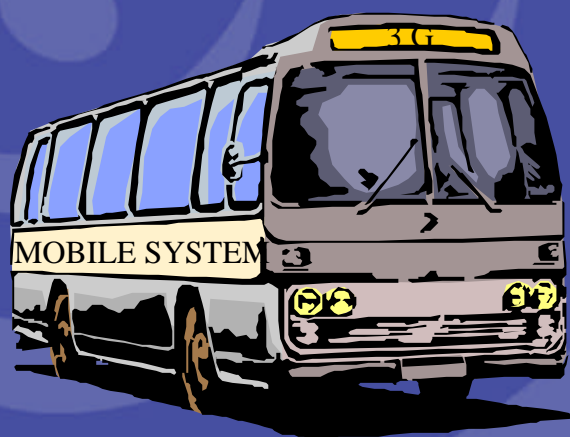


OVERVIEW OF ETISALAT'S UMTS TRIALS



Hatem Bamatraf
EMIRATES TELECOMMUNICATIONS CORPORATION -
ETISALAT

ITU Conference
SEPT 29-OCT 1st, 2003
DOHA, QATAR



Agenda.....

- Overview of Mobile System
- Quality VS Growth
- The Way towards 3G
- ETISALAT UMTS Trial



•The Start

- | Commercial launch in September 1994
- | Low configurations.
- | Most users in small geographical areas.
- | 30,000 Subscribers.

Over View of
Mobile System

Over View of

Mobile System



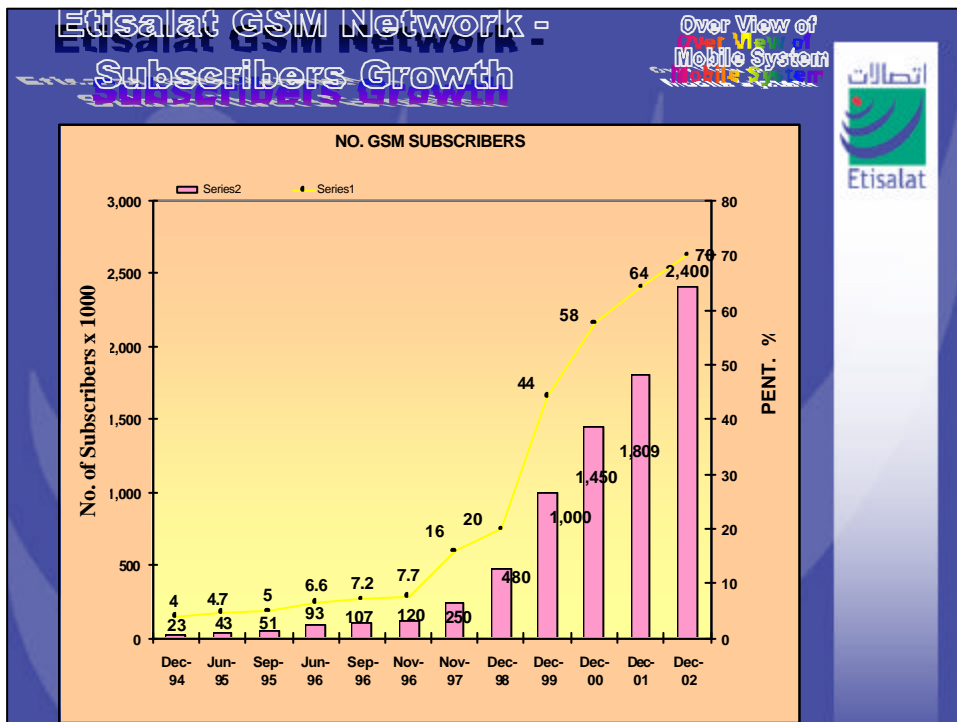
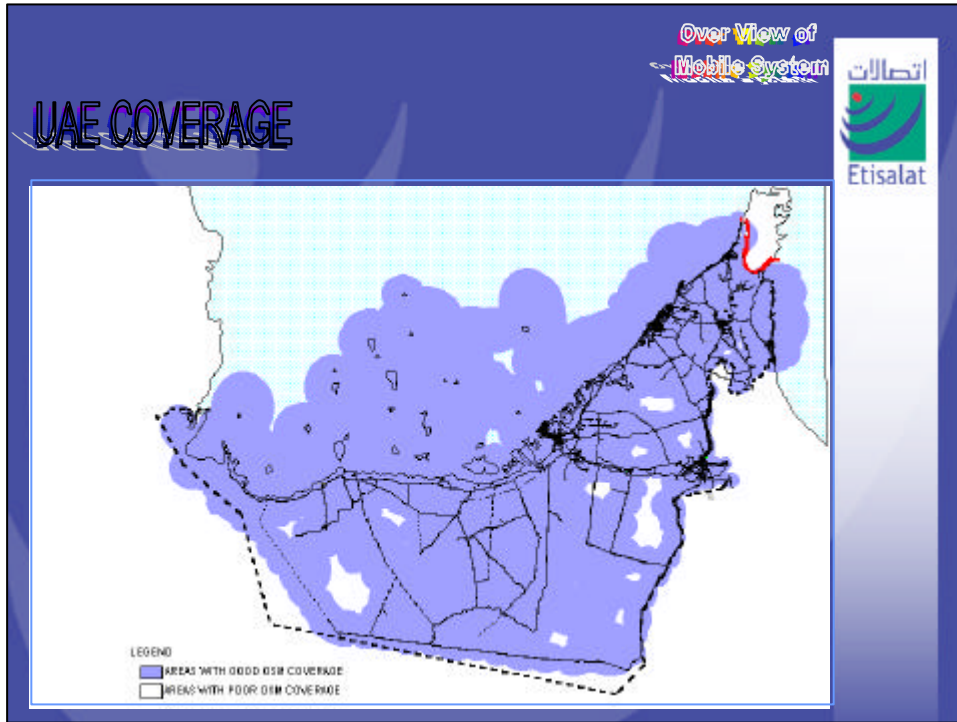


