WLAN -
The next challenge for Network Operators

MÜNCHNER KREIS

Breitband-Perspektiven

4. November 2003

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Bild: Arraycom

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Outline

1. WLAN Importance
2. WLAN Trends and Challenges
3. WLAN@SWISSCOM
4. Conclusions

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WLAN - More than Wireless Ethernet

The Killerapplication: Internet Access/Surfing

1993

WWW

For Everybody

2003

WLAN

From Anywhere

The ultimate driver for fixed mobile convergence

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WLAN will challenge Telco's world

Not marginally, but tremendously
Similar as Digitisation, Packetisation,
Fibre Optics and Mobile Communication

Drivers

- Exisiting Network Infrastructure
- Emerging WLAN Technologies
- Emerging end Devices
- Mobility – The Megatrend
- Business Models
- Regulatory, Political


WLAN Hot Spot: Base Camp Mt. Everest

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Existing Infrastructure Evolution

Wireless/Mobile Network

GSM/GPRS

UMTS

FBW/WLAN

UWB

Fix Network

LEX
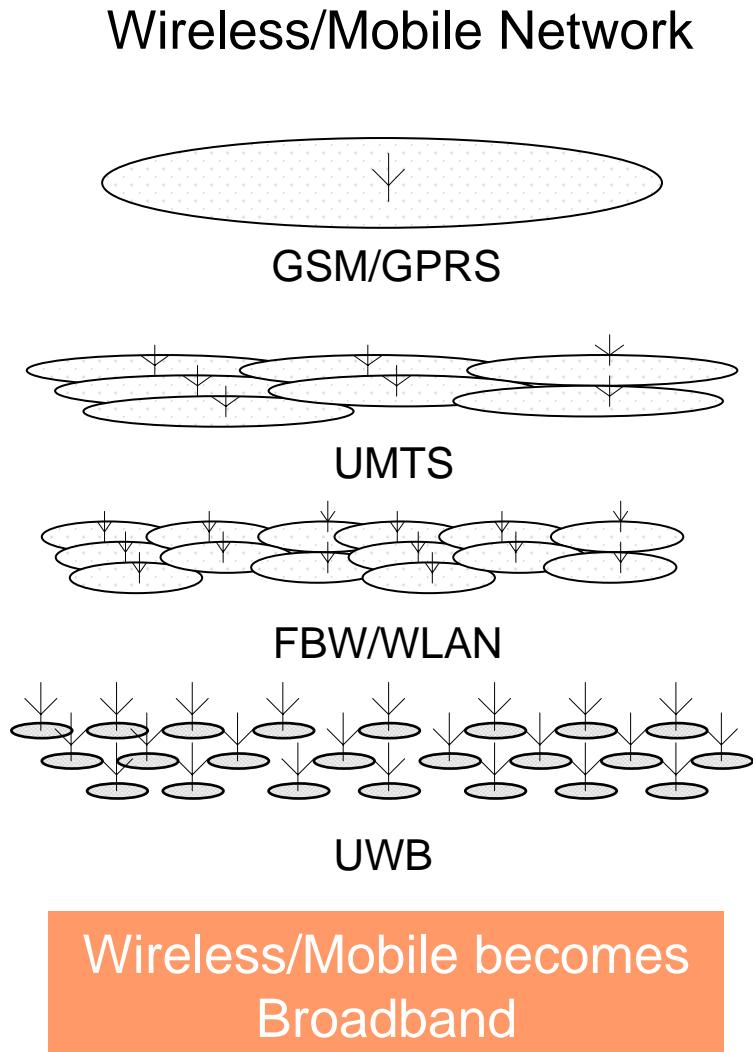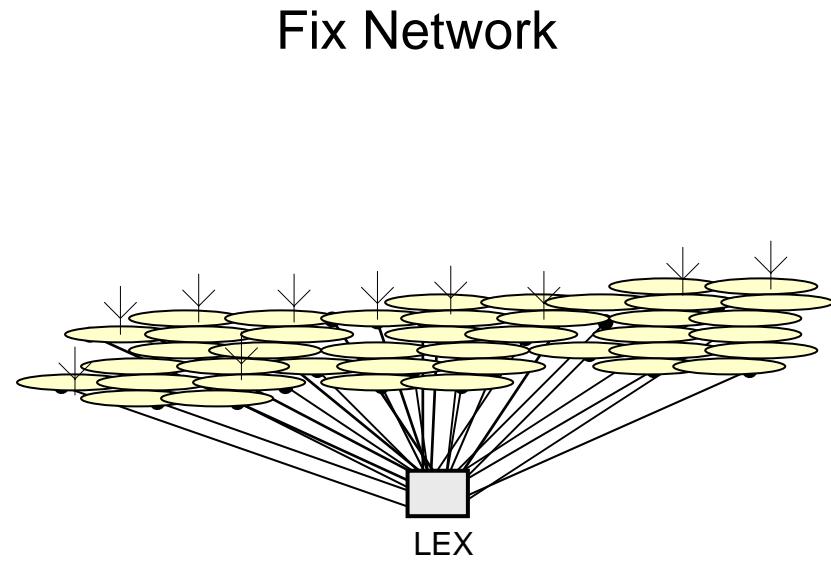
Millions of broadband DSL lines ready to be used as feeder lines for wireless access

