Transition Path to IMT-2000 in Serbia

Divna Vuckovic, Ericsson d.o.o, Serbia&Montenegro
Director Customer Solutions & Sales Support
Dejan Simic, Telekom Srbija Mobile
Prepaid services Team Leader

AGENDA

- GSM/EDGE/WCDMA Seamless Network
- Serbia&Montenegro Country Information
- Serbia&Montenegro Telecom Market
- Mobile Operators Telekom Srbija
- UMTS/WCDMA Pilot Precommercial Networks for Telekom Srbija Mobile
Mobile Market Segmentation in Europe

- Well Developed GSM operators in Europe going WCDMA
- GSM operators still building out coverage

Well Developed GSM operators going WCDMA

The GSM and WCDMA evolution raises several critical questions for the operator:

- How can operators maximize and reuse current GSM assets?
- How can they deploy WCDMA while maintaining profitability in GSM?
- How do they best allocate investments between GSM and WCDMA infrastructures?
- How will users experience the new combined GSM and WCDMA services?
Well Developed GSM operators going WCDMA

Seamless Network - Ericsson’s view on how existing GSM networks will evolve and interwork with WCDMA

- The evolution scenarios, operator needs and suggested solutions
- System evolution for GSM, the introduction of third-generation (3G) services and the integration of GSM and WCDMA to form a seamless network
- Evolution of GSM and WCDMA networks as a single, unified seamless network that shares core, transmission, radio and application resources.
- The seamless network ensures the most efficient use of GSM and WCDMA
- Seamless user experience – transparency of services to users
- Ensures operator’s investment protection in GSM/GPRS and re-use of 2G/2.5G equipment for WCDMA networks

Well Developed GSM Operators Going WCDMA

3G Service Continuity

Challenges:

- Make Applications adaptive
- Surviving handover between two Network Technologies
Well Developed GSM Operators Not Going WCDMA in Near Time

Roll-Out Options

- Start Building EDGE coverage in dense areas
- Use GPRS as fallback initially
- Be competitive if WCDMA is available in other networks
- Handsets available in volumes
- Low entry market segments

---

Well Developed GSM Operators Going WCDMA

Roll-Out Options – Time-To-Market by Fast Roll Out

- One EDGE TRU per cell for coverage
- RBSs EDGE enabled
Well Developed GSM Operators Going WCDMA

Seamless Network

GSM/EDGE Radio Access

Common GSM/WCDMA Core Network

WCDMA Radio Access

Common
- Core Network
- Transmission
- Sites
- Handsets
- Service network
- CAS
- OSS and NMS

Well Developed GSM Operators Going WCDMA

Roll-Out Scenario

EDGE roll-out in “rural” areas
(combined GSM/EDGE/WCDMA NW)

2nd Phase of EDGE deployment due to GSM/GPRS growth

Deployment of EDGE capable TRUs due to GSM/GPRS growth

1st Phase of WCDMA roll-out

2nd Phase of WCDMA roll-out

Final phase in WCDMA roll-out: “Rural area coverage”

EDGE roll-out WCDMA roll-out

0% POPULATION COVERAGE 100%
Well Developed GSM Operators Going WCDMA
Seamless Network - Benefits Introduced

- 100% node reuse
- 50% spectrum gain
- 50% transmission savings
- 80% co-siting

Serbia and Montenegro (former Yugoslavia)

The Republic of Serbia:

- Territory: 88.361 sq.km
- Population:
  - 7.5 mil. with 110 inh./sq.km
  - Belgrade with 2 mil. citizens
- GDP per capita 3000$ (2004)
- GDP yearly increase 13%
Mobile operators status in Serbia

- **063 MOBTEL***, Mobile Telecommunications “Srbija” BK-PTT, operates as a joint-venture company by:
  1. “BK Trade”, Moscow (51% shares – private capital)
  2. PTT “Srbija” (49 % shares – state capital)

- **Telekom Srbija**, Mobile Telecommunications of Srbija, operates as a joint-venture company by:
  1. PTT “Srbija” (80% shares – state capital)
  2. OTE Greece (20% shares – private capital)

