
Overview of wireless IP devices

(Network implications...)

IAB wireless workshop

Mountain View

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Focus of presentation

- Interactive user terminal (vs. burglar alarm or webcam)
- Personal terminal (vs. car, office, home)
- "Real reality" (vs. virtual reality)
- 100 kbits everywhere (vs. 100Mbits somewhere)
- Several visual input types (one-handed, pen, keyboard)
- Multiservice terminals (PS+CS, purse, GPS, FM radio, ...)
- Extensions to cellular (WLAN, BlueTooth, ...)

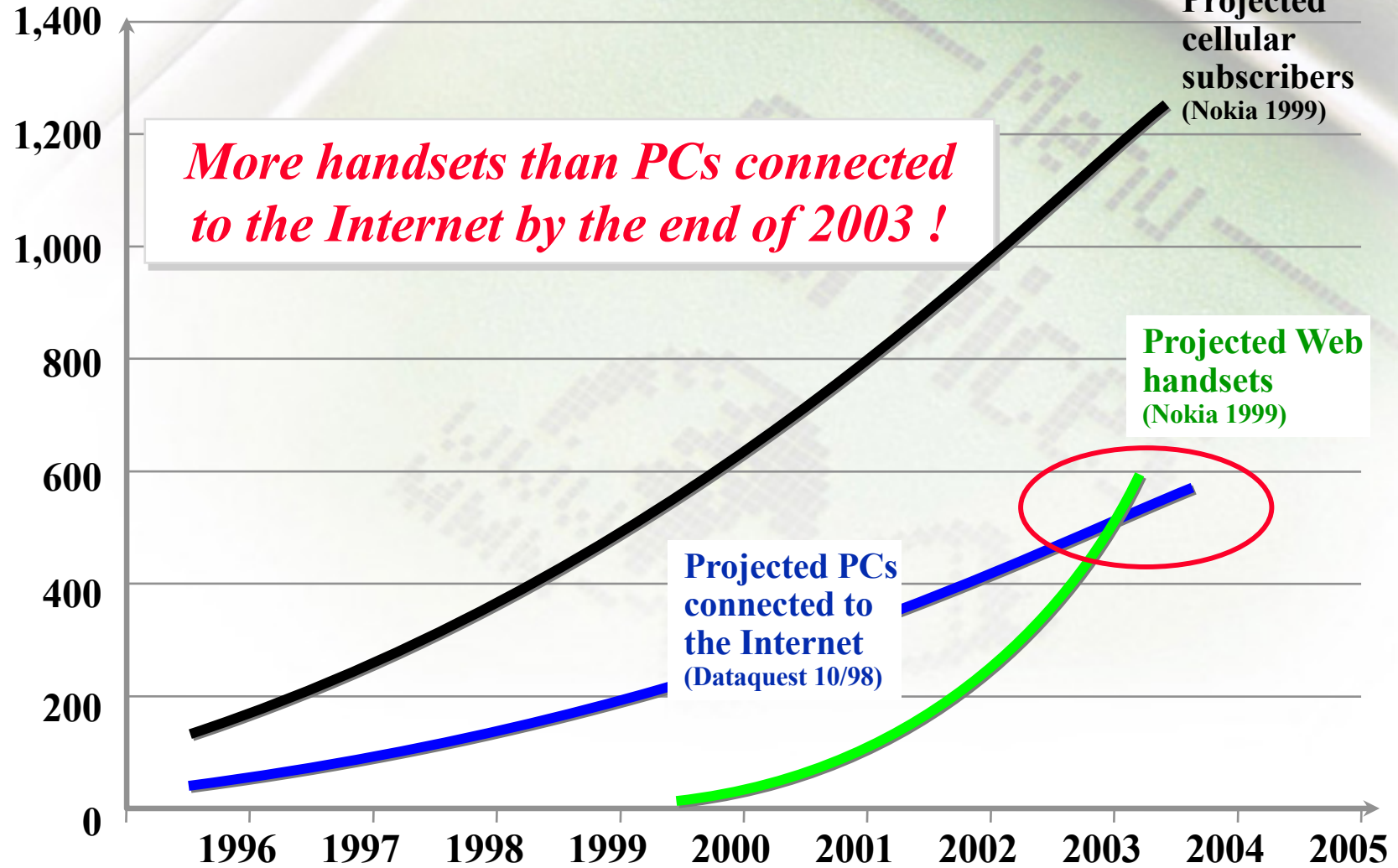


Technology trends of wireless handsets

- Color screen
- Built-in battery
- FM radio
- MP3 audio
- Video
- PKI security
- Location (GPS and cellular)
- Voice recognition and control
- Personal area networks for gadgets (BlueTooth)
- OTA sync

