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	ETISALAT @ GITEX '99 "Hello...it is the Millennium calling !" Etisalat is once again proud to participate in Gitex (Gulf Information Technology Exhibition) - the region's premier and the third largest Information Technology exhibition in the world. Get ready to gain 5 days of critical knowledge converging from the major streams of IT and communication technologies that will rewire and reshape the world in the 21st century. Etisalat has prepared its Showcase, Special offers and New Launches with you in mind...and it just takes your participation to make this IT event of the century complete. So, be there !			
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GITEX '99 SERVICES

The 'Whole New World' Experience

Etisalat takes you into the new millennium by introducing you to solutions and super-fast technologies that will change life, business and society forever !

The Age of the Broadband is here ! Etisalat will bring multimedia services and the World Wide Web screaming into your homes alive and real with ADSL. This will accelerate your multimedia and Internet experience as well as your lifestyle. For corporates : 128 k, ATM and FRAME RELAY technologies will catapult you into the next level of business. Etisalat also prepares you for the third generation mobile experience with futuristic services such as : e-mobile (receive e-mail on your GSM), online GSM billing via SMS (Short Messaging Service) and the Personal ATM service (you can carry out your bank transactions from your mobile phone !)

The Era of E-commerce explodes in the Middle East with Comtrust. Now online trading, shopping, auctioning etc. can be carried out with secure and trusted E-commerce solutions from Etisalat.

Etisalat writes a new saga of solutions with SIS (Systems Integrated Services). It provides sophisticated telecom applications and solutions for different needs.

In this final Gitex of the century, Etisalat's showcase of products, services and new launches will give you a whole New World experience. Be Prepared !

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GITEK '99 SERVICES

The Age of the Broadband

Broaden your horizons with the following high-speed broadband solutions from Etisalat. Take your pick :

- [ISDN 128K](#)
- [ADSL](#)
- [ATM](#)
- [Frame Relay](#)

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ISDN 128 K

The Right Connection will take you places

If the world today is all about connections and communication, then here is a connection that will put you on the fast track of the 21st century - **Emirates Internet ISDN Dial Up connection at 128 Kbps speed.**

Benefits for the Home User

Home Users can experience :

- Faster downloads
- Quick browsing
- Multimedia applications, etc.

Business Benefits of 128Kbps ISDN Internet Access :

- Quick transfer of high resolution color images globally
- High Speed transfer of documents
- Multimedia applications

Already an ISDN User ? Configuration Instructions for 128 k speed

Internet Dial Up customers can configure their ISDN Terminal Adapters for access at 128 Kbps. Just change your profile at the Internet Customer Care site - <http://cc.emirates.net.ae> and configure your ISDN Terminal Adapters for access to Internet at 128 kbps. Configuration details for Etisalat supported ISDN modems can be found at <http://www.emirates.net.ae/128k/taguide.html>.

Usage Rate :

Access at 128Kbps will be charged :

- Dhs 6 per hour (Peak Hour)
- Dhs 3.6 per hour (Off-Peak Hour)

ISDN 128 K - The Right Connection

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ADSL

Finally, Multimedia and Internet at speeds that match your imagination and pace of life !

ADSL is Etisalat's express multimedia service that will bring rich audio-video content and "Always On" Internet connectivity on your PC or TV.

Now you can experience high-speed Internet and multimedia services like :

- [Video on Demand](#)
- [Interactive News](#)
- [Software on Demand](#)
- [High-speed Online Gaming](#)
- [Distance Education](#) etc.

- the stuff the future is made of !

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Introduction to ADSL

A Whole New World of Infotainment

ADSL is an multimedia service from Etisalat that is going to revolutionize your world of infotainment (information + entertainment☺).

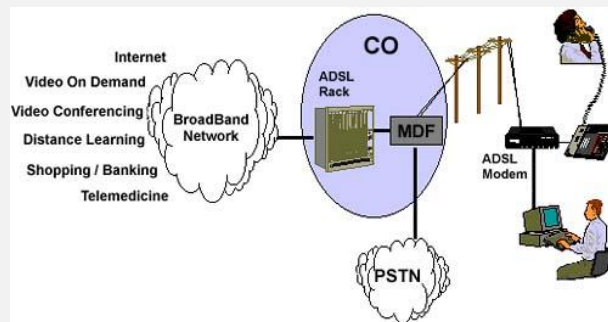
What A . D . S . L . stands for

ADSL stands for **Asymmetric Digital Subscriber Line** technology that is now being put to use in many advanced Countries.

It is a modem technology that transforms ordinary phone lines into high speed digital lines and enables you to access interactive multimedia services and the Internet at speeds up to 8 Mbps depending on various line factors.

How it Accelerates your Communications

The **ADSL modems** extracts maximum capacity out of your normal phone line without hindering your regular phone use. This allows you to simultaneously talk on your phone or send a fax while surfing the World Wide Web.



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High Speed Internet Access

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HIGH SPEED INTERNET ACCESS

The high-speed ADSL modem allows you to access the Internet and the World Wide Web at 384 kbps. It also enables :

"Always on" Internet & "Unlimited Access"

24 hours Internet connection...you no longer have to dial and wait. Just turn on your PC and you are online !

This also means that you no longer pay by the minute. Just a flat monthly rate and you can be online all that you want.

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MULTIMEDIA SERVICES

Etisalat's ADSL express multimedia service will soon provide you with a variety of multimedia applications like :

- **Instant, real-time, interactive Audio and Video News** - Sports, news, events...all on your desktop, live !
- **Video Conferencing**
Work anytime and interact with your office from the comfort of your home.
- **Video on Demand**
Order and view the video of your choice anytime you want.
- **Distance Learning**
Access a whole universe of knowledge with online courses from reputed universities and learn what you want at your own pace.
- **Online Shopping and E-Commerce**
Secure nature of ADSL technology makes online shopping simple and safe.
- **Software on Demand**
No more spending on expensive software -use software when you want , wherever you want. You can choose from a wide range of legal and the latest versions of business, educational and design software.
- **Online Games**
Experience the thrill of arcade games and pitch your skills against the best players from around the world.

