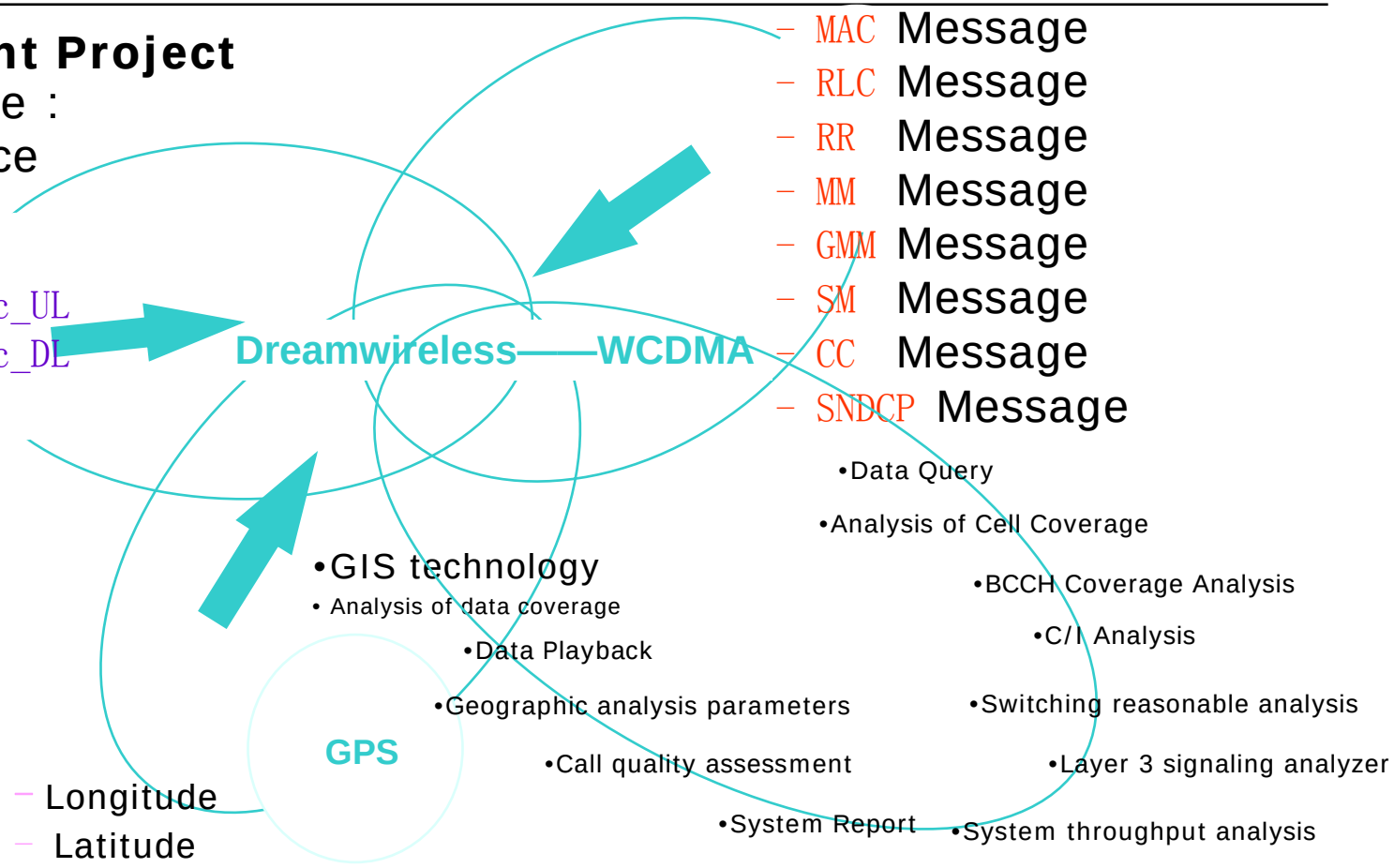
Functional Analysis

- 7. Support interaction message;
- 8. Real-time wireless display geographic parameters;
- 9. Air interface with the analytical news show ;
- 10. Support for user-defined parameters window shows ;
- 11. GPS time synchronization ;
- 12. Support a variety of voice and data service testing business ;
- 13. Testing analysis report auto-made.

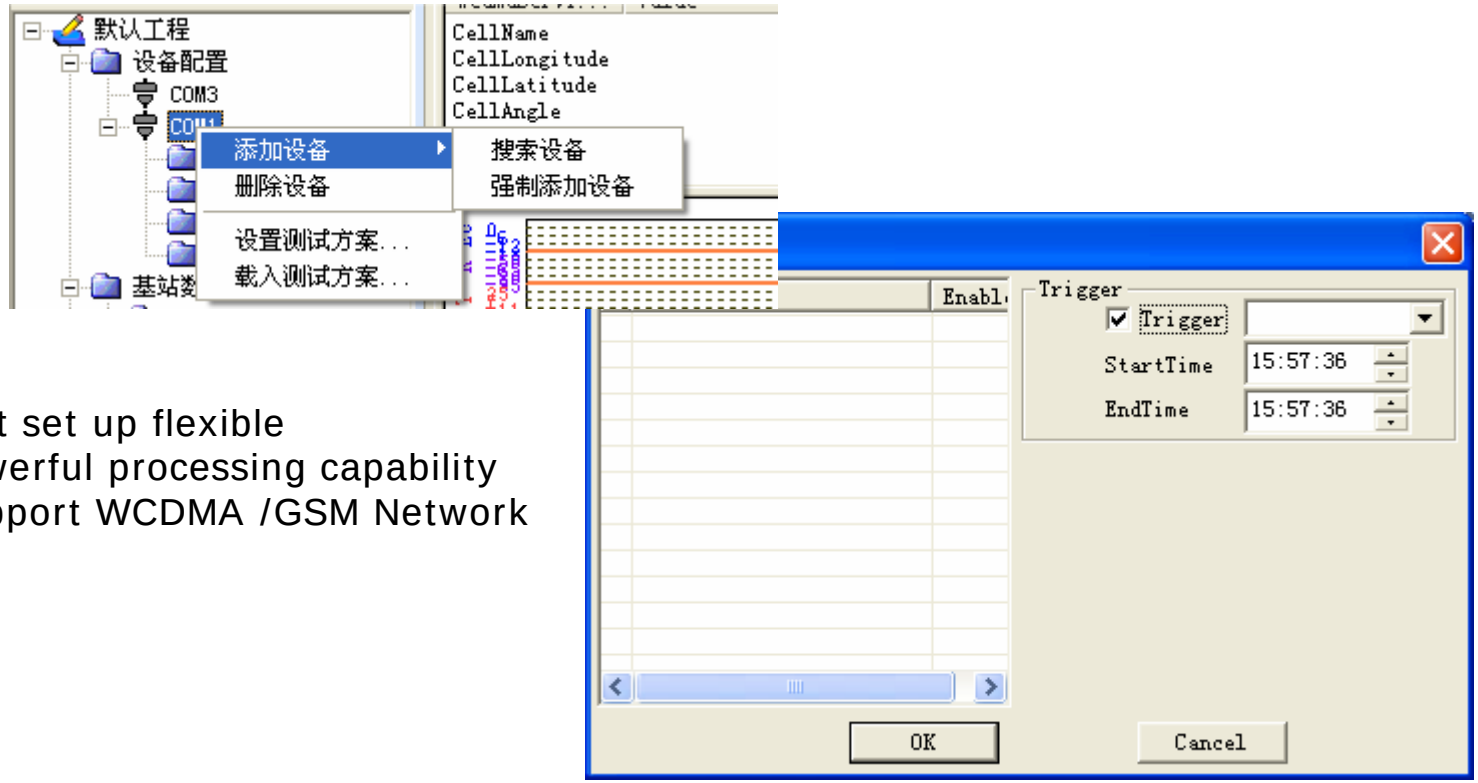
Testing and optimizing program

Measurement Project

- Voice phone :
- Data Service
- UTMS:Status
- UTMS:Qos
- RLC Statistic_UL
- RLC Statistic_DL