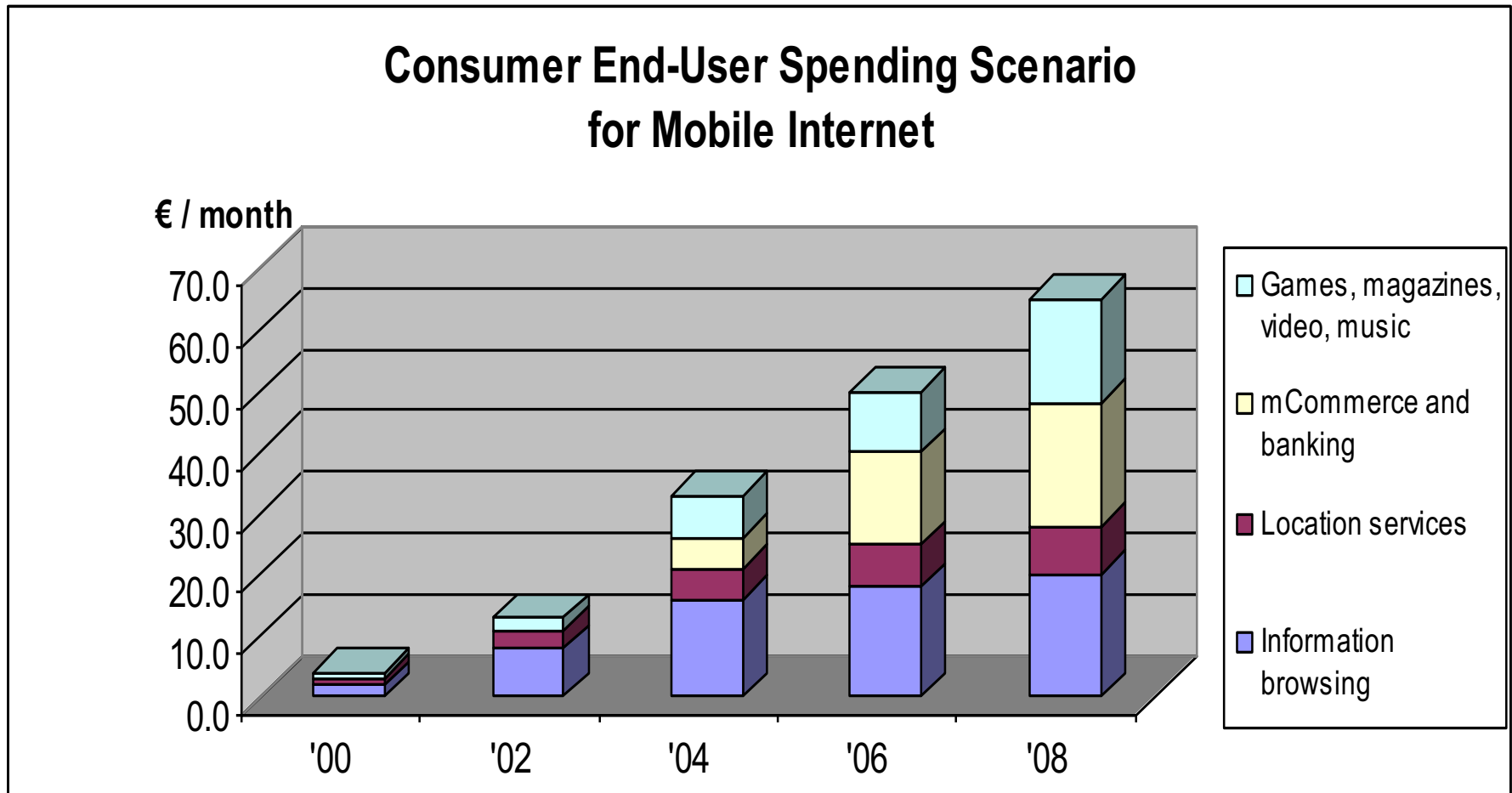
Mobile Internet Outlook

Millions

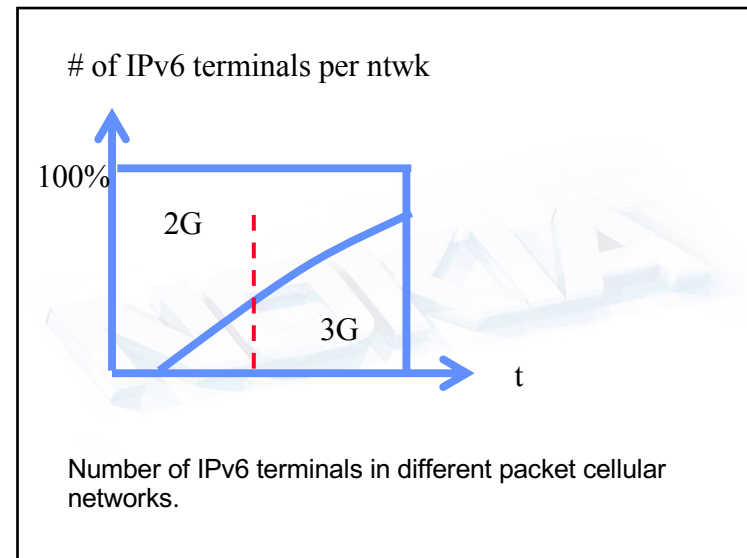