Attention: *Cross ownership of the two operators by PTT!*

Mobile market in Serbia

**GSM 900/1800 operators**:

1. **063 MOBTEL** (launched in 1996)

2. **064 Telekom Srbija** (launched in 1998)

Total mobile subscribers: 4,7 millions (60% penetration)

Market share: 46/54 % (Mobtel/Telekom)
Regulation in Serbia

- *Competition* market, increasing the benefits in terms of price and QoS, is not yet regulated completely.
- New Telecom Act is approved in April, 2003, designed on the basis of EU legislation (licensing, interconnection, transparent, objective and non-discriminatory basis, open network provision on all hierarchical level, competition for the open market).
- New Act is not yet put into force, since the management board of NRA is not yet approved by the Parliament.
- Telekom Srbija (incumbent) operates public fixed network and mobile network as well, with monopoly for fixed telephony until June, 2005. → liberalization allowing new players!
- No official announcement has been issued for the IMT-2000 license, frequency bands are still occupied by other users.

Frequency bands for UTRA
*(UMTS Terrestrial Radio Access)*

1. 60 MHz x 2 for FDD = 1920-1980/2110-2170 MHz (up/down link)
2. 20 + 15 MHz for TDD = 1900-1920 + 2010-2025 MHz (up+down link)
Frequency bands allocated in Serbia

- Frequency Plan is adopted by the Authority in Serbia, quite fully in accordance with WARC/ITU and CEPT/ECC/ERC decisions and recommendations.
- Bands allocated for the UMTS/IMT-2000 network are:

  1. 1900 – 1939 MHz | UMTS TDD/FDD
  2. 1930 – 1980 MHz
  3. 1980 – 2010 MHz | (mobile satellite component)
  4. 2010 – 2025 MHz | UMTS TDD
  5. 2110 – 2120 MHz | UMTS
  6. 2120 – 2170 MHz
  7. 2170 – 2200 MHz | (mobile satellite component)
  8. 2500 – 2520 MHz
  9. 2520 – 2655 MHz | UMTS
 10. 2655 – 2670 MHz
 11. 2670 – 2690 MHz

- All bands are currently occupied and negotiations with the User should be finalised before the licensing procedure start.

REGULATORY AGENCY

- Set-up future requirements in the overall telecom sector regulation process
- Analyse the data from mobile market survey and define needs and demands
- Put into force the new Telecom Act → ASAP!
- Main priority is to remove measures that restrict competition
- Free the frequency bands for the IMT-2000 (UMTS) development
- Define the principles and methods for the licensing
- Define the preconditions of the licenses
- Define obligations related to the universal services
- Define the number of licenses, based on market potential
- Proceed with the licensing process!
Some key questions for 3G evolution/migration

- Licensing
- 2GHz frequency band occupied
- Transmission network evolution both for core and access network to meet requirements for increased flexibility, capacity and availability
- Terminals availability covering GSM/GPRS/EDGE/WCDMA (handsets and PCMCI cards)
- Readiness of operator's organizations for 3G (resources, competencies...)
- Evolution vs. migration
- CS & PS handovers
- Role of IMT-2000 in Corporate Social Responsibility:
  The responsibility of the state/government, vendors, operators and regulators to support new technologies bringing new dimension of communications. Preparing for the Information Society inclusion.
- Pilot 3G Network for Telekom Srbija and Mobtel

Telekom Srbija Mobile

- Established in 1998 as second mobile operator in Serbia
- 2.500.000 users in May 2005
- More than 600 RBSs installed
- 84% territory coverage and 94% of population
Number of subscribers

