



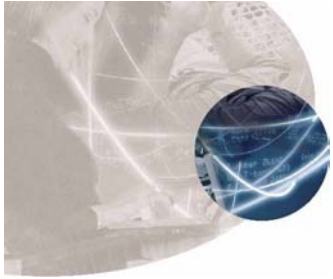
WLAN Hotzone Opportunity for operators & service providers

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CTO
Radionet**



Agenda

- Radionet introduction
- WLAN Hotspot market overview
- WLAN Hotzone concept
- Benefits for Hotzone counterparts
- Hotzone deployment steps
- Examples from Finland
- Hotzone technology overview



Radionet Ltd.

a company with.....



....wireless technology for the future available already today



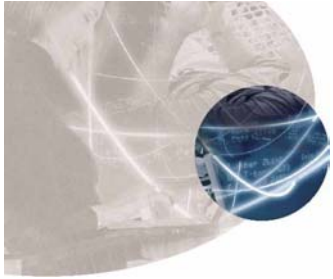
Company overview

- Provider of advanced WLAN products
 - Base stations for outdoor 802.11 access (2,4 & 5GHz)
 - Antennas
 - Network controller
 - Radionet Open Source Environment (ROSE)
 - ▶ Embedded WLAN AP platform SW
- Products optimized for large scale Metropolitan Area Networks (Wi-Fi Hotzones)
- Operations in Finland and Sweden
- International sales through distributor and OEM partners