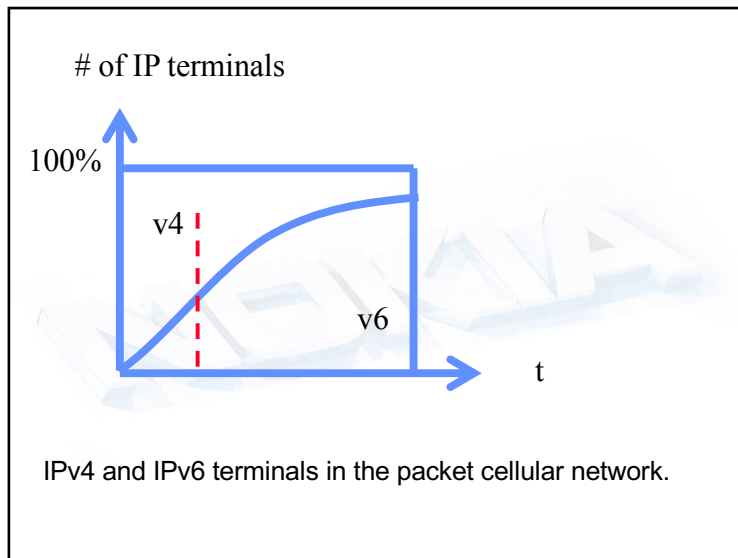
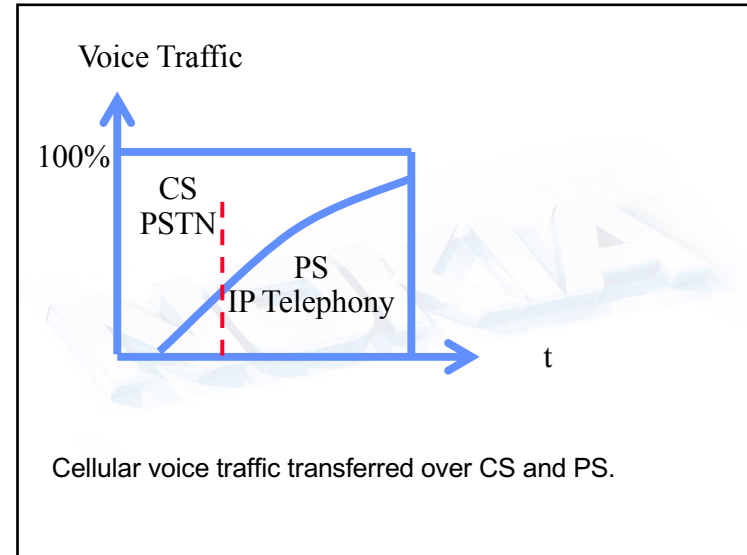
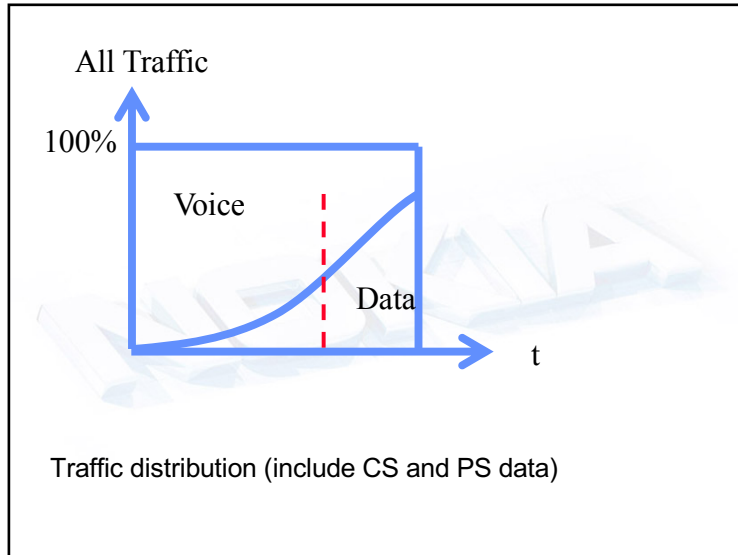


