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WiFi - The Opportunity



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Wi-Fi - THE OPPORTUNITY



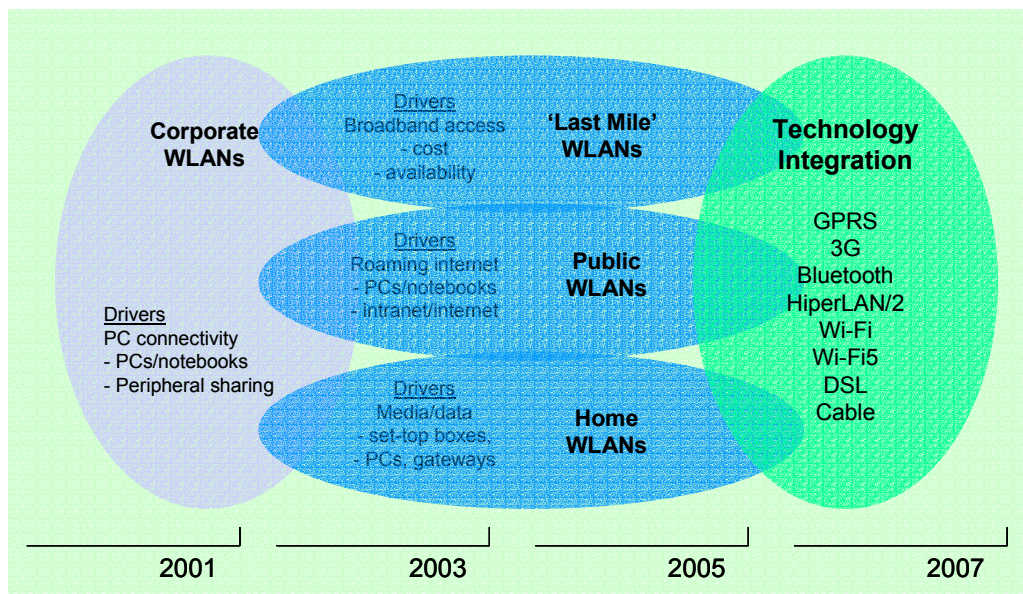
. . . information you can do business with

Wi-Fi

The Opportunity

The commercial success of the Wi-Fi (802.11b) standard has accelerated the growth of the WLAN market, and expanded its potential into new application areas and vertical markets. Today's WLAN market is multi-faceted, and incorporates a very wide range of sectors and applications. The initial focus on the corporate sector still remains, but it has spawned three other major growth areas - 'last mile' broadband access, public hotspots and Home networking. In three or four years time many of the competing networking technologies of today will be integrated into access points and devices to enable seamless connections between different technologies.

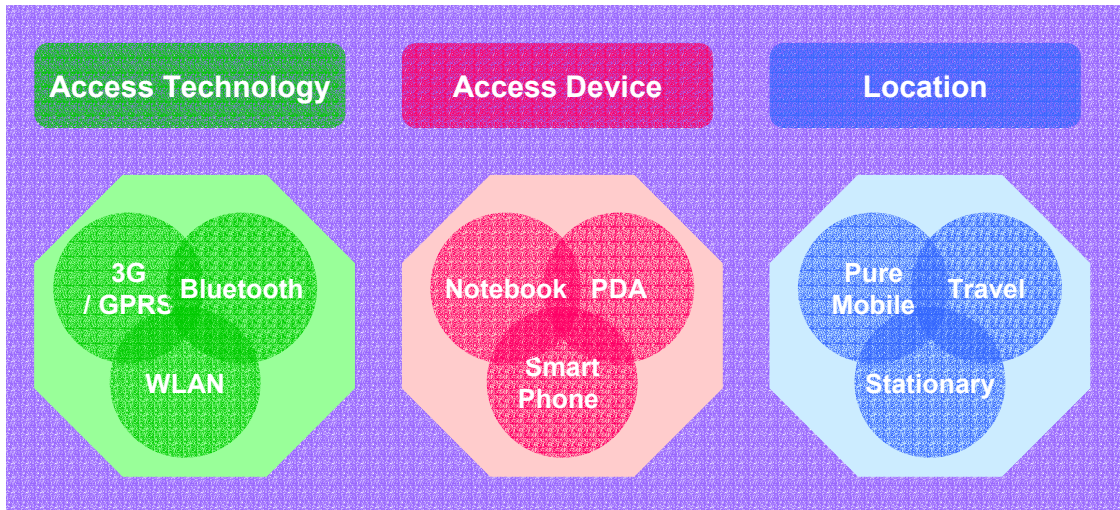
Figure WP1: WLAN Evolution, 2001-2007



Source: Juniper Research

The nomadic and mobile user will increasingly have the choice of accessing the Internet wirelessly, whilst out of the office or away from home. They will need an access device that is capable of wirelessly connecting to an appropriate network. This maybe through a mobile phone based device, a PDA or a computer notebook. Increasingly over the next five years, these three separate forms of mobile device will begin to merge and become increasingly similar in functionality and form, although there will always be a market for low and high end devices, as well as devices offering particular strengths and specialist options.