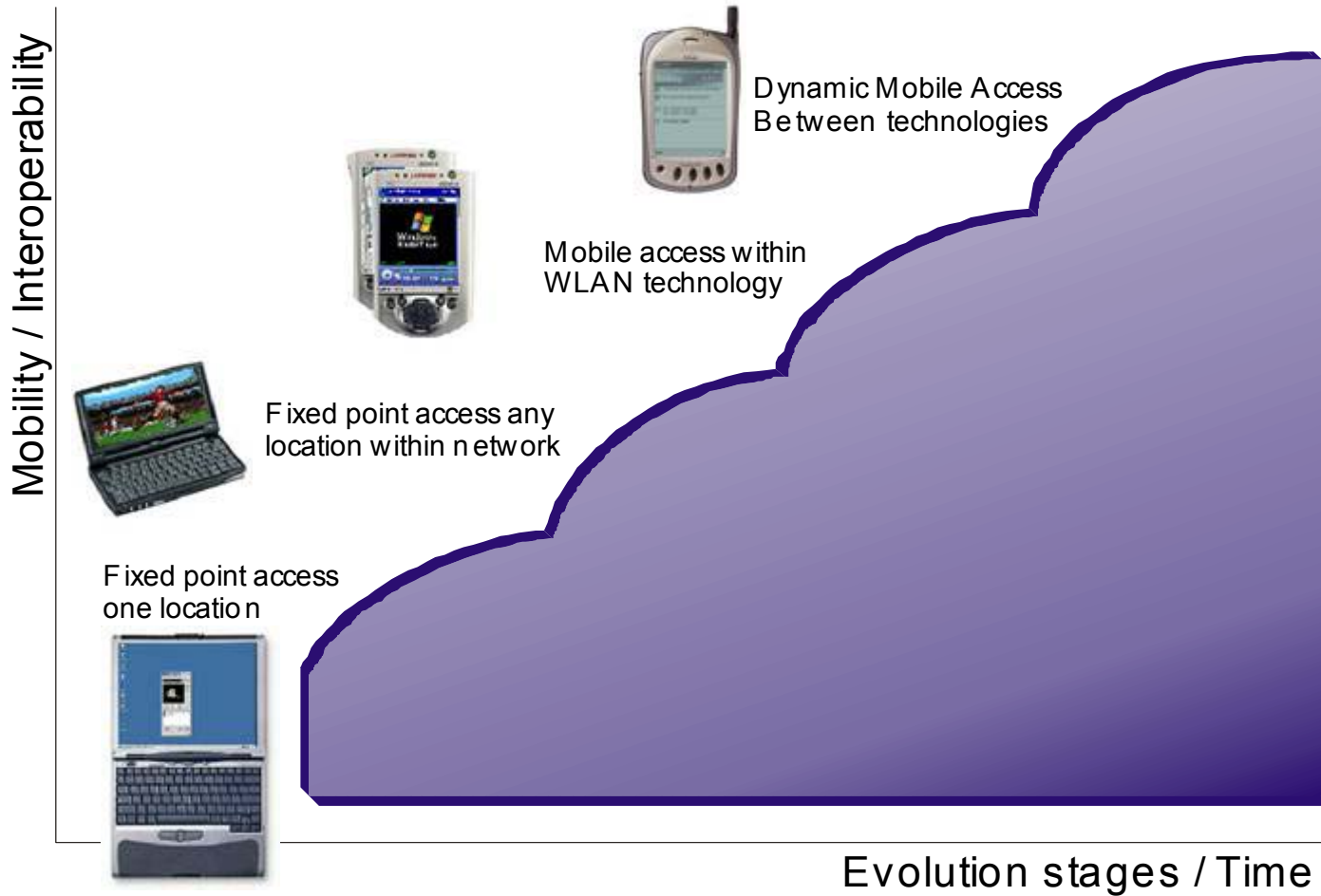


Company profile

- Privately-held Company: founded 2000
- Mission
 - to develop, produce and market carrier grade wireless products and solutions
- Competitive advantage
 - Robust AP design for carrier grade outdoor usage
 - Mobility - intelligent hand-over mechanism enables high network stability and seamless end-user movement in routed networks
 - Intelligent AP solution – FW, routing, QoS.....



Development of Broadband Wireless Access





Public Hotspot market

- The computer industry is working hard to broaden the acceptance
 - The Wi-Fi hardware is already commoditized (802.11b)
 - Intel Centrino hype helping here
- The networking industry is supporting the roll-out of public access
 - Key factors are lower cost and ease of installation
- Many large operators have announced Wi-Fi plans
 - SBC, Verizon, BT, Swisscom etc.
- Customers are using the service when it is there
 - CAGR is expected to be 112% annually over 2003-2007 (IDC)
 - Few users have subscriptions, most use pay-as-you-go
 - Hotels with Wi-Fi average 8-15% usage
- Public Wi-Fi somewhat over-hyped, taking some back-lash now



Public WLAN is an important opportunity

- Effective data transmission technology
 - Can provide several Mbit/s to the user
- Low capital costs
 - Low & falling price of equipment
 - No spectrum costs - no coverage targets
- Demand for wireless data
 - Poor substitutes (slow, expensive, inconvenient)
- Applications already exist
 - ▶ Infotainment content - WWW
 - ▶ Communications - email
 - ▶ Biz-apps - CRM, ERP, intranet