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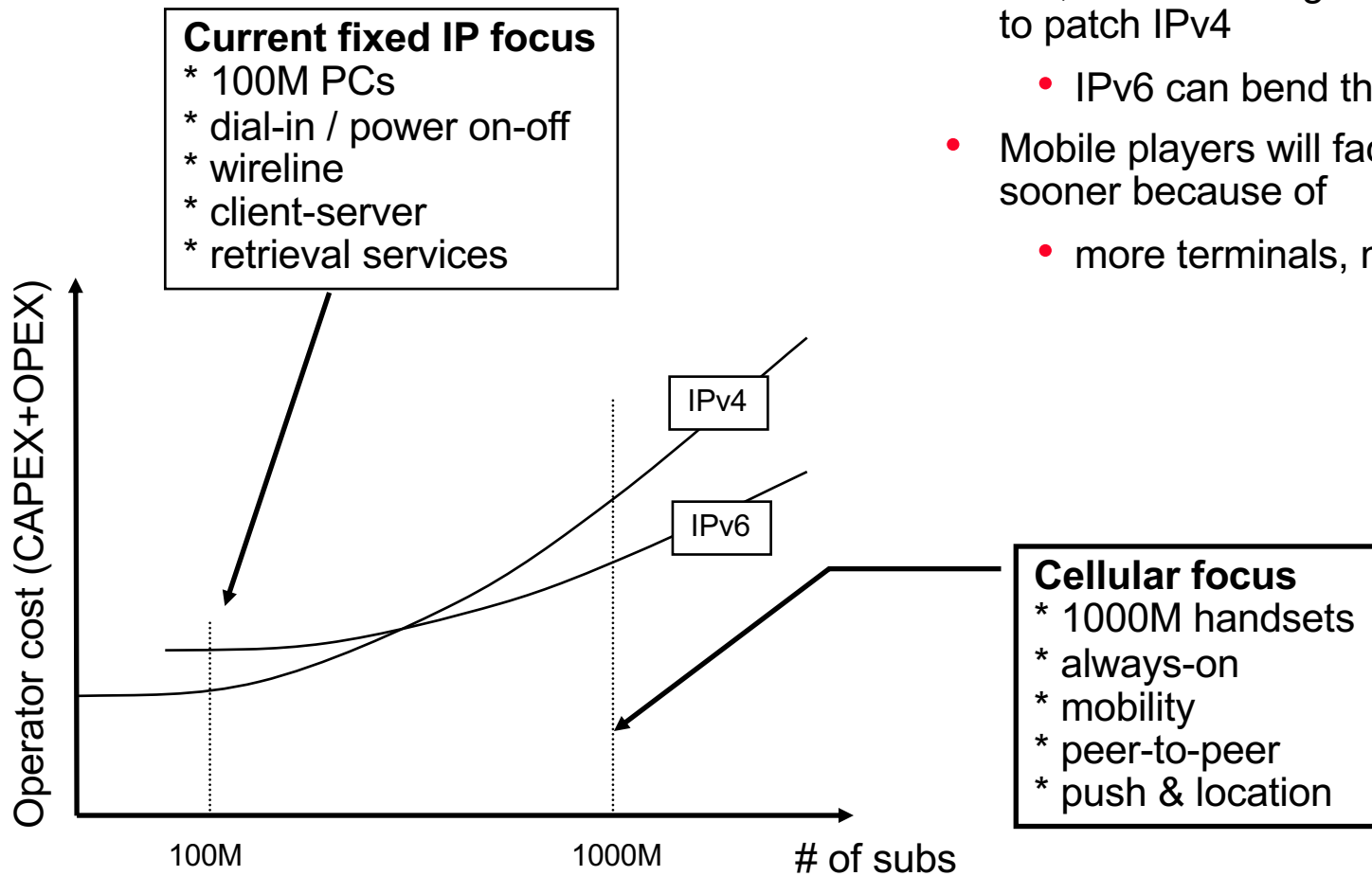
Mobile internet will bring the total value of the mediaphone use into a new level