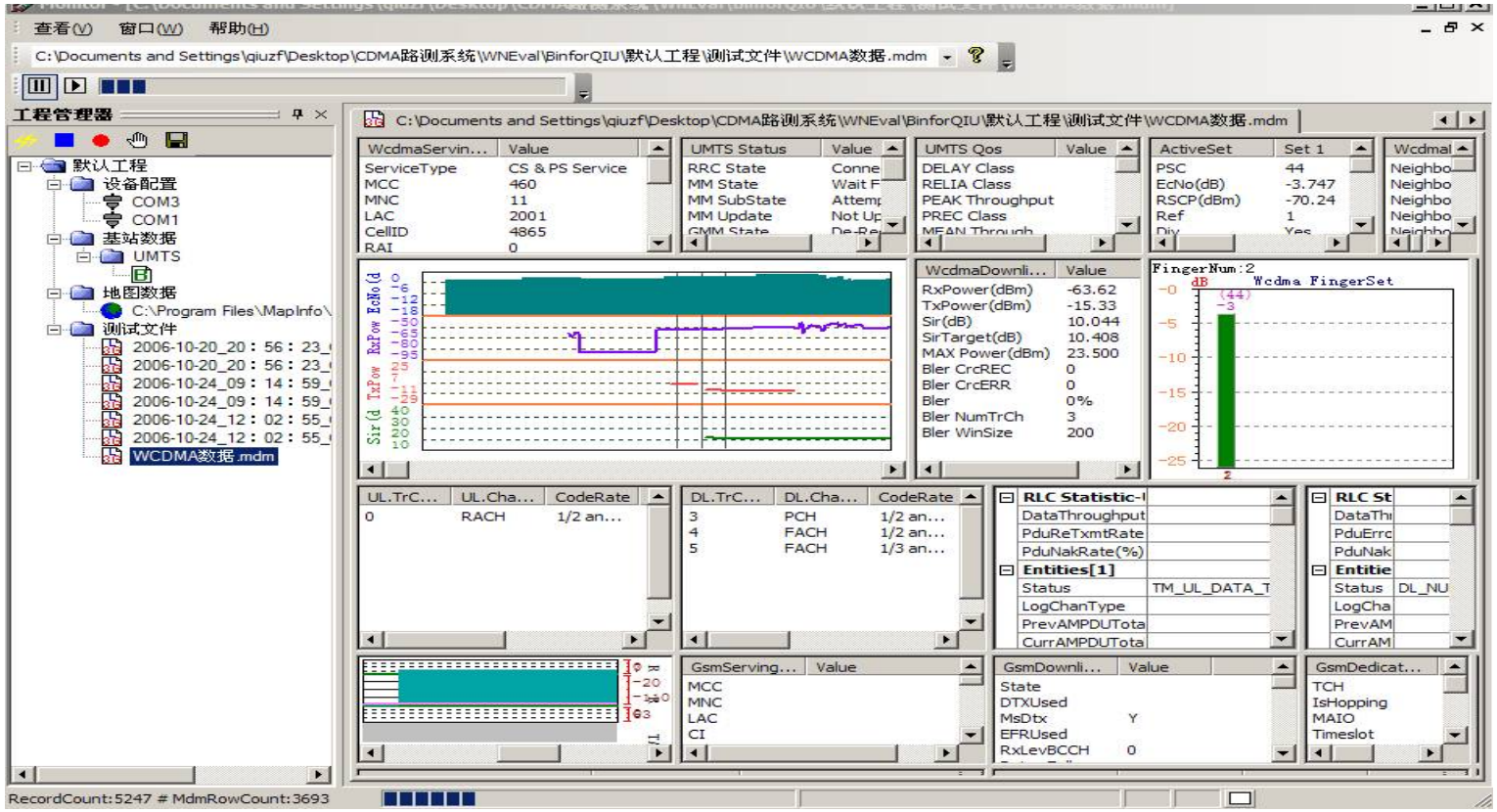


System Setting



Port set up flexible
Powerful processing capability
Support WCDMA /GSM Network

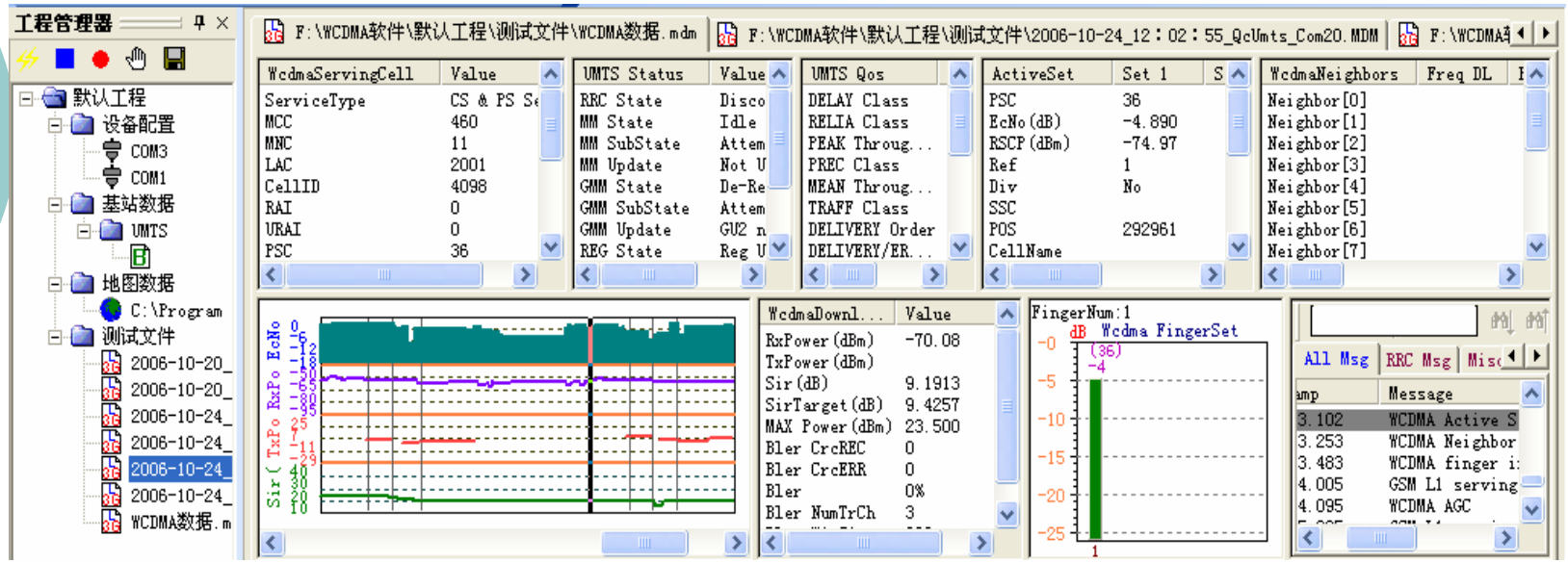
Windows Interface



1.Large amounts of information is visual interface .

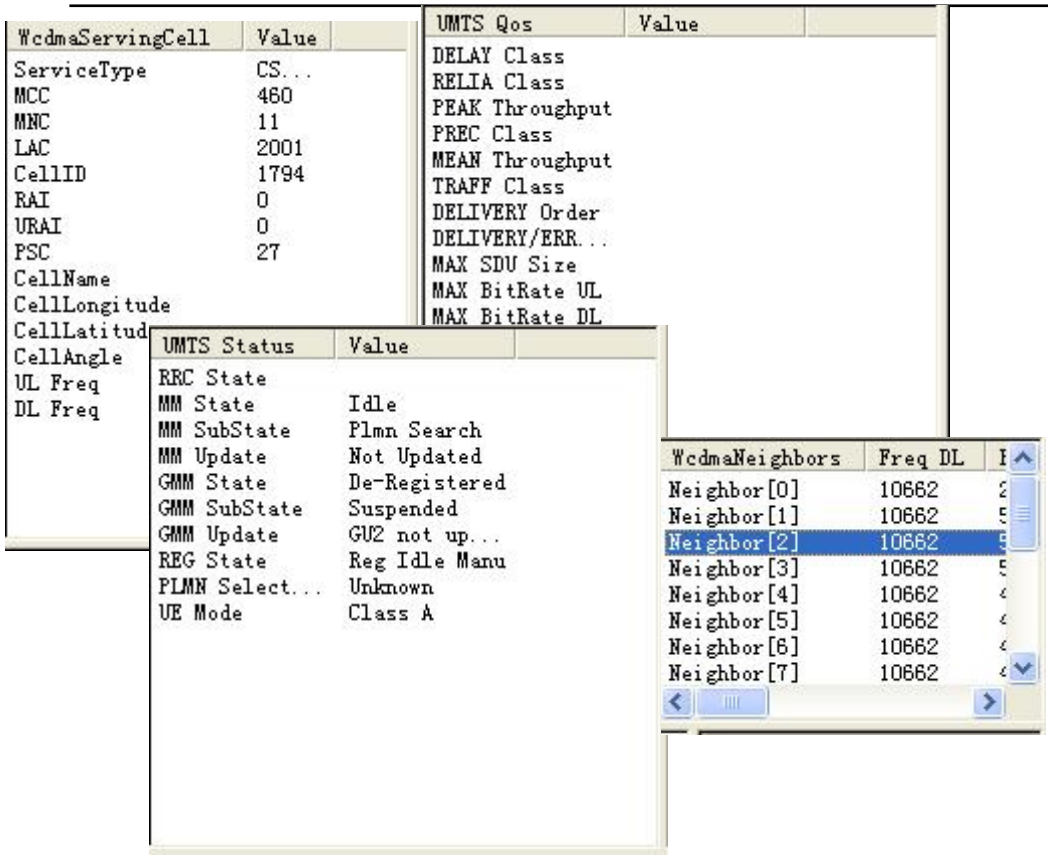
2.Real-time positioning the main areas of neighboring district .

WCDMA/GSM Voice tests 1



Designate a WCDMA/GSM mobile phone in the region and around the NodeB then record the procedure between the cell phone and Node B which inculde channel Switching, station switching, disconnection etc. It will be helpful to understand the problem.