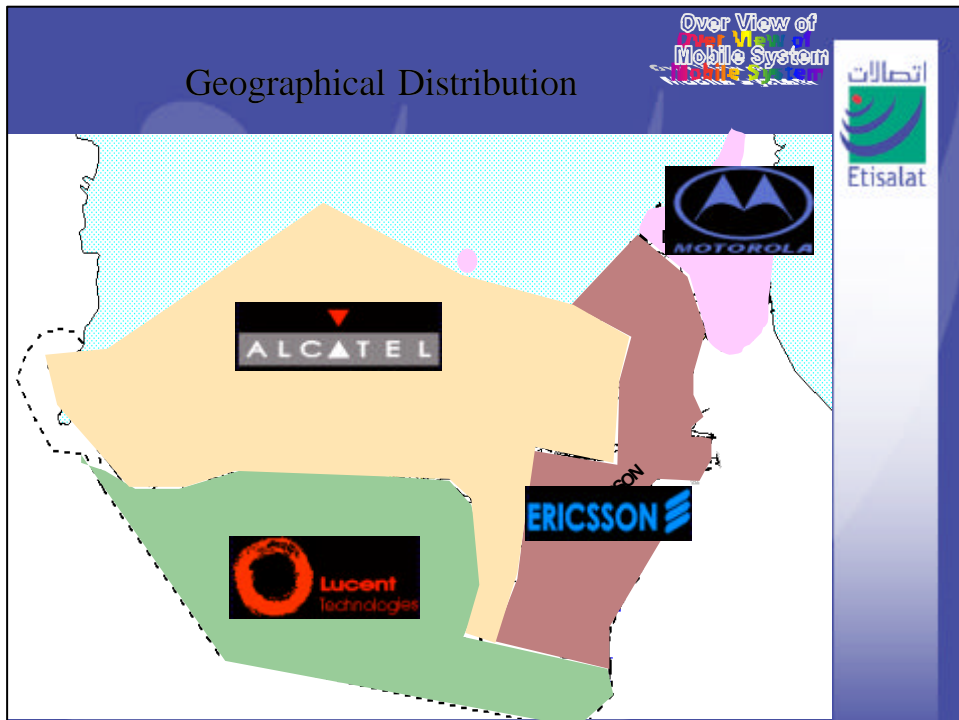
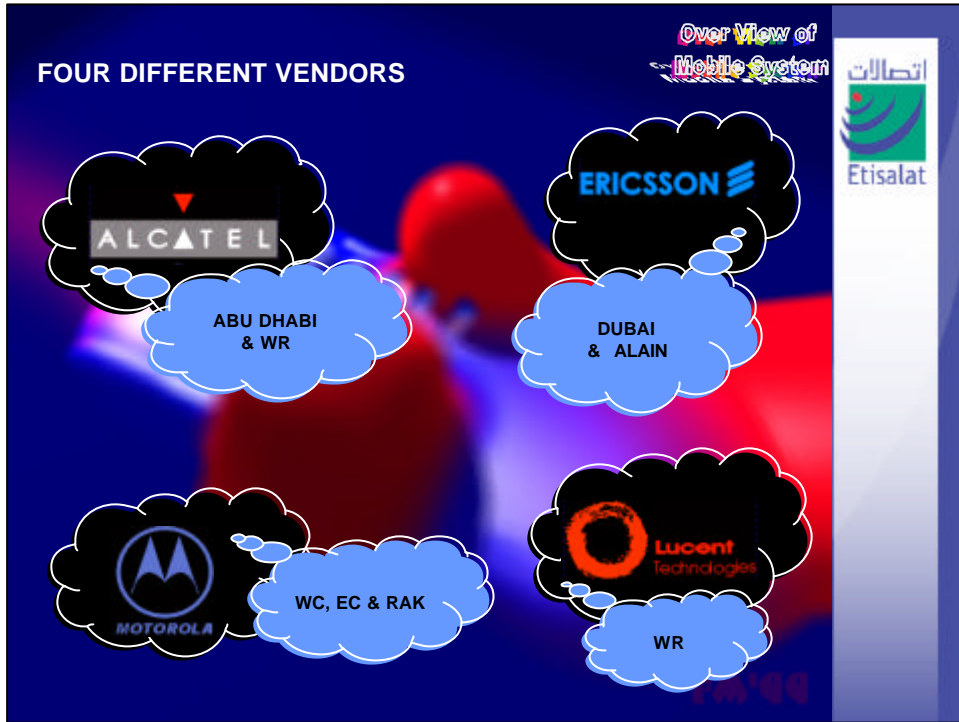
Over View of Mobile System