Wireless/Mobile becomes Broadband

Broadband becomes ubiquitous and wireless

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The Challenge to deliver more Bandwidth

...

Customer   **Network Operator**

**Hard
Disks**

**PC
Clock**

Core

Metro

LAN

Access

WLAN

DSL
Cable   UMTS

| 100 GB | 3 GHz | 100 Mb/s - 1 Gb/s | 54 Mb/s | | | 10 Gb/s | > 1 Tb/s |

0.5-2.0   384
Mb/s   kb/s

EVOLUTION CONTINUES
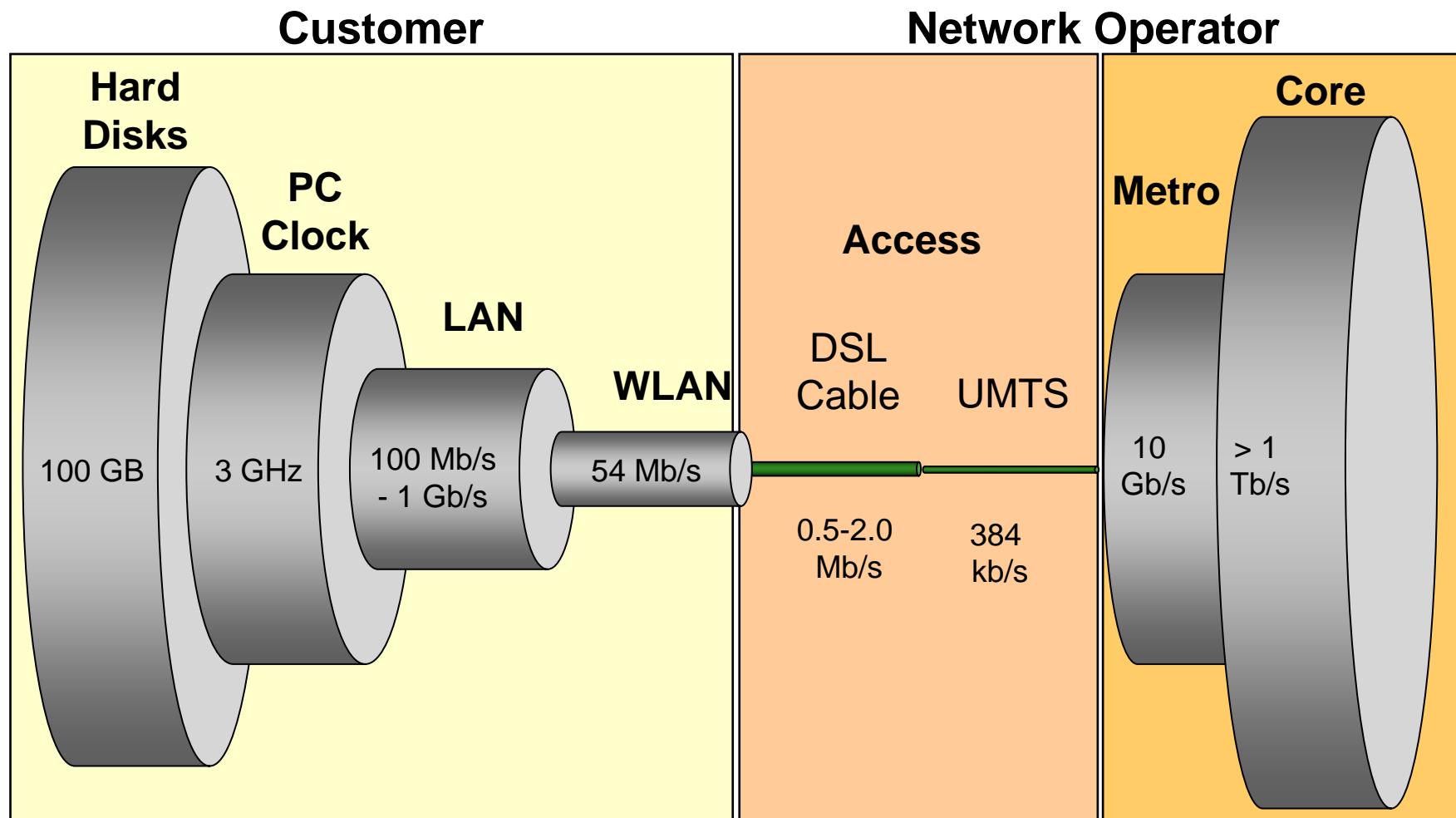
(c) WWW.OHMYGOODNESS.COM ROBERTO MANGOSI