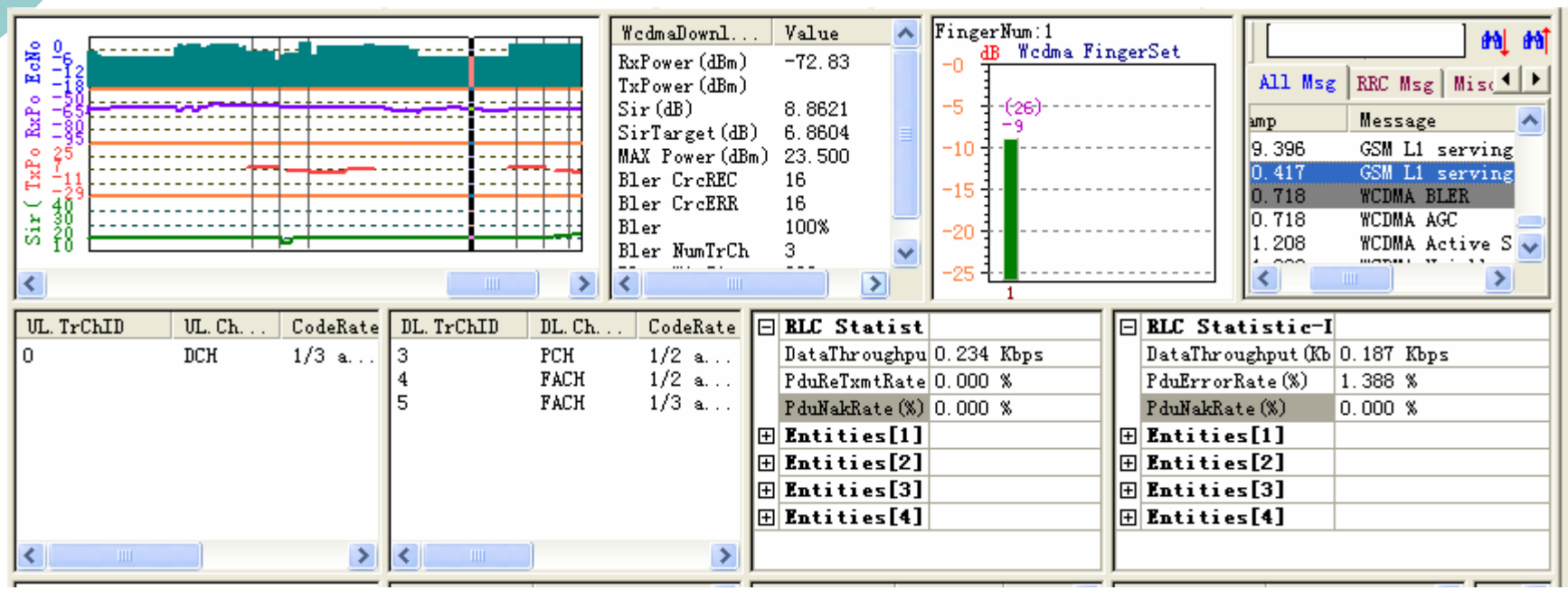
WCDMA/GSM Voice tests 2



Through the test, a detail understanding of the WCDMA network specific situation in the region can be understanded.

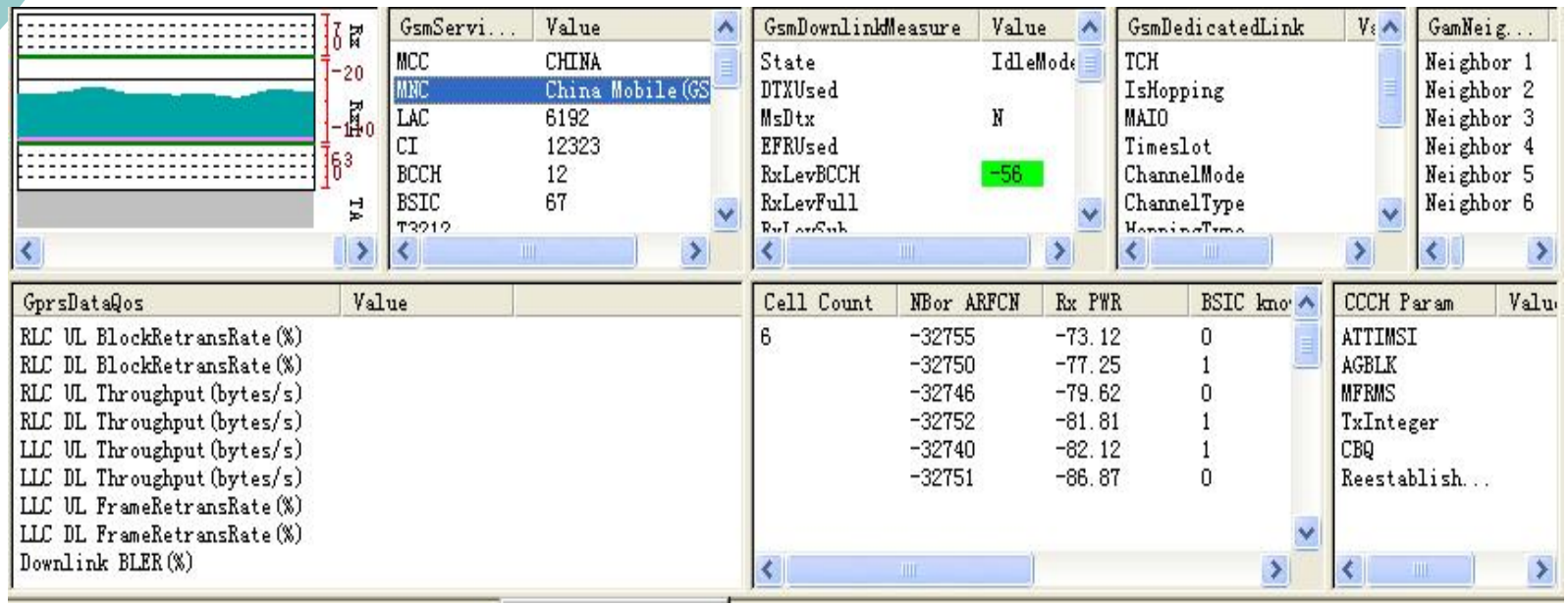
WCDMA/GSM Voice tests 3

Through software,we can see the changes in each of signaling processes, and will analysis every message.

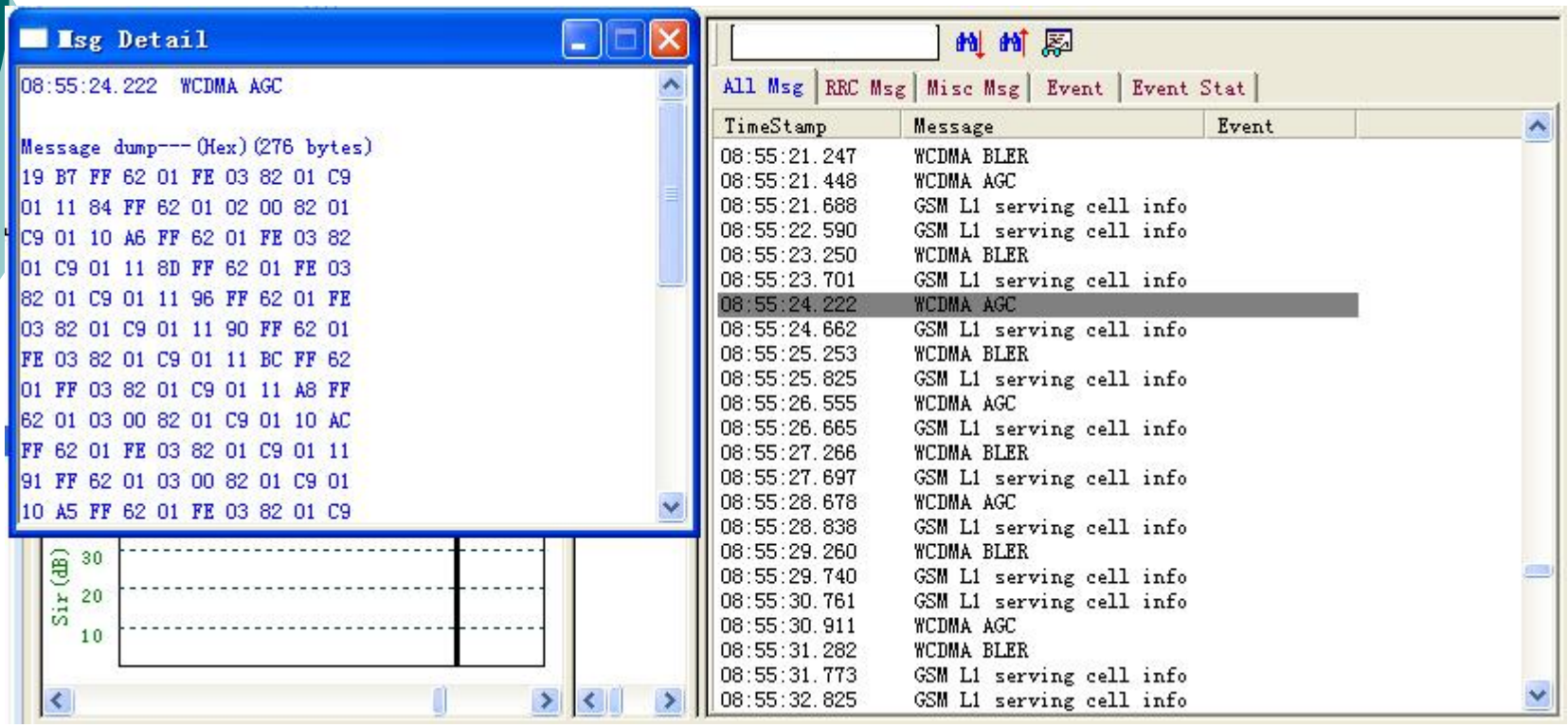


WCDMA/GSM Voice tests 4

Designate a GSM mobile phone in the region and around the NodeB then record the procedure between the cell phone and Node B which inculde channel Switching, station switching, disconnection etc. It will be helpful to understand the problem.



