Migrating from HSPA to HSPA+ and LTE

PANEL: DEPLOYMENT OF MOBILE BROADBAND

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Nokia Siemens Networks
Global mobile broadband traffic

Projected change by 2015

- Mobile voice: +50%
- Laptop data: +1,000%
- Smart device data: +10,000%
- Signalling load: 50%

23 Exabytes/year by 2015
23,000,000,000,000,000,000 Bytes/year

23 Exabyte/year = 6.3 billion people each downloading a digital book every day
Motivation for LTE deployment

High-Speed Broadband
- 10-20ms latency
- 173 Mbps peak data rate

Cost per bit
- Flat IP architecture, high hardware efficiency, SON

Capacity
- New bandwidth, more spectral efficiency to offload 3G network

Mobile Broadband Outlook for the Americas, Rio de Janeiro, 26 April 2010
End user experience

Peak rates
- 2.14 Mbps (HSPA)
- 42..168 Mbps (HSPA+)
- 150..300 Mbps (LTE)
- 1..2 Gbps (LTE-A)

Target 1 Gbps

QoS and service differentiation
- QoS 0
- QoS 1
- QoS 2
- QoS 3
- QoS 4
- QoS 5

Fast setup and low latency
- Always on
- Battery life

Smartphones

Latency
- HSPA
- HSPA+
- LTE
HSPA and LTE peak rate evolution

<table>
<thead>
<tr>
<th>3GPP Rel. 6</th>
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### Average capacity (Mbps/cell)

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### Peak data rates (Mbps)

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### Round Trip Time (RTT: ms)

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HSPA and LTE voice evolution

- Existing Rel4 core network can be used
  - 3G: CS Voice over HSPA with no changes in core network
  - LTE: Fast Track to VoLTE utilising existing installed CS core
- Evolution to a full IMS centric architecture
Evolution towards Single RAN

Current model
- Increasing costs
- Difficult to manage
- Hard to maintain
- Complexity

Single RAN makes it simpler

One efficient, simple and adaptive network.

- GSM/EDGE
- WCDMA/HSPA
- LTE/LTE-A
- All 3GPP Technologies
Single RAN enabling smooth evolution

Site solutions

Compact, high performance site

Network management

SON for 2G, 3G and LTE

NetAct

IP backhaul

Network architecture

GSM/EDGE & HSPA & I-HSPA & LTE

Efficient Spectrum

Re-farming

Features enhancing end-user quality and efficiency

CPC
CS Voice over HSPA
QoS
Short Latency
Battery Life

4.2 MHz

Mobile Broadband Outlook for the Americas, Rio de Janeiro, 26 April 2010
**Nokia Siemens Networks Track record in commercializing LTE**

<table>
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<tr>
<th>World’s 1st</th>
<th>11 commercial LTE deals</th>
<th>World’s 1st</th>
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<tbody>
<tr>
<td>2009 LTE call on commercial standards baseline, commercial HW and SW</td>
<td><strong>docomo</strong> - Japan</td>
<td>TD-LTE femtocell demonstration</td>
</tr>
<tr>
<td>2006 LTE demo with 160Mb/s</td>
<td><strong>telenor</strong> - Denmark</td>
<td>LTE live network</td>
</tr>
<tr>
<td>+25 LTE trials with leading CSPs</td>
<td><strong>Bahrain</strong></td>
<td>World’s fastest LTE: 100 Mbps live with LG device</td>
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<tr>
<td>end-to-end with leading device vendors</td>
<td><strong>Sweden</strong></td>
<td>Most LTE essential patents</td>
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<tr>
<td>LTE Centers of Competence in all lead markets</td>
<td><strong>USA</strong></td>
<td>LTE-ready Flexi Multiradio BTS shipped to close to all of our 3G customers</td>
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**confidential**
Summary

• Evolution to LTE and HSPA+ is mandatory to meet the needed capacity and end user demand
• Single RAN offers flexible and efficient platform for multiradio, multiband deployments for 2G, 3G, LTE
• Peak rates, QoS, latency, setup times and battery lifetime improvements drive the end user experience
Thank You!