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THE ADSL HOME

The ADSL home of tomorrow is one step closer to a futuristic wired home :

Dad, home from work, video-conferences with his colleagues while accessing his corporate LAN and sending a fax. Majid, the son, home from college, watches a movie on one TV. Noor, the daughter, a high school student, does interactive homework on another TV, while Fatima, the mother, is on the phone speaking with her friend.

The impact ADSL will have on your lifestyle is far reaching. Are you ready for it ?

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FAQs

Q- What are the advantages of ADSL?

A – The advantage is the speed. People normally use a 56 K modem these days. But with the ADSL service you can achieve upto 384 kbps speed.

Q – How much will ADSL cost me ?

A – Initially, the ADSL service will offer “Always On” access to the Internet. The charges will be announced when the service is launched.

Q – When can we expect to get ADSL into our homes ?

A – ADSL will be launched in the near future and will be promoted extensively in the media. You just can't miss it.

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LINKS

The ADSL Forum

Represents the telecommunications and IT companies developing and offering the ADSL service. It is responsible for formulating the international standards.

<http://www.adsl.com>

ADSL Tutorial

Learn the basics of ADSL. There is a bit of technical stuff too.

<http://www.dsllife.com/tutorials/adsl01/index.htm>

DSL Prime

Provides the latest news and happening in the industry

<http://www.dslprime.com>

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ATM

**ONE NETWORK,
MULTIPLE APPLICATIONS**



The Background

Businesses that rely on LANs for internal networking, and on WANs for broader data exchange, are aware of the problems and frustration that can arise. These frustrations are compounded when networks have to cope with sending data, image, voice and video traffic to any number of differently configured end systems.

The Task

Ensuring data integrity, achieving system compatibility, and accomplishing fast delivery are just some of the key issues facing network administrations tasked with transporting data from a wide range of applications. An efficient communications network is the key to business success. It can bring with it reduced costs and enhanced global competitiveness. Isn't there a single, worldwide standard to allow interoperability of information - regardless of the end system or type of information being transmitted ?

The Solution

The answer is - **Asynchronous Transfer Mode (ATM)** from Etisalat

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What is ATM ?

The Seamless Solution for Tomorrow's Business World

Asynchronous Transfer Mode or ATM is the new form of broadband technology that provides a way of transporting data from a wide range of applications using one seamless network and supports many types of traffic - data, image, voice and video - over common facilities, enabling users to consolidate current diverse networks.

The system operates on a basic procedure where information to be sent is segmented into a fixed cell length (53 bytes) then transported to and reassembled at the destination. Being fixed length allows the information to be transported in a predictable manner, and accommodates different types of traffic on the same network, improving its efficiency and manageability. This confers the benefits of easier, faster and smoother flow of communications - internally, externally or locally.



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Why ATM ?

Dual Capabilities

Voice, data and video transmission all have different characteristics. While data traffic tends to be bursty voice and video traffic is more evenly spread.

ATM can be used as a basis for both LAN and WAN technologies. It eliminates the need for separate networks, ensures data integrity and has a capability to operate at various speeds from Megabytes to Gigabytes.

- ***Simultaneous Transmission***

ATM is the only standard-based technology which has been created to accommodate the simultaneous transmission of diverse customer applications. The transmission is simultaneous and fast.

- ***Other Features***

The technology also offers users other features such as dedicated bandwidth per connection, higher aggregate bandwidth, well defined connection procedures and flexible access speeds. All these ensure smoother, more reliable transmissions.

(Contd....)



New and Enhanced Applications :

High speeds and integration of traffic types enables the creation and expansion of new applications on desktops. For businesses, this opens up a whole new world, such as multimedia combining voice, video, text and images. The possibilities are endless.

ATM enables workgroups and collaborative computing and high resolution video conferencing. And the potential applications for healthcare and education are greater with ATM's capacity to handle remote telemedicine research, diagnosis and treatment as well as to-end imaging.

ATM also provides a production environment for motion picture and television, while its high bandwidth backbone networking, support for real-time and television, high quality video and native LAN-speed network interconnection make it the ideal medium for scientific visualization or any applications which require 2 Mbps or greater transmission for bandwidth-intensive applications between multiple sites.

Backward Compatible :

ATM is not based on a specific type of physical transport. The system is compatible with currently deployed physical networks and can be transported over twisted pair, coax and fiber optics, depending on the requested bandwidth.

The system has limitless possibilities for the future and businesses can invest in this - secure in the knowledge that it will not become obsolete. Incremental Migration Efforts within the standards organization and the ATM Forum ensure that the embedded networks will be able to gain the benefits of this technology incrementally, upgrading portions of the new network based on new application requirements and business needs.

Long Lifetime, Cost Effective

Information systems and telecommunications industries are focusing and standardizing on ATM technology. The system has been designed from the outset to scalable and flexible in terms of geographic distance, the number of users it can support, and in access and trunk bandwidths.

The system combines superior quality performance with cost-effectiveness and enables users to serve multiple sites through a single network interface. It is rapidly evolving into the standard technology for local, campus/backbone and public and private wide area services. This uniformity is intended to simplify network management by using the same technology for all levels of a network.

ATM is a revolutionary new cell relay technology that utilizes a high-speed switching which involves moving cells rapidly between two (or more) distinct points in a network.

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ATM FEATURES

Technical Characteristics



The Cell Structure

An ATM cell consists of 53 bytes or "octets".

Of these, five constitute the header, the remaining 48 carry the data payload.

Header

The five bytes in an ATM cell that supply addressing and control information comprise generic flow control, virtual path identifier, virtual circuit identifier, payload type and cell-loss priority.