Cellular traffic evolution 2005

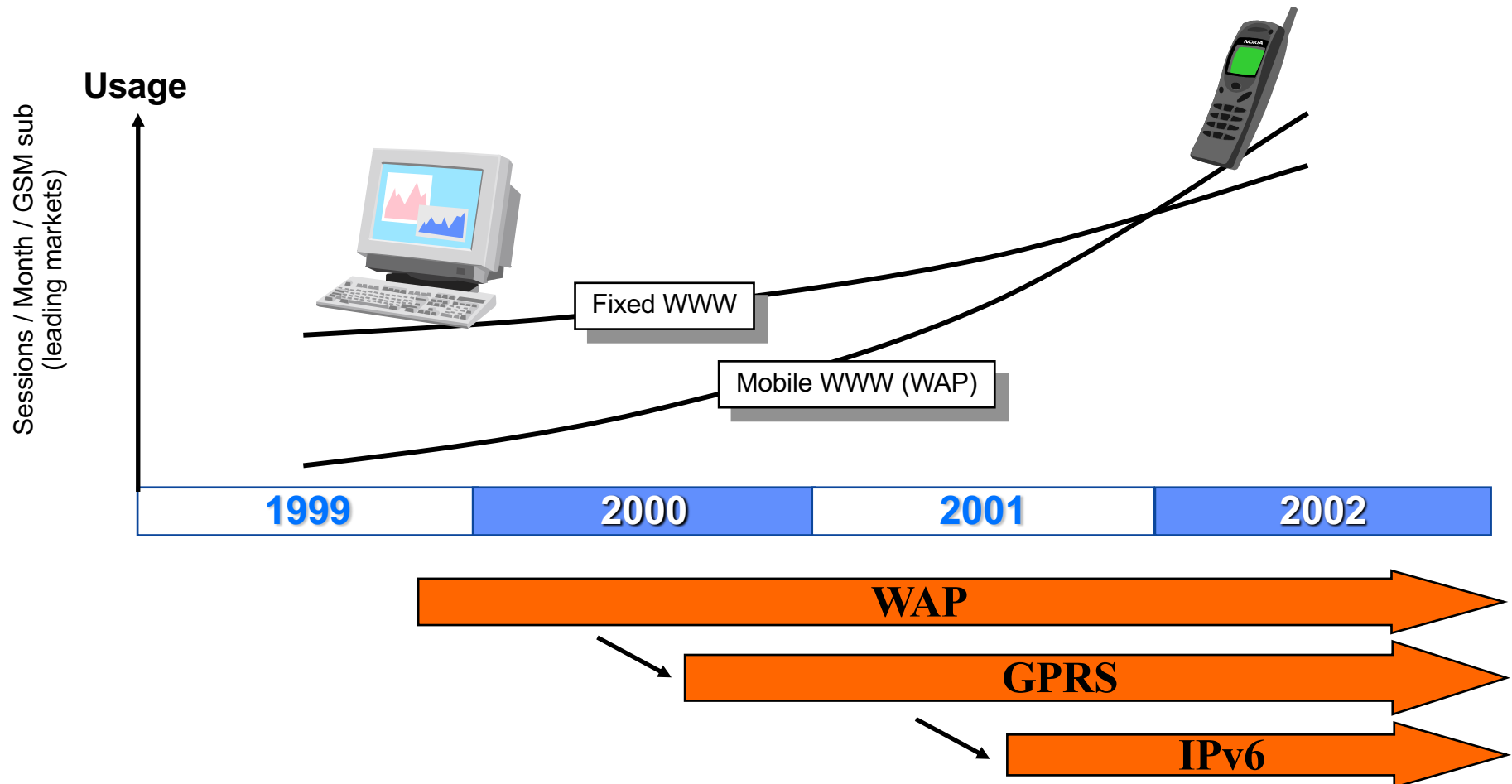


Why IPv6: Cost of patching IPv4 is the key



- It is *possible* to implement new services using IPv4
- But, it is becoming *more and more expensive* to patch IPv4
 - IPv6 can bend the cost curve
- Mobile players will face the cost challenge sooner because of
 - more terminals, mobility, push, location

Mobile Internet will be always-on



Cohabitation of IP and telecom in handset

Isolated service sets

- sequential service for cellular (phone, fax, ...) and IP (WAP, Web, email, ...)
- terminal: unified user interface, isolated stacks