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WLAN Evolution

802.11 cont'd

- a/b/b1/e/g/h/i/n/x

Trends:

- Faster
- More security
- QoS

Becomes better and better …

ViVATO

2 Mbps

3 Mbps 1 Mbps

WiFi Switching

- WiFi out of the switch not Ethernet
- Multiple WiFi Beams

Phased array antennas

RFmagic

Multi Band Radio

- Integrated chip set 1.8 -6 GHz
- GPS, DVB, GSM, UMTS, WLAN, Bluettooth, ….

Multi Access Support

Mesh Networks

- Wireless routers
- Low cost range/ coverage extension
- Organic growth of networks

New Topologies

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The Challenge to choose the Standards...

WAN

IEEE 802.20
(in process)

3GPP, EDGE
(GSM)

MAN

IEEE 802.16
WMAN

ETSI HiperMAN &
HIPERACCESS

LAN

IEEE 802.11
WLAN

ETSI
HiperLAN

PAN

IEEE 802.15
Bluetooth

ETSI
HiperPAN

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Source: Sriram Viswanathan, INTEL Capital, April 2003

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WLAN Security

New device detected

Airbus A300:
Start driver update for the landing gears ?

Yes   Abort
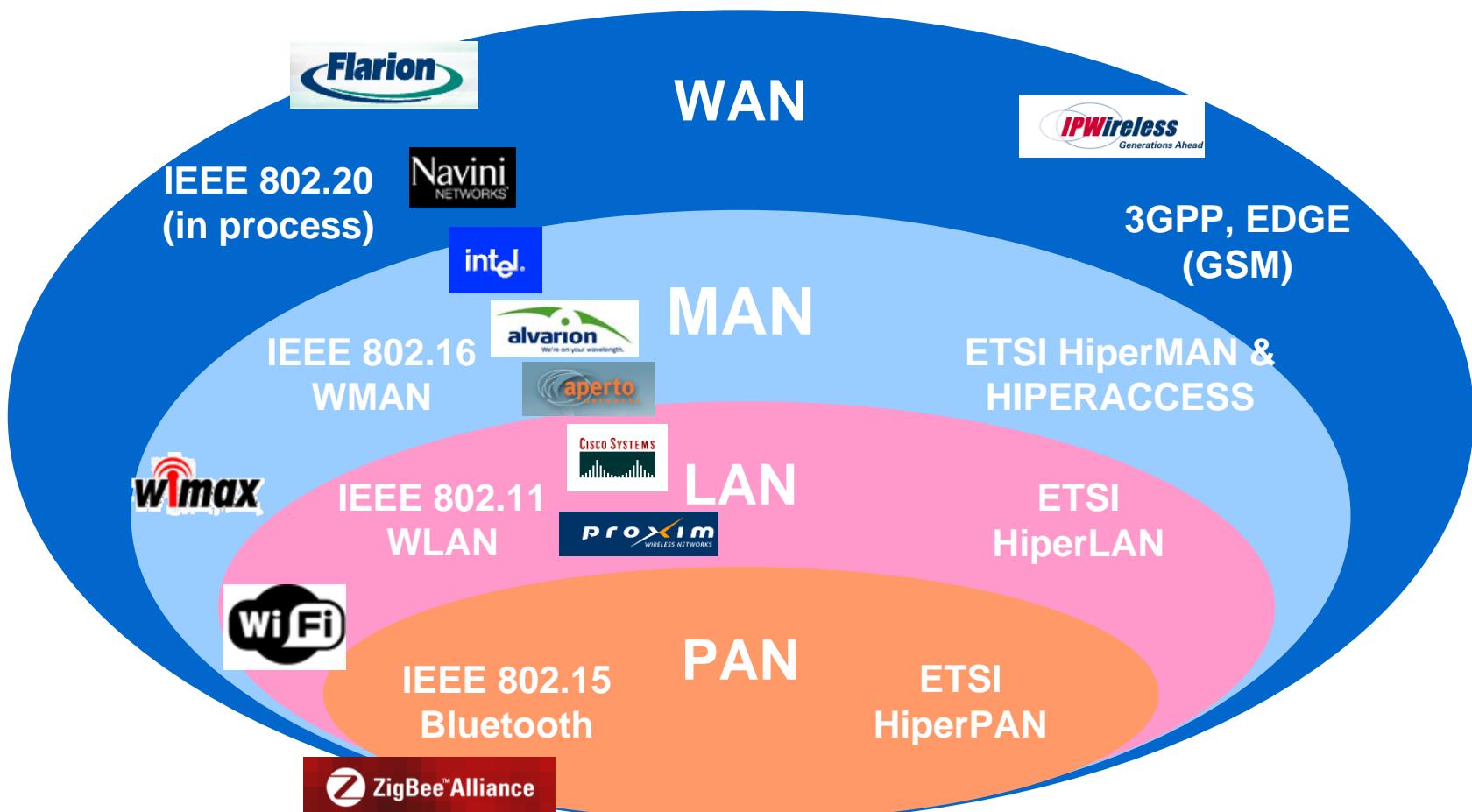
Is WLAN really secure ?
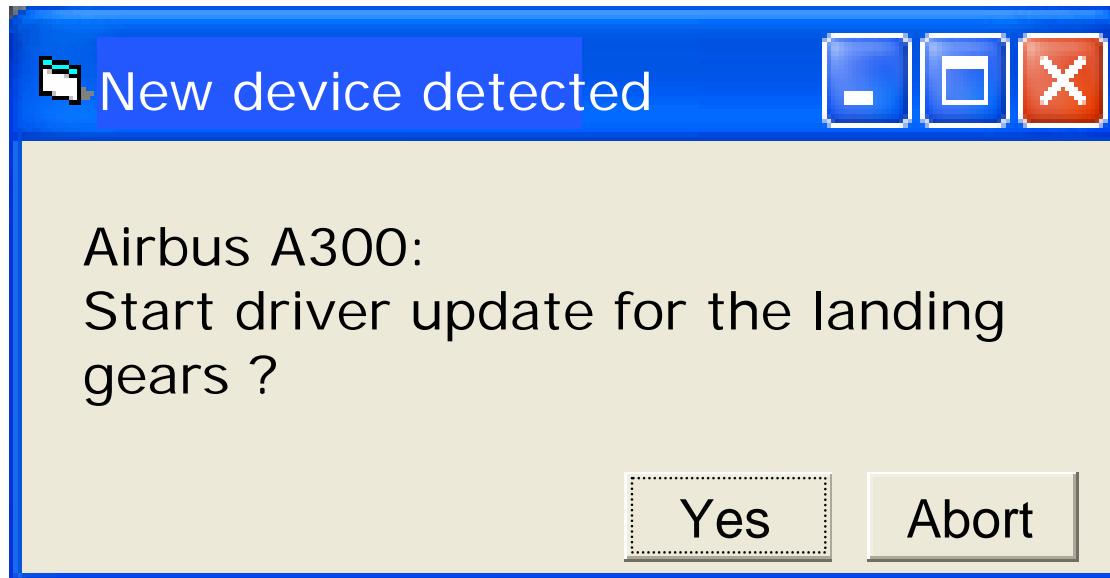
Yes, if one uses the available security options (e.g. WPA, EAP, IPSec-VPN)

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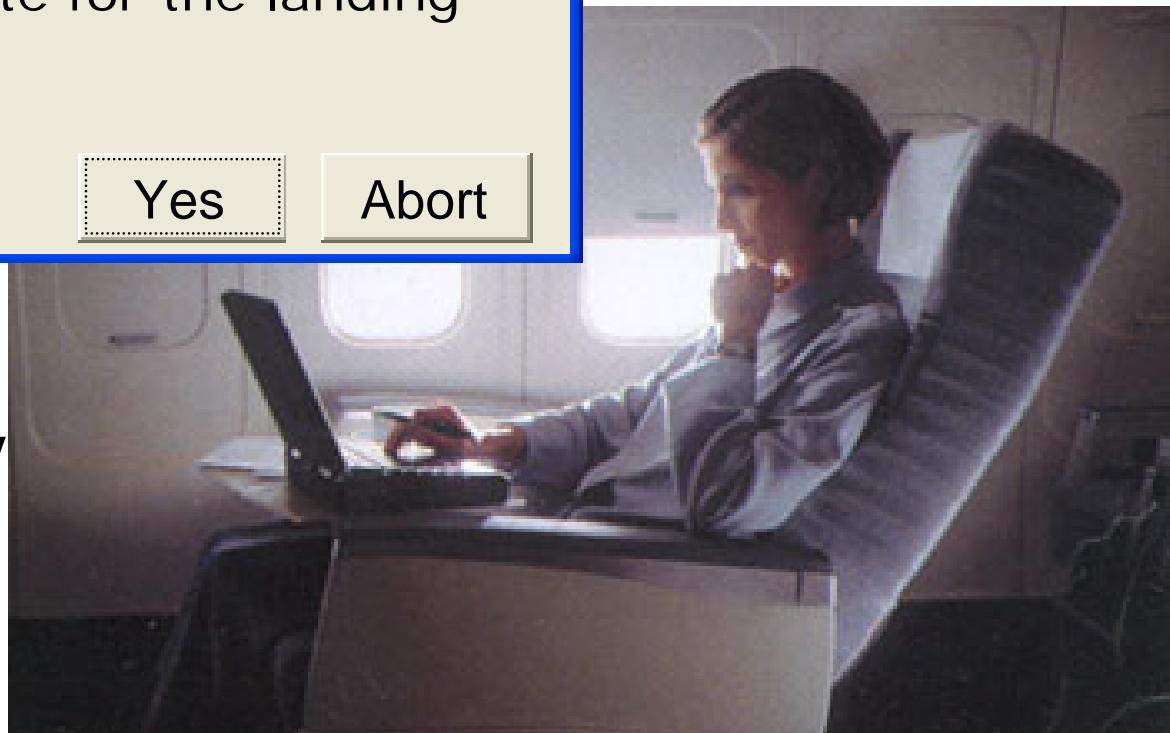
The Challenge to support the capabilities of end devices

Voice/WiFi ?