Payload

The information portion of an ATM cell, exclusive of header. ATM cells typically have 48-byte payloads, but size can vary depending upon type of data and the ATM Adaptation Layer (AAL)

The AAL translates user traffic into a size and format that can be contained in the payload of an ATM cell and return it to its original form at the destination. Each AAL consists of two sublayers : **the segmentation and reassembly (SAR)** sublayer and **the convergence sublayer**. Each is geared to a particular class of traffic, with specific characteristics concerning delay and cell loss. All AAL functions occur at the ATM end-station rather than at the switch.

(CONTD....)

Access

Provision of ATM service requires infrastructure capable of supporting high speed broadband multi-media services. This is achieved through the use of Fiber-based carrier systems based on the Synchronous Digital Hierarchy (SDH).

Three types of access to the ATM switch are available for WAN applications :

- **E1 Access** : This provides a 2MB access to the ATM node over a normal copper pair using the HDSL technology.
- **E3 Access** : This facilitates a 34 MB pipe access over fiber optic links. The 34 MB bandwidth can be divided into a smaller pipes to provide virtual connections to multiple locations in the WAN environment.
- **STM1 Access** : A maximum bandwidth of 155 MB is possible over fiber optic links in this type of access. This link support different configurations of Virtual connections such as 3 E3 and numerous 2MB Virtual connections, depending on WAN requirements.

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ATM Bearer Service Definition



Customers select the access rates based on the cumulative bearer bandwidth of the number of virtual links - called **Permananet Virtual Paths** (PPS) - at any given site.

- **Permanent Virtual Paths (PVP)**

Permanent Virtual Paths are analogous to a dedicated circuit where the two end points and bandwidth are pre-defined. Any data entering a virtual channel is seamlessly delivered over the ATM Network to a specific distant end point. Virtual channels are the I/O channels passed through any given Virtual path.

- **Constant Bit Rate (CBR) Service**

The constant Bit Rate service ensures guaranteed bandwidth for video, voice and multimedia applications. The CBR bearers - called Permanent Virtual Paths - can be configured as a semi-permanent point-to-point channel between any two customer sites. The CBR PVPs are provided at data rates from 1 Mbps to 155 Mbps.

At rates up to 2 Mbps, the CBR PVPs are expected to carry inter-PABX voice traffic for large businesses. At higher data rates, the CBR PVPs are ideal for Television and Cable Operators to network their stations and head-ends respectively.

- **Variable Bit Rates (VBR)**

The variable Bit Rate service is designed for bursty data applications. The VBR service achieves this by ensuring average throughput and allowing the customer to burst to a peak cell rate for short period of time. The VBR bearers-called Permanent Virtual Paths - can be configured as a semi-permanent point-to-point channel between any two customer sites.

The VBR PVPs are provided at data rates from 1 Mbps to 155 Mbps. The VBR service will typically be used by corporate customers to consolidate their backbone data networks.

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TARIFFS

• **Access**

The Dedicated Access monthly charge is based on a fixed monthly lease charge (per site) :

Dedicated Access Rate (Mbps)	Monthly Charge (UAE Dirham)	Installation Charge (UAE Dirham)
E1 - 2Mbps	2,500	1,000
E3 - 34 Mbps	6,500	3,000
STM1 - 155 Mbps	8,000	3,000

No installation charges will apply for access rate change from E3 to STM1, otherwise, full installation charges will apply.

Contd...



- **Permanent Virtual Paths**

Constant Bit Rate

Constant Bit Rate	Permanent Virtual Path(PVP) Monthly charge in UAE Dirham	
	LCCA	Intra-UAE
E1 Access ▪ First 1 Mbps ▪ 2 Mbps	1,000 1,500	6,400 7,500
E3 Access ▪ Up to 2 Mbps ▪ Increment of 1Mbps ▪ 20 Mbps and above	1,500 250 6,000	7,500 416 15,000
STM1 Access ▪ Up to 10Mbps ▪ Increment of 5Mbps ▪ 70 Mbps and above	5,000 350 9,000	12,000 1,000 24,000

Installation charge per PVP will be Dhs 200.
Maintenance charge per modification will be Dhs 100.

Contd...

- **Variable Bit Rate**

Variable Bit Rate	Permanent Virtual Path(PVP) Monthly Charge in UAE Dirham	
	LCCA	Intra-UAE
E1 Access		
▪ First 1 Mbps	800	5,000
▪ 2 Mbps	1,200	6,000
E3 Access		
▪ Up to 2 Mbps	1,200	6,000
▪ Increment of 1Mbps	200	330
▪ 20 Mbps and above	4,800	12,000
STM1 Access		
▪ Up to 10Mbps	4,000	9,600
▪ Increment of 5Mbps	250	800
▪ 70 Mbps and above	7,200	19,200

Installation charge per PVP will be Dhs 200.
Maintenance charge per modification will be Dhs 100.

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Who to contact in Etisalat

Ms. Fatima Mohsen
Superintendent Marketing -WAN
Tel : 02-2084436
Fax: 02-324499



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Interesting ATM sites

For more descriptive information on ATM, you can visit the following sites :

ATM Tutorial

http://www.wipg.umds.ac.uk/~dlgh/teaching/atm_tutorial.html

ATM Basics

<http://www.atmforum.com>

Topics on ATM

<http://www.ee.umanitoba.ca/~blight/telecom.html>

ATM Information

<http://www.ee.umanitoba.ca/~blight/telecommunications/atm.html>

ATM Technique & Applications

<http://msia02.msi.se/~maxim/atm.html>

ATM References all over the world

<http://www.icg.tu-graz.ac.at/herwig/Research/ATM/ATM.html>
[atm_svc.htm](#)



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ATM Testing

The following applications and ATM equipment were tested by Etisalat. More such tests are planned in the near future.