- infra: radio capacity sharing, user-initiated IP connectivity, cellular push

Integrated service sets

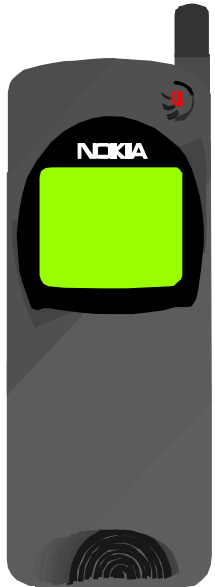
- parallel service for cellular and IP (e.g. WAP and GSM voice)
- integrated service for cellular and IP (e.g. WTA and GSM voice)
- terminal: "pre all-IP" user interface
- infra: radio coordination, PS control plane for CS user plane

All-IP service set

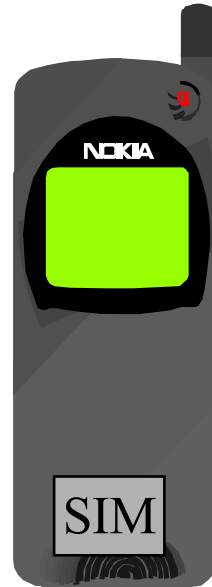
- IP traffic evolution: bursty + streaming + real-time voice&video
- key requirements: fast session set-up, push, QoS (handover, delay, jitter)