All PDAs WLAN enabled	WLAN in phones announced

Philips Streamium MC-i250: WiFi enabled Micro Hifi-Anlage mit Breitband-Anschluss

Hewlett Packard: WiFi enabled digital media receiver

WiFi for HiFi	Multi Access enabled

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Mobility – The Megatrend

Business People   Students   Home

PWLAN/EWLAN

HWLAN

WLAN supports a Megatrend

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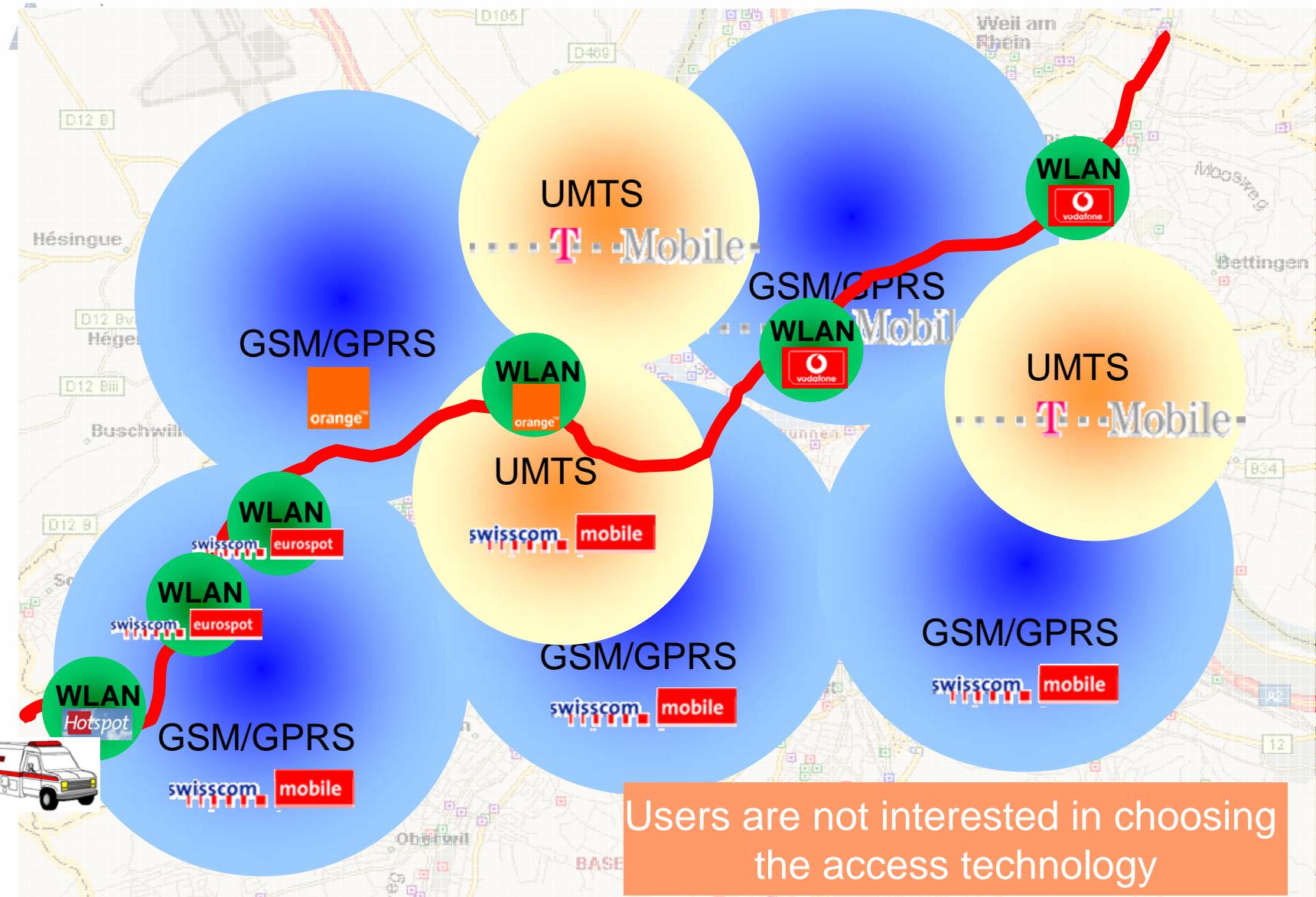
WLAN Business Models(1)

