Macedonia Achieves Communications Milestone by Launching the First National Wireless Broadband Network

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How Motorola's Canopy® platform is providing the wireless backbone that delivers high-speed wireless connectivity nationally to urban and rural areas alike.

Synopsis

Economic leaders worldwide are beginning to recognize that broadband Internet connectivity is as critical to an area's economic and educational development as other essential infrastructure such as roads, water and electricity.

Ironically, one of the first to build this essential infrastructure on a grand scale is a country best known for its civil unrest, not its forward-thinking economic development. Back in 2001, Macedonia, a former Yugoslav Republic, was in danger of being torn apart by a civil war. Today, with threats of its near-civil war a distant memory, its country is being united by communications. Specifically, it has built what is believed to be the first national wireless broadband network.

The progress in Macedonia stands as an example of how quickly a broadband wireless network can be built to deliver connectivity to an entire nation. In 2005, less than a year after the country issued an RFP for the deployment of a nationwide broadband network, more than 95 percent of Macedonia's population has the option of connecting to the Internet wirelessly. Already, Internet penetration in the country has jumped from less than 4 percent to 27 percent.

It is a success story that can serve as an inspiration to other countries that wish to help their citizens experience a better connected, more promising future.

FAST FACTS ABOUT MACEDONIA

Population
2 million (UN, 2003)

Capital
Skopje

Major Language
Macedonian, Albanian

Major Religion
Christianity, Islam

President
Branko Crvenkovski

Prime Minister
Vlado Buckovski

Life Expectancy
71 years (men),
76 years (women) (UN)

Monetary Unit
1 denar = 100 deni

Main Exports
Clothing, Iron and Steel

GNI Per Capita
U.S. $2,350 (World Bank, 2005)

Internet domain
.mk

International Dialing Code
+389

Source: BBC

The country has come a long way in just five years. Today, Macedonia serves as an example of progress that other developing countries can follow. Perhaps one of the biggest symbols of that success is its Macedonia Connects program, which achieved a big milestone in 2005: it deployed what is believed to be the world's first national wireless broadband network.

Just a few short years ago, the former Yugoslav Republic Macedonia was on the brink of civil war. In 2001, when rebel leaders put down their guns in return for a greater recognition of ethnic-Albanian rights, the whole country breathed a sigh of relief.

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Designed to provide the entire country with affordable high-speed wireless connectivity, the Macedonia Connects program's wireless broadband network today has made affordable Internet connectivity available to 95 percent of the country's population. Motorola's Canopy® platform is providing the wireless backbone that delivers high-speed wireless connectivity nationally to urban and rural areas alike.

An Education in Progress

Thanks to the Macedonia Connects program, Macedonia's 360 primary and 100 secondary schools now have high-speed Internet access, computer labs and trained IT teachers. In addition, two-dozen secondary school dormitories, 15 university faculties and another 15 local Educational Development Board offices also have connectivity, More than 1,000 businesses are also served by the network.

"To establish a national wireless network requires that at least 95 percent of a country's population has ready access to low-cost Internet connectivity," said Glenn Strachan, the director of the Macedonia Connects Project for the Academy for Educational Development (AED), the independent, nonprofit organization charged with managing the Macedonia Connects project. As the manager of the project, AED was the driver behind expanding the program beyond an education-only project into a nationwide development project.

"Wiring the schools created the springboard to full connectivity, and we knew from experience that this would produce a tremendously positive economic impact for Macedonia. In terms of Macedonia's relatively small land mass, which is about 25,333 square kilometers, we were able to conduct this cost-effective program on a national, rather than a pilot scale," Strachan added.

Recognizing the Need for Speed

While the deployment of the network took just a few months, planning for the project took several years. Early on, funds were secured from the United States Agency for International Development (USAID) in cooperation with the Ministry of Education and Science of the Republic of Macedonia.

Beginning in 2003, The Foundation Open Society Institute Macedonia and Metamorphosis undertook a study to examine the average citizen's access to information technologies in Macedonia. The reality was that Internet penetration in Macedonia was less than 4 percent, which lagged far behind other countries in Eastern Europe.

Leaders in Macedonia and at AED knew that improving the country's ability to access the Internet was vital to driving further economic development and delivering a high quality of education. So together they issued a request for proposal in December 2004. The goal was to select a vendor to support the expansion of broadband networking and Internet connectivity throughout Macedonia.

The RFP, which was drafted by Strachan, was neutral as to what technology should be used to support the project, stating that it would consider everything from wireless technologies to DSL and cable services.