Figure WP2: Access Technology Choices, Device Choices & Location Variables for the Nomadic User



Source: Juniper Research

The choice of access technology will increasingly become part of the device choice. Already notebook computers and some mobile phones are being sold with Wi-Fi and Bluetooth (a short range radio Personal Area Network) technologies embedded within the device, or with the appropriate cards pre-installed. Already 3G (high speed, always on third generation mobile communications technology) capabilities are being added to mobile phones and other capable devices. During the early part of the forecast period, most of these devices will be installed with only one form of wireless access technology due to reasons of cost, technical barriers (eg battery life) and/or a particular vendor's prior association with a specific technology. As the years roll on, and component prices fall, device vendors will increasingly pre-install multiple wireless capabilities into their products, with hybrid wireless devices becoming the norm.

Juniper Research's forecasts reflect today's product categorisation and capabilities of laptops, mobile phones and PDAs. These devices are generally considered to be separate entities, with different purposes and uses. It is very likely however that during the later part of this half decade, these devices will begin to merge in functionality terms and market focus. Clear distinctions between many of the devices available will not be apparent. In addition, WLAN capabilities will become standard in some devices, and available as an add-on card in others. Our forecasts are intended to provide today's reader with an appreciation of the potential market size, and the types of devices that will have WLAN capabilities.

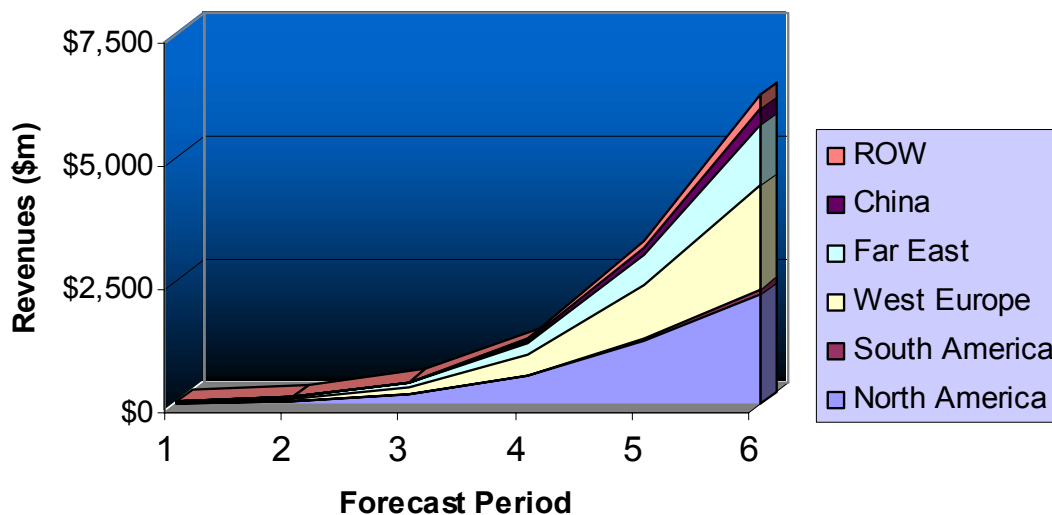
Commercial Wi-Fi Hotspots

Wireless Internet Service Providers, or WISPs, are rapidly deploying networks in the 'Public Space', or 'Public Hotspot' sector. A 'Hotspot' is a location that offers wireless Internet access to people who have devices with WLAN capabilities. Currently only laptops / notebooks and some PDAs can be upgraded with a WLAN card, or are sold with an in-built WLAN capability. In addition, it is felt that some mobile telephones will be able to connect to these hotspots via their Bluetooth (a PAN technology) capability, or through a WLAN capability.

Examples of hotspots include hotel lobbies, coffee shops, convention centres, petrol stations and airports. This subject is covered in much greater detail in our report 'Commercial Wi-Fi Hotspots'.

There is already ample evidence that this market that this sector will be hotly contested by both the mobile wireless and the fixed telecoms players. Hotspot numbers are growing rapidly, with deployment announcements being made almost weekly, with some very grand roll-out plans by Cometa, BT and the like.