[Fore Switch](#)

[Net Edge Switch](#)

[General Datacomm APEX Switch](#)

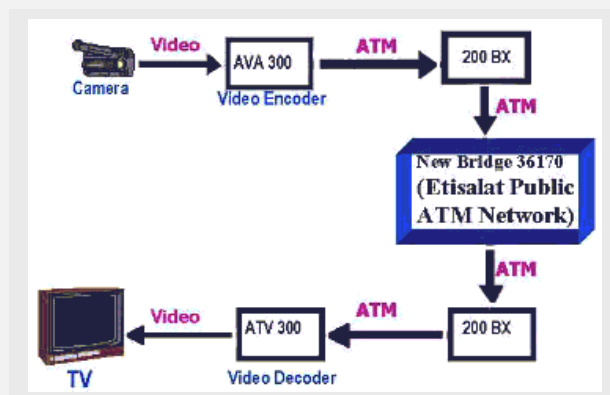
Contd...

FORE SWITCH

A couple of tests were conducted on Fore Systems ATM Edge equipment. The Fore Switch used was the 200X multi-service campus switch. The equipment comes with Ethernet, Token Ring and FDDI interfaces so that customers can interconnect LAN's through the Etisalat Public ATM network.

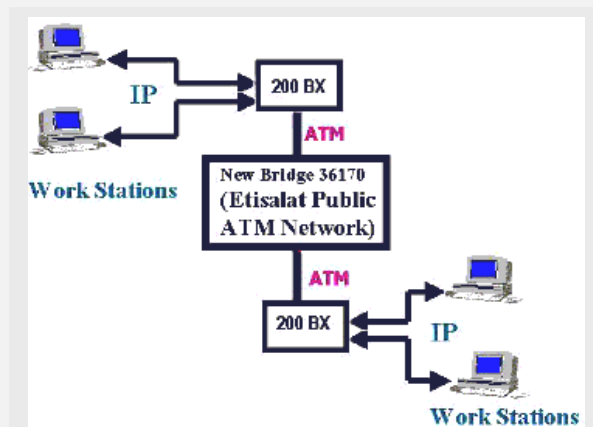
Test 1

The first test was to examine video conferencing-over-ATM. The picture quality was JPEG. The AVA 300 ATM video encoder and ATV 300 ATM decoder were used for the conversion of analog video to ATM and back.



Test 2

The second test was IP-over-ATM. The 200 BX converted the IP to ATM that was then transported over the Etisalat Public ATM network backbone.



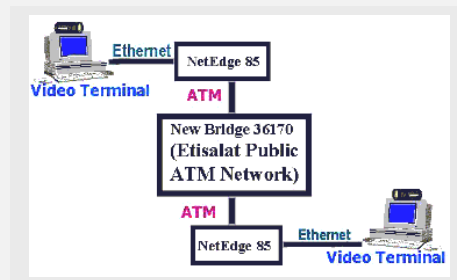
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NetEdge SWITCH

The switch used was NetEdge 85, a multi-service ATM edge device. This switch comes with ATM, Ethernet, Token Ring and FDDI interfaces. It can be used to connect native ATM equipment, bridged LAN interconnection as well as routed LAN interconnection. Multiple customers can be served from one such box through the use of CUGs (Closed User Groups)

Test 1

The first test was the transport of Video over Ethernet through the Etisalat Public ATM network.



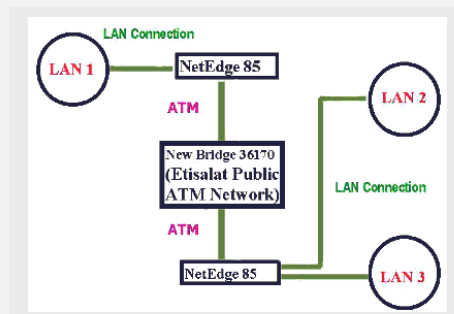
Test 2

The second test was the LAN interconnection through bridging.



Test 3

The third test was the LAN interconnection through bridging/routing



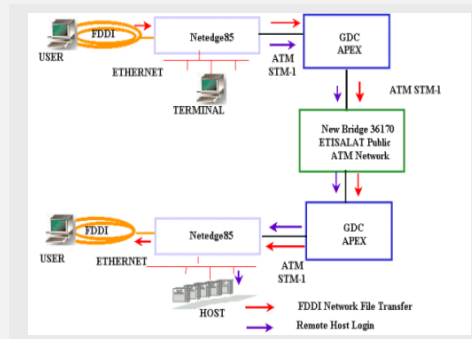
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General Datacomm APEX Switch

A number of tests were conducted on the General Datacomm APEX ATM switch. The APEX switch used was the APEX DV2 multi-service ATM Wide Area Network Edge Switch. This switch can be configured to serve Voice, Video and Data integration over ATM. The APEX switch is used in ETISALAT's Enterprise Corporate ATM Backbone to provide WAN connection to LAN Bridge groups (VLANs).

Test 1

The first test was to test LAN interconnection, by File Transfer Protocol, across the FDDI LAN and Ethernet LAN segments over the WAN using the APEX switch and the Etisalat Public ATM network.



Test 2

Using the same LAN setup as above Remote Login from a Workstation on an Ethernet LAN segment to a Server across the Wide Area Network was then tested.

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SERVICE DESCRIPTION

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Etisalat's Frame Relay service enables integration of high-speed LAN's and low-speed, packet switched data (X.25) communications to accommodate bursty traffic over a single access line.