The only real technical requirement outlined was that the broadband network "should meet a minimum standard of 128K upload and 512K download." Less than a year later, the wireless broadband network is delivering speeds of 512K on both the upload and the download.

On.net, a large Internet service provider in Macedonia, was selected to build the network using wireless technology. On.net designed

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Macedonia's country-wide wireless broadband network using the Motorola Canopy specification. In just three months, the ISP had built out the network across most of the country.

"Wi-Fi repeaters have been installed in 545 locations at schools, universities and local government offices to facilitate additional network connectivity to individuals and businesses," said Predrag Cemerikic, On.net's CEO.

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On.net has also been able to use the broadband platform it deployed for the schools to expand its existing broadband business.

Wireless Broadband: The Best Choice
Wireless was the logical choice for the Macedonia Connects Project, particularly given that Macedonia is a country filled with hundreds of remote villages. Relying on a broadband

wireless solution allowed the country to quickly reach its scattered population without laying expensive cables. In fact, the network actually uses Macedonia's mountain-filled terrain to its advantage, using these mountains as sites for its wireless antennas.

The network includes more than 170 access points located on 74 mountains across the country, reaching 36 cities and 170 villages throughout the Republic of Macedonia.

By using some creativity when designing the Canopy network, On.net was able to cover difficult locations more easily. "The Canopy access points have a very short latency, which allowed us to relay the signal from one access point to another to extend coverage to difficult-to-reach areas—without negatively affecting the quality of the signal," said Cemerikic. "This made it affordable to serve locations that were difficult to cover."

The Canopy network has also stood up well to the highly variable weather in the country of Macedonia. "We experience temperatures as high as 50 degrees Celsius in the summer and as low as -30 degrees Celsius in the winter," said Cemerikic. "We have all the rain and haze that you can imagine, and so far we have had no problem with the Canopy equipment."

Cemerikic also raves about the Canopy network's ease-of-installation. While only three of the company's more than 70 employees were actually trained on how to install the equipment, more than 28 employees now can complete installations. "All they have to know is to point it in the right direction and run Internet cable to the customer," Cemerikic said. "It's that easy."

On.net: A Canopy Success Story

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The Macedonian-based Internet service provider On.net was founded in the year 2000 with $500,000 in capital by two local entrepreneurs, with funding from a U.S. venture capital company. On.net is a telecommunications success story - the company recently sold a 76 percent share to Telekom Slovenije for $9 million.

But the road to success hasn't been an easy one for On.net. When the company first launched, On.net—like all the ISPs in the country—was required to run its last-mile connections through the incumbent operator.

The process of privatizing telecommunications in Macedonia began to pick up steam in 2000, and regulations slowly began to change. On.net was exploring the possibility of building out its own network but was in no hurry—until the incumbent operator decided to change its pricing model in July of 2004. The pricing change made On.net's broadband pricing extremely non-competitive, and On.net lost nearly all of its residential clients almost overnight.

Fortunately, On.net had already ordered a demo kit of Motorola's Canopy technology, and it immediately switched many of its most valuable business customers to the Canopy network. When it became clear that these customers were satisfied with the change, On.net ordered more than 100 new access points and converted all of its remaining customers to the Canopy network.

Today, On.net boasts a 40 percent market share in the business market, with more than 1,500 business customers paying the equivalent of $80 to $270 per month, depending on speeds delivered—a price that includes not only Internet access but also services such as Web hosting. The company also delivers voice over IP (VoIP) service across the Canopy network to more than 50 percent of its business customers. And the company continues to grow quite quickly. In fact, it has doubled its client base in each of the last few years.

Success Leads to More Success

The company's proven success gave it an advantage when applying for the Macedonia Connects grant, which was put out for bid in December 2004. On.net won the contract for the project in May 2005, and Cemerikic credits the win to the company's significant experience and its use of the market-proven Canopy technology.

"Given our extremely positive experience with the Canopy network, we suggested using the Canopy wireless broadband technology to cover about 500 schools across the country," said Predrag Cemerikic, On.net's CEO. "This proposal gave us an advantage, because we were offering a product that we had already been operating for six months."

On.net recently began targeting the residential market once again—this time using Canopy Lite equipment. The lower cost of the Canopy Lite product makes it possible for On.net to subsidize the end user equipment. This is critical to driving adoption with Macedonian residents, who bring home just $250 to $300 in salary each month, Cemerikic said. On.net's goal is to eventually serve more than 10,000 home users with broadband and IP voice services.