Current Status.....

- currently standing at 2.77 million
- Corresponds to 79% of population
- 99% coverage
(Cities,Highways,villages,sea,inbuilding...etc)

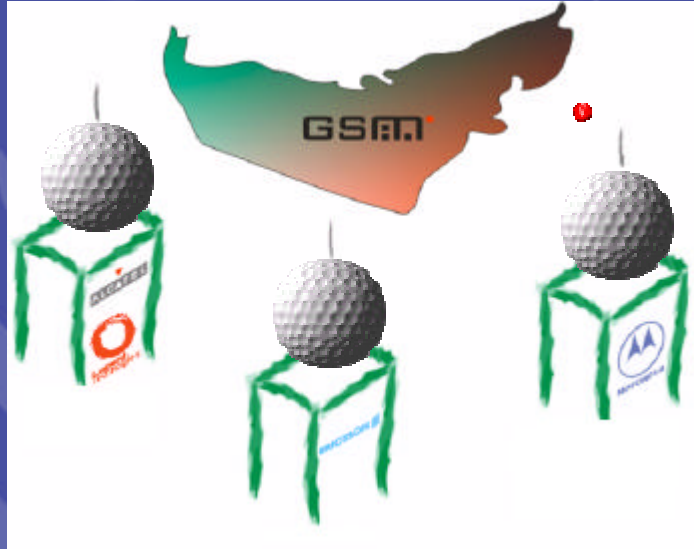
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CONTROL CENTERS

Over View of
Mobile System



QUALITY vs. GROWTH

Quality
Vs
Growth

- Improving Quality while growing
- HOW ??
- Dedication is the key

Quality
Vs
Growth



Quality
Vs
Growth

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How to measure Quality?

