Case Study: NETGEAR ProSafe* Access Points
Making Wireless Work for Small-Medium Businesses (SMBs)

Summary
What will it take for Small-Medium Businesses (SMBs) to jump on the wireless bandwagon? Lower costs? Ease-of-use? Better security? Stable standards?

All of the above, says NETGEAR*. With the introduction of its new ProSafe* WLAN product line, NETGEAR offers enterprise-quality wireless computing that meets the ease-of-use, quality, reliability, performance and affordability requirements of the SMB segment.

NETGEAR designed the ProSafe product line around a single processing architecture platform: Intel® IXP4XX network processors. The IXP4XX product line combines a high-performance Intel XScale® core with integrated Network Processing Engines (NPEs) to enable rich application features such as security while achieving wire-speed packet processing performance. The consistent architecture of the IXP4XX family gives NETGEAR the flexibility to scale their solution for the SMB segment while maximizing performance and keeping development costs low.

This case study takes a closer look at the newest members of the NETGEAR ProSafe product line—WG302* and WAG302*—and the Intel® IXP422 network processor that powers these enterprise-quality access points for SMBs.

Background: When Will SMBs Go Wireless?
The potential benefits of wireless computing are many: flexibility, scalability, lower Total Cost of Ownership (TCO), enhanced productivity, better communication, improved access, and so on. So why haven’t more businesses signed on? Especially the SMBs that could truly benefit from a more cost-effective, simplified infrastructure?
NETGEAR offers three possible reasons. Troubled by a poor economy and an uncertain future, many businesses — small and large alike — have postponed major technology enhancements. Some have expressed confusion about evolving wireless standards, not knowing whether 802.11a, b, or g will be the “right” protocol for their environment. Others have raised legitimate questions about wireless security: Can wireless networking be just as secure as wired?

Fortunately, the economy is improving. Newer wireless products support multiple protocols, so businesses can adopt WLAN technology without worrying whether they have selected the “right” standard. And with the recent publication of the Wi-Fi Protected Access (WPA) standard — and soon to be published IEEE 802.11i specification — the industry has provided a mechanism for security in wireless that compares favorably to wired alternatives.

With these issues resolved, NETGEAR believes that now is the time for SMBs to go wireless — in a big way. What’s needed are WLAN products that meet the new security standards, delivering enterprise-quality features in an easy-to-use, reliable, high-performance, low-cost package.

**The Challenge:**
**Scaling to Fit SMBs**

Developing products for the SMB segment is always a challenge. These businesses want — and need — many of the same features available in enterprise solutions. Yet products designed for larger computing environments rarely work for smaller networks. High costs and product complexity don’t square with the constrained resources — both budget and staff — of the typical SMB.

To facilitate the technology shift to wireless in the SMB segment, vendors must find ways to scale enterprise-class solutions down to size. According to NETGEAR, the wireless “must-haves” for the SMB environment include:

**Security:** With little time for oversight, SMBs require strong, low-maintenance security to protect their valuable data and infrastructure. The new WPA standard meets these needs. WPA provides enhanced data encryption through Temporal Key Integrity Protocol (TKIP) and user authentication through 802.1x and Extensible Authentication Protocol (EAP), as well as all of the benefits of the original Wired Equivalent Privacy (WEP) specification used in first-generation wireless products.

**Ease of use:** Wireless systems must be easy to install, manage, adapt and scale to provide the flexibility and low TCO promised by wireless technology. With few staff resources available, SMBs look for solutions that require minimal attention.

**Compatibility:** Standards-based products enable SMBs to preserve existing infrastructure while migrating to new technology without requiring “forklift” upgrades.

**Enterprise-level features:** Just like their large-scale counterparts, SMBs need versatile, feature-rich networks to enhance productivity. Desired features include: Virtual Private Network (VPN) capability, advanced security (WPA), and advanced management.

**High performance/bandwidth:** Productivity and usability depend on maximum performance and bandwidth. No matter what other efficiencies might be gained, no business will move backwards to slower technology. Wireless solutions are no exception.

**Low TCO:** To justify the expense of adopting a new technology like wireless, the long-term TCO must be significantly lower than the wired alternative. Long-term product warranties, ease-of-use, flexibility and scalability all contribute to low overall TCO.

**Key Decisions**

Sensing an imminent window of opportunity, NETGEAR jumped at the chance to build wireless solutions for the SMB segment. With proven experience and leadership in the Small Office/Home Office (SOHO) category, the company formed a new division dedicated to building enterprise-quality products for SMBs.