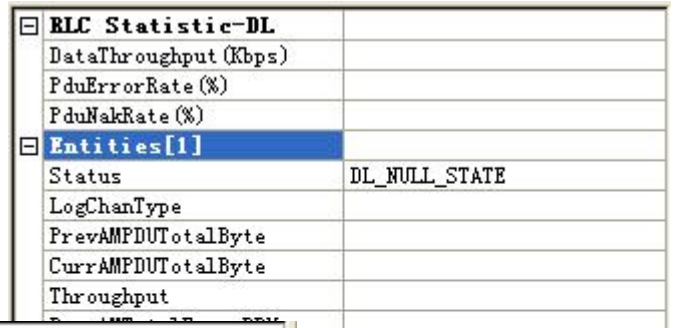
WCDMA/GSM Voice tests 5



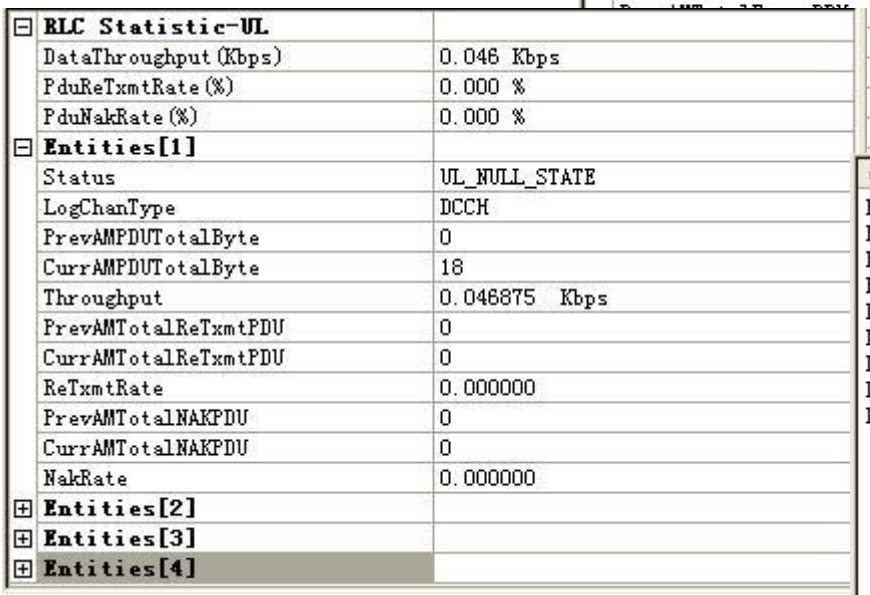
Complete air interface signaling acquisition and decoding.
Detailed analysis of signaling events.
Signaling Network Fault interpretation.

WCDMA/GSM Data Test Service

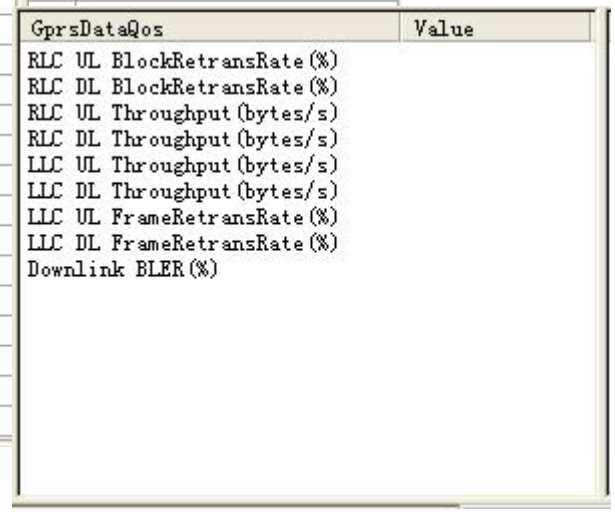
- RLC/MAC
- LLC
- RLC BLER



RLC Statistic-DL	
DataThroughput(Kbps)	
PduErrorRate(%)	
PduNakRate(%)	
Entities[1]	
Status	DL_NULL_STATE
LogChanType	
PrevAMPDUTotalByte	
CurrAMPDUTotalByte	
Throughput	

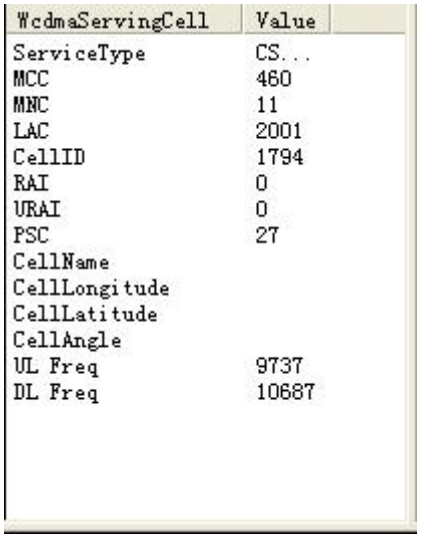


RLC Statistic-UL	
DataThroughput(Kbps)	0.046 Kbps
PduReTxmtRate(%)	0.000 %
PduNakRate(%)	0.000 %
Entities[1]	
Status	UL_NULL_STATE
LogChanType	DCCH
PrevAMPDUTotalByte	0
CurrAMPDUTotalByte	18
Throughput	0.046875 Kbps
PrevAMTotalReTxmtPDU	0
CurrAMTotalReTxmtPDU	0
ReTxmtRate	0.000000
PrevAMTotalNAKPDU	0
CurrAMTotalNAKPDU	0
NakRate	0.000000
Entities[2]	
Entities[3]	
Entities[4]	



GprsDataQos	Value
RLC UL BlockRetransRate(%)	
RLC DL BlockRetransRate(%)	
RLC UL Throughput(bytes/s)	
RLC DL Throughput(bytes/s)	
LLC UL Throughput(bytes/s)	
LLC DL Throughput(bytes/s)	
LLC UL FrameRetransRate(%)	
LLC DL FrameRetransRate(%)	
Downlink BLER(%)	

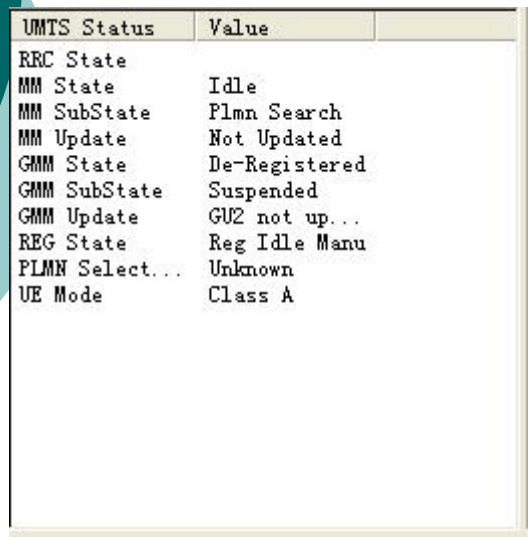
Detailed parameter 1



WcdmaServingCell	Value
ServiceType	CS...
MCC	460
MNC	11
LAC	2001
CellID	1794
RAI	0
URAI	0
PSC	27
CellName	
CellLongitude	
CellLatitude	
CellAngle	
UL Freq	9737
DL Freq	10687

- WcdmaServingCell
- Service Type　CS&PS Service
- MCC：Mobile Country Code
- MNC：Mobile Network Code
- LAC：Location Area Code
- Cell ID
- RAI：Routing Area Identity
- URAI：unique Routing Area Identity
- PSC：Primary Synchronization Code
- Cell Name
- Cell Longitude
- Cell Latitude
- Cell Angle
- UL Freq　uplink Frequency
- DL Freq Downlink Frequency

Detailed parameter 2



UMTS Status	Value
RRC State	
MM State	Idle
MM SubState	Plmn Search
MM Update	Not Updated
GMM State	De-Registered
GMM SubState	Suspended
GMM Update	GU2 not up...
REG State	Reg Idle Manu
PLMN Select...	Unknown
UE Mode	Class A

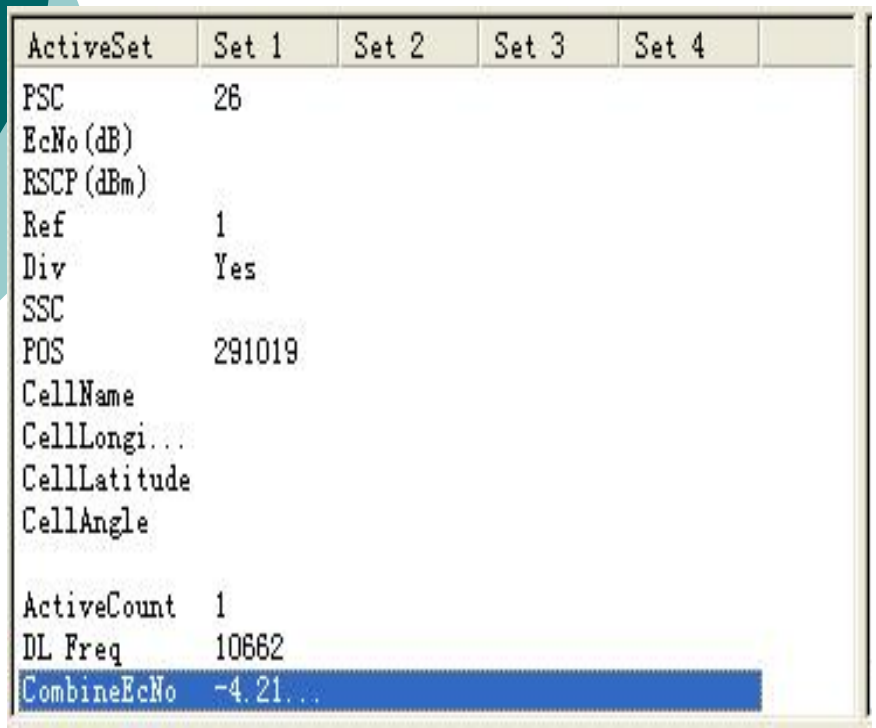
- UMTS Status
- RRC State：Radio Resource Control State
- MM State：Mobility Management State
- MM SubState
- MM Update
- GMM State :Global Multimedia Mobility State
- GMM SubState
- GMM Update
- REG State： Registor State
- PLMM Selection
- UE Mode