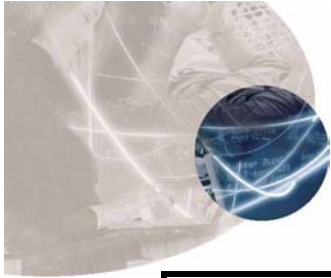


of Hotspots per Region

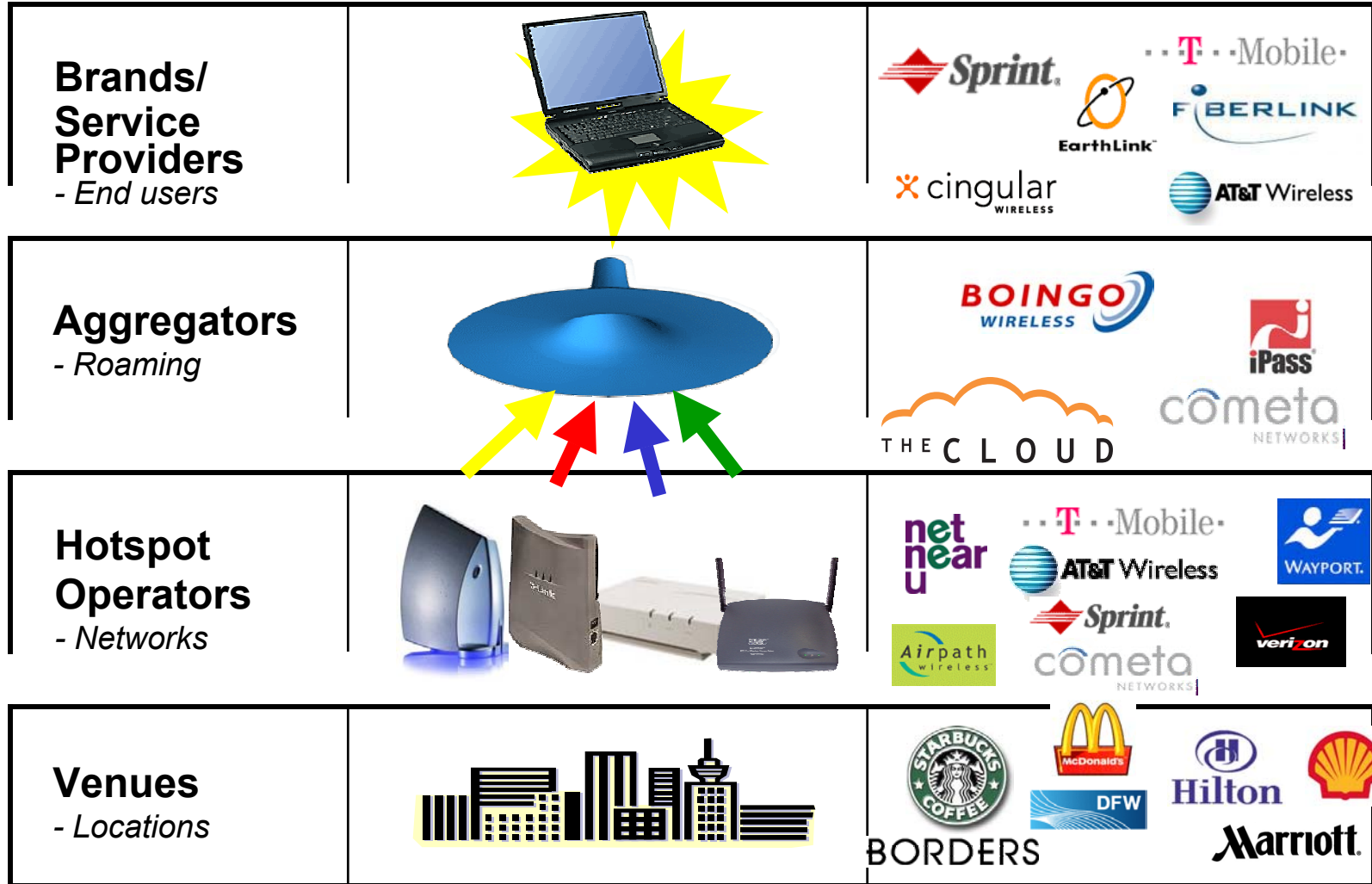
# of Hot Spots	2001	2002	2003	2004	2005	2006	2007
Europe	50	1,000	5,000	9,400	17,700	24,000	28,200
Americas	750	4,000	18,000	30,000	45,000	55,000	62,000
Far-East	100	10,500	25,000	51,500	69,000	83,000	93,000
ROW		500	1,000	2,100	3,300	5,000	6,800
Total	900	16,000	49,000	93,000	135,000	167,000	190,000
Growth Total		1678%	206%	90%	45%	24%	14%
Growth Europe		1900%	400%	88%	88%	36%	18%

Source: IDC + various other sources

Note: Europe is catching up this year

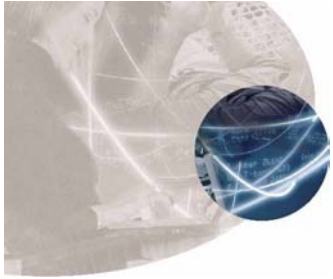


Hotspot Market Segmentation



Courtesy¹ Boingo Wireless
Telecommunications Forum





Hotspots per Location

	2001	2002	2003	2004	2005	2006	2007
Airports	75	200	400	500	600	650	700
Hotels	520	2,500	9,000	20,000	30,000	40,000	45,000
Retail outlets	320	12,000	44,000	60,000	75,000	85,000	90,000
Enterprise Guesting Areas	84	600	1,000	4,000	5,000	6,000	8,000
Transportation (trains, planes)		100	600	2,000	14,000	23,000	30,000
Community Hotspots	1	300	3,000	5,000	8,000	9,000	12,000
Others		300	1,000	1,500	2,400	3,350	4,300
Total number of hotspots	1,000	16,000	59,000	93,000	135,000	167,000	190,000

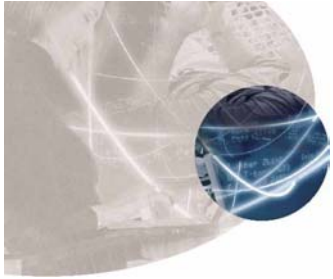
Source: Gartner

Note: status per 01-Jul-2003 estimated at 10,000
of which 12,000 in South Korea



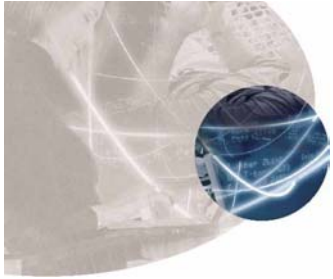
Land grab - going on right now

- Asia
 - Korea dominates in hot-spot deployments with 8,500 in place via Korea Telecom
 - China and Japan also quickly deploying
- Followed by the US
 - Cometa (Intel, IBM and AT&T backed) to become Hot-spot operator, planning to deploy 20,000 hot spots by 2004
 - T-Mobile operating at Starbucks 2,100 coffee shops (of 3,645 total) and recently signed up Kinko's
 - Starbucks also uses the network for it's field managers



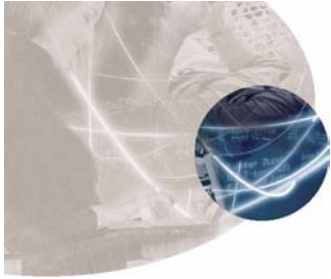
Europe expanding rapidly

- All major European operators either deploying/branding or planning to deploy/brand
- Swisscom Eurospot is making a run for the European hotspot market
 - Purchased smaller WISP's such as Megabeam, Aervik etc.
 - Acquisitions gave it footprint in the UK, Germany, NL, Belgium, Switzerland
 - Significant investments for unclear returns
 - Have already migrated to a wholesale approach
- In the UK BT is most active
 - BT Openzone working with The Cloud on deployment of up to 21,000 hot spots in UK pubs and restaurants
 - Also signals that BT Openzone will start wholesaling to their competitors
- T-Mobile is the market leader in the US, becoming active in Germany
 - Known to be making significant investments
 - Not clear about the customer take rate or level of profitability
- France (Orange etc) is running its own projects
 - The French Operators (Orange, SFR etc.) are cooperating



Hotspot Market Trends & Issues

- Estimated some 250 – 300 operators in place today
 - Expect consolidation
- Hardware providers stand to gain
 - Proxim, Nomadix, Colubris, Toshiba etc.
- Roaming and billing issues not yet resolved
 - France showing a leadership position on interoperability/roaming within local market (Orange, SFR and Bouygues Telecom)
 - Several operators do not support roaming (BT Openzone, T-Mobile)
- Recognition of opportunity for service providers in the enterprise
 - Offer guest user access in the enterprise
- **Expansion from Hotspots to Hotzones**
 - Covering downtown areas or small villages



What is a Wi-Fi Hotzone ?

- **Be online everywhere**
 - city-wide, campus coverage
 - at home, at work, at hotspots, public places and in-between
- **Seamless mobility between coverage cells**
- **Easy, Secure & Affordable**
 - easy login, affordable price
- **Roaming with other Hotzones**
- **Instant Access for visitors**
- **Not only access services**
 - VOIP
 - Location based services
- **Wide user base**





Why do we need Wi-Fi Hotzones?

- **Need**
 - wireless data becomes like needs for wireless voice
- **Productivity**
 - people working on the move
- **Last mile access**
 - complimentary, where wires not available or too expensive
- **High speed wireless data**
 - 3G & 2,5G today not suitable
- **Future**
 - WLAN is one major access technology in the heterogeneous networks



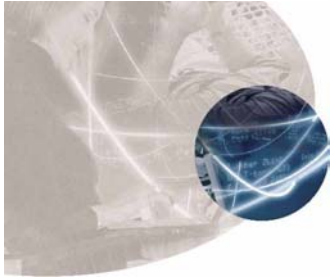


Zone: Outdoors



- Areas where people are living, spending time or visiting
- Attracts monthly subscribers, visitors and roaming users
- Gives additional revenue for operators, venue owners & service providers
- Special services for each area
- Easy to expand to city-wide access areas for e.g. FWA

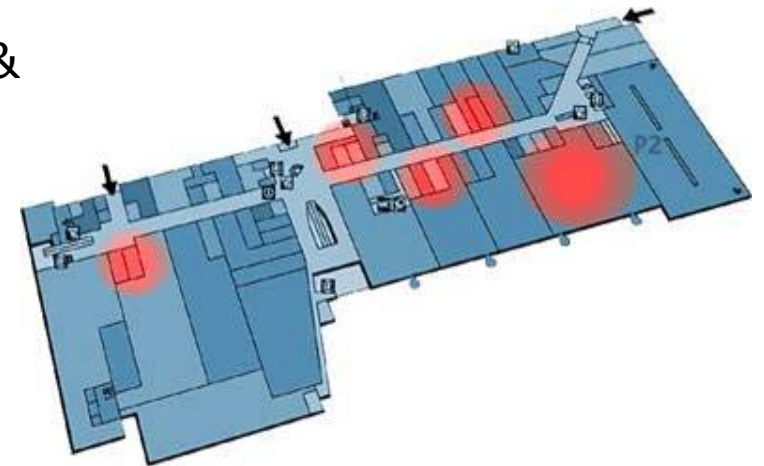


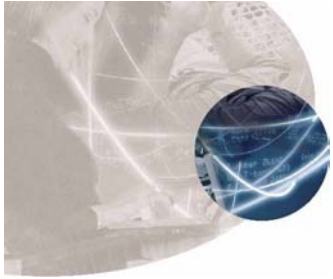


Zone: Indoors



- Cafés, Public areas, Shopping malls...
- Common brand (Wi-Fi Hotzone)
- Easy to find and to use
- Attracts visitors and roaming users
- Gives added revenue for operators & venue owners
- Location based services – not only access

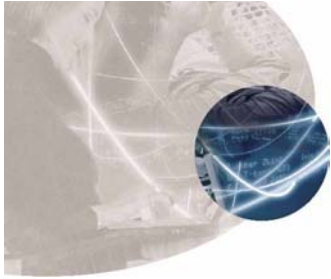




Zone: Enterprise & SMEs

- Public and private WLAN within an enterprise
- Services:
 - Company visitors access
 - Possibility to use all Hotspots in a Hotzone
 - Roaming
 - VOIP
 - VPN



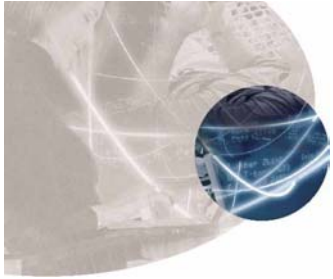


Zone: Homes



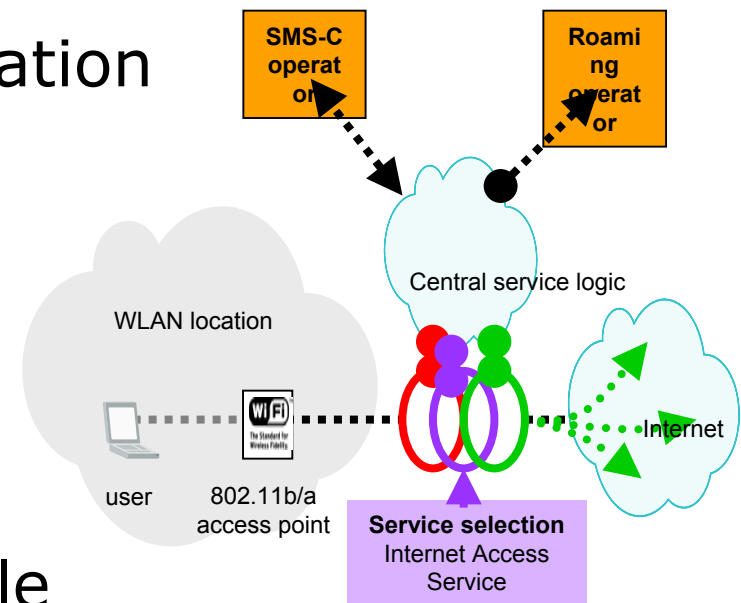
- Homes with fixed wireless or wired Internet access
- Small & cheap home APs
- Wired Internet users (xDSL, HomePNA...) can be included in the Hotzone service provisioning as well
- Different price categories per QoS or access type
- Fixed Internet access subscribers create stable income
- Homes can become small Hotspots as a part of Wi-Fi Hotzone

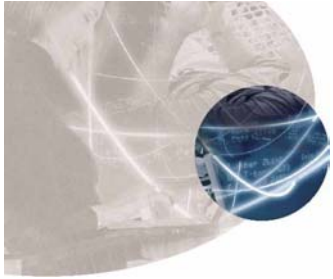




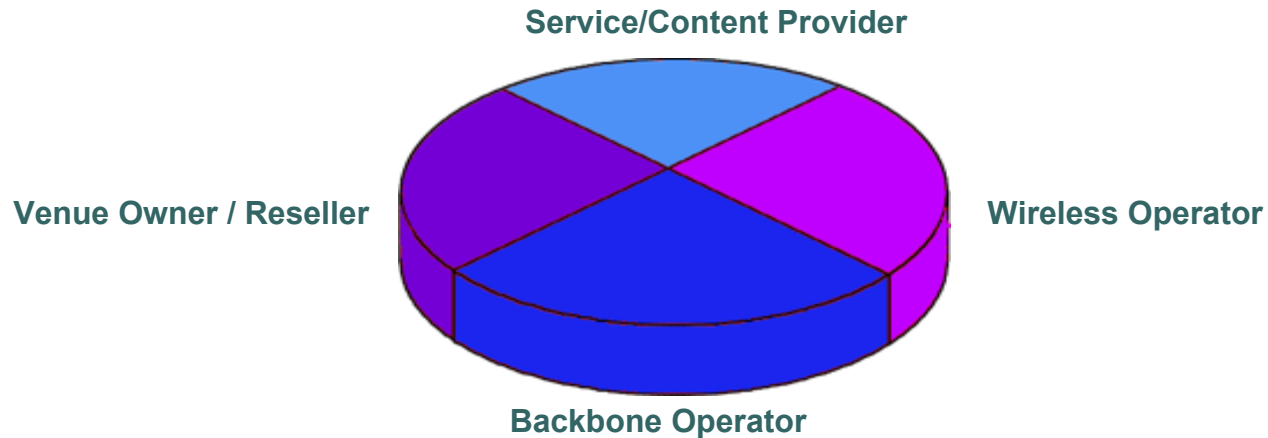
Advanced Provisioning Features

- To support all types of Wi-Fi users
- Centralized user administration
- Centralized billing and accounting
- Flexible payment methods
- Unified multiple methods authentication system
- Roaming enabled for mobile subscribers

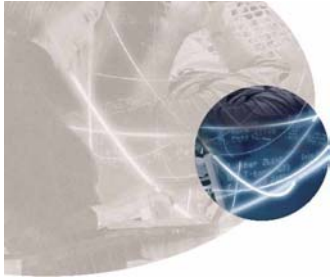




Wi-Fi Hotzone Counterparts



- Revenues are shared between the counterparts
- Every party has it's own role and own business model
- In some cases, some or all of these counterparts can be the same company vertical integration
- Enabling new type of business for service providers



Benefits for Hotzone End User

- Increase personal efficiency
- Mobility / portability
→ Access where-ever and when-ever
- Easy to get and use
- Affordable prices
- Good Security
- Reliable services
- Fast connections





Benefits for the Operator

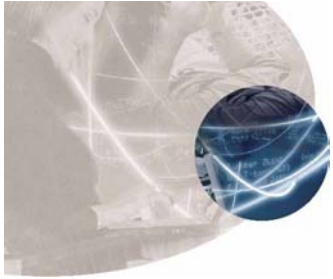
- Increased revenues by new type of service offer
- Fast time to market
- Low entry for new operators
- Free up GPRS data load in existing mobile network
- Platform for creating new business (M-2-M, logistics..)
- Share WLAN infrastructure (Virtual Operators)
- Expand user base by roaming and instant access
- Location based services
- Extensive growth path



Benefits for venue/site owners

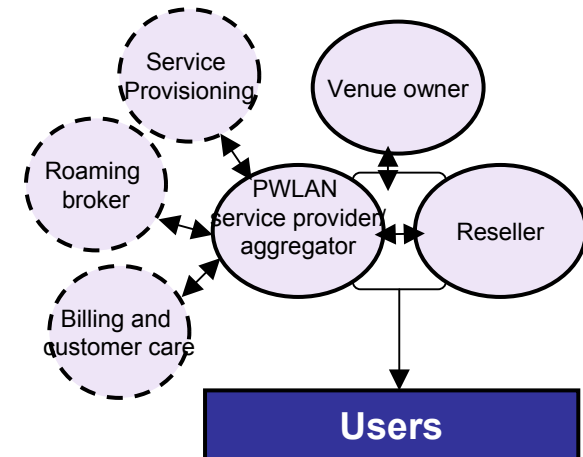
- Attract more people to the venue (Hotspot)
- Increase value of the property
- Revenue sharing with Hotzone operator
- Raising brand and image

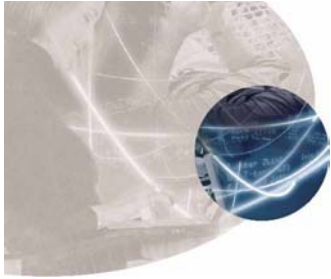




Whole sale business model

- Wi-Fi Hotzone concept
 - Combination of business models
 - Large WLAN coverage
 - Monthly subscribers & temporary subscribers
 - Several paying methods
 - ▶ Monthly fee
 - ▶ Mobile phone payment
 - ▶ Credit cards, scratch cards...
 - Organized user support
 - Additional services
 - ▶ WLAN roaming
 - ▶ VOIP
 - ▶ Localized services





Implementation steps of large scale Hotzones

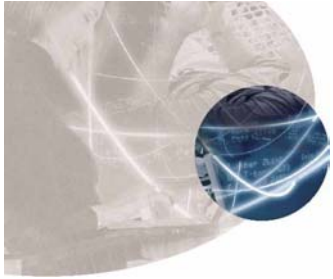
- Create a solid business plan
- Team up with the right counter parts
- Make professional network planning
- Attract venue/site owners
- Attract local PC or mobile phone retailers for subscription and HW sales
- Ensure customer support that can deal with totally new type of questions
- Make up a marketing plan together with the counter parts
- Invest in or carrier grade WLAN infrastructure and provisioning system