Identify Key Performance Indicator (KPI)

Call Setup Success Rate (CSSR)	Hand Over Success Rate (HOSR)
TCH and SDCCH congestion rates	
Call Drop Rate	SDCCH Drop Rate

Quality
Vs
Growth

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KPIs: Key Performance Indicators.

Set threshold for each KPI.

- Network KPIs were observed.
- Vendors recommendations were reviewed.
- Thresholds were set that were :
 - Challengeable
 - Achievable
 - Non comparable with other networks

Our Thresholds:

- Call Setup Success Rate (CSSR) >99 %
- Hand Over Success Rate (HOSR) >98 %
- Call Drop Rate <0.9 %
- SDCCH Drop Rate <0.5 %
- TCH and SDCCH Congestion <1 % & <0.5 %

Quality
Vs
Growth



Cont...KPIs: Key Performance Indicators.

Quality Assurance team has been established to guard the quality of the network.

Who measures?

KPIs are monitored

Violations are highlighted

Quality
Vs
Growth



Quality Assurance Team:

Quality
Vs
Growth



Monitor System Statistics



Handle Customer Complaints



Perform A and Abis traces



Pe

NSM: Network Status
Monitoring report.

CC: Customer Complaint
report.



Produce reports

NSM NSQ CC reports

Monitor System Statistics

Quality
Vs
Growth



• **OASIS**: **O**nline **A**nalysis **S**tatistical
Information **S**ystem

- Produce customised Statistics
- Windows based
- Long term/short term stats
- Flexible (Format, Addition)

Handle Customer Complaints

Quality
Vs
Growth



- Automated Process
- Call Centre → QA → Concerned Sections
- Record and follow up of complaints till closed
- Update Customer

Perform Periodic Drive tests

Quality
Vs
Growth



- To experience network's behavior from customer's perspective
- Network Level
- Highlight Call drop, H.O. Failure, Rx Qual & Rx level

Reports....

NSM : Network Statistics Monitoring

- Daily report containing Statistical Violations on the network level
- Monthly report highlighting status of problems

NCQ : Network Coverage and Quality

- Quarterly report indicating status of problems faced in the drive tests (closed, Pending & Open)

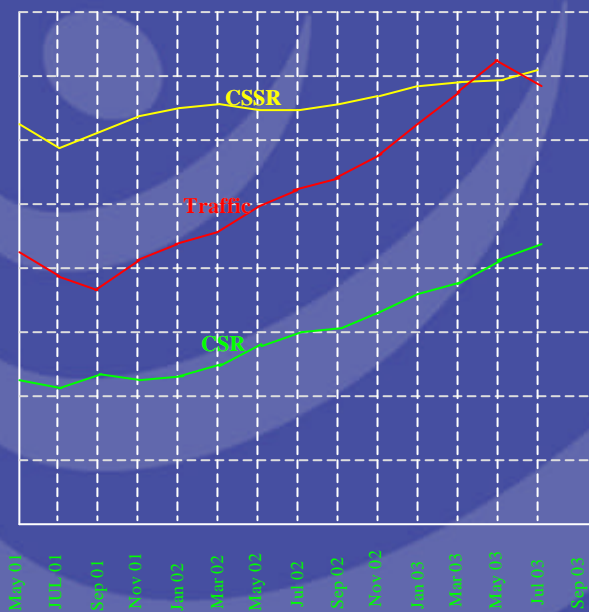
CC : Customer Complaint

- Monthly report containing the status of the customer complaints.

