From GSM to UMTS network
by Siemens

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AGENDA

UMTS : a Market Demand
Siemens UMTS vision and strategy
GPRS : the First Step
Evolution towards UMTS
Why Siemens ?
A New Market Demand:

Mobility + Internet = UMTS
Practical aim of UMTS

- Internet access
- Electronic mail
- Real-time image transfer
- Multimedia document transfer
- Mobile computing

- ISDN services
- Video telephony
- Wideband data services

- Video on demand
- Interactive video services
- TV/radio/data contribution & distribution

- Mobility
- High speed services
- Mobility
- Personal services

Cost efficient communication seamless at any time at any place!
The mega trend #1 in the Telco industry: the booming mobility market requires new network structure to cope with new user demands
I-mode has made NTT DoCoMo to Japan’s largest ISP

- Number of subscribers raised from 0 to 11 million in 1.5 years
  - 1/3 of all DoCoMo customers are i-mode users
  - i-mode is the largest ISP in Japan
- Number of sites increased to 18,700 sites within 1.5 years
- i-mode receives 9% commission of content providers’ revenues
- Voluntary site provider receives 0.3 per ad click

Success in mobile data is driven by open access

Source: Goldman Sachs 03/00, ING Barings 04/00, 3G Mobile Communications International 04/00; Siemens ICN Marketing
Siemens UMTS vision and strategy
Siemens mobile network vision: seamless services across IP-based networks
IP technology is the basis for future mobile networks

Anything over IP
IP facilitates usage of applications across network boundaries (develop once - use many times)

IP over Anything
A common IP layer harmonises networks and provides internetworking over different network technologies

- Fast and cost efficient deployment of applications
- Open Interfaces independant from the access type
- Reduced complexity and cost (CAPEX & OPEX)
Operators will move to GPRS and finally to IP as fast as possible, when IP issues are resolved.

Expected hype cycle: IP goes UMTS

- WAP / GPRS, I-Mode
- 3GPP
- Core network migration to IP
- all IP-based mobile networks

IP issues not resolved: QoS, carrier grade, security, ...

Operators order 1st UMTS Core Network when confidence in IP is low.

UMTS commercial introduction

Source: ICM CA NT 14
IP End to End target: YES but not anyhow: 
Evolution and not Revolution

Common technology in radio access and core network

IP transport also for real time/voice

higher data rates

medium data rates

GSM

Release 97-98

UMTS

Release 99

UMSC

Release 00

UTRAN

Release 0x

Evolution

All IP network

Information and Communication mobile
Tomorrow’s service demand requires high data rates: This will drive the network evolution and the use of the IP technology.

- Smooth evolution of the GSM network towards UMTS enables a smooth integration of new services requested by the market.
The First Step to go towards UMTS:

GPRS
GPRS: The first evolution step. Introduction of the data traffic servers as an add on to GSM switches

- Higher user rates using traffic channel combining and new coding schemes
- Improved spectrum efficiency by multiplexing onto the same resources
- Higher user rates to data networks
- Direct access to internet/packet data network

Network components:
- Visited MSC/VLR
- Gateway MSC
- HLR/GR
- Serving GSN
- Gateway GSN
- Packet switched backbone network servers

Dependencies:
- Mobile
- BSS
- PCU
- PSTN
- Internet
- Intranet
Siemens high performance GSN platform for GPRS and UMTS

Key features are:

- high scalability,
- strictly non-blocking switching fabric,
- sophisticated Traffic Management,
- handling of different signalling protocols,
- narrowband broadband interworking,
- high reliability and availability,
- node management via Q3,
- standard compliance and interoperability
- future proof design.
The best and the more secure way to go towards UMTS:

Smooth evolution from GSM towards UMTS
UMTS Evolution

- Smooth migration with guaranteed service continuity and quality of service
- Investment protection
- Fast time to market

Enhanced Release 99
- Voice over ATM
- IN Camel Phase 3
- iHLR

Release 2000
- IP trunking
- End-to-end VoIP

Release 2000+
- IP based UTRAN

All IP network

- IN
- UTRAN
- Core

Information and Communication mobile
First step from GPRS to UMTS: Enhanced R99
Siemens Architecture (B 2002)

Reuse of the GPRS GSN servers
R00 architecture with Siemens Products (B 2003)-
Physical separation between Control and Transport

Existing IN/Camel (SCP, LNP)

R00 architecture with Siemens Products (B 2003) - Physical separation between Control and Transport

MSCS

BICC (IP/ATM)

HSS Mobility

DHCP, DNS, Radius,...

VAS: WAP, LS, Portal,...

Interconnection / peering

PSTN / ISDN

Voice trunking (over IP / AAL2)

Packet network

ATM

Gb

RNC

H.248

V.248

voice

3G-SGSN

3G-GGSN

Global IP Network

: MGW for IP core

: alternative MGW for pure ATM core
R00 architecture: End-to-end voice over IP (B 2003)

IMCS
(Call State Control Function, Call Feature Server)

IMGC
(Media Gateway Control Function, Signalling Gateway, Roaming Gateway)
Siemens’ Server-based solution

- Single backbone technology from the core to the Node B
- Reduced O&M costs
- Reduced Planning effort

IN + Applications

PSTN/ISDN

PLMN

Global IP Network

HSS Home Subscription Server
RNC Radio Network Controller
Why Siemens?
Strategic Alliance between Siemens and NEC for the UTRAN radio access technology

- Co-operation ongoing since 3/98, mobisphere founded in 10/99
- Development sites: Munich, Ulm, Berlin, Tokio, London, Vienna, Milano, Beijing...
- Production sites: Germany, Japan, Italy, China

Combine leading Expert Technologies
Main Siemens UMTS market success

Contracts
- D2 Mannesmann Vodafone
- D1 Deutsche Telekom Mobile
- BT Manx (UK)
- NTT DoCoMo (Japan)
- Japan Telecom (Japan)
- Radiolinja (Finland)
- TIM
- TMN
- Cegetel
- ...

Testbeds & Trials
- NTT DoCoMo (Japan)
- TIM (Italy)
- BT (UK)
- SingTel (Singapore)
- SK Telecom (Korea)
- TOT (Thailand)
- ...

D1 Deutsche Telekom Mobile
Conclusions: Optimized Siemens GSM /GPRS / UMTS Core Network migration solution

- Full reuse of GSM & GPRS equipment for UMTS. Investment protection for operators
- Full reuse of UMTS Enhanced R’99 equipment for UMTS R’00
- Feature rich voice services, Prepaid & value added services
- Support for both ATM and IP backbones
- Very high reliability and performance
- Integrated solutions to save operational cost: GSM, GPRS, UMTS in one node (U-MSC)
- Early and secure Time to Market
Thank you for your attention