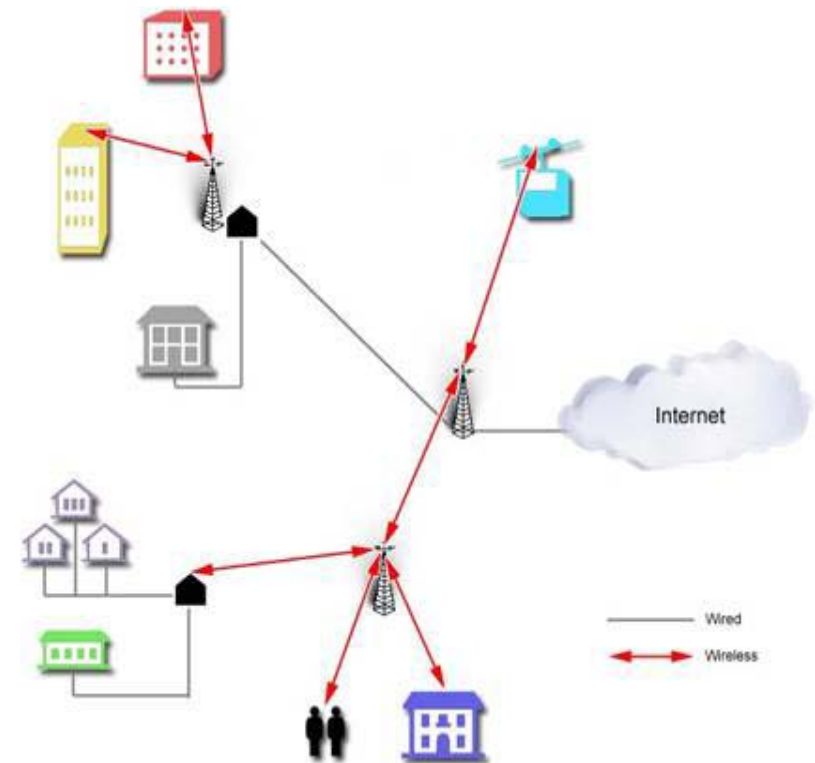
Challenges for Hotzone operators

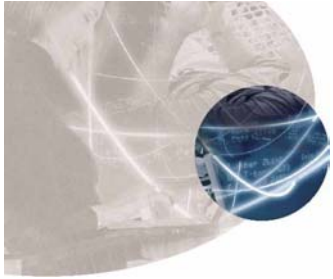
- Unrealistic expectations
- Business model not always clear
- Service differentiation – access only is usually not enough
- To cope with continuously developing technology and standards
- To build/source a well working subscriber support organization



Combination of technologies for creating Hotzones

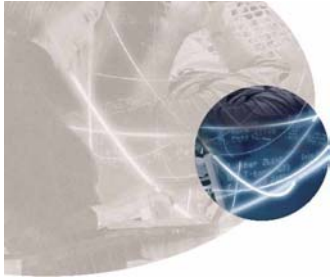
- Transmission network consist of wired and wireless alternatives
 - WLAN, WLL, 802.16...
 - Fiber, xDSL, DOCSIS, Ethernet...
- Multiple last mile alternatives
 - Wireless (FWA)
 - Wireless – xDSL-wireless
 - Wireless – HomePNA-Wireless
 - ...
- Wi-Fi access for end users





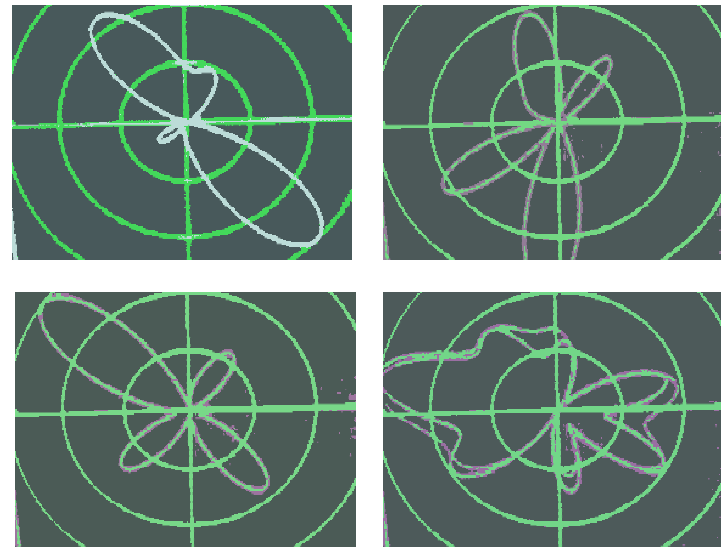
Conclusions

- Number of Wi-Fi users will grow dramatically
- People expect to get WLAN connection at work, at home and in between
- Number of Wi-Fi Hotzones will grow strongly
- Roaming between WLAN operators is a critical success factor
- Flexible payment methods (free zones, pay per surf, pay per month...)
- New location based services – not only Internet access
- Integration /close co-operation between mobile operator and WLAN operators foreseeable



Thank You

Time for Q&A



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