Detailed parameter 3

UMTS Qos	Value
DELAY Class	
RELIA Class	
PEAK Throughput	
PREC Class	
MEAN Throughput	
TRAFF Class	
DELIVERY Order	
DELIVERY/ERR...	
MAX SDU Size	
MAX BitRate UL	
MAX BitRate DL	
RESID BER	
SDU ERROR	
TRANS Delay	
TRAFF Priority	

- DELAY Class
- RELIA Class
- PEAK Throughput
- PREC Class
- MEAN Throughput
- TRAFF Class
- DELIVERY Order
- DELIVERY/ERR SDU
- MAX Bit rate UL
- MAX Bit rate DL
- RESID BER
- SDU BER
- TRANS Delay
- TRAFF Priority

Detailed parameter 4



ActiveSet	Set 1	Set 2	Set 3	Set 4
PSC	26			
EcNo(dB)				
RSCP(dBm)				
Ref	1			
Div	Yes			
SSC				
POS	291019			
CellName				
CellLongi...				
CellLatitude				
CellAngle				
ActiveCount	1			
DL Freq	10662			
CombineEcNo	-4.21...			

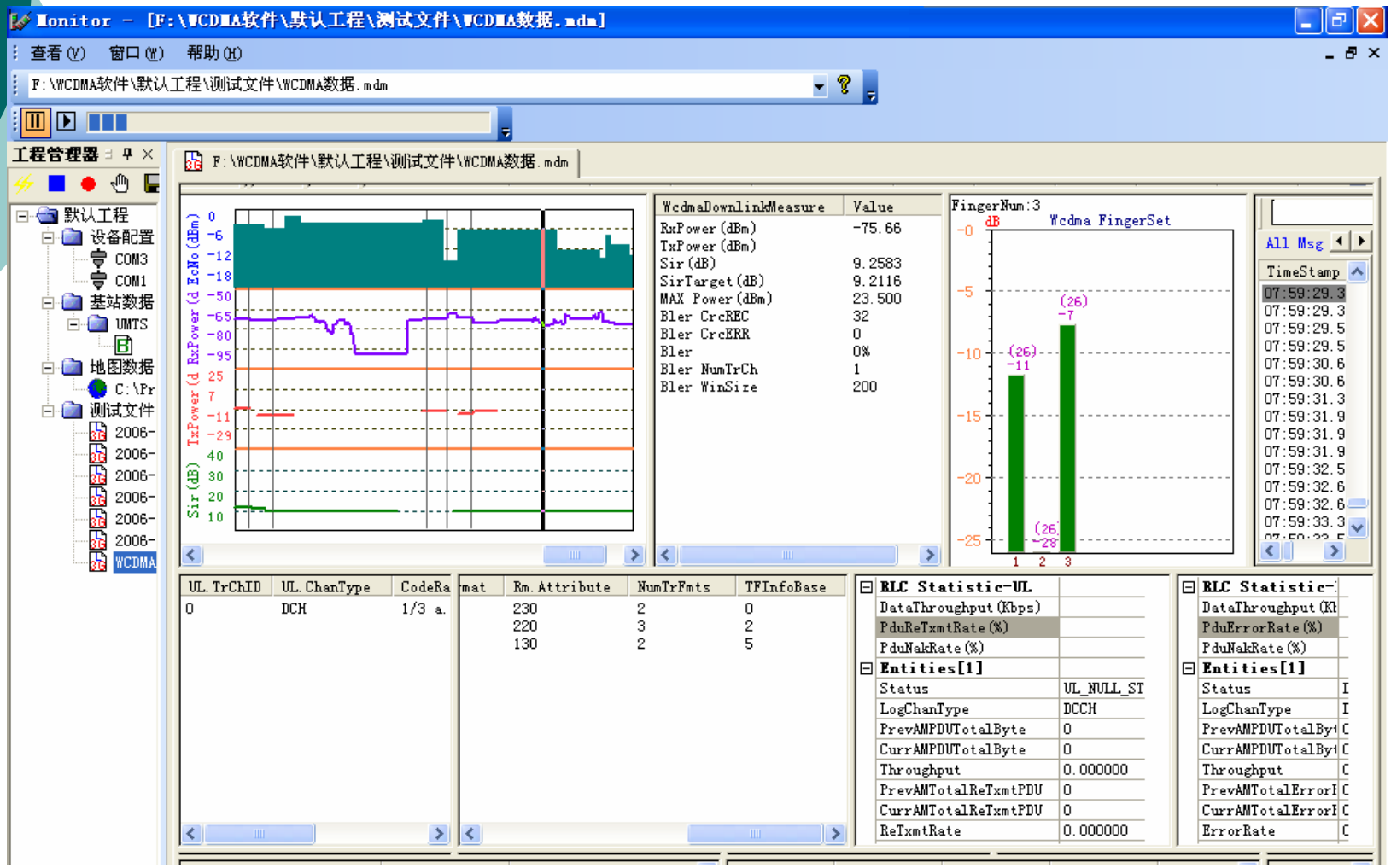
- PSC: Primary Synchronization Code
- Ec/No(dB) Ec/No=RSCP/RSSI
- RSCP(dBm)
- Ref
- Div
- SSC Second spreading codes
- POS
- Cell Name
- Cell Longitude
- Cell Latitude
- Cell Angle
- Active Count
- DL Freq
- Combine EcNo

Detailed parameter 5

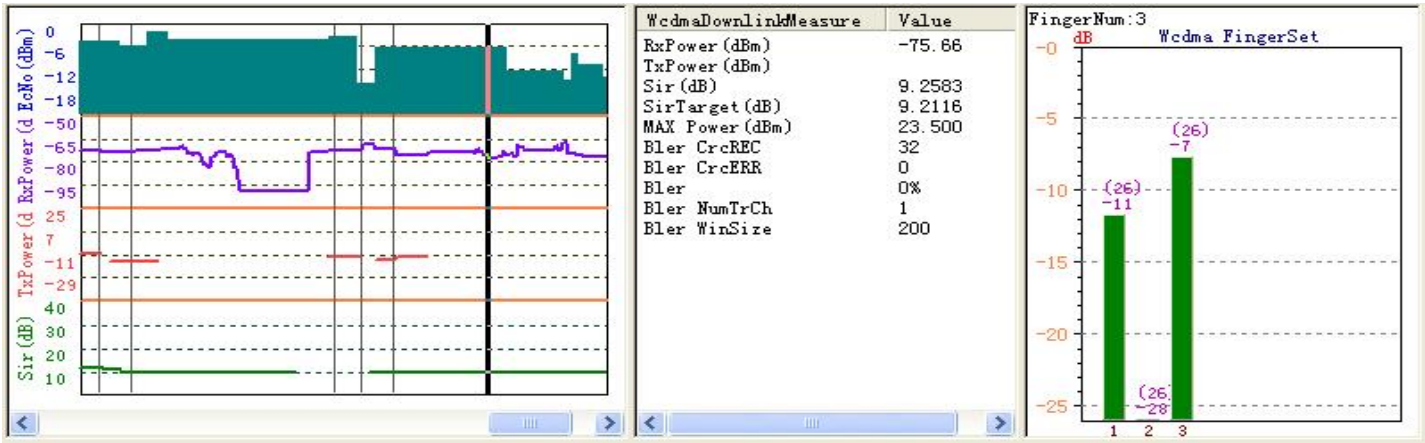
WcdmaNeighbors	Freq DL	PSC	Div	Postion	CellName	CI	Longi...	Latitude	Angle
Neighbor[0]	10662	44	Off	19296					
Neighbor[1]	10662	26	Off	291171					
Neighbor[2]	10662	50	Off	Pos Unknown					
Neighbor[3]	10662	55	Off	Pos Unknown					
Neighbor[4]	10662	53	Off	Pos Unknown					
Neighbor[5]	10662	49	Off	Pos Unknown					
Neighbor[6]	10662	48	Off	Pos Unknown					
Neighbor[7]	10662	46	Off	Pos Unknown					
Neighbor[8]	10662	45	Off	Pos Unknown					
Neighbor[9]	10662	41	Off	Pos Unknown					
Neighbor[10]	10662	37	Off	Pos Unknown					
Neighbor[11]	10662	35	Off	Pos Unknown					
Neighbor[12]									
Neighbor[13]									
Neighbor[14]									

- WcdmaNeighbors:
- DL Freq
- PSC: Primary Synchronization Code
- Div
- Postion
- Cell Name
- CI: Cell ID
- Longitude
- Latitude
- Angle