[International
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Some of the features include :

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- Bandwidth on Demand
- Protocol Transparency
- Ideal for bursty traffic
- Hubbing
- It allows the co-existence of multiple data networks such as LANs, SNA, X.25 under one environment

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APPLICABLE CHARGES

National Charges

STANDARD CHARGES

Monthly Tariff Charges (in UAE Dirhams)

Speed		Access Facility		Traffic Charges	
CIR Bc	Burst Be	Line N X 64K	Port Charge	Fixed Charge	Maximum Traffic Charge
		L	B	C	T
				D Band	Be @ 1.0/ Kframe
0	0 - 64	S	100	100	2500
0	0 - 128	T	200	100	4500
0	0 - 256	A	400	100	7000
0	0 - 384	N	600	100	9000
0	0 - 512	D	800	100	11000
0	0 - 1Mbps	A	1600	100	12000
0	0 - 2Mbps	R	3100	100	14000
		D		C Band	Be @ 0.8Kframe
0	0 - 64	L	100	100	2000
0	0 - 128	E	200	100	3500
0	0 - 256	A	400	100	5500
0	0 - 384	S	600	100	7000
0	0 - 512	E	800	100	8000
0	0 - 1Mbps	D	1600	100	9000
0	0 - 2Mbps		3100	100	10000

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		C		B Band	Be @ 0.6/Kframe
0	0 - 64	I	100	100	1200
0	0 - 128	R	200	100	2000
0	0 - 256	C	400	100	3500
0	0 - 384	U	600	100	4500
0	0 - 512	I	800	100	5500
0	0 - 1Mbps	T	1600	100	6000
0	0 - 2Mbps	S	3100	100	6500
				LCCA & A Band	Be @ 0.5/Kframe
0	0 - 64	C	100	100	400
0	0 - 128	H	200	100	900
0	0 - 256	A	400	100	1300
0	0 - 384	R	600	100	1500
0	0 - 512	G	800	100	1800
0	0 - 1Mbps	E	1600	100	2300
0	0 - 2Mbps	S	3100	100	2600

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RESERVED CHARGES

Monthly Tariff Charges (in UAE Dirhams)

Speed		Access Facility		Traffic Charges
CIR Bc	Burst Be	Line N X 64K	Port Charge	Fixed Charge
		L	B	C
64	128	S	200	4000
128	256	T	400	7500
256	384	A	600	9000
384	512	N	800	10000
512	1Mbps	D	1600	12000
1Mbps	2Mbps	A	3100	14000
		R	C Band	
64	128	D	200	3000

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128	256	L E A S E D	200	5500
256	384		600	7000
384	512		800	8000
512	1Mbps		1600	9000
1Mbps	2Mbps		8100	10000
		C I R C U I T	B and	
64	128		200	2000
128	256		400	3000
256	384		600	4500
384	512		800	5500
512	1Mbps		1600	6000
1Mbps	2Mbps		8100	7000
		Charges	LCCA & A Band	
64	128		200	500
128	256		400	1000
256	384		600	1500
384	512		800	2000
512	1Mbps		1600	2500
1Mbps	2Mbps		8100	2700

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INTERNATIONAL FRAME RELAY

is an emerging network access protocol designed to accommodate bursty data applications. It is characterized by four key features :

- High transmission needs
- Low Network delays
- High connectivity
- Efficient bandwidth use

Frame Relay services represent cost savings when compared with equivalent dedicated leased line services. The service can also improve performance and response times of applications by providing a common network transport that supports multi-protocol networking.

The International Frame Relay service is available to the following destinations :

USA	Canada	Mexico
Austria	Belgium	New Zealand
Finland	France	Germany
Italy	Netherlands	Norway
Portugal	Spain	Sweden
Switzerland	UK	Ireland
Luxembourg	Puerto Rico	Australia
Hongkong	Japan	Korea
Singapore	Taiwan	Russia
India	Brazil	Chile
Colombia	Venezuela	Greece
Denmark	Czech Rep.	Indonesia
Malaysia	Philippines	Egypt
Lebanon		

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Applicable Charges

The monthly International Frame Relay Charges applicable are shown below with corresponding CIRs (Committed Information Rates) :

CIR Speed (K)	Burst Speed (K)	Monthly Charges
0	64	Dhs. 14625
38.4	64	Dhs. 18400
64	128	Dhs. 22000
128	256	Dhs. 40000
256	512	Dhs. 58500
512	1 MB	Dhs. 87750

Additional charges are as follows:

- Port Charges = Dhs. **100/-** per month
- Local Access Leased Circuit Charges = Normal LCCA charges (information is available at all Etisalat Sales Offices)
- Installation of PLL (Permanent Logical Link) = Dhs. **50/-**
- Minimum Rental Period is **ONE** month

Application Procedure

- Standard FRAME RELAY Application Form is available at all Etisalat Sales Office.

Customer will have to ensure that Matching Order is placed at the distant end with M/s Global One.

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LIST OF FRAME RELAY ACCESS DEVICES

Router, Bridge, Frame Relay Access Devices that support LMI, ANSI Annex D, FECN/BECN & DE Bit are as follows:

Equipment	Model	H/W	S/W	Manufacturer
Router/Bridge	2000	N/A	9.1 (5)	CISCO System
Router/Bridge	3000	N/A	9.1 (4.3)	CISCO System
Router/Bridge	AGS 1 AGS MGS CGS IGS	N/A	91 (4.3)	CISCO System
Router	Netware	N/A	1.0	Novell Inc.
Router/Bridge	Timelan 100	2.1	3.0	Ascom Timeplex
Frame Relay Access Device	Elcon DPNA/PC Card	310.077	V3R1	Elcon Technology
Frame Relay Access Device	Elcon HS1/PC- IMB Card	310.052	V3R1	Elcon Technology
Router/Bridge	6611 Model 140 & 170	N/A	18 F	IBM
Router/Bridge for OS/2 PC	RouteXpander /2	N/A	1.0	IBM

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Equipment	Model	H/W	S/W	Manufacturer
Router/Bridge	2000	N/A	9.1 (5)	CISCO System
Router/Bridge	3000	N/A	9.1 (4.3)	CISCO System
Router/Bridge	AGS 1 AGS MGS CGS IGS	N/A	91 (4.3)	CISCO System
Router	Netware	N/A	1.0	Novell Inc.
Router/Bridge	Timelan 100	2.1	3.0	Ascom Timeplex
Frame Relay Access Device	Elcon DPNA/PC Card	310.077	V3R1	Elcon Technology
Frame Relay Access Device	Elcon HS1/PC- IMB Card	310.052	V3R1	Elcon Technology
Router/Bridge	6611 Model 140 & 170	N/A	18 F	IBM
Router/Bridge for OS/2 PC	RouteXpander /2	N/A	1.0	IBM

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CASE STUDY

Aviation Industry

Problem:

An aviation company maintains a leased line based mesh network of 8 sites in UAE. Is this network still cost effective?

