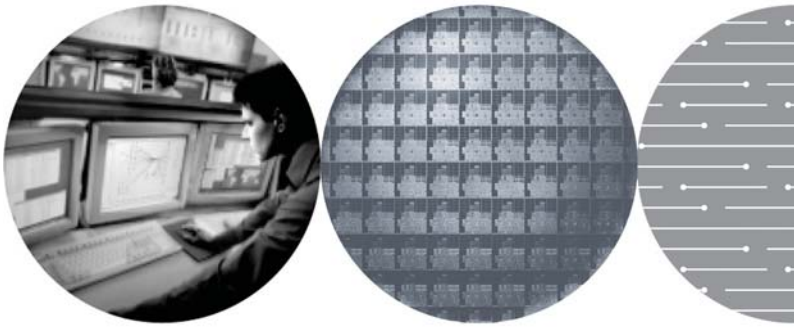
Intel in Communications

Case Study: Zamora

Spain scores world first with public wireless Internet

Solution Summary	World-leading public wireless Internet service being piloted in Zamora, Spain, with the potential to be expanded to 200 cities across Europe during the next three years. Range at 11 Mbps (typical)
Industry	Wireless Internet
Company Profile	Wireless and Satellite Networks (WSN) is a start-up WiFi network operator based in Madrid, Spain, which runs the newly-launched Afitel broadband wireless service.
Challenge	To adapt 802.11 technology for use across towns and cities so that WiFi enabled devices can be used to access the Internet anywhere any time reliably and at an affordable price.
Solution	Some 200 Intel access points currently installed, of which 40 provide transport and distribution capacity, while 160 deliver end-user access. Servers and middleware process, authenticate and filter end users for security.
Products	Intel® PRO/Wireless 2011B LAN Enterprise Access Point Intel® 13.9 dBi, 2.4 GHZ Yagi Antenna Kit Intel® 5 dBi In/Outdoor Drop Omni 2.4 GHz Antenna Intel® PRO/Wireless 2011B LAN PC Card Intel® PRO/Wireless 2011B LAN USB Device
Benefits	Cheapest commercial broadband Internet access – almost half the cost of dial-up and many times its speed. Well above 3,000 subscribers expected for first year in Zamora. Service enabled thanks to excellent price performance of Intel access points and first class Intel service and support.



Business Challenge

Wireless and Satellite Networks (WSN) is a WiFi (Wireless Fidelity) network operator based in Madrid, Spain. The company was set up in March 2000 with the aim of becoming a pioneer in WiFi technology and services. WSN began operating in 2001 and by September of that year had set its main goal at designing a viable technical and economic solution for a public WiFi network.

As a small start-up, WSN had around a dozen people at its Madrid headquarters in Spain by September 2002, and another half dozen employees based in the town of Zamora, in the Castilla y Leon region.

The WSN service, Afitel, provides Internet access in a similar way to a traditional ISP. However, unlike an ISP, in addition to connectivity, WSN also provides the means of accessing the network through its access points. These act as a substitute for the dial-up phone lines, modems and other telecoms infrastructure that are not part of a conventional ISP's business.

WiFi development

WiFi has been around for some time for use as a wireless extension to LAN technology using the 802.11 protocol to broadcast the Ethernet over radio waves. Initially, it was used in offices to provide employees with the ability to communicate with corporate LANs using mobile devices.

Next came the introduction of public WiFi services at "hot spots" such as cafes and airports allowing people to keep in touch while away from home or office using WiFi enabled mobile devices. However, this type of service proved less popular than was originally anticipated.

Access anywhere

"The real compelling proposition is Internet access from anywhere, whether the place is public, private, home, office, street, park, town hall or shopping mall," says Manuel Maese. This is the thinking behind WSN's world-leading public wireless Internet service currently being pioneered in Zamora – the world's first "hot city." Subscribers to Afitel in Zamora can now use WiFi enabled devices to access the Internet wherever and whenever they require – any place, any time.

"There were very good synergies with Intel Strategically, Intel is committed to promoting WiFi networking because this creates the market conditions in which there is a demand for the WiFi-enabled devices that Intel provides."

Manuel Maese,
Director of Corporate Development Strategy at WSN

Afitel is targeted at the general consumer market and is proving extremely popular, exceeding all WSN's initial expectations. Within the first month, some 352 customers have signed up – more than double the number WSN had forecasted.

Wireless Solution

Trial network

In January 2002, WSN announced its intention to enable Zamora to become a wireless town as a pilot for the whole of Spain. With 70,000 inhabitants, Zamora is a good size for a trial. Moreover, Zamora's local government provided strong support and encouragement for the project, giving WSN full permission to build the trial network.

WSN's aim was initially to set up some 200 access points around the town that would provide the WLAN service (to be increased to almost 400), propagating the radio signals to WiFi-enabled devices such as laptop computers, personal digital assistants (PDAs) or indeed any PC computer in the home or office. In the future, a WLAN network like this will be particularly interesting to computers featuring the upcoming Banias processor, which combines WiFi functionality with the power and performance of conventional Intel microprocessors.

After reviewing the market and evaluating a number of potential access point solutions, WSN selected Intel as its supplier of choice. As a leading player in the WiFi market already, Intel seemed an ideal fit with WSN from a technical and business perspective. Intel has already developed a wide range of WiFi drivers and utilities for clients along with adaptors used in PCMCIA cards, USB hubs and other items.

For the Zamora project, Intel's access point technology offered a very high level of price performance, but in addition to this, WSN was confident that Intel would provide the service and support it needed in establishing an innovative and pioneering network. "The decision turns out to have been very well-judged," Manuel Maese says. "Intel has been extremely supportive from a business and service point of view, as well as, providing a highly effective technological solution."

Technology

Intel Access Points

- Intel® PRO/Wireless 2011B LAN Enterprise Access Point
- Intel® 13.9 dBi, 2.4 GHZ Yagi Antenna Kit
- Intel® 5 dBi In/Outdoor Drop Omni 2.4 GHz Antenna
- Intel® PRO/Wireless 2011B LAN PC Card
- Intel® PRO/Wireless 2011B LAN USB Device

Deployment

"Intel showed a great willingness to help. It's not every day you try to adapt a technology designed for an office to cover a whole city."

Manuel Maese,
Director of Corporate Development Strategy at WSN

First network deployment began in March 2002. Intel access points are used throughout the town, providing both the access (customer) layer and the transport/distribution layer (to/from the backbone). Of the 200 Intel access points installed, 20 per cent provide transport and distribution capacity, while 80 per cent provide end-user access. Behind the scenes are servers equipped with Bluesocket middleware to process, authenticate and filter the end users for security. This set-up will be replicated in each town or city where the service is implemented.

Three months after initial deployment, in June 2002, first customer trials began and by September, Afitel was ready for full commercialization. Tariffs were set at 9.90 euros per month for unlimited access to the Internet. Manuel Maese says: "We are offering the cheapest commercial broadband Internet access service – almost half the cost of dial-up and many times its speed."

By the end of the month, Afitel had signed up more than 350 customers, compared with the 150 it had anticipated. "We seem to be running way ahead of our targets," says Manuel Maese. "It would appear likely that we will comfortably exceed the goal of 3,000 customers in Zamora we originally set for the first year of operation."

Partnership and collaboration

"Strategically, Intel is committed to promoting WLAN networking because this creates the market conditions in which there is a demand for the WLAN-enabled devices that Intel provides." Manuel Maese

A key reason for Intel's interest in WLAN networks is its Banias processor, which is intended to become a key platform for laptops and ultimately even desktop computers as they move towards wireless technology. "The Banias processor will be a tremendous advantage for services like Afitel because users won't have to buy a special USB hub device or PCMCIA card," says Manuel Maese.

Overall, the strategies of Intel and WSN overlap in a useful way, and the two companies share network goals. "It's a strategic tie-up," says Manuel Maese.

Supportive approach

Another benefit WSN has found in working with Intel has been the company's strong co-operative and supportive approach. "Intel has been a great co-operator in the development of the Zamora network, for example by helping us with the deployment and ensuring the access points worked as effectively as possible," Manuel Maese says.

"Intel showed a great willingness to help. It's not every day you try to adapt a technology designed for an office to cover a whole city." WSN has learned a huge amount through its trials, and has experimented with three or four different network topologies until it found one that really works. For example, working with Intel it discovered that costs could be reduced by combining routing capabilities with transport capabilities within a single access point using the WiFi protocol.

Customised products

WSN has effectively customised the Intel access points in order to meet its network requirements. "We call it the 'Wirelator'", says Manuel Maese. "It's like a souped-up access point that can do radio access transmission and transport transmission, connecting one access point to another and all of them to the backbone of the network. In the next development stage, WSN and Intel plan to enhance the functionality of the product, adding new service features that would make the Wirelator the most suitable solution for public WLAN networks. This is an example of the relationship we have."

"This network architecture provides backbone transport capacity in a very economical way, and improves the network reach with enhanced coverage," Manuel Maese says. "The Wirelator access point could be of interest to potential Intel customers, if it goes ahead as a commercial product."

The result will be more powerful access points built around the 802.11 standard, of which fewer are needed to cover a whole city. This enables WSN to connect each access point to the backbone at a much lower cost, which allows WSN offer its Afitel service at very attractive prices. "Intel's disposition is very positive, helpful and supportive in this area," Manuel Maese says. "The Intel team in Spain should be praised because they really have pulled out all the stops on this project."

He acknowledges Intel's significant contribution to the success of the Zamora project. "WSN and Afitel is the first public WLAN project in Europe and it is very big. WSN offers universal Internet access using Intel's wireless product family."

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Director of Corporate Development Strategy at WSN

Future

WSN's first network development stage is to service the entire town of Zamora providing as extensive coverage as possible. The next stage will be to increase the density of the service, building a higher level of capacity within the area. For example, an area that currently has one access point might end up with six.

In addition, the idea is to extend the service to other cities across Spain and other European countries during the coming months. The first Spanish regions likely to receive the service include Cataluña, Madrid, Levante, Castilla La Mancha, Navarra/Le Rioja and Andalusia.

"Our plans are to deploy in more than 200 cities using over 180,000 access points from Intel, which will be used to give wireless Internet access to in excess of one million users in the next three years," Manuel Maese says.

In the future, WSN aims to be the enabler of a wireless Internet ecosystem, where providers of value added services market a range of new products to an increasingly mobile customer base.

Looking to the Future

- It is possible to use 802.11 technology to deliver a city-wide service that for people with WiFi-enabled devices to access the Internet anywhere, any time, whether it be at home, work or in public places.
- With more than twice the 150 new subscribers expected for the first month of service, Alfitel looks set to comfortably exceed its 3,000 target customers in the first year in Zamora.
- In addition to supplying leading edge wireless technology Intel delivered an excellent level of service and support. For WSN, it was Intel's willingness to collaborate that was most important.
- Such a collaborative approach can lead to the development of exciting new products that offer potential for commercial exploitation by both partners. The development of the enhanced and more powerful access point is a good example of this.
- Based on the Zamora experience, it seems that there will be huge demand for devices based on the Banias processor from Intel with its built-in WiFi functionality and high performance.

For more information, visit the Intel web site at: developer.intel.com