Handsets becoming trusted devices via PKI

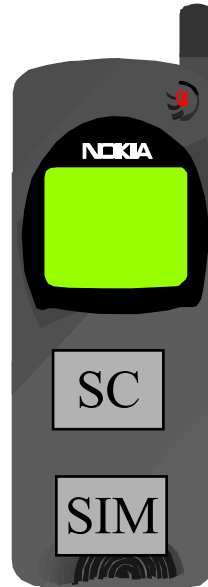
Security integrated into terminal HW and/or SW



Security functionality installed on SIM card



Additional security chip, "Dual chip"



Integrated reader for external smart cards, "dual slot"

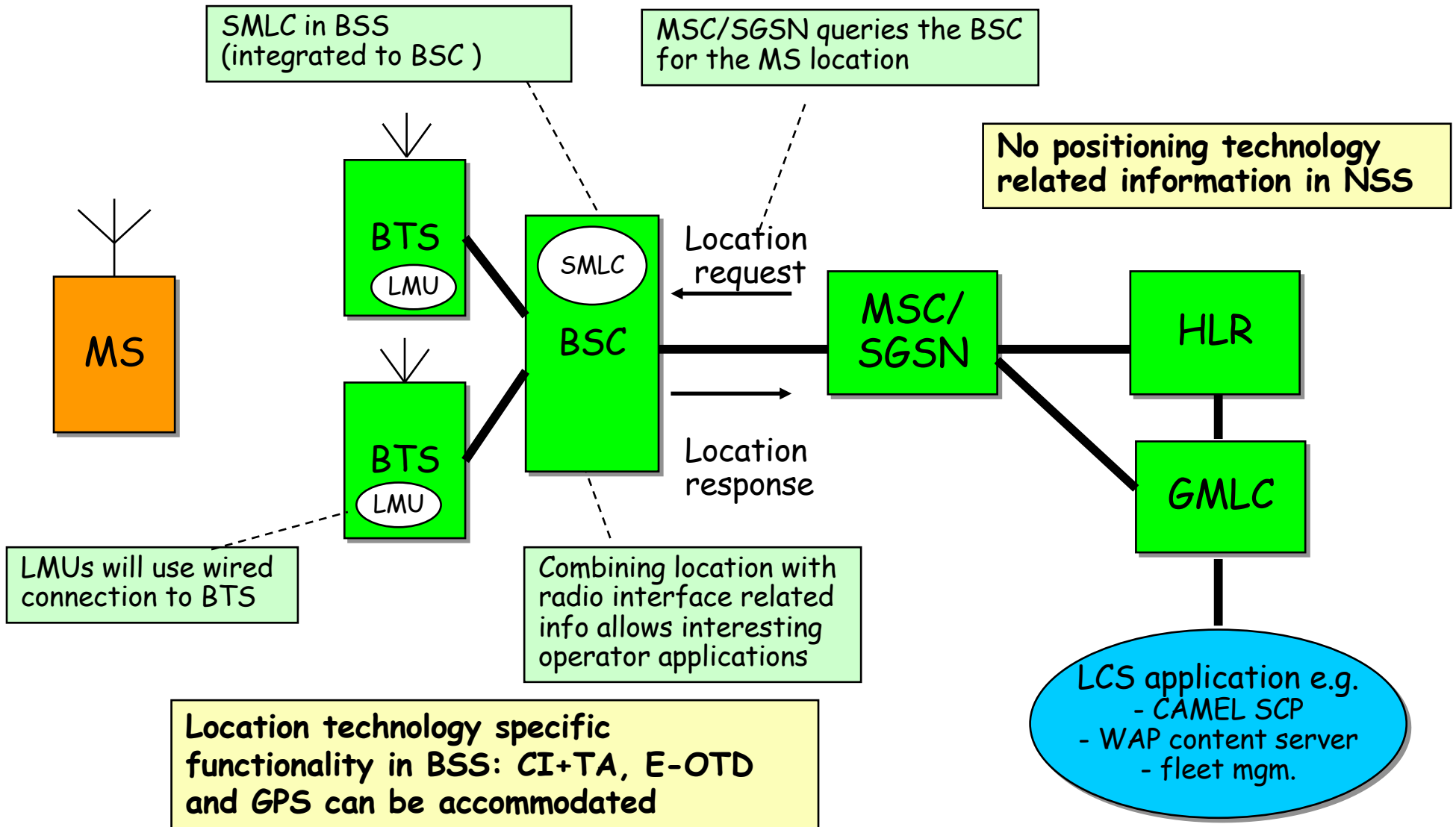


External reader for external smart cards



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Handsets becoming navigators