Detailed parameter 6

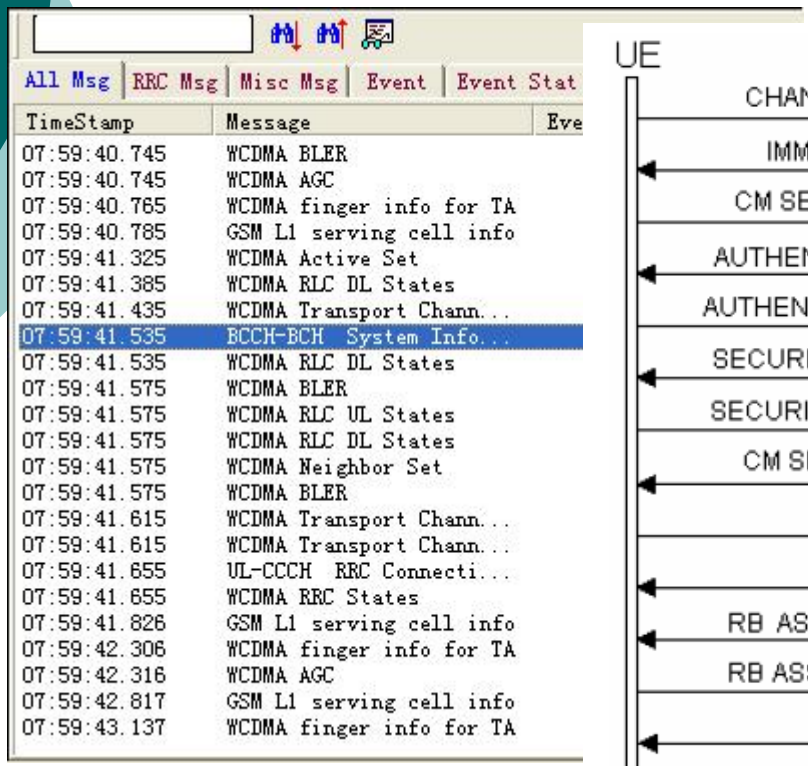


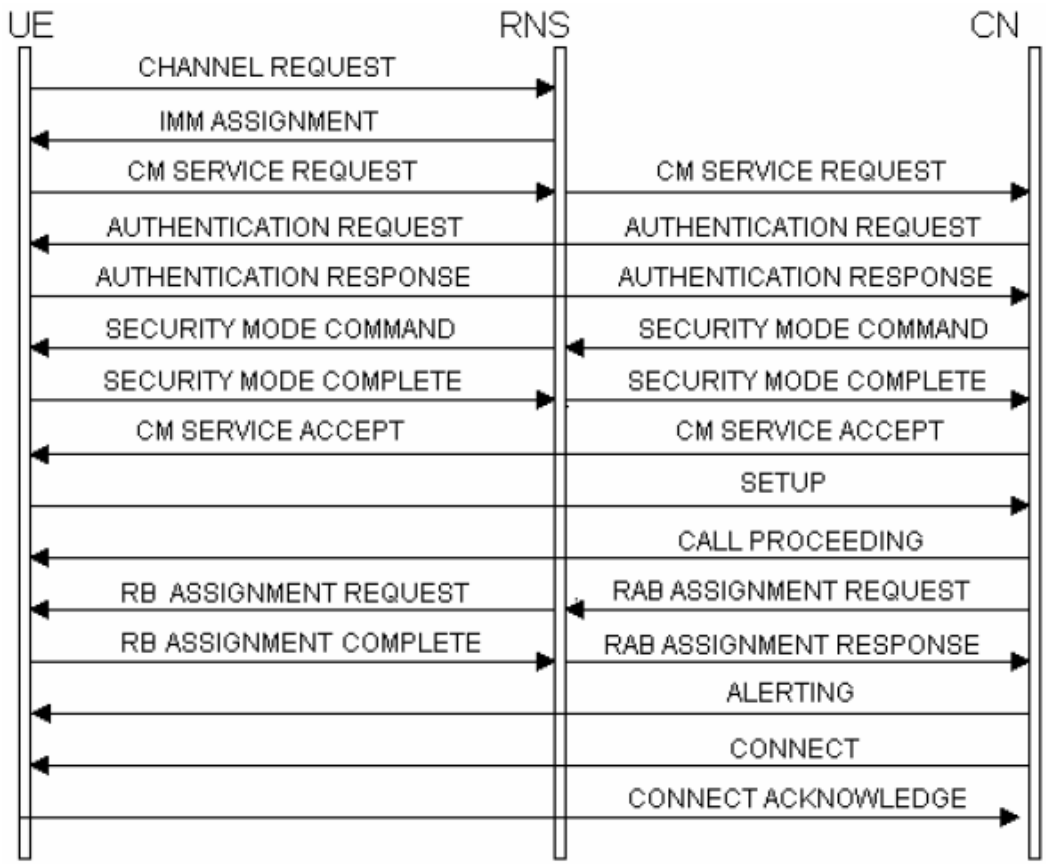
Detailed parameter 7



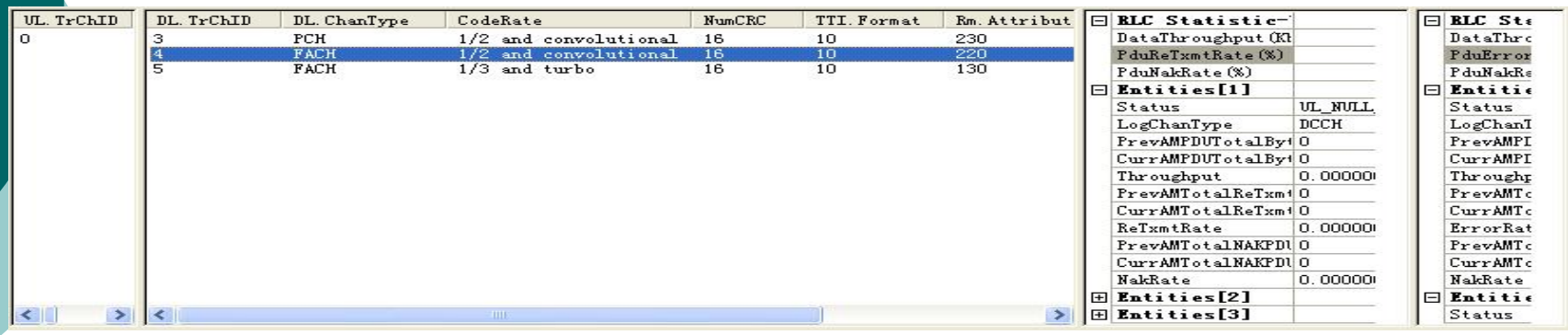
- SIR=RSCP/ISCP
- RSCP
- ISCP
- RxPower(dBm)
- TxPower(dBm)
- SirTarget
- MAX Power(dBm)
- Bler CrcREC
- Bler CrcERR
- Bler
- Bler NumTrCh
- Bler WinSize
- FingerSet:

Detailed parameter 8





Detailed parameter 9



UL. TrChID
0

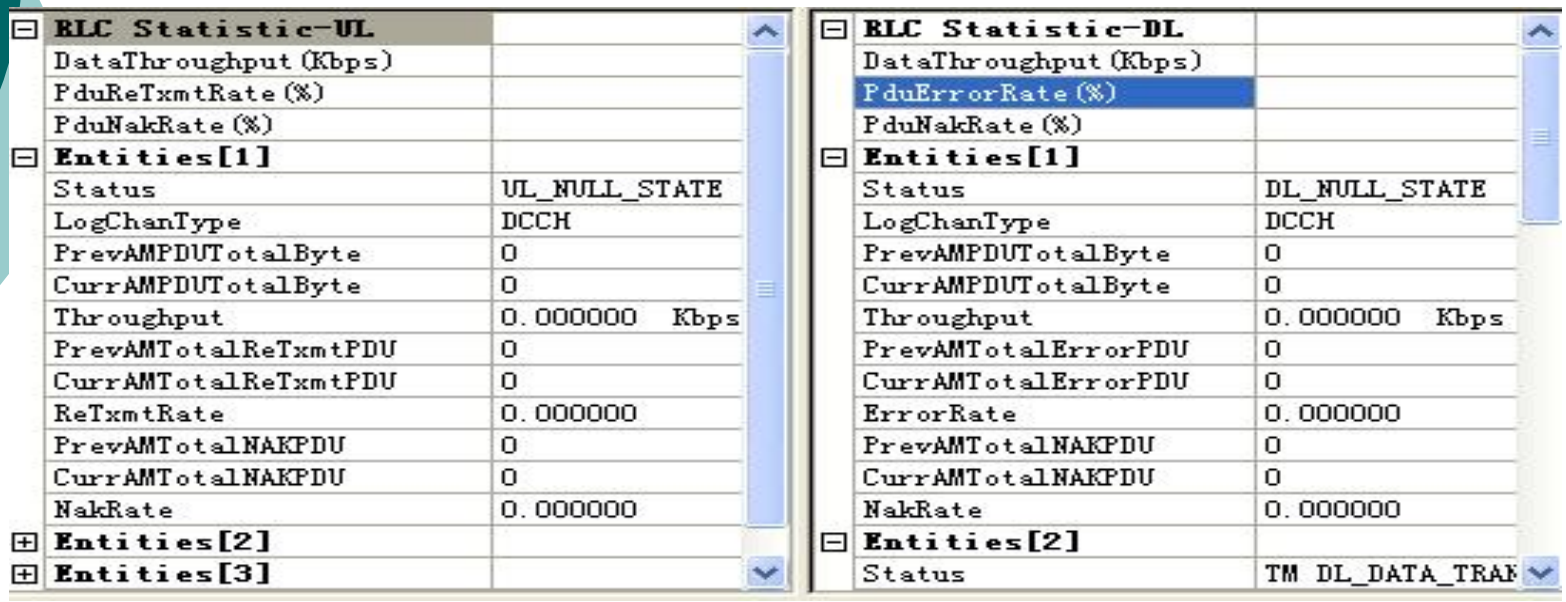
DL. TrChID	DL. ChanType	CodeRate	NumCRC	TTI. Format	Rm. Attribut
3	PCH	1/2 and convolutional	16	10	230
4	FACH	1/2 and convolutional	16	10	220
5	FACH	1/3 and turbo	16	10	130