Quality
Vs
Growth



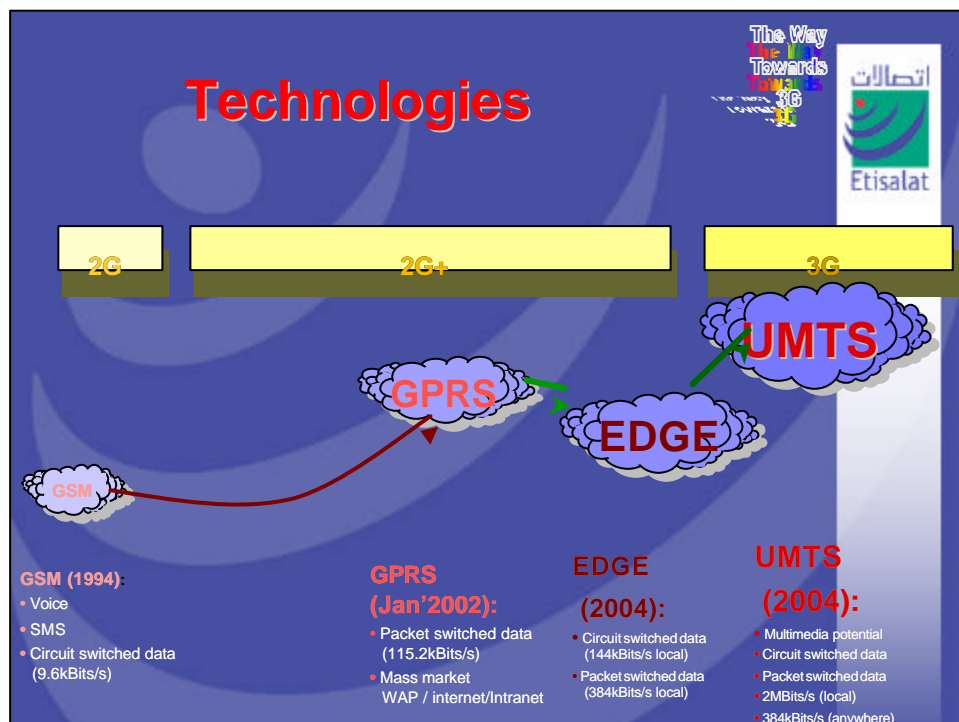
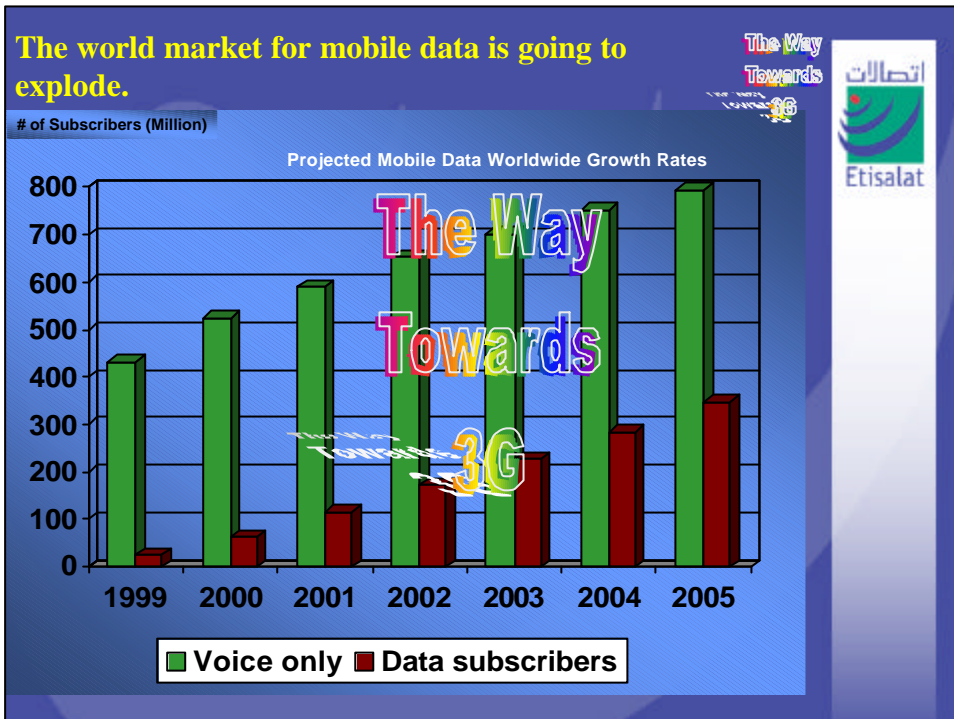
Quality Vs Growth