Figure WP3: Revenues (\$m) Accruing From Total Commercial Hotspot Users. Worldwide Forecast by Six Geographic Regions, 2003-2008



Source: Juniper Research

Our forecasts show that the world market will generate a total of \$6.2bn by 2008, with the majority of revenues arising from the North American and West European markets. Juniper Research believes that the pioneering US market will continue to expand, with West Europe, the Far East and China offering huge potential. The sector will increasingly attract the attentions of the more established mobile and fixed operators, with structural consolidation inevitable, and roaming capabilities introduced across markets. Detailed analysis of this sector can be found in Chapter 4.

Already a number of international restaurant / café / bar chains have announced partnerships with Wireless ISPs, but a word of caution when estimating the size of this sector. The deployment figures for many locations include more than one hotspot. Airports for instance will have different hotspots operating in each of the main airline lounges, and terminals. Hotels may have hotspots covering the business centre, meeting rooms, restaurant/bars, and leisure areas. These large deployment numbers however must not be confused with revenue and profitability potential. Juniper Research believes that locations attracting business travellers will continue to be the most profitable for W-ISPs. Airport lounges and public areas, together with convention centres and business hotels will offer the greatest margin potential, and become the focus of contention by the major WISPs and mobile operators. Café / bar locations however, offer a much less robust business case, and many will no doubt prove difficult to attract subscribers. It maybe that some W-ISPs and property owners will regard particular locations as loss leaders, and concentrate more on the marketing benefits of offering 100% coverage across all outlets, as part of their promotion. The advent of mass market Wi-Fi enables phones however could profoundly close or reverse the revenue/profitability difference between business focussed hotspots and consumer focused hotspots.

Last Mile WLAN

In addition to Hotspot provision, WISPs are using WLAN technologies to provide 'last mile' broadband access. This unconventional application for WLANs is difficult for many inside and outside the industry to accept. WLAN has previously been neatly 'pigeon holed' into the traditional role of a wired LAN replacement technology, and applications outside this use have been viewed with suspicion by some. However, a large number of enterprising Internet service Providers (ISPs), have shown that WLANs can be very flexible, and can be used to provide robust services to communities, businesses and consumers. Reminiscent of the early pioneering days of the internet, small WISPs, now number in their thousands, offering 'free' community connections, or full commercial services to businesses and residential customers. Despite potential market inhibitors like radio interference and line of sight limitations, Juniper Research believes that the sector has a significant growth potential. The use of 802.11a (5GHz) and the 802.16 standard will play an important part in this sector.

The fundamentals of WLAN technology make it a good 'last mile' access solution for small ISPs who wish to provide broadband access without investing large amounts of capital in infrastructure. This makes it an ideal solution for rural locations and developing economies, where a digital wired infrastructure is not widely available.

The Challenges

Amongst the many mountains to climb for the worldwide high-tec industry of 2003, are those of confidence, profitability and stability. The industry must address each of its customer groups and re-build the shattered confidence that has been spectacularly lost over the past two years. The following table lists a few of these issues, with particular focus on the WLAN sector, and its growing but fragile success.

Table WP1: Industry Challenges

Roaming & Seamless Integration

True roaming on a regional, national and international basis is a strategic necessity for the medium and long term survival of the industry. Seamless integration between service areas will be as important as seamless integration between wireless technologies. The industry has an opportunity to get this right first time, and must not let the wider market feel that this yet another false dawn.

Service Offers

Wireless ISPs, in their struggle to make their business models work, must not stifle this embryonic market through unreasonable pricing and terms of service. Users must be encouraged to extol the many virtues of WLAN connectivity, and feel they are getting value for money. This market must not be allowed to stall due to inconsiderate pricing and inadequate customer care strategies.

Security

The widely publicised security weaknesses in 802.11b must not be allowed to blight the sector, and provide an excuse for business to defer deploy. Security, and the integrity of personal data, must be an absolute given – particularly if users are going to be asked to provide personal financial details over these networks, in order to receive service. The market for bad news is extremely ripe in 2003.

Market Perception

The excitement of WLANs needs to be communicated to both business and consumer user groups. Rarely does a technology offer such an attractive combination of features and benefits: Low cost, high bandwidth; easy to install; standards already in place; wide equipment availability & a user enthusiasm that is bound to spread. Last Mile WLANs and Public Hotspots offer a unique opportunity to cost effectively distribute broadband services on a wide scale – previously unknown to the industry. This message needs to be delivered to both the financial and business communities.

Standards, Technologies, Interoperability, frequency availability & Interference

Such issues, whilst being of prime importance to the industry, should only be aired and resolved internally (to the industry). A professional benefits-driven face needs to be shown to the outside world. Too often in the short history of broadband wireless, have the technical/regulatory challenges overshadowed the final goal, with investors, customers and end-users feeling drowned in the detail. Clarity in communication, and confidence in presentation, is a must for this industry to blossom.