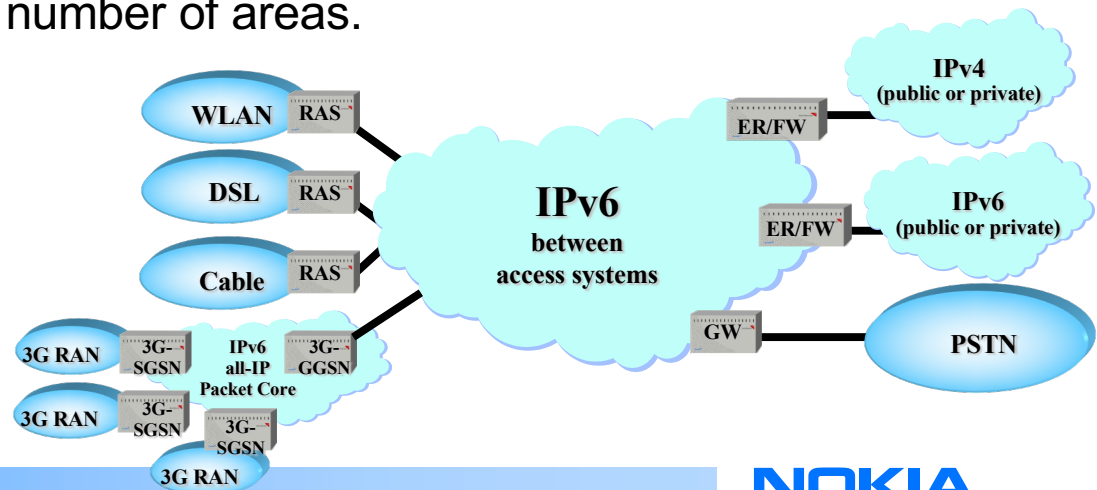
Cellular data rates - hype and reality!

kbit/s	How calculated	Comments
> 600	171.2 kbit/s + V.42 Bis Compression	Encrypted and already compressed data (images) do not compress
171.2	8 Timeslots x 21,4 kbit/s, CS-4	This is theoretical maximum for carrier capacity
149.8	7 Timeslots x 21.4 kbit/s, CS-4	1 timeslot reserved for signalling
115.2	8 Timeslots x 14,4 kbit/s, CS-2	First network implementations support CS-1 and CS-2
100.8	7 Timeslots x 14.4 kbit/s, CS-2	1 timeslot reserved for signalling
43.2	3+1 Timeslot mobile, CS-2	First terminal implementations will be at most 3+1 (3 downlink TSs, 1 uplink). Uplink data rate 14,4 kbit/s
34.6	-20 % protocol overhead	Assumed 80-20 payload-protocol ratio
31.1	-10 % retransmissions	Retransmission rate depends on carrier quality
10-30	Simulations	Simulation results for user data rate

Note: Radio path is a shared media: Carrier capacity ≠ Data rate seen by individual user

IP Version 6: The Basis of the All-IP System

- Huge growth of mobile Internet terminals will exhaust IPv4 address space
 - All wireless terminals will have WAP and GPRS
 - IPv6 brings enough IP addresses
- Ease of scalability
 - Supporting billions of new devices and huge amounts of new bandwidth
 - Simplified, cost-efficient architecture without NATs , Proxies, ALGs,...
- Always-on connection establishes a variety of new services
 - Push, location-based, etc.
- Integrated Security
- Efficiency: IPv6 improves efficiency in a number of areas.
 - Routing, Broadcast handling
- Quality of Service improvements
 - Fragmentation, Flows
- Mobility Across Access Technologies



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**THANKS
FOR
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