NETGEAR’s experience in the SOHO segment offered invaluable insight for the SMB project. To succeed, NETGEAR engineers had to find ways to scale up the performance and features of their new products while keeping design and development efforts to a minimum. By leveraging proven components and third-party development expertise, NETGEAR hoped to deliver a feature-rich WLAN product line that met the cost and usability requirements for the SMB segment. NETGEAR
engineers came up with several design criteria that would enable them to meet their end goals. The solution called for:

- High performance processing to support advanced security and other enterprise-level features
- Low/no-cost elements (e.g. “Free” Linux* OS) to reduce expenses
- Proven and validated components to minimize the design effort
- Design and development support from a third party ecosystem of component providers for fast time-to-market and lower development costs

The Solution: Intel IXP4XX Network Processors

WPA security and advanced management features set the new enterprise-class NETGEAR ProSafe WLAN access points apart from other SMB solutions. What’s more, scaling these features precisely into a package specifically for the SMB segment required the right combination of components and development ingenuity.

One important design decision made it all possible: choosing Intel IXP4XX network processors. NETGEAR needed a development environment that made it possible to easily incorporate the advanced management and security features, which they got with the Intel IXP4XX network processors. “In addition to meeting our needs for high-performance and scalability, Intel’s IXP4XX network processors gave us the advantage and flexibility to design one platform for the entire product line,” explains Stephen Tsai, Product Development Manager, NETGEAR.

NETGEAR selected the Intel IXP4XX network processor family for several reasons, not the least of which was the powerful Intel XScale® core and its associated Network Processing Engines (NPEs). “The NPEs really impressed me because we could offload functions from the Intel XScale core to get really high performance for encryption and other security features,” says Tsai. “It’s the best architecture for connecting 802.11 silicon and switching to on-board Ethernet MACs, all while providing integrated encryption acceleration, providing a scalable platform that fits neatly with our target segment and business objectives.”

By choosing one processing architecture for the entire product line, NETGEAR can leverage the design effort from the first two products for even greater cost savings and faster time-to-market on future products. “The Intel IXP422 network processor helped us get to the cost-performance level we needed for the small-medium business segment, and we can leverage that development effort for the rest of the product line,” says Tsai.

NETGEAR used the Intel IXP422 network processor in the first two ProSafe products: WG302 and WAG302 WLAN access points. It is used to manage 1-2 Atheros® 802.11 sub-systems while providing system-level integration and management. Included with the IXP422 NPU was Intel StrataFlash® memory, which worked with the integrated security acceleration to provide overall cost savings on the ProSafe Build-of-Materials (BOM), not to mention time savings on development and design work.

Although Intel is well known for providing technical and customer support, even NETGEAR was surprised. “I’ve been impressed by their commitment to meeting our needs. Because Intel has a worldwide engineering team that could work in conjunction with our Taiwan-based ODM, we had almost constant communication throughout design and development. It was almost like a 24-hour operation,” exclaims Tsai.

Because Intel works with a broad range of developers, “they had a long list of best-practices tips to offer our designers,” says Tsai. “They told us what to watch out for and how to optimize our solution based on the cumulative experiences of many, many engineers. Those tips were extremely valuable to our overall process.”

In addition, “Intel managed our entire third-party ecosystem – everything from the Linux OS, our software designer, our Taiwan ODM, and our wireless chipset vendor,” explains Tsai. “They did everything to make our job easier. I can’t even begin to estimate how much time they saved us, I just know it was significant.”
The Roadmap: NETGEAR and SMBs

Advanced security and management capabilities set the ProSafe product line apart from many competitive networking products. Priced comparably and backed by the company’s industry-leading 3-year warranty, ProSafe products offer ease-of-use, reliability, flexibility and affordability — all essential for the SMB segment.

NETGEAR plans to extend the line of ProSafe products to include additional access points. Future ProSafe wireless product plans include additional security enhancements, faster throughput and extended range, and forward-compatibility with coming wireless standards. With a dedicated team of product engineers, NETGEAR expects to be an early leader in wireless solutions for the SMB segment.

The long-term roadmap for Intel network processors is a big benefit to NETGEAR’s future plans. Intel shares its roadmaps with customers under NDAs to help vendors understand what future capabilities Intel network processors will support. Such advanced planning helps optimize performance and features while keeping development costs down.

Conclusion

Now that NETGEAR has delivered its new products, it may finally be time for SMBs to go wireless. The wireless ProSafe product line offers enterprise-quality features — including new WPA security — in an easy-to-use, flexible, affordable package.

Thanks to keen segment analysis and lots of wireless technology experience, NETGEAR’s new products fill a gap between large-scale and SOHO solutions. With help from Intel’s worldwide design and engineering team and the versatile, scalable Intel IXP4XX network processor family, NETGEAR achieved its design and cost objectives, as well as very fast time-to-market. Even the future is bright, with much of the design and development work already completed with the first platform.

Other developers take note. What might Intel do for you?

For More Information:

About NETGEAR ProSafe Access Points:
www.netgear.com

About Intel IXP4XX Network Processors:
http://developer.intel.com/design/network/products/npfamily

Additional case studies can be found at: