ITU-T 2003 INFORMAL FORUM SUMMIT

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TD-SCDMA Technology

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TD-SCDMA Technology Forum

By Neil Jin
Secretary-general of TD-SCDMA Technology Forum

7/21/2003
Outline

1. TD-SCDMA Technology Features and Development
2. Prospect of TD-SCDMA
3. TD-SCDMA Forum Introduction and Prospect
4. Conclusions
The key features of TD-SCDMA

- Smart antenna
- Joint detection
- Uplink synchronization
- Dynamic channel allocation
- Software radio
- OPEX
# Key Features of the Air-Interface TD-SCDMA

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>High data rates</td>
<td>up to 2 Mbit/s</td>
</tr>
<tr>
<td>Large cell ranges</td>
<td>up to 40 km</td>
</tr>
<tr>
<td>High vehicular speeds</td>
<td>up to 500 km/h</td>
</tr>
<tr>
<td>Asymmetrical data</td>
<td>up to 1:6 asymmetry</td>
</tr>
<tr>
<td>Outstanding Voice Capacity</td>
<td>216 Users / 10 MHz/Cell*</td>
</tr>
</tbody>
</table>

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TDD for Capacity Enhancements

- Fits in the already allocated unpaired spectrum
- Efficiency for high share of asymmetric traffic
- Simplified network planning (no cell breathing effect, no soft handover)
- Personalised seamless services in combination with GSM and FDD everywhere

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FDD and TDD
Uplink / Downlink Symmetry

**FDD**
Frequency Division Duplex (W-CDMA):
UL band separated from DL band

**TDD**
Time Division Duplex (TD-SCDMA):
UL band same as DL band

- Resource Units

with asymmetric loads, portions of the spectrum are occupied but not used
### Drivers of TD-SCDMA

<table>
<thead>
<tr>
<th>China</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Allocation by MII of 155 MHz of spectrum for TD-SCDMA&lt;br&gt;• Formation of the TD-SCDMA Industry Alliance by eight leading Chinese telecommunication firms&lt;br&gt;• Strong support by MII, MOST and SDPC&lt;br&gt;• Siemens announced the investment of €50 million for the current fiscal year for further development of TD-SCDMA technology and products&lt;br&gt;• Completion of phase 2 of MTNet tests by Siemens &amp; Datang, required for field trial deployments&lt;br&gt;• Deployment of two TD-SCDMA field trial networks with Chinese operators in Chongqing (CRC) and Chengdu (CMCC)?&lt;br&gt;• TD-SCDMA commercial availability within 1Q of 2004.</td>
<td></td>
</tr>
</tbody>
</table>
In China, 155 MHz have been assigned to TDD

**FDD** Frequency Division Duplexing

**TDD** Time Division Duplexing

- **Primary FDD frequency band**
- **Secondary FDD frequency band**
- **Primary TDD frequency band**
- **Secondary TDD frequency band**

**Status:** November 2002
TD-SCDMA multi-vendor support

SIEMENS

PHILIPS

SAMSUNG

“T3G“

Agilent Technologies

ROHDE & SCHWARZ

cadence

T3G

Texas Instruments

Nokia

AEG Telekom

LG Electronics

Commit

RACAL

HUAWEI TECHNOLOGIES

PTIC

Soutec

SYNOPSYS

COMMIT

UT Starcom

Holley Group

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TD-SCDMA Test Terminal Features

Single-mode TD-SCDMA jacket (TSM)
- Equivalent TD1.2 feature support
- Voice (MOC, MTC, MMC)
- Packet data up to 148 kbps (single slot)

Optimal mechanical integration
- Uses standard iPAQ feature connector
- Built-in Lithium-Ion battery (1400 mAh)
- 100 hrs stand-by
- 4 hrs talk-time

Ideal for extended field trials
- Sleek, 3G-like appearance
- Meets user’s 3G expectations
- Available in large quantities (>500)

Windows Pocket PC 2002 standard SW
- Microsoft Chinese user interface
- Web Browser
- Media Player
- Email client
- etc…

Pocket PC telephone application
- Simple MMI development
- Standard API for applications

Microphone and loudspeaker integrated in the expansion jacket, optional over headset

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RTX Platform Availability Maximise re-use of GSM/GPRS platforms is key to success in TD-SCDMA
Latest Development of TD-SCDMA

- 3G Phone Has Realized Call With Datang TD-SCDMA Base station.
- Siemens succeeded in 384k data transmission demo on TD-SCDMA system on July 14th, 2003 in Beijing.
TD-SCDMA Product

Smart Antenna (cover removed)

NB-430TS

NB-450TS
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China Mobile 3G - Subscribers by Operator

Unit: million subscribers

<table>
<thead>
<tr>
<th>Year</th>
<th>CMCC</th>
<th>CUC</th>
<th>New operators</th>
<th>Total subscribers</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2001</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2002</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2003</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2004</td>
<td>0.5</td>
<td>0.4</td>
<td>0.0</td>
<td>3.4</td>
</tr>
<tr>
<td>2005</td>
<td>1.5</td>
<td>1.2</td>
<td>1.0</td>
<td>12.7</td>
</tr>
<tr>
<td>2006</td>
<td>10.0</td>
<td>6.9</td>
<td>6.0</td>
<td>38.93</td>
</tr>
<tr>
<td>2007</td>
<td>20.0</td>
<td>16.37</td>
<td>16.37</td>
<td>72.37</td>
</tr>
<tr>
<td>2008</td>
<td>38.0</td>
<td>33.81</td>
<td>33.81</td>
<td>120.81</td>
</tr>
<tr>
<td>2009</td>
<td>60.0</td>
<td>58.80</td>
<td>58.80</td>
<td>179.8</td>
</tr>
<tr>
<td>2010</td>
<td>85.0</td>
<td>83.75</td>
<td>83.75</td>
<td>240.75</td>
</tr>
</tbody>
</table>

Unit: million subscribers

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### 3G Subscriber Development in 2004 - 2005

Unit: million subscribers

<table>
<thead>
<tr>
<th>Best Case</th>
<th>Carrier</th>
<th>2004</th>
<th>2005</th>
<th></th>
<th>2004</th>
<th>2005</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TD-SCDMA</td>
<td>CDMA2000</td>
<td>W-CDMA</td>
<td>Total</td>
<td>TD-SCDMA</td>
<td>CDMA2000</td>
<td>W-CDMA</td>
<td>Total</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CMCC</td>
<td>0.00</td>
<td>0.00</td>
<td>0.50</td>
<td>0.50</td>
<td>0.00</td>
<td>0.00</td>
<td>1.50</td>
<td>1.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUC</td>
<td>0.00</td>
<td>0.40</td>
<td>0.00</td>
<td>0.40</td>
<td>0.00</td>
<td>1.20</td>
<td>0.00</td>
<td>1.20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Operator I</td>
<td>0.00</td>
<td>0.00</td>
<td>1.50</td>
<td>1.50</td>
<td>0.00</td>
<td>0.00</td>
<td>6.00</td>
<td>6.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Operator II</td>
<td>1.00</td>
<td>0.00</td>
<td>0.00</td>
<td>1.00</td>
<td>4.00</td>
<td>0.00</td>
<td>0.00</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1.00</strong></td>
<td><strong>0.40</strong></td>
<td><strong>2.00</strong></td>
<td><strong>3.40</strong></td>
<td><strong>4.00</strong></td>
<td><strong>1.20</strong></td>
<td><strong>7.50</strong></td>
<td><strong>12.70</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## 3G Mobile Infrastructure Investment in 2004 - 2005

<table>
<thead>
<tr>
<th>Carrier Carrier</th>
<th>2004</th>
<th>2005</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TD-SCDMA</td>
<td>CDMA2000</td>
</tr>
<tr>
<td>CMCC</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>CUC</td>
<td>0</td>
<td>390</td>
</tr>
<tr>
<td>New Operator I</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>New Operator II</td>
<td>1,560</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1,560</td>
<td>390</td>
</tr>
</tbody>
</table>

Unit: million Euro

**Best Case**

The table above illustrates the estimated 3G mobile infrastructure investment by carrier and technology for the years 2004 and 2005. The investments are categorized by technology (TD-SCDMA, CDMA2000, W-CDMA) and carrier (CMCC, CUC, New Operator I, New Operator II). The total investment figures show the combined investment across all carriers and technologies for each year.
Outline

1. TD-SCDMA Technology Features and Development

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On December 12th, 2000, TD-SCDMA technology Forum established

Foundation conference
Date: Dec, 12th 2000
Venue: Beijing, people’s hall
Founder of TD-SCDMA technology Forum
Tenet of TD-SCDMA technology Forum

- Provide a platform for worldwide operators, manufacturers, research institutes, educational services, standardization organizations and other companies or groups to communicate and cooperate the TD-SCDMA technology.

- Promote the development of TD-SCDMA and related products.
Working Scope of TD-SCDMA technology Forum

- Propagandize and promote the TD-SCDMA Technology;
- Develop domestic and international academic exchanges, promote the evolution of the TD-SCDMA technology;
- Establish working groups to implement monographic research, promote the development and consummation of TD-SCDMA;
- Set up and manage website of the TD-SCDMA Forum;
- Edit and publish forum periodicals;
- Hold seminar and demo conference periodically;
Target of TD-SCDMA technology Forum

- Promote the industrialization of TD-SCDMA and eventually drive the worldwide application of the TD-SCDMA in the future;
- Set up the communication bridge for all members to cooperation on TD-SCDMA.
- Provide a shortcut for the communication between government and companies by the platform of TD-SCDMA Forum.
- Promoted cross-strait and international 3G communications, strategically promoted TD-SCDMA globally.
- Made active contacts with standardization organizations and research institutes to promote the progress of substantial work such as IPR.
Members Category of TD-SCDMA technology Forum

- Operator: 575
- R&D institutes and organization: 22
- Manufacturers: 84
- ICP: 276
- Chip Provider: 410

Total Members: 410
Activities of TD-SCDMA technology Forum

TD-SCDMA Live Demo
Time: 2002-2-3
Venue: DaTang

3G Symposium
2002-11-14

TD-SCDMA Summit
Beijing
2001-9

IPR Regulation Seminar
2002-12-12
Constant self-improvement Promoting the industrialization of TD-SCDMA

Industrialization Promotion Workgroup Meeting
Time: 2002-06-14
Venue: CATT

TD-SCDMA Tech & Industrialization Development Seminar
Time: 2001-07-12
Promoted cross-strait and international 3G communications, strategically promoted TD-SCDMA in the global scope, promoted the internationalization of TD-SCDMA.

Korea
APTIT-3 Forum

USA
Asia Telecom Investor Tour by LEHMAN BROTHERS

UMTS
Worldwide Mobile Communications System Forum

B3G
Wireless Communications International Forum

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On June 23, 2003, the Organizational Partners of the Third Generation Partnership Project (3GPP™) have approved an application by the TD-SCDMA Forum to become a Market Representation Partner (MRP) within the project.
Our website

Http://www.tdscdma-forum.org

5610 clicks per day, including 50% Chinese browsers and 50% overseas browsers.
• Great achievements in strengthen the communication with the relevant governmental departments

• Mobilized industrial resource and senior internal staff officers to suggest means and ways to push the issue of 3G Frequency Planning.
Powerful Media Propaganda, aroused advantageous social opinions
Future Organization and development direction of Forum

Executive Organization

- Secretariat

- External Contact Team

- Presidium

- Council

- Industrialization Promotion Group

- B3G Promotion

- IPR Promotion and Coordination

- Application

- Others

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① TD-SCDMA technology has unique advantages, it can be migrated from GSM to 3G smoothly and has flexible networks buildup mode.

② TD-SCDMA got strong support from Chinese government and vendors.

③ TD-SCDMA Technology Forum will coordinate the forum members, ascertain the direction of TD-SCDMA and get more support from Chinese government and carriers.

④ By cooperating with overseas standardization organizations, TD-SCDMA Technology Forum will promote the internationalization of TD-SCDMA.

⑤ TD-SCDMA Technology Forum will explore the industrialization, commercialization, internationalization and strategic expansion of TD-SCDMA.