Quality
Vs
Growth



Traffic (Erlang)



Services

GSM	:	Sep 1994
GSM Data	:	Dec 1995
GSM Prepaid	:	Mar 1997
Voice Mail	:	Nov 1998
SMS	:	Apr 1999
WAP	:	Apr 2001
SMS Breaking News	:	Nov 2001
GPRS	:	Jan 2002
GPRS Prepaid	:	OCT 2002
MMS	:	July 2003

The Way
Towards
3G



Wireless Application Protocol

Light protocol specifically for wireless clients

Commercial launch in april,2001

Contents and terminals are improving → traffic increasing

SUBS = 410,000

The Way
Towards
3G



GPRS

The Way
Towards
3G



- First GPRS call in the Lab in June 2000
- Launched GPRS for Pre-Paid Subscribers in OCT 14th,2002
- # SUBS = 75,000
- CS3 & CS4 testing

MMS MULTIMEDIA MESSAGING

The Way
Towards
3G



- Launched in July,2003
- Graphics, Images,Audio&Video Clips
- Mobile to Mobile/E-mail
- Encouraging results
- # SUBS = 160,000



Services Planned for 2003/2004

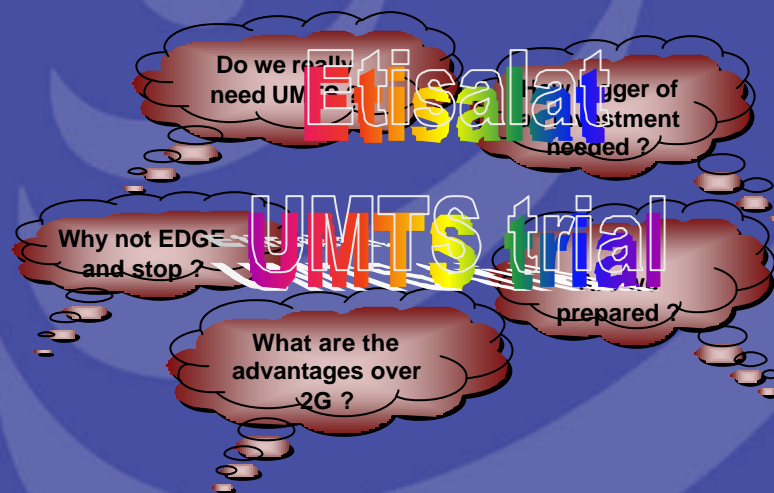
The Way
Towards
3G



- ◆ GPRS Roaming
- ◆ Mobile Portal (Personalization)
- ◆ CBS: Cell Broadcast System
- ◆ LBS: Location Based Service
- ◆ Mobile Chat & Instance Messaging (Web, WAP, SMS)
- ◆ Mobile Office (Email, Intranet, PIM)
- ◆ JAVA (J2ME) Application Download to Mobiles
- ◆ Public WLAN

Why 3G ???

Etisalat
UMTS trial



Why UMTS ?!!

- 3G is a new technology to build a mobile network which can use spectrum more efficiently.
- This technology can also increase network capacity and traffic volume.
- The following throughputs will be offered :
 - up to 384 kb/s downlink for the packet switched services
- GSM and GPRS services/features presently offered will be provided by the UMTS network with higher bit rates
- 3G means new services opportunities.



UMTS : A FOCUSED INVESTMENT

- UMTS will start as “Islands in a Sea of GSM” and coverage will grow over a number of years
- GSM/GPRS will allow to provide a seamless service delivery to the UMTS subscribers nationwide



GSM/GPRS will remain the key element for service continuity



UMTS



Trials Agreements



- In order to test and acquire UMTS equipment, Etisalat has signed a Framework Agreement with Three UMTS Vendors.
- These Trial Agreements include commitments from the manufacturers regarding the experimentation process :
 - Commitments for the provision of equipment : Access Network, Core Network, test tools and terminals for the trial network
 - Commitment for the training of Etisalat Staff
 - Commitment on support : experts to assist in performing tests, operate and maintain the equipment

TRIALS OBJECTIVE



- **Analyse & Test the Capabilities of the UMTS systems.**
- **Test Conformance of the offered systems to Standards.**
- **Experience ahead of live network deployment**
- **Develop the Knowledge in Network Planning, operation and optimisation skills**
- **Familiarise our Engineers in UMTS.**
- **Integration, performance and tuning tests in multi-vendors environment**

UMTS Trial Plan



- **PHASE 1**
 - Isolated platform
 - End to end test for all supported features of all elements
 - Conformance test of interfaces
 - Basic CS and PS service
- **PHASE 2**
 - Inter-working with Etisalat GSM/GPRS network
 - IOT with other UMTS vendor
 - Load testing
 - Additional application service

ETISALAT UMTS Trials



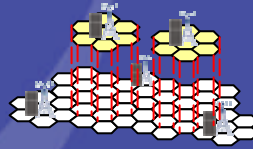
- **Trials started Q4,2002**
- **Covering 3 Cities: Abu Dhabi,Dubai,and Northern Emirates.**
- **Three different vendors**

Coverage Plan & Deployment

Etisalat
UMTS trial



- To preserve invested capital, UMTS sites were designed to reuse existing GSM/GPRS facilities to the full extent, such as tower, transmission, shelter and so on.
- UMTS sites installed along with existing GSM sites



System Testing

Etisalat
UMTS trial



Covers the following interfaces :

- **Iub**
Node B to RNC
- **Iu-cs**
RNC to MSC
- **Iu-ps**
RNC to SGSN
- **Uu**
Ue to Node B
- **Gn**
SGSN to GGSN

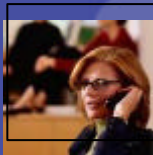
System Testing

Etisalat
UMTS trial

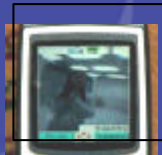


- **Acceptance Test Plan covers the following domains:**
 - Circuit Switch Domain
 - Packet Switch Domain
 - Combination of Circuit and Packet
 - Stability & Load domains
- **CS Test cases covers:**
 - Registration phase
 - Mobile originating/terminating calls
 - Scenario related to the Radio Resource Management, i.e.:
 - Soft/Softer Handover
 - Power control algorithm
- **PS Test cases covers:**
 - Attach/detach procedure
 - PDP context activation/de-activation
 - Mobile originating PS transfer with different traffic type (FTP, HTTP,....)
 - Soft and Softer Handover tests

TESTED APPLICATIONS



Voice



Video Phone



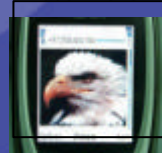
Email



Video Conference



SMS



MMS



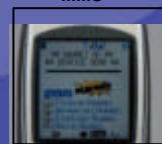
Laptop Web Browse



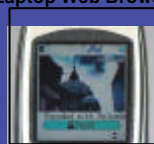
LBS



WAP



Palm Web Browse



Video on Demand



Live TV streaming

ETISALAT UMTS Demonstrated Applications

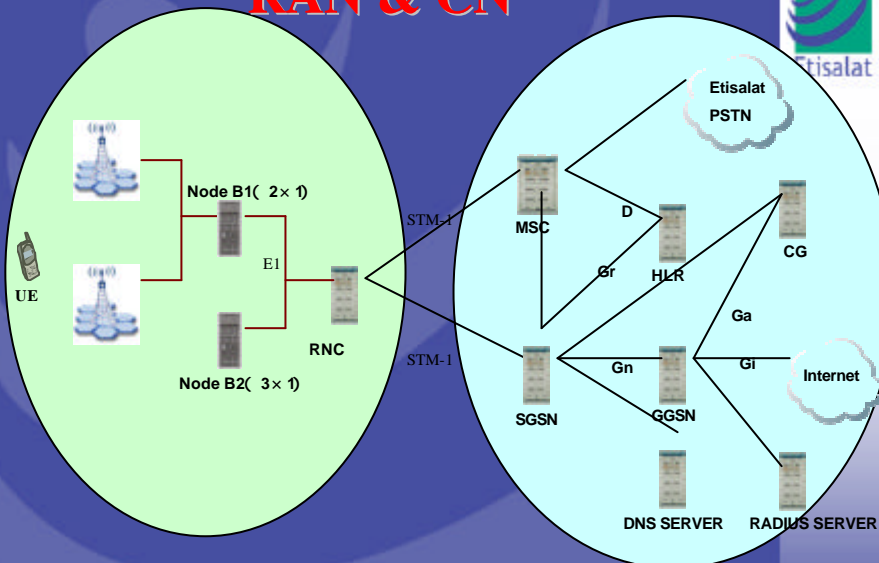
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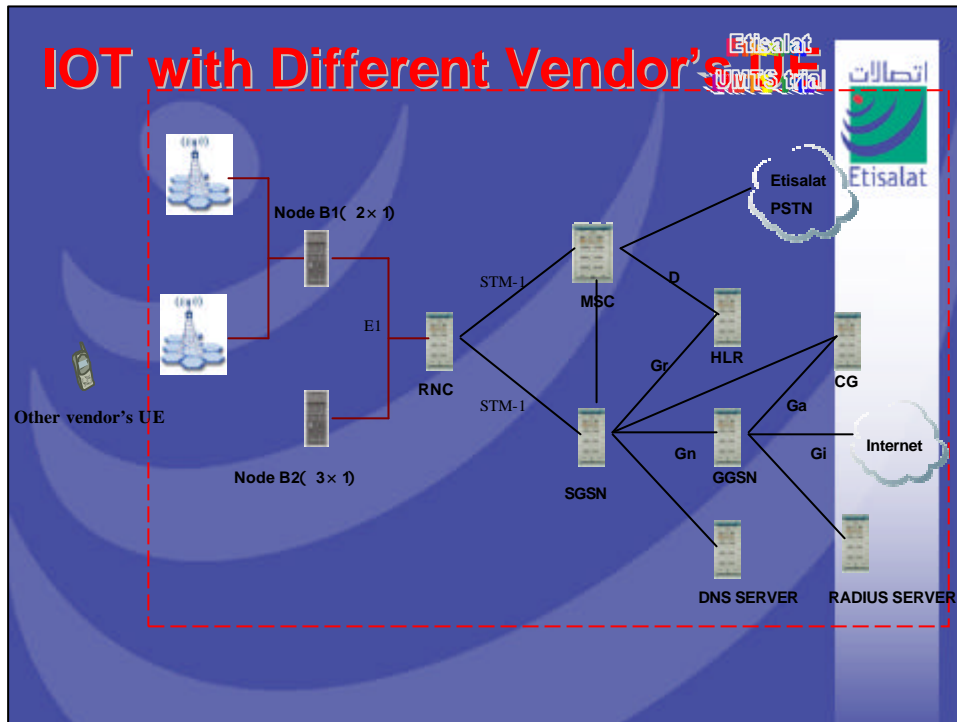


- AMR Voice
- FTP & email
- Clips Download
 - Video Streaming
 - Live TV Streaming
 - Live Video Applications:
 - Video Feeds CAM Streaming
 - Video Telephony/Video Conference (Planned)
- High Internet Browsing
- Interactive Network Gaming

IOT with Different Vendor RAN & CN

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UMTS trial





SYSTEM DESIGN

- The Coverage initially will Target Specific areas within the the cities and it will grow based on feasibility and requirements
- Most of the existing GSM sites will be reused, they will be turned in GSM/UMTS sites
 - When the existing GSM grid is not sufficient to provide the throughputs necessary in a given area, some pure UMTS sites are added.

Challenges: Interoperability

- 3GPP Specifications
 - Interpretation
 - Operator/vendor defined
 - Moving target
- Within the 3G Network
(UE<->Node B <-> RNC <-> MSC/GSN)
 - Terminals and RNC dominant
- Between the 3G Network and legacy Networks
 - With PSTN/2G/ISP/Billing

Further Challenges

- Maintain similar or better Quality & depth of coverage than Existing 2G Network
- Availability of (Reasonably priced, Volume, Feature rich) Dual mode mobile terminals
- "3G" Rich content & applications