RLC Statistic	
DataThroughput (Kb	
PduReTxmtRate (%)	
PduNakRate (%)	
Entities[1]	
Status	UL_NULL
LogChanType	DCCH
PrevAMPDUTotalBy	0
CurrAMPDUTotalBy	0
Throughput	0.00000
PrevAMTotalReTxm	0
CurrAMTotalReTxm	0
ReTxmtRate	0.00000
PrevAMTotalNAKPDU	0
CurrAMTotalNAKPDU	0
NakRate	0.00000
Entities[2]	
Entities[3]	

RLC St
DataThrc
PduError
PduNakRa
Entitie
Status
LogChanI
PrevAMPI
CurrAMPI
Throughp
PrevAMTc
CurrAMTc
ErrorRat
PrevAMTc
CurrAMTc
NakRate
Entitie
Status

- DL TrChID：Downlink transmission channel ID
- DL ChanType :Downlink channel type
- Code Rate
- NumCRC :CRC Num
- TTI Format： Transmission Time Interval Format
- Rm. Attribute： Rate-matching Attribute:
- NumTrFmts: Number of Transport formats per channel
- TFInfoBase Starting index of TF information from this Trch in TF information array

Detailed parameter 10

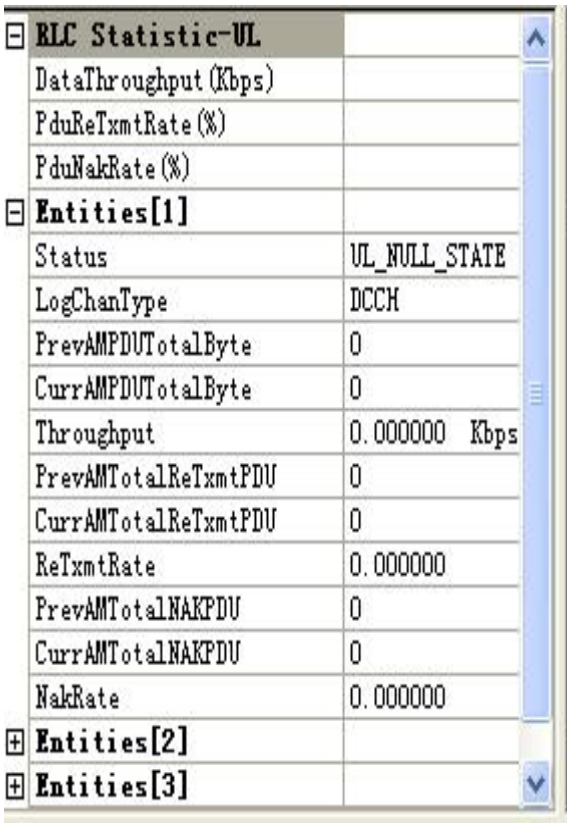


RLC Statistic-UL	
DataThroughput(Kbps)	
PduReTxmtRate(%)	
PduNakRate(%)	
Entities[1]	
Status	UL_NULL_STATE
LogChanType	DCCH
PrevAMPDUTotalByte	0
CurrAMPDUTotalByte	0
Throughput	0.000000 Kbps
PrevAMTotalReTxmtPDU	0
CurrAMTotalReTxmtPDU	0
ReTxmtRate	0.000000
PrevAMTotalNAKPDU	0
CurrAMTotalNAKPDU	0
NakRate	0.000000
Entities[2]	
Entities[3]	

RLC Statistic-DL	
DataThroughput(Kbps)	
PduErrorRate(%)	
PduNakRate(%)	
Entities[1]	
Status	DL_NULL_STATE
LogChanType	DCCH
PrevAMPDUTotalByte	0
CurrAMPDUTotalByte	0
Throughput	0.000000 Kbps
PrevAMTotalErrorPDU	0
CurrAMTotalErrorPDU	0
ErrorRate	0.000000
PrevAMTotalNAKPDU	0
CurrAMTotalNAKPDU	0
NakRate	0.000000
Entities[2]	
Status	TM DL_DATA_TRAI

RLC Statistic- UL (Radio Link Control)
DataThroughput
PduReTxmtRate
Protocol Data Unit
PduNakRate PDU No Ack Rate

Detailed parameter 11

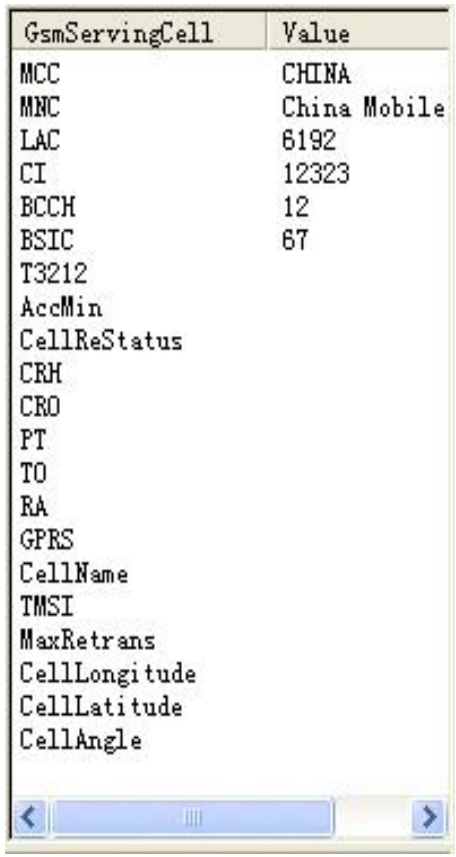


RLC Statistic-UL	
DataThroughput(Kbps)	
PduReTxmtRate(%)	
PduNakRate(%)	
Entities[1]	
Status	UL_NULL_STATE
LogChanType	DCCH
PrevAMPDUTotalByte	0
CurrAMPDUTotalByte	0
Throughput	0.000000 Kbps
PrevAMTotalReTxmtPDU	0
CurrAMTotalReTxmtPDU	0
ReTxmtRate	0.000000
PrevAMTotalNAKPDU	0
CurrAMTotalNAKPDU	0
NakRate	0.000000
Entities[2]	
Entities[3]	

- Entities
- Status
- LogChanType Logical Channel Type
- PrevAMPDUTotalByte Pre Ack Mode PDU
- CurrAMPDUTotalByte
- Thorughput
- PrevaAMTotalReTxmtPDU
- CurrAMTotalReTxmtPDU
- ReTxmtRate
- PrevAMTotalNAKPUD
- CurrAMTotalNAKPUD
- NakRate

(TM)、 (UM) 、(AM)。

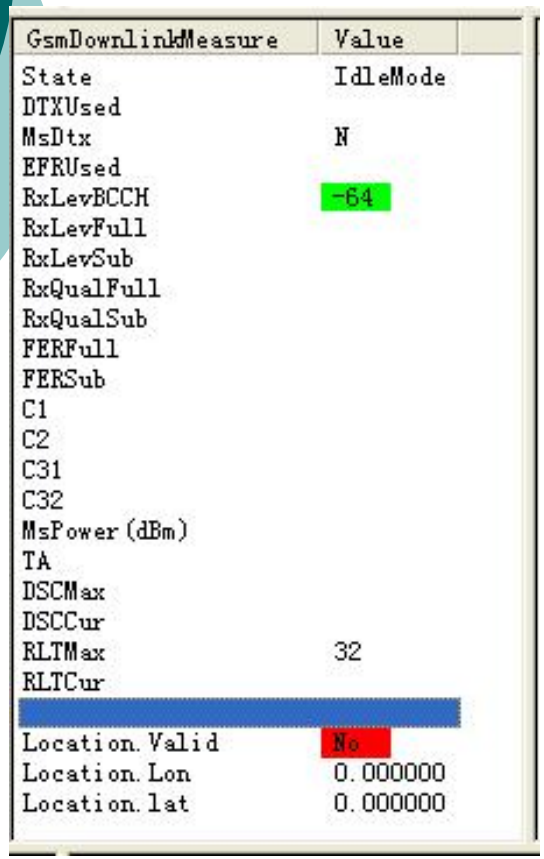
Detailed parameter 12-GSM



GsmServingCell	Value
MCC	CHINA
MNC	China Mobile
LAC	6192
CI	12323
BCCH	12
BSIC	67
T3212	
AccMin	
CellReStatus	
CRH	
CRO	
PT	
TO	
RA	
GPRS	
CellName	
TMSI	
MaxRetrans	
CellLongitude	
CellLatitude	
CellAngle	

- GSMServingCell:
- MCC：Mobile Country Code
- MNC：Mobile Network Code
- LAC：Location Area Code
- CI ：Cell Idently
- BCCH ：
- BSIC:
- T3212:
- AccMin: Access Min Power
- CellReStatus: Cell Reselect Status
- CRH: Cell Reselect H
- CRO: Cell Reselect Offset
- PT: Penalty Time.
- TO: **Temporary Offset**
- RA: Route Area
- GPRS:
- Cell Name:
- TMSI:
- MaxRetrans:
- Cell Longitude:
- Cell Latitude:
- Cell Angle：