Services and Applications

- mid 1998 - Prepaid
- end of 1998 - Postpaid
- 2001 - VPN offered to business users as VPM 50 package
- 2002 - SMS based VAS services
- 2002 – new mobile numbering 065 -postpaid service Friend 065
- 2003 - Friends&Family tariff package for prepaid (3 favorite numbers)
- 2003 - Prepaid roaming, Call Center
- 2003 - GPRS and MMS
- 2003 - 3G trial with Ericsson and first video call presented during Telfor
- 2003 – BEL, BIZNET postpaid tariff profiles
- 2004 - MONDO WAP portal
- 2004 - M-Payment platform for prepaid recharge
- 2004 - MTS Postpaid Club, TOKI, TIPI and NETI prepaid tariff profiles
- 2004 - LBS (Near me and Buddy locator)
- 2005 – Special tariff profiles for disabled persons
### Operators’ Business Plans with Gradual Introduction of the UMTS Relative to the GSM/EDGE

<table>
<thead>
<tr>
<th>Year</th>
<th>Rural</th>
<th>Sub-urban</th>
<th>Urban</th>
<th>Sub-urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>GSM/GPRS</td>
<td>EDGE</td>
<td>GSM/GPRS</td>
<td>EDGE</td>
<td>GSM/GPRS</td>
</tr>
<tr>
<td>2004</td>
<td>GSM/GPRS</td>
<td>EDGE</td>
<td>GSM/GPRS</td>
<td>EDGE</td>
<td>GSM/GPRS</td>
</tr>
<tr>
<td>2005</td>
<td>GSM/GPRS</td>
<td>EDGE</td>
<td>GSM/GPRS</td>
<td>EDGE</td>
<td>EDGE</td>
</tr>
<tr>
<td>2006</td>
<td>EDGE</td>
<td>EDGE</td>
<td>EDGE</td>
<td>EDGE</td>
<td>EDGE</td>
</tr>
</tbody>
</table>

- EDGE used as a complement to WCDMA
- Service Continuity
- Seamless Network
- Business aspects for rural areas

### Telekom Srbija and Ericsson Pre-Commercial WCDMA/UMTS Systems

**Purpose of the trial**

- Use of WCDMA/UMTS pre-commercial trial for different kinds of load and interoperability testing in order to prepare the operator’s network for the fast 3G launch

- To give the opportunity to Telekom Srbija to:
  - Build up competence and get hands on experience of IMT-2000 networks and services
  - Implement and test end-to-end solution for a 3G system
  - Look into integration issues, e.g. billing and customer care
  - Prepare for an early IMT-2000 launch - immediate transition to commercially ready-for-launch network
  - Hold market events
MTS WCDMA/UMTS Trial

Responsibilities:

**Ericsson:**

- 3G System:
  - Hardware
  - Software
  - Implementation services
  - Operation & Maintenance
  - Support

**Telekom Srbija Mobile:**

- Licenses
- USIMs
- Terminals
- Transmission
- Floor Space
- Power Supply (except for RBSs)

Telekom Srbija & Ericsson 3G Network Diagram – Trial Configuration
End-user services that could be offered

<table>
<thead>
<tr>
<th>Basic Services</th>
<th>Voice</th>
<th>SMS</th>
<th>MMS</th>
<th>Browsing</th>
<th>Gaming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video Services</td>
<td>Video/Music Streaming</td>
<td>Mobile TV</td>
<td>Video Download</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Videocall

"Rich Call" *

* Possibility to use multimedia services during a voice call

RAN Functionalities

**Radio Access Bearers Supported:**
- Conversational RAB for AMR speech 12.2 kbps
- Conversational RAB for 64 kbps multimedia
- Interactive RAB, RB 64/64 kbps (UL/DL)
- Interactive RAB, RB 64/128 kbps (UL/DL)
- Interactive RAB, RB 64/384 kbps (UL/DL)
- Streaming RAB for non-transparent Circuit Switched data, 57.6 kbps
- Speech and Packet data RAB combination

**GSM Handover:**
- UMTS to GSM Handover (Cell Re-selection, Voice, PS Data, MultiRab)
- GSM to UMTS Handover (Cell Re-selection, Voice, PS Data)
Thank you for your attention!

Contacts:
Divna Vuckovic
divna.vuckovic@ericsson.com

Dejan Simic
sdejan@telekom.yu