How to make money out of WiFi ?

Fee or Free ?

• Co-existence of free and fee

• Attractive offer for Hot Spot Owner

• Bundling

  • Wireline and Wireless/Mobile

  • 2G, 2.5G, 3G, PWLAN

• Large coverage with roaming partners

• Ease of use: Seamless handover across different access technologies

• Security: e.g. VPN solution

• Wholesaling WiFi

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Ref. http:www.wireless-bern.ch

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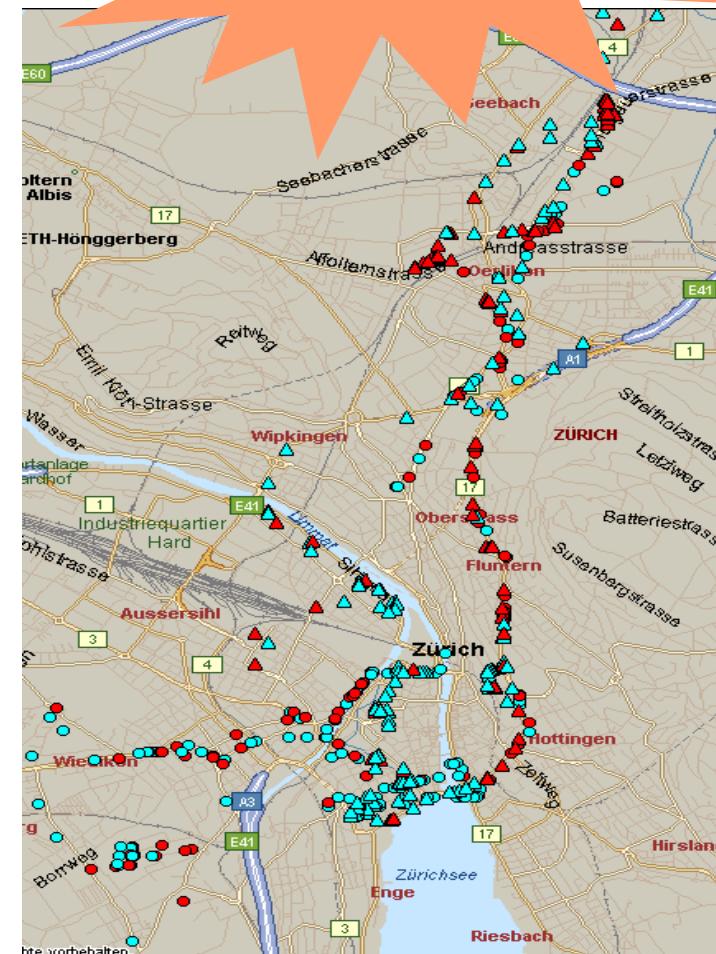
The EU's WLAN recommendation

European Commission adopts Recommendation to promote public wireless broadband services in Europe (March 2003)

- „The R-LAN technology will give European citizens ready-access to the knowledge based society …"
- „… therefore the EU encourages the member states to allow deployement of R-LAN networks"

http://europa.eu.int/rapid/start/cgi/guesten.ksh?p_action.gettxt=gt&doc=IP/03/418|0|RAPID&lg=EN&display=

WLAN is considered by the EU as
the Broadband Enabling Technology
for the future knowledge based society

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Public Wireless LAN
Hotspot

… in Europe

WISP approach
• Radius Authentication
• „IP World"