Solution:

The IT department of the company found that the Frame Relay solution offered substantial savings while providing similar resilience. Cisco routers with Frame Relay are used. The Frame Relay network uses a much smaller number of ports (one per site) compared to the leased line network. The IT department is also considering ISDN standby and dialup-on-demand feature of these routers to further enhance availability and throughput.

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GITEX '99 SERVICES

The Mobile Millennium

The number of mobile phone users around the world has grown phenomenally. With it, the demand for various applications and services has grown too. Etisalat has always been in touch with the pulse of the market and its customers. At the threshold of the new millennium, it once again takes the opportunity to introduce mobile services that will put you in touch with the essence of what the future of mobile communications will be

:

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e-mobile

One Step Closer to the Completely Wireless You

GSM and Wasel customers will be able to receive e-mails (160 characters) directly on their GSM handsets. They will also be able to forward their e-mails, but only from their Emirates Internet account to their GSM address e.g. 1234567@gsm.net.ae.

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E-Mail Notification on GSM

You can forward your E-mails (max. 160 characters) from the Emirates Internet address to your GSM address.

How to activate E-Mail Forwarding to a GSM

1. From the Emirates Internet home page select the E-Mail forwarding option.
2. **Type the address as follows to activate the forwarding of E-Mail to GSM**

xxxxxxx (7 digit mobile number)@gsm.net.ae

The GSM user will be notified on his/her GSM handset and 160 characters of the E-mail will be displayed. The forwarding option can be activated and deactivated at any time from the Emirates Internet homepage.

The forwarding option can be activated and deactivated at any time from the Emirates Internet homepage.

Direct E-mail to GSM

You can receive E-mail directly on your GSM from any domain/address, a maximum of 160 characters.

1. Type the address in the E-Mail address field as follows:
xxxxxxx (7 digit mobile number)@gsm.net.ae
2. Write your message (maximum 160 characters including address and subject) and send the message.
3. GSM user will be notified on his/her GSM handset of an incoming E-Mail that can be viewed through the text message menu.

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Online Billing via SMS

Added Convenience at your Fingertips

GSM subscribers will be able to check their current bill, up to one hour ago, by sending an SMS request. They will also be able to get details of the last 5 international calls made, the previous month's outstanding bill including break up of local and international calls and rental charges.

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Personal ATM Service

Your Mobile Bank

This service will be offered to the Banks. Customers will be able to use their GSM handsets to check their account balance, transfer money from one account to another and request a mini bank statement via SMS.

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ETISALAT SYSTEMS INTEGRATED SERVICES A New Saga of Solutions



Etisalat has put its experience and expertise into creating time, cost saving and quality enhancing solutions and applications for other telecommunication exchanges, carriers and vendors.

Systems Integrated Services is a result of this and was showcased at Geneve Telecom 99, arousing much interest.

Its objectives are :

- Achieve substantial savings by reducing operating cost.
- Quick reaction and faster realization of opportunities via expediting new product roll-out
- Benchmarking performance levels through Quality Assurance

It consists of :

[INCAS](#)
Intercarrier Accounting System

[MDS](#)
Mediation Device System

[NOOR](#)
Network Operating and Organization Project

[TELEVOTING](#)

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INCAS Intercarrier Accounting System



Introduction

International Telephone Traffic generates high levels of revenue. Incorrect carrier settlements can result in a loss of this revenue and consequently your profits. As an Inter Carrier service provider, you need to have in place a state-of-the-art, fully automated, reliable and comprehensive accounting system which takes care of your international telephone traffic settlement.

Questions to be Addressed

You need to address these questions:

- Does your settlement exclude calls with 'No charge' indications?
- Does your settlement exclude ineffective HCD traffic?
- Does your settlement exclude test calls?
- Do you have an estimate of your yearly out-payment for non accountable traffic?
- Are you able to produce accurate data for the other administration in the event of a disputed settlement?
- Are you able to clearly categorize the traffic?
- Are you able to reconcile statements received from other carriers?
- Can you reconcile your international paid minutes with your customer billing system?
- Do you have a fraud analysis mechanism built into your international traffic accounting system?
- Are you in a position to do trend analysis of your international traffic?
- How comprehensive is your statistical data?
- Is your system flexible and adaptable to network changes?

The Answer

If your current settlement system does not address the above issues, then it is time to consider Etisalat's Inter Carrier Accounting System - INCAS. Etisalat's INCAS system is made up of well defined functional modules. The interface between modules has been designed with a futuristic view so that system enhancements and modifications can be implemented with ease.

Contd...

Our Requirements

Your International Gateway switches must have the ability to produce 'Call Data Records' with incoming and outgoing route names, date, time, duration of the call and the called number. INCAS will then take over and do the rest.

INCAS Offers you

Online or batch mode data collection from the switches.

Adapt to CDR formats that are system (switch) specific.

Segregate accountable traffic from non accountable.

Categorize call records into:

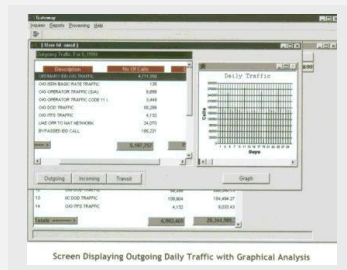
- Outgoing IDD Traffic
- Incoming (terminating) IDD Traffic
- Semi auto traffic
- Traffic with code 11 or code 12
- Voice Traffic
- Data Traffic
- Premium Rate Traffic
- Test Traffic
- Home country Direct Traffic
- International Toll Free Service Traffic

Produce monthly statements for settlement Produce text and/or graphics based on daily & monthly statistics

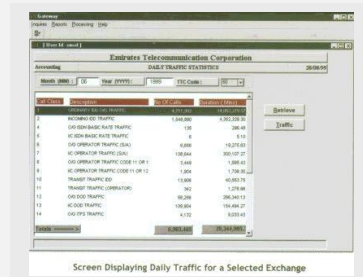
Provide trend analysis

Highlight suspected fraud

System Architecture



Screen Displaying Outgoing Daily Traffic with Graphical Analysis



Screen Displaying Daily Traffic for a Selected Exchange

Contd...