Detailed parameter 13-GSM



GsmDownlinkMeasure	Value
State	IdleMode
DTXUsed	
MsDtx	N
EFRUsed	
RxLevBCCH	-64
RxLevFull	
RxLevSub	
RxQualFull	
RxQualSub	
FERFull	
FERSub	
C1	
C2	
C31	
C32	
MsPower(dBm)	
TA	
DSCMax	
DSCCur	
RLTMax	32
RLTCur	
Location.Valid	No
Location.Lon	0.000000
Location.lat	0.000000

- State:状态
- DTXUsed :DTX Is Used?
- MsDtx (Mobile Station) DTX support
- EFRUsed:
- RxLevBCCH:
- RxLevFull: Receive Level of Full Status
- RxLevSub: Receive
- RxQualFull: Receive Quality of Full
- RxQualSub: Receive Quality of Sub
- FERFull:
- FERSub:
- C1: C1 C2 C31, C32 is a cell selection algorithm employed in GSM and GPRS
- C2:
- C31
- C32
- MsPower(dBm)
- TA: Time Advancing
- DSCMax the Max Value of Downlink Share Channel
- DSCCur the Current value of Downlink Share Channel
- RLTMax the Max Radio Link Timeout
- RLTCur current Radio Link Timeout
- Location Valid
- Location Lon
- Location Lat

Detailed parameter 14-GSM

GsmDedicatedLink	Value
TCH	
IsHopping	
MAIO	
Timeslot	
ChannelMode	
ChannelType	
HoppingType	
NumofSubs	
HSN	
HoppingList	
TSC	

- TCH:
- IsHopping:
- MAIO: Mobile allocation index offset
- Timeslot:
- ChannelMode:
- ChannelType:
- HoppingType: **0: Random, 1 Cyclic**
- NumofSubs: Number of subs
- HSN:
- HoppingList:
- TSC: Training sequence code

Detailed parameter 15-GSM

GamNeighbors	BSIC	BCCH	RxLev	C1	C2	C31	C32	CellName	Longi...	Latitude	Angle	CI
Neighbor[1]												
Neighbor[2]												
Neighbor[3]												
Neighbor[4]												
Neighbor[5]												
Neighbor[6]												

- GsmNeighbors:
- BSIC: Base Station Identity Code
- BCCH:
- RxLev:
- C1: C1 C2 C31, C32 is a cell selection algorithm employed in GSM and GPRS
- C2:
- C31:
- C32:
- CellName:
- Longitude:
- Latitude:
- Angle:
- CI:

Detailed parameter 16-GSM

GprsDataQos	Value
RLC UL BlockRetransRate(%)	
RLC DL BlockRetransRate(%)	
RLC UL Throughput(bytes/s)	
RLC DL Throughput(bytes/s)	
LLC UL Throughput(bytes/s)	
LLC DL Throughput(bytes/s)	
LLC UL FrameRetransRate(%)	
LLC DL FrameRetransRate(%)	
Downlink BLER(%)	

- RLC UL BlockRetransRate(%)
- RLC DL BlockRetransRate(%)
- RLC UL Throughput(bytes/s)
- RLC DL Throughput(bytes/s)
- LLC UL Throughput(bytes/s)
- LLC DL Throughput(bytes/s)
- LLC UL FrameRetransRate(%)
- LLC DL FrameRetransRate(%)
- Downlink BLER(%)

Detailed parameter 17-GSM

Cell Count	NBor ARFCN	Rx PWR	BSIC known	BSIC	QBIT	QFN
6	-32755	-73.62	0	0	0	0
	-32750	-78.25	1	16	2660	2429831
	-32752	-82.56	1	15	1640	2016290
	-32766	-86.25	1	17	152	1224824
	-32751	-87.62	0	0	431	1739243
	-32740	-89.18	1	13	3904	215775

- Cell Count:
- NBor ARFCN : ARFCN
- Rx PWR:
- BSIC known:
- BSIC:
- QBIT: Quarter bit flag indication
- QFN: Frame Number Flag indication

Detailed parameter 18-GSM

CCCH Param	Value
ATTIMSI	
AGBLK	
MFRMS	
TxInteger	
CBQ	
Reestablish...	

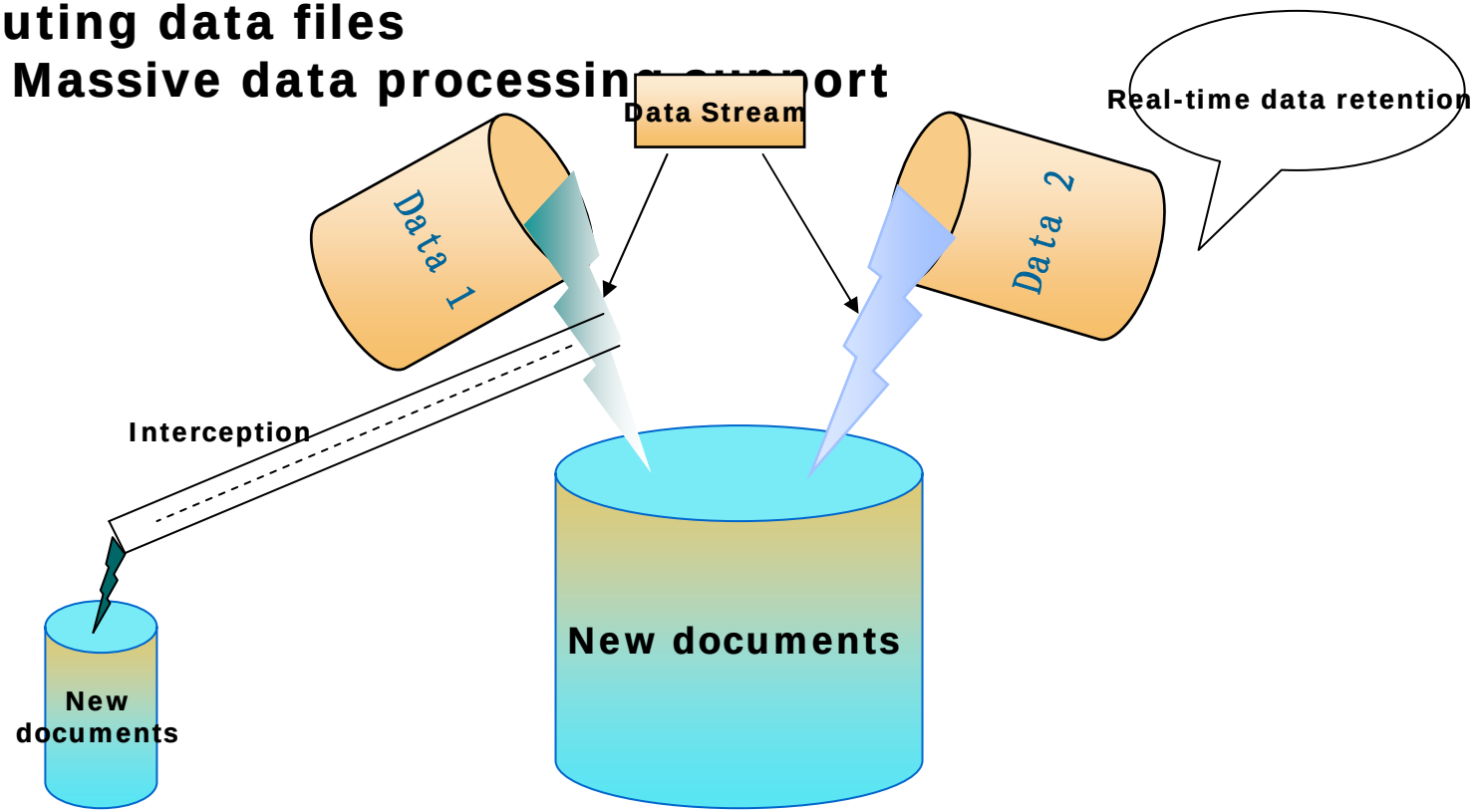
- CCCH Param: Common Control Channel
- ATTIMSI: Attach IMSI Enable
- AGBLK: Blocks reserved for access grant
- TxInteger: The actual retransmission sequence
- CBQ: Cell Bar Qualify
- Reestablishment: Indicate the reestablishment of a voice call is allowed in the current serving cell

GIS System

- 1. Can normal scanning maps (. BMP) into Mapinfo maps.
- 2. Support MapInfo Map .
- 3. Real time GPS Track. Automatic alarm without GPS signal.
- 4. Support three different kinds of formats (TAB/JPG/MAP)
- 5. GPS Track compensate (Patents)

Data protection

- **Support power supply cutting protection to ensure data security**
- **Support merging and draw-outing data files**
- **Massive data processing support**



Main advantages：

advantages：

- **Support WCDMA/GSM network simultaneous test , and improving work efficiency .**
- **Graphic shows support parameters**
- **The powerful statistical functions, a comprehensive statistical system project**
- **Developed a strong technical force and improve services**

WCDMA/GSM

Wireless network testing and optimization system

Help you achieve your goals———

Network optimization, increase the rate of return on investment !

- **Build an excellent platform for WCDMA Network**
- **Maintaining WCDMA network platform**
- **WCDMA operation to ensure maximum efficiency**
- **optimization WCDMA network**
- **Evaluating WCDMA network performance and quality assessment**

Thank you for your time !