… in Switzerland

MNO approach
• SIM Authentication
• „Carrier World"

It's not clear who will be the winner: SIM or RADIUS or

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WLAN@Swisscom in Switzerland

Vision:

Mobile Broadband Access, best coverage, speed , security and unified price

Public Wireless LAN

Hotspot

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Internal decision to start: 8/2001
Public launch announcement: 9/2002

Strategy:

• Co-existence GPRS, UMTS, WLAN

• National Hot Spot acquisition

• Business Users

• Access Technology invisible for user

• Pricing: Seamless, Adaptive Flat rate

Status (Nov'03)

• UMTS coverage 50 %

• 350 Hot Spots

• Post- and Pre-Paid, Hotline

• Roaming Eurospot/Telia

• Hot Spot Locator

• Partnership Microsoft/Intel

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WLAN in Train: The Killer Hot Spot

AP1 03

160km/ h

AP1 43
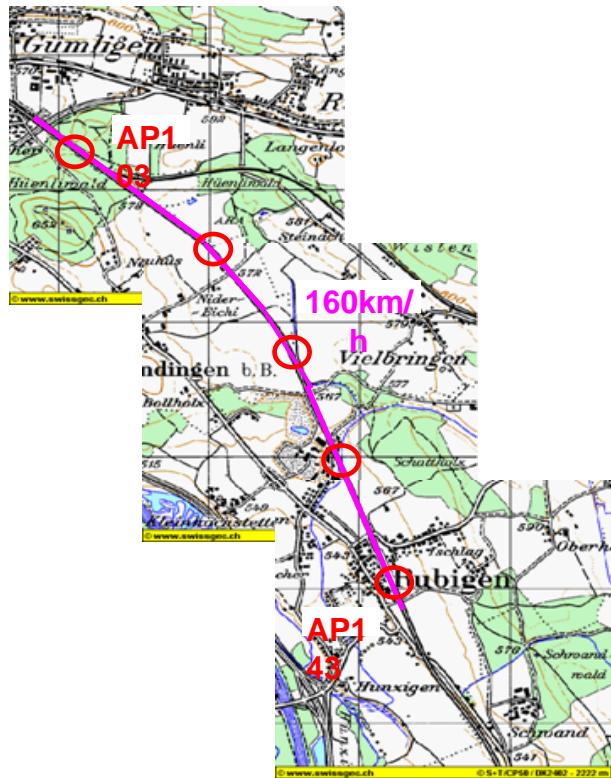
One of the very interesting broadband perspecitves

V = 160 km/h
Throughput measured:
Max.   5.0 Mb/s
Min.   0.2 Mb/s
Mittel: 3.2 Mb/s

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WLAN@Swisscom in Europe

swisscom eurospot

Vision:

Swisscom Eurospot is the leading pan-European provider of broadband internet access for business users outside their office or home

„Business customers need Internet access - everywhere !"

Internal decision to start: 9/2002
Public launch announcement: 3/2003

Strategy:

- Business Users

- Well selected locations with fixed and wireless access

- Roaming: To be the leader

- Pricing: A variety of payment channels under development

Status (Nov'03)

- 2150 Hot Spots (1300 Own)

- Roaming Partners

- Prepaid and credit card

- Hot Spot Locator

- Partnership Microsoft/Intel

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Conclusions

- WLAN opens new broadband perspectives
- WLAN is the begin of ….
  - the mobile Internet, more than 3G promised
  - the Fix/Mobile -, IT-Telco- and IT-Entertainement convergence
- WLAN will challenge traditional business models for network access
- WLAN will blur the borders between fixed and mobile providers
- PWLAN must be bundled with other fix and mobile Services
- Access Technologies must be invisible for the end user

„WiFi – the wireless extension of Ethernet – can be the foundation of a grand vision: Ubiquitous broadband mobility „

Paul. S. Henry, Hui Luo,
AT&T Labs Research, Dec. 2002

Thank Thank You

THANK YOU

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