System Modularity

Etisalat's INCAS system is made up of well defined functional modules. The interface between modules has been designed with a futuristic view so that system enhancements and modifications can be implemented with ease.

System Flexibility

INCAS is highly flexible. The Input Data from any type of switch can be easily integrated to the system using input templates. All possible variables in the system have been fully parameterized to avoid frequent requirements for program modifications.

Parameterized Derivation Rules

The Data fields available in the Call Data Record (CDR) of each switch vendor differs in form and content. Precise derivation rules are crucial for the logical analysis and categorization of call records according to the requirements of the administration. A high degree of flexibility is also required in this area to enable easy adaptability of these derivation rules to periodic changes in the network and business.

Route Translation

The route names or trunk group numbers presented in the CDR do not have any logical meaning. Route Translation gives meaning to such arbitrary strings of data

Interested

For further information on Etisalat's Inter Carrier Accounting System - INCAS.

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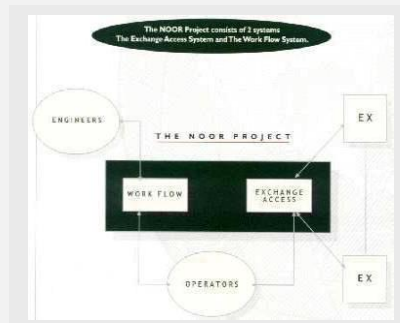
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NOOR Network Operation and Organization Project



Introduction

Emirates Telecommunication Corporation - Etisalat's Network Operation and Organization Project - NOOR regulates and secures the way operators access and maintain the exchanges. This is crucial for a rapidly growing network with a large number of multi-vendor network elements.



The Work Flow System

The project introduces the concept of work order. The work order is a request to do a specific task on one or more exchanges. The work order is created by the engineers and passed down to the operators using The Work Flow System's mailing features. The work order specifies all the information required for the operator to carry out the task.

The Exchange Access System

The Exchange Access System is the complement of The work flow System with the NOOR project. It is responsible for providing the operators with access to the exchanges, ensuring security and allowing managers to monitor all the activities performed.

Contd...

Security

- The availability of a valid work order is a basis for granting the operator access to the exchanges. However, it is not enough. Operators require a JAVA ring and a valid PIN as a first step to gain access.
- The operator is granted access rights as specified by the work order, which are just enough to accomplish the task specified in the work order. Hence operators have no fixed access rights - they are decided dynamically at the moment of the request for access.
- Operators have no knowledge or access to the real exchange passwords. They are secured within the system.
- Access is granted only to destination(s), exchange(s) that are specified by the work order.

Accessibility

The system is based on a client server model. This eliminates the need for dedicated terminals situated within the confined premises.

The system caters to the fact that there will be more requests than the number of physical ports available. It uses an intelligent algorithm to allocate ports for pending access requests.

Clients have built in JAVA so that they are not limited to run in one kind of platform.

Audit

- The system provides a comprehensive log of all activities to and from the exchanges. The logs are organized on a work order basis.
- Operators can review logs of pending (not completed) work order in order to assess their progress.
- Management can review logs in order to know WHO did WHAT, WHEN and WHY.
- The system provides the facility of viewing exchange activity in real time.

Contd...

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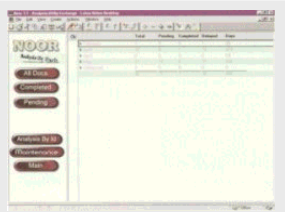
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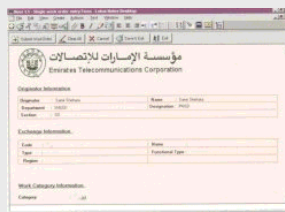
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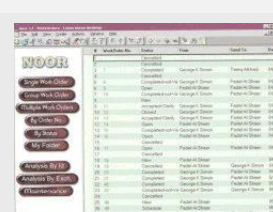
**Statistics & Enquiry
Screen in
NOOR System**



**Analysis/Delayed/By ID
Enquiry in NOOR System**



**Work order Entry Screen in
NOOR System**



**Main Menu for NOOR
System in Etisalat**

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MDS Mediation Device System



Introduction

The Mediation Device System (MDS) is a system which is designed & developed by Emirates Telecommunication Corporation Switching & Software Development Department

The main purpose of the MDS is to execute all types of requests from front end systems like Subscriber Application Processing Systems (SAPS), Credit Control Systems, Billing, Customer Care Systems, Interactive Voice Response Systems for services offered by Etisalat that require the exchange work. These requests are received in the form of standard messages which are translated by MDS in to proper exchange commands for the respective exchange type and version. The responses from the different exchanges are reformatted into standard messages and forwarded to the respective systems and consequently to the users.

MDS currently supports the following areas in Telecommunications:

- Public Switched Telephone Networks
- Public Land Mobile Networks
- Intelligent Networks
- Internet
- Short Message Services
- Pagers
- Access Networks

Contd...

Main Functions

The Mediation Device system (MDS) currently handles the following major functions within Emirates Telecommunications Corporation - [Etisalat](#)

- Creation of New Subscriber
- Delete the existing Subscribers
- Add facilities to the existing Subscribers
- Delete facilities to the existing Subscribers
- Automatic Temporary Out of Service (TOS) for Non Payment
- Automatic Temporary Out of Service (TOS) for Subscriber Request
- Automatic Temporary Out of Service (TOS) for High Consumption
- Automatic Reconnection (Restoration)
- Automatic Selection of Equipment in PSTN switches for New Connection
- Automatic Preparation of Jumper Sheets

MDS in PSTN Networks

Supports multi-vendor PSTN switches

- Ericsson AXE Switches
- Alcatel E10B Switches
- Fujitsu Fetex150 Switches
- Siemens EWSD Switches

MDS in PSTN Networks has got a sub system called OMCSYS which is responsible for the management of exchange equipments & terminations. It will provide automation of circuit allocation process with traffic load balancing in the Local Switching System.