Source: Juniper Research

Commercial Wi-Fi Hotspots

Juniper Research's aim in this report is to depict clearly the evolution of Wireless Local Area Network (WLAN) hotspot services, concentrating on those using 802.11 or Wi-Fi (Wireless Fidelity) technology and on the present and forthcoming market activities of the innovators in this field. Our interviews with many of the principal Wi-Fi hotspot service providers have been reconciled with published market data and existing industry analysis.

Market Projections

In the report we have provided six-year forecasts for the increase in the number of hotspots and their users. Worldwide numbers of hotspot users, and their associated revenues, are projected for six regions of the world, with breakdowns showing the numbers and revenues for 'heavy', 'regular', and 'occasional' users. Heavy users are business people/travellers and early adopters on the more expensive monthly price plans, while regular users subscribe to a less expensive monthly plan or to a higher-priced pay-as-you-go tariff. Occasional users are those on the lower-priced pay-as-you-go plans. We also project the numbers of hotspots themselves and the revenues associated with them, according to geographic regions and venue type.

Sector Focus

We examine the different markets for public hotspots, including the travel, hotel, conference, and restaurant/café sectors, and consider partnerships between various types of player involved in the fledgling hotspot industry. We note hotspot deployments around the world, comparing and contrasting the pricing strategies of several hotspot operators, as well as looking at the issues related to interoperability: in particular, roaming and billing. Wi-Fi applications, such as Voice over WLAN, are discussed, as are hotspots located on various modes of transport (aircraft, ships, trains, and cars).

Wi-Fi Chipsets, Equipment & End-User Devices

In this report, Juniper Research aims to give a clear picture of the evolution of Wireless Local Area Network (WLAN) equipment and end-user devices, concentrating on 802.11 or Wi-Fi (Wireless Fidelity) technology and on the present and forthcoming market activities of the innovators in this field. Our interviews with many of the principal Wi-Fi equipment players have been reconciled with published market data and existing industry analysis.

Market Projections

We have provided six-year forecasts in the report for Wi-Fi chipsets, equipment shipments, and equipment in use. Worldwide chipset shipments are projected, according to the various 802.11 technology standards, as are chipset prices and revenues. We forecast worldwide shipments of wireless Access Points and end-user devices, as well as end-user devices split by type (personal computers (PCs), notebooks/large Tablet PCs, personal digital assistants (PDAs)/small Tablets, and smartphones). The split between shipments of Wi-Fi adapter cards and integrated wireless-enabled devices is forecast, as are shipments of Wi-Fi equipment, split both by 802.11

standard and by geographic regions. Our projections also cover growth in the use of mobile/nomadic Wi-Fi devices by region, both for all devices as well as for notebooks/large Tablets, PDAs/small Tablets, and smartphones.

Sector Focus

In considering the activities and strategies of the major players in the Wi-Fi equipment industry, we have paid particular attention to those of the mobile/cellular telephone operators and the positioning of Wi-Fi relative to Third Generation (3G) phone services. In addition, the issue of security, seen as one of the main challenges to the spread of Wi-Fi, has been examined in detail, as has the rise of systems designed to manage the deployment of Wi-Fi infrastructure. Profiles are included of some of the key Wi-Fi microelectronics manufacturers, as well as suppliers of Wi-Fi technology and end-user equipment.

About Juniper Research

Juniper Research is a UK based provider of business intelligence. Our overriding goal is to provide our clients with a reliable source of quality research, analysis and forecasting. In a highly complex and diverse market, Juniper aims to provide a high degree of clarity and precision, whilst remaining pragmatic in our conclusions, recommendations and forecasts.

Experience and Professionalism

Our analysts are all experienced professionals within their areas of expertise, and provide a reliable and balanced approach to technology and market assessment. The sectors covered by Juniper Research include: Broadband Access; Content & Applications; Cable; Digital TV; DSL; Fibre Access; Fixed Wireless; Free Space Optics; Mobile Access, Content & Applications; Mobile Devices; Mobile Internet; Ultra-wide-band; Wireless LAN; Wireless Personal Area Networks.

Strategic Reports

Our reports are designed to be quickly absorbed by both the technical and non-technical reader and are written in a user friendly style, whilst retaining detail and depth. We appreciate that time is a scarce commodity, and therefore provide an easily referenced format that clearly highlights the key points and issues raised within each chapter. Our reports offer a rich mix of graphics, illustrations, technology roadmaps and tables, and are presented in full colour. All printed reports are bound in a hardback cover, whilst CD-ROMs are professionally produced with easy to navigate menu systems.

For Further information, please visit our web site at: www.juniperresearch.com or contact: Michele Ince at: micheleince@juniperresearch.com

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