MDS in PLMN Networks

Supports multi- vendor PLMN Switches

- Alcatel
- Ericsson
- Siemens

MDS in PLMN Networks has a sub system called PCS which is responsible for defining the new IMSIs in Authentication Centres (AUC) of PLMN HLRs.

MDS in Intelligent Networks

Supports multi vendor Intelligent Networks

- Alcatel
- Ericsson

Contd...

MDS - The Value Proposition

Without MDS	With MDS
• Customer Places an order with Commercial Dept. • Commercial Dept. prepares Service Order through SAPS system • Identify Local Exchange/HLR manually • Send the SO info to Corresponding HLR manually • Execute Exchange Commands manually • Service Order Closure manually Costs Time Labor Intensive Prone to Errors	• Customer Places an order with Commercial Dept. • Commercial Dept. prepares Service Order through SAPS system • SAPS send message to MDS automatically • MDS select HLR automatically • MDS execute exchange command automatically Saves Money Saves Time Less prone to errors

MDS Values

- Increased utilization of specialized personnel (centralization)
- Automation of trivial, labor-intensive tasks
- Lowered risk of co-ordination errors
- Shorter time to Customer
- Earlier start of billing to customer
- Decrease the delay in introducing new facilities & services

MDS is a Gateway Connection Manager

Connection Manager Provides

- Automation of end-to-end port connection and configuration activities.
- Stand-alone service provisioning solution for the provision of end customer connectivity services.
- Determines the routing of the connection.
- Integration of management activities across different management functions.

Visual Interface of MDS

I. MDS Setup

- Exchange Maintenance
- Exchange Command Maintenance
- PSTN Exchange Routing Table
- GSM Exchange Routing Table Maintenance
- IN Exchange Routing Table maintenance

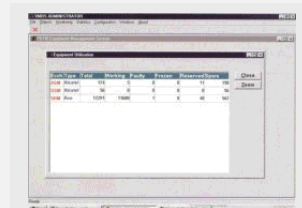


Contd....

II. Customer Care System

1. New Connection

- Service Order Number
- Service Order Date
- Subscriber Details
- For GSM
 - MSISDN
 - IMSI
 - Equipment Details
- For PSTN
 - Exchange
 - MDF
 - MDF bar pair
 - Subscriber number
 - DP

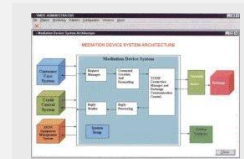


Equipment Type	Quantity	Status	Remarks
MSISDN	10	Active	
IMSI	10	Active	
Equipment Details	10	Active	

Screen Showing Equipment Utilization for PSTN Exchange

2. Facilities

- Service Order Number
- Service Order Date
- Subscriber Details
- MSISDN
- IMSI
- Equipment Details
- Type of Facility (common)
 - Call Waiting (Provision/Cessation)
 - Call Transfer
 - Call Barring
 - Code Control Barring
- Type of Facility (PSTN)
 - CLIP (Caller Line Identification)



System Architecture of Mediation Device System in Etisalat

3. Disconnection

- Service Order Number
- Service Order Date
- Subscriber Details
- MSISDN
- IMSI

III Credit Control System

1. Types of Operation

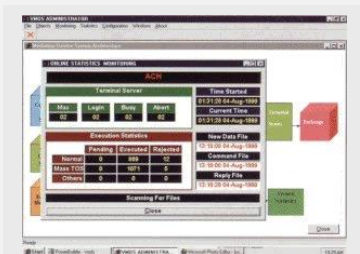
- Disconnection for Non-Payment
- Disconnection for Bad Debts
- Subscriber Request TOS
- Reconnection after payment
- Reconnection by subscriber request (after SRTOS)

IV. System Statistics

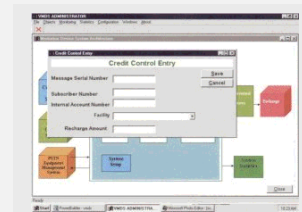
- System Architecture
- Online Execution Inquiry
- Equipment utilization
- Equipment Map
- Exchange command Inquiry

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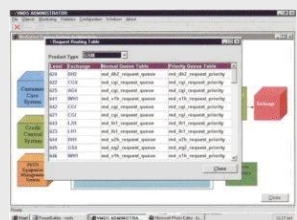
For further information on Etisalat's MDS



Screen for online Monitoring of MDS Execution Statistics



Screen for Posting a Simulated Credit Control Request



Screen Showing GSM Request Routing Table Entry

Interested

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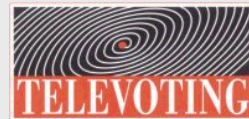
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TELEVOTING



Introduction

Tele voting is the process through which the public, after having been presented with choice options interactively via a particular IVR (Interactive Voice Response) service on the telephone network, register their preference or choice (which is then collected, presented and processed) for a specific purpose.

Objectives

The Etisalat Tele voting service was designed to satisfy the following requirements.

- To interact in real time with the Etisalat IVR system to collect votes.
- To present the vote count at real time.
- To select and present the winning televoter(s) at the end of the voting.

The system is based on a client-server model and was implemented totally in Java. This allows the system to be deployed on any kind of platform. For keeping the data a Sybase database engine was used. The system is mostly data-driven, which makes it highly flexible and customizable.

Features

- The system can cater for multiple tele voting programs.
- The system keeps information about all previous tele voting sessions. This is useful for extended shows which require back-dated information.
- Using dial-up connections, the system can deliver voting information any where in the world.
- The system provides graphical presentation of vote counts and winner(s) after the voting.

Interested

For further information on Etisalat's Televoting

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Monthly Charge :	